City of Ramsey
Agenda
Public Works Committee
Tuesday, October 19, 2021
5:30 pm
Lake Itasca Room, 7550 Sunwood Drive NW

1. Call to Order

2. Citizen Input

3. Approve Agenda

4. Approve Minutes

1. Approve the following meeting minutes.
1. Public Works Committee meeting dated September 21, 2021.

5. Committee Business

1. Discuss Potential Pedestrian Crossing at Hwy 47/142nd Ave

2. Consider Revised Cost Share Framework for Riverdale Drive Extension Improvement Project Related to Riverstone South; Case of Capstone Homes and Pearson Properties of Ramsey

3. Receive Sound Wall Request Letter from Residents East of State Highway 47, North of Xkimo Street

4. Consider Recommending City Council Authorization to Prepare Plans and Specifications for 2022 Pavement Management Program Projects.

5. Consider Recommending City Council Authorization for Flashing Yellow Arrow Study at the Intersection of Sunwood Drive and Ramsey Boulevard/CSAH 56

6. Committee/Staff Input

1. Receive Staff Updates on 148th Lane NW Cul-De-Sac and Easement Vacations

2. Review Final Northwest Metro Regional Surface Water Supply Study

3. Receive Staff Updates on Improvement Projects, Studies and Items of Interest

4. Review Future Topics Calendar

7. Adjournment

Public Works Committee **4. 1.**

Meeting Date: 10/19/2021
Submitted For: Grant Riemer, Engineering/Public Works
By: MaryJo Warner, Engineering/Public Works

Title:

Approve the following meeting minutes.
1. Public Works Committee meeting dated September 21, 2021.

Purpose/Background:

Purpose: To review and approve meeting minutes.
Background: Attached are the meeting minutes for review.

Timeframe:

5 minutes.

Observations/Alternatives:

n/a

Funding Source:

n/a

Recommendation:

To review and approve meeting minutes dated September 21, 2021.

Action:

Motion to approve meeting minutes dated September 21, 2021.

Attachments

Minutes

Form Review

Inbox	Reviewed By	Date
Grant Riemer	Grant Riemer	10/13/2021 03:40 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:38 PM
Form Started By: MaryJo Warner		Started On: 10/13/2021 09:12 AM
Final Approval Date: 10/14/2021		

PUBLIC WORKS COMMITTEE
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Public Works Committee conducted a regular meeting on Tuesday, September 21, 2021, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present: Chairperson Chris Riley
Councilmember Debra Musgrove
Councilmember Matt Woestehoff

Also Present: Public Works Superintendent Grant Riemer
City Engineer Bruce Westby

1. CALL TO ORDER

Chairperson Riley called the regular meeting of the Public Works Committee to order at 5:30 p.m.

2. CITIZEN INPUT

Councilmember Musgrove asked if there was a decision made to not hold Public Works Committee meetings virtually.

City Engineer Westby replied that the meeting was held virtually for a bit but has not been for about four or five months.

Chairperson Riley stated that typically staff would be aware if a resident had input to provide or an issue to discuss with the Committee. He stated that the meetings are open to the public and asked if Councilmember Musgrove had a concern.

Councilmember Musgrove stated that she did not but stated that perhaps it would be helpful to have the option open to residents.

3. APPROVE AGENDA

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to approve the agenda, as presented.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

4. APPROVE MINUTES

4.01: Approve July 20, 2021, Meeting Minutes

Motion by Councilmember Woestehoff, seconded by Councilmember Musgrove, to approve the following minutes:

Regular Meeting Minutes dated July 20, 2021

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Woestehoff and Musgrove. Voting No: None.

5. COMMITTEE BUSINESS

5.01: Consider Stop Sign Installation at Garnet St and 137th Lane

Public Works Superintendent Riemer reviewed the staff report and recommendation to not install additional stop signs at this intersection, based on the traffic counts and accident history. Staff would recommend that the trees located in the ROW be trimmed back to improve visibility.

Matt Blanchard resident, stated that he did not see a need to trim the trees further and wondered what the City Code states related to the required distance from the corner needed to provide visibility. He stated that it would be better to place the stop sign north/south rather than east/west as most of the traffic speeds coming into the development, not leaving the development. He stated that there are children at the intersection riding their bikes as there is a little library at the corner. He believed it would be safer to place stop signs. He stated that there has been a lot of money put into deciding whether to place a stop sign when installing a stop sign would not have a large expense.

Public Works Superintendent Riemer estimated about 150 feet would be needed to provide visibility when traffic is moving at 30 mph.

Mr. Blanchard stated that those trees do not even start until 75 feet from the corner, and he has the trees trimmed to see the intersection at 137th Avenue. He stated that trimming the trees further would impede upon his privacy. He believed that it would be safer to place a stop sign. He noted that if the trees are trimmed there would still be an issue with vehicles traveling too fast and not stopping. He stated that he has lived in his home for nine years and the trees have been mature throughout that time. He noted that there have only been two accidents during that nine-year period.

Councilmember Musgrove clarified the locations proposed by the resident for stop signs, which would stop north and south traffic. She also asked for clarification on the location of the little library.

Mr. Blanchard identified the location of the little library, which is on private property.

Councilmember Musgrove asked if there has been any consideration for a yield sign rather than a stop sign, or a crosswalk.

Public Works Superintendent Riemer replied that there has not been consideration to a yield sign.

Mr. Blanchard stated that perhaps if there were a sign for a crosswalk, traffic would slow, but noted that there are not sidewalks in that location so he was unsure that would make sense. He believed that a stop sign would be best.

Councilmember Musgrove stated that people become dependent on a stop sign as traffic control, but people do not always pay attention to that. She stated that in rural sections intersections with no control seem to work best as everyone has to pay attention. She asked for staff input on a yield sign.

Public Works Superintendent Riemer stated that he believes yield signs are ineffective. He noted that this is a urban section and therefore people should already be paying attention. He noted that stop signs would not be placed on Garnet because that is the larger road.

Mr. Blanchard stated that there is no control in place now. He stated that if there is a problem, that should be controlled with a stop sign rather than tree trimming. He commented on the high number of children riding bicycles in the neighborhood and stopping that traffic as it comes into the neighborhood would be helpful.

Chairperson Riley stated that he did not believe a yield sign would provide benefit.

Councilmember Woestehoff asked where the request was generated from.

Mr. Blanchard stated that he suggested the stop sign.

Chairperson Riley asked and received confirmation that the trees that would be trimmed are located in the right-of-way.

Public Works Superintendent Riemer stated that his concern would be that if there were an accident it could be mentioned that the trees should have been trimmed for visibility.

Mr. Blanchard acknowledged the comment that people do not always stop at stop signs, but stated that if they do not stop, they would be breaking the law.

Chairperson Riley commented that the number of trips and traffic counts would not support a stop sign. He noted that the speed threshold was also not met. He stated that there is another threshold that takes into account different circumstances such as hills or accidents and that threshold is not met. He stated that the City receives many requests for stop signs, but most do not meet the criteria.

Mr. Blanchard commented that a stop sign would make the neighborhood safer. He stated that a stop sign was placed at the next intersection, and he was told that decision was political and therefore seems to be a situation of who you know.

Public Works Superintendent Riemer stated that his job is to provide the recommendation based on the criteria.

Mr. Blanchard stated that his opinion is that a stop sign would be safer than trimming his trees.

Councilmember Woestehoff stated that placing stop signs at these type of intersections often provides a false sense of security for pedestrians which is why the criteria were developed. He stated that he went through a similar situation when he requested a stop sign at Variolite and 161st because the criteria were not met. He stated that if the stop signs were placed, they would be placed on 137th and not Garnet and therefore the trees would still need to be trimmed and that would not solve that issue.

Chairperson Riley commented that the City has the responsibility to keep the right-of-way clean and if it is determined trees will need to be trimmed, that will be done to the minimal amount possible. He stated that in the issue of the stop sign, he does not believe it is warranted. He stated that the trees would still need to be trimmed within the right-of-way.

Mr. Blanchard continued to provide examples of visibility from his property. He was unsure why his trees would need to be trimmed when you can see to the corner.

Motion by Councilmember Riley, seconded by Councilmember Musgrove, to accept the staff recommendation to not install additional stop signs at 137th Lane/Garnet St. based on the traffic counts and accident history and that trees located in the ROW be trimmed as little as possible to improve visibility.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

5.02: Update on Street Light Request for Bear Park

Public Works Superintendent Riemer reviewed the staff report and recommendation to install a streetlight at 15500 Roanoke St (Bear Park) as requested by the residents in that area.

Councilmember Musgrove commented that she believes this is a good idea and was glad to see some responses were received back from residents.

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to accept the staff recommendation and move forward with installation of a streetlight at 15500 Roanoke Street (Bear Park).

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

6. COMMITTEE / STAFF INPUT

6.01: Staff Updates on Improvement Projects and Items of Interest

City Engineer Westby provided an update on current and proposed City improvement projects.

Public Works Superintendent Riemer provided an update on the water treatment plant process.

Chairperson Riley asked when the City would be looking at the road overlays proposed for 2022.

City Engineer Westby stated that staff is working on those preparations in order to tee up the proposed projects. He noted that cases will go before the City Council in the near future, assuming there would be funding. He stated that staff is also working on the updated CIP to bring before the Council and advised that those actions would come forward in similar timing.

Chairperson Riley stated that the CIP is smart and provided the best information at that time but also recognized that some streets have deteriorated faster than others and may need to move forward in a faster schedule.

City Engineer Westby asked if the Public Works Committee would like to review the draft CIP before the Council considered approving it.

Chairperson Riley stated that he did not see that as necessary and noted that staff has the information in order to make the best decision on the order of road repairs. He asked if the website tool showing when streets will be repaired will be updated when the CIP is updated.

City Engineer Westby confirmed that tool would be updated once the CIP is updated and adopted.

Chairperson Riley suggested that tool be placed in a more prominent location on the website.

City Engineer Westby provided an update on current and proposed County and MnDOT improvement projects and studies, and other items of interest.

Councilmember Musgrove stated that she would like to add a sound wall to the list of studies at the corner of Hwy 47 and CR 5. She stated that the residents in that area do not feel that the existing sound wall is helpful and did not meet the intent.

Chairperson Riley clarified that Councilmember Musgrove is stating that the wall was put in, but it is inadequate.

City Engineer Westby provided background information noting that the wall was constructed as proposed within the approved plans.

6.02: Review Future Topics Calendar

Chairperson Riley referenced the first item, Sunfish Lake sedimentation basin, which has been on the list for about the past six years.

City Engineer Westby stated that the intent was to get that going this year but there has not been contact from that resident and that was pushed down as there is not a great sense of urgency as compared to other items staff are working on. He noted that wetland mitigation would be required and therefore staff wanted to present costs to determine whether it would be a worthwhile project.

Councilmember Musgrove asked if that is a project that could be added to the watershed implementation plan list.

City Engineer Westby provided background information on the request and what that project would entail. He noted that the project would not provide water quality benefit.

7. ADJOURNMENT

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to adjourn the Public Works Committee meeting.

Motion carried.

The regular meeting of the Public Works Committee adjourned at 6:38 p.m.

Respectfully submitted,

_____

Grant Riemer
Public Works Superintendent

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

Public Works Committee **5. 1.**

Meeting Date: 10/19/2021

Submitted For: Grant Riemer, Engineering/Public Works

By: Grant Riemer, Engineering/Public Works

Title:

Discuss Potential Pedestrian Crossing at Hwy 47/142nd Ave

Purpose/Background:

Staff received an inquiry from a resident about the possibility of a pedestrian crossing at Hwy 47 and 142nd Ave. The resident assumed that a ped crossing was coming in the near future, because of the ADA ramps and pedestrian refuge area installed in the median. Staff reached out to MnDOT, as they have jurisdiction over Hwy 47, to ask what their plan was.for the crossing. There full response is attached to the case, but the next project planned for this area is 2027, at which time they could look at upgrading the intersection to include a ped crossing. At that time the city would make the final trail connection, if the ped crossing was approved and constructed by MnDOT.

Timeframe:

10 minutes

Observations/Alternatives:

Because of the traffic volume and speed in this area, staff feels this would not be a safe area for a ped crossing in its current configuration. The safer alternative at this time, is to cross at the signal lights either north or south of this location.

Funding Source:

N/A

Recommendation:

Staff recommendation would be to work with MnDot in 2027 to explore safe alternatives for a pedestrian crossing in this area.

Action:

Motion staff to work with MnDOT in 2027 to explore safe alternatives for a pedestrian crossing at Hwy 47/142nd Ave

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Attachments

MnDot Response

Form Review

Inbox	Reviewed By	Date
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:39 PM
Form Started By: Grant Riemer		Started On: 10/13/2021 12:38 PM
Final Approval Date: 10/14/2021		

Grant Riemer

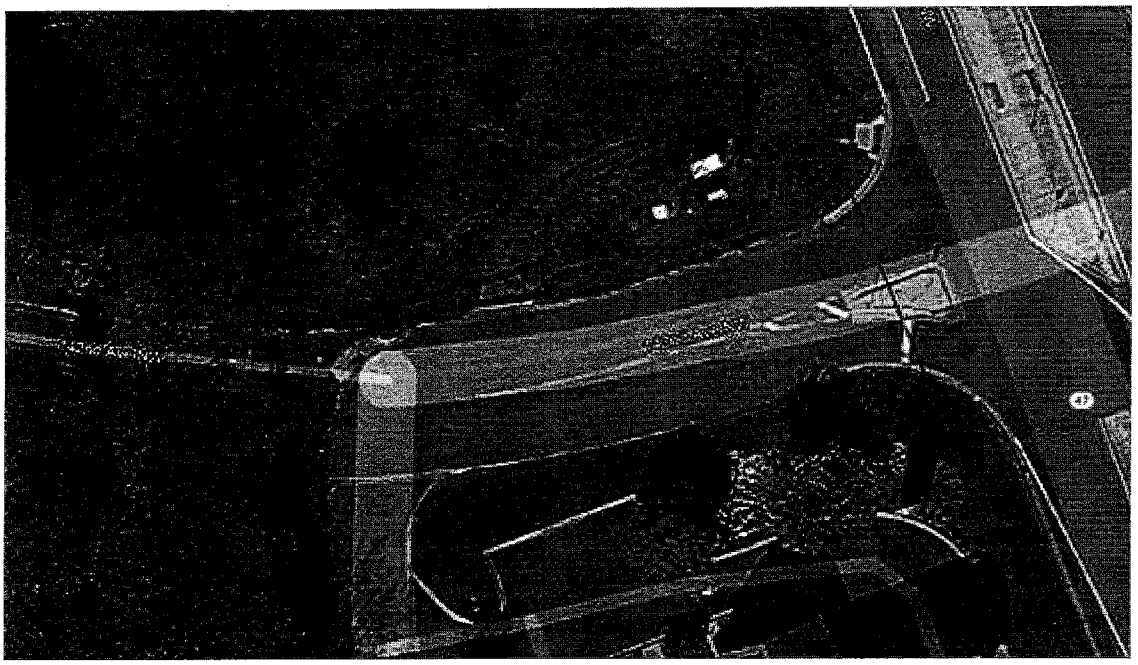
From: Wiltgen, Jennifer (DOT) <jennifer.wiltgen@state.mn.us>
Sent: Wednesday, September 15, 2021 10:54 AM
To: Bruce Westby
Subject: RE: Question re: crosswalk improvements at Hwy 47 and 142nd Ave

Good Morning Bruce,

My apologies for the delayed reply. I was checking on a few things.

At this time we just have an accessible crossing on the North Side of the intersection but no marked crosswalk. The situation is a bit more complicated with the median, free right and the left-in. We may need to reconfigure the intersection if we wanted to add crosswalk improvements. Our next planned project is in 2027, so we can add it as a need in scoping and take a closer look at it.

Also- does the city have any plans to make the connection illustrated below? If so- 2027 may be a good time to look at that connection as well.



From: Bruce Westby
Sent: Monday, September 13, 2021 8:53 AM
To: Wiltgen, Jennifer (DOT)
Subject: Question re: crosswalk improvements at Hwy 47 and 142nd Ave

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Good morning, Jennifer.

Public Works Committee **5. 2.**

Meeting Date: 10/19/2021

Submitted For: Sean Sullivan, Community Development

By: Sean Sullivan, Community Development

Title:

Consider Revised Cost Share Framework for Riverdale Drive Extension Improvement Project Related to Riverstone South; Case of Capstone Homes and Pearson Properties of Ramsey

Purpose/Background:

The purpose of this case is to consider a revised Cost Share Framework for the Riverdale Drive Extension related to the Riverstone South Subdivision.

The need for this project is being driven by a development proposal known as Riverstone South by Capstone Homes located on property owned by Pearson Properties of Ramsey on the south side of Highway 10. That being said, the project has a broader benefit for Highway 10 Safety/Congestion and the Bowers Drive Neighborhood.

This topic was last discussed in January 2021 by the Public Works Committee and City Council. Direction was to refine project costs and to explore grant opportunities and other funding sources to help fund the City portion of the Riverdale Drive project and the $350,000 tree preservation credit to Capstone Homes. The Ramsey HRA fund is a viable fund for Riverdale Drive project but cannot be used for the tree preservation credit.

Deputy City Administrator Gladhill explored potential grant opportunities to help with the tree preservation credit and was unable to find a viable grant for the tree preservation credit. The City of Ramsey did not receive the $1.25M MnDOT Local Road Improvement Program (LRIP) grant for Riverdale Drive it applied for under the framework approved in January. However, the City did apply for a MnDOT Local Partnership Program (LPP) Grant of $710K and was awarded $612K which can only be used for the construction of Riverdale Drive; not the tree preservation credit.

Below is a summary of topics and new information for discussion as part of the revised framework attached. Additional detail is included in the attached presentation and attachments.

- Developer/Owner object to contributing to the construction of off-site improvements (County Parcel, Bowers Drive) and PWC and City Council agreed to this in the past framework
- Acquisition/repayment of previous funding for the County Parcel (RALF and Anoka County) will be required for ROW purchase
- Planning Level Layout has been adjusted slightly and continues to be adjusted slightly to maximize development potential.
- Construction cost estimate for Riverdale Drive and related improvements have been updated and is $1,706,000
- The estimated cost for acquisition of the ROW needed for Riverdale Drive from Anoka County has been reduced from $950K to $283K.
- Estimated City of Ramsey total Contribution for Riverdale Drive and Tree Preservation is reduced from $1,025,520 to $1,018,486
- The City was unsuccessful in receiving the MnDOT LRIP Grant ($1.25M)
- The City applied for a MnDOT LPP Grant ($710K) and received a $612K award
- A solution for payment of the tree preservation credit of $350K to Capstone includes combination of HRA ($240K) and PIR Funds ($110K)

Timeframe:

30 minutes.

Observations/Alternatives:

Assessment Method

All parties involved have verbally agreed to a split of the assessment between Capstone's residential development and the Pearson's future commercial/industrial development along Highway 10. The assumption is that all parties will agree to these terms in a future Assessment Agreement that eliminates any risk and/or liability from deviating from the 'net developable acreage' method of assessment used on Puma Street on the north side of Highway 10. Capstone and Pearson's have a separate agreement to allocate special assessments that is based on lineal front footage along each property (outlined on Revised Cost Share Framework).

City Contribution to Collector Road

The January 26, 2021 approved framework is attached along with minutes from Public Works Committee and City Council for additional detail.

A key component to the success of this project is obtaining grant money and identifying eligible funding sources for the City contribution to this project. Resolution #21-101 directed staff to explore grant opportunities and other funding sources to reduce the City contribution to the project. The MnDOT LPP Grant, City of Ramsey HRA Funds, MSA Funds and City of Ramsey PIR Funds are eligible funding sources for the City contribution to this project. This project is listed in MnDOT and Anoka County's 2014 Highway 10 Access Planning Study, and the City's 2019 Ramsey Gateway Study.

A portion of the full Riverdale Drive project is located on real property owned by Anoka County. This corridor was originally planned for a river crossing across the Mississippi River to the City of Dayton. At this time, Anoka County does not have funding available to contribute to this project (Riverdale Drive Extension). As such, Anoka County has offered that the City can purchase the ROW needed for the construction of Riverdale Drive. This would not be a County Road - it would be a local City Street. The cost for this ROW is estimated to be approximately $283K.

As a sidebar, the City still desires to plan for a river crossing, the alignment simply has changed to coincide with Armstrong Boulevard. MnDOT is currently leading a study on the feasibility of this river crossing.

Total Assessment Amount and Preliminary Assessment Amount

Attached to this case is a detailed breakdown of the proposed Cost Share Framework.

Timelines

Capstone Homes has their schedule for subdivision approval for Riverstone South by the end of 2021 with construction to commence in 2022. If the City Council is comfortable with the proposed revised cost share agreement, this timeframe is feasible. The City Council could consider a higher contribution with traditional funds or introducing an eligible Tax Increment Financing (TIF) economic development project on the commercial/industrial parcels along Highway 10. This would extend the desired timeframe.

At the end of the day, the City is not obligated to contribute to any portion of this project at any given time, although there would be value in doing so. Staff has negotiated with Capstone and the Pearson's and has presented a viable funding solution.

Future Discussions

This case is intended to provide a recommendation to City Council for policy direction. Next steps including, but not limited to, approval of Assessment Agreement(s), authorization to prepare plans and specifications, approval of plans and specifications, and award of construction contracts, all of which will provide additional levels of detail.

The intent of this step is to confirm the revised Cost Share Framework or to develop another course of action.

Alternatives

Alternative 1 - Recommend that the City Council approve the **REVISED** Cost Share Framework including Tree Preservation, including the City contribution to the County Property, updating planned grant fund revenue and ROW acquisition cost.

Alternative 2 - Recommend that the City Council approve the **REVISED** Cost Share Framework w/o Tree Preservation, including the City contribution to the County Property, updating planned grant fund revenue and ROW acquisition cost.

Alternative 3 - Direct Staff, the Pearson's and Capstone to continue negotiations.

Alternative 4 - Something else.

Funding Source:

The proposed funding for this project is proposed to be a combination of City Contributions (HRA and PIR), Grant Funds and Developer Assessments as outlined in the Revised Framework. The funding solution presented by staff uses a combination of HRA Funds and PIR funds to satisfy the $350K tree preservation credit to Capstone. As it pertains to the City's Cost Share (Municipal Contribution to Collector Road + Assessment Amount for Ownership of Real Property), several funding sources are available below if a different structure is desired.

1. City's Public Improvement Revolving (PIR) Fund (generated from local property tax revenue)
2. Anoka County Redevelopment Authority (ACHRA)
3. State of Minnesota Municipal State Aid (MSA) Account
4. MnDOT LPP Grant ($612K received)
5. Tax Increment Financing (for qualifying projects in the Commercial/Industrial District) (could delay project)

If ACHRA funds are to be used a Resolution requesting the use of funds will need to be submitted to the ACHRA.

Recommendation:

Staff has worked hard to bring forward a creative solution to fund the Riverdale Drive Extension and tree preservation credit that utilizes MnDOT Grants, Ramsey HRA funds and PIR funds. This project will open up more land for residential and commercial/industrial development and increase safety for existing and future Ramsey residents and businesses.

Staff recommends the following:

Alternative 1 - Recommend that the City Council approve the **REVISED** Cost Share Framework including Tree Preservation, including the City contribution to the County Property, updating planned grant fund revenue and ROW acquisition cost.

Action:

Based on Discussion

Alternative 1 - Recommend that the City Council approve the **REVISED** Cost Share Framework including Tree Preservation, including the City contribution to the County Property, updating planned grant fund revenue and ROW acquisition cost.

and;

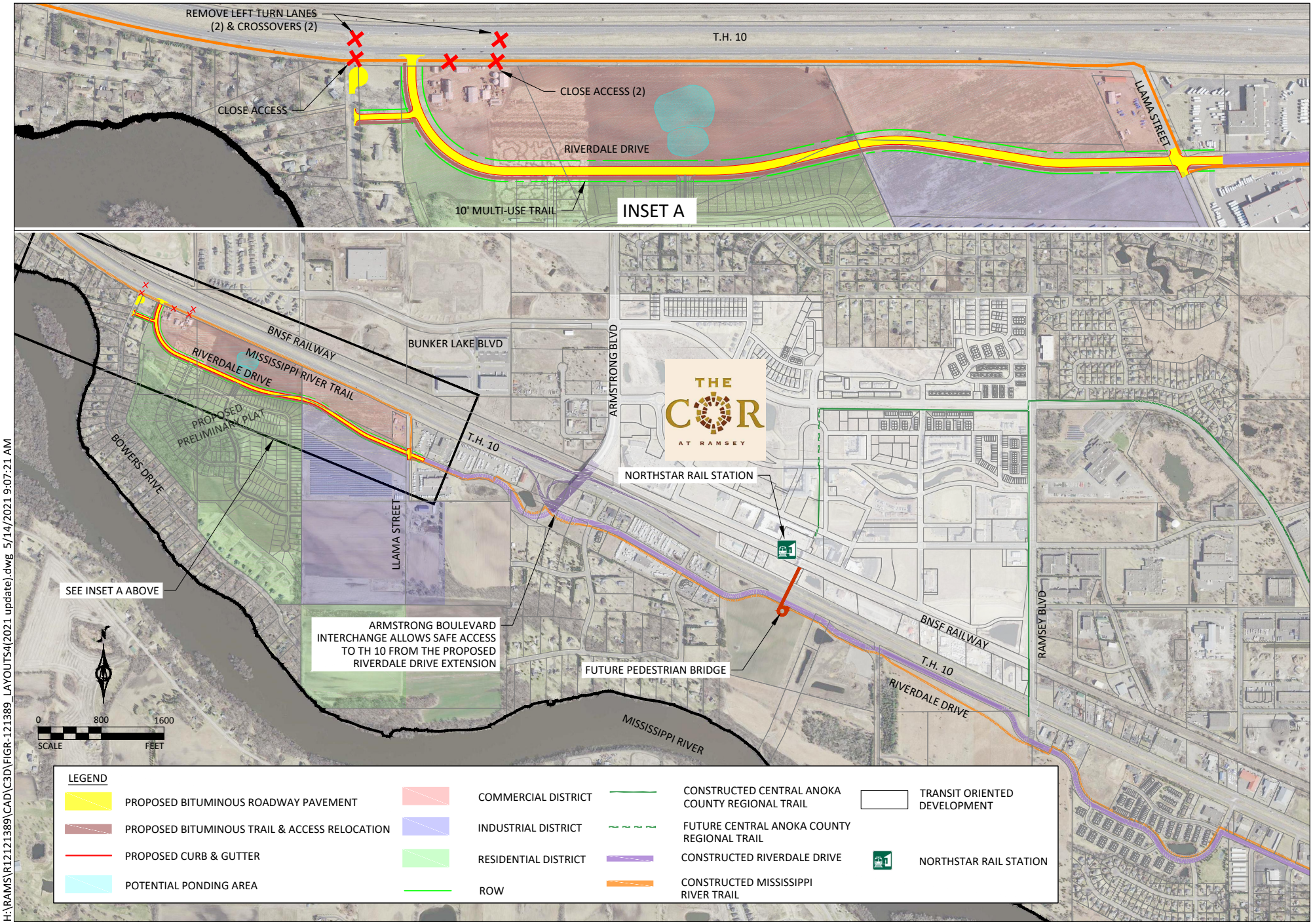
The Public Works Committee feels that a contribution to a collector road has a broader public benefit and that the revised cost share framework is close to the original framework originally approved (non-binding) by the City Council.

Attachments

Riverdale Dr Planning Level Layout
Capstone Plans
Capstone Plans
ACTION - REVISED Cost Share Framework 10.19.21
Revised Cost Share Framework w/o Tree Preservation
CC 1.26.21 Approved Cost Share Framework
Talking Points - Benefits and Additional information on Project
Resolution #21-101 (funding source direction)
Riverstone South Plat
PWC Minutes 1.19.21
CC minutes 1.26.21

Form Review

Inbox	Reviewed By	Date
Grant Riemer	Sean Sullivan	10/13/2021 11:27 AM
Sean Sullivan (Originator)	Sean Sullivan	10/13/2021 11:28 AM
Bruce Westby	Bruce Westby	10/14/2021 10:22 AM
Grant Riemer	Grant Riemer	10/14/2021 11:32 AM
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:35 PM
Form Started By: Sean Sullivan		Started On: 10/08/2021 02:32 PM
Final Approval Date: 10/14/2021		



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LEGAL DESCRIPTION

PARCEL DESCRIPTION: (Per Schedule A of Title Commitment File No. 2651, with a commitment date of October 17, 2019 at 7:00 am, prepared Twin City Title Company, LLC as issuing agent for Old Republic National Title Insurance Company)

Parcel A: Outlot B, Pearson Place, Anoka County, Minnesota.

Parcel B: That part of the Northwest Quarter of the Northwest Quarter of Section 29, Township 32, Range 25, Anoka County, Minnesota, lying southerly of U.S. Highway 10 and 169.

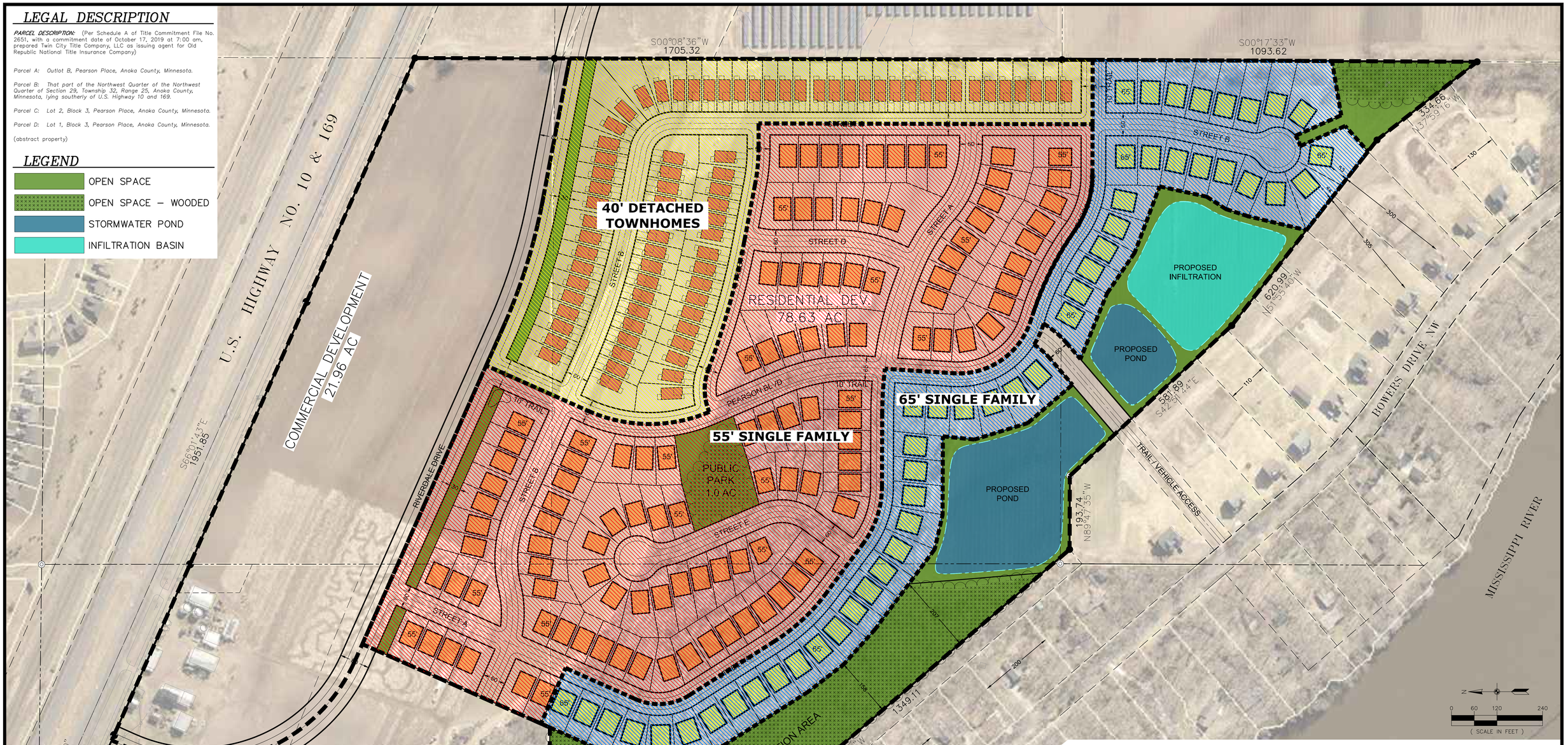
Parcel C: Lot 2, Block 3, Pearson Place, Anoka County, Minnesota.

Parcel D: Lot 1, Block 3, Pearson Place, Anoka County, Minnesota.

(abstract property)

LEGEND

- OPEN SPACE
- OPEN SPACE – WOODED
- STORMWATER POND
- INFILTRATION BASIN



SITE DATA

TOTAL AREA	±110.29 AC.
RESIDENTIAL DEVELOPMENT AREA	78.63
PUBLIC PARK AREA	1.0
TREE PRESERVATION AREA	7.0
COMMERCIAL DEVELOPMENT AREA	22.98
AREA RETAINED BY LANDOWNER	8.68

RESIDENTIAL DEVELOPMENT DATA

TOTAL NUMBER OF LOTS	242
GROSS DENSITY	3.1 U/AC
DETACHED TOWNHOMES	77
55' SINGLE FAMILY	115
65' SINGLE FAMILY	50

DETACHED TOWNHOME LOTS	77
DETACHED TOWNHOME GROSS AREA	15.05 AC.
(MINUS 30' OUTLOTS)	0.57 AC.
NET AREA	14.48 AC.
NET DENSITY	5.32 UNITS/AC.

55' SINGLE FAMILY LOTS	115
55' SINGLE FAMILY GROSS AREA	32.96 AC.
(MINUS 30' OUTLOTS & PARK)	1.48 AC.
NET AREA	31.48 AC.
NET DENSITY	3.65 UNITS/AC.

65' SINGLE FAMILY LOTS	50
65' SINGLE FAMILY GROSS AREA	14.42 AC.
NET DENSITY	3.47 UNITS/AC.

CARLSON McCAIN ENGINEERING SURVEYING ENVIRONMENTAL
3890 PHEASANT RIDGE DR NE
SUITE 100
BLAINE, MN 55449
TEL 763.489.7900
FAX 763.489.7959
CARLSONMCCAIN.COM

DRAWN BY: C#
ISSUE DATE: 08/05/2020
Revisions:

CAPSTONE HOMES, INC.
14015 Sunfish Lake Blvd. NW, Suite 400
Ramsey, MN 55303

RIVERSTONE SOUTH
Ramsey, Minnesota

PRODUCT DENSITY EXHIBIT

1 of 1

[Save Date: 08/05/20] F:\jobs\8481 - 8500\8494 - pearson place 2nd\cad c3d\survey\layouts\8494_layout 4 product areas.dwg

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Parcel D: Lot 1, Block 3, Pearson Place, Anoka County, Minnesota.

(abstract property)

LEGEND

- OPEN SPACE
- OPEN SPACE – WOODED
- STORMWATER POND
- INFILTRATION BASIN

SITE DATA

TOTAL AREA	±110.29 AC.
RESIDENTIAL DEVELOPMENT AREA	78.63
PUBLIC PARK AREA	1.0
TREE PRESERVATION AREA	7.0
OPEN SPACE / PONDING AREA	8.08
RIVERDALE BUFFER AREA	1.05
ROW AREA	15.37
LIFT STATION AREA	0.22
COMMERCIAL DEVELOPMENT AREA	21.96
AREA RETAINED BY LANDOWNER	9.70

0 60 120 240
(SCALE IN FEET)

RESIDENTIAL DEVELOPMENT DATA

TOTAL NUMBER OF LOTS	243
GROSS DENSITY	3.1 U/AC
DETACHED TOWNHOMES	78
55' SINGLE FAMILY	116
65' SINGLE FAMILY	49

40' DETACHED TOWNHOME LOT DETAIL
20' REAR SETBACK
SIDE YARD SETBACKS
GARAGE: 5 FT.
HOUSE: 5 FT.
CORNER: 25 FT.
65
30
25' FRONT SETBACK
55' SINGLE FAMILY LOT DETAIL
25' MIN. REAR SETBACK
SIDE YARD SETBACKS
GARAGE: 5 FT.
HOUSE: 5 FT.
CORNER: 25 FT.
60
45
25' FRONT SETBACK
65' SINGLE FAMILY LOT DETAIL
25' MIN. REAR SETBACK
SIDE YARD SETBACKS
GARAGE: 7.5 FT.
HOUSE: 7.5 FT.
CORNER: 25 FT.
60
50
25' FRONT SETBACK

CARLSON McCAIN
ENGINEERING SURVEYING ENVIRONMENTAL
3890 PHEASANT RIDGE DR NE
SUITE 100
BLAINE, MN 55449
TEL 763.489.7900
FAX 763.489.7959
CARLSONMCCAIN.COM

DRAWN BY: C#/RR
ISSUE DATE: 12/3/20
Revisions:

CAPSTONE HOMES, INC.
14015 Sunfish Lake Blvd. NW, Suite 400
Ramsey, MN 55303

RIVERSTONE SOUTH
Ramsey, Minnesota

SKETCH PLAN W/AERIAL

Save Date: 10/21/20 f:\jobs\8481 - 8500\8494 - pearson place 2nd\cad c3d\survey\layouts\8494_sketch plan.dwg

10.19.21 PWC Presentation Solving for 350K Tree Preservation with HRA and PIR Funding

City/Grant Fully Funding County Parcel **Project Costs (including ROW)**

Area Description	Cost Allocation	Lineal Footage	%	City %	Capstone %	Pearson%
County Parcel	$612,226	1532	35.89%	100%	0	0
County ROW DRAFT	**$283,000**	0	0	100%		
Pearson Parcel	$979,881	2452	57.44%	52.5%	0.0%	47.5%
Bowers Drive Modifications	$113,893	285	6.68%	100%	0	0
Total	**$1,989,000**	4269	100.00%			

Note: utilities not included - paid for by Trunk Fees

Sources of Funds						
	County Parcel	Pearson Parcel	%	Bowers Drive	Total	Project %
MnDOT Grant	$612,000	$0			$612,000	30.8%
City Contribution (HRA)	$283,226	$514,242	52.5%	$113,893	$911,361	45.8%
Pearson Contribution		$465,639	47.5%		$465,639	23.4%
Capstone Contribution		$0	0.0%		$0	0.0%
	$895,226	$979,881	100.0%		$1,989,000	100.0%
Uses (Project Costs)						
Portion of Overall Project	35.9%	57.4%		6.7%	100.0%	
Road, Trail, Storm	$612,226	$979,881		$113,893	$1,706,000	
ROW	**$283,000**				$283,000	
	$895,226	$979,881		$113,893	$1,989,000	

County Parcel + ROW =	$895,226		1/3 of funding gap
		Funding Gap	**$0** *$0.00*

Public vs. Private Dollars

Private (Capstone + Pearson)	$465,639	23%
Public (City + MnDOT)	$1,523,361	77%
	$1,989,000	

Capstone / Pearson Agreement*	**Party**	**Assessment Amt**	**%**
Private Pearson Parcel Total	Capstone	$239,875	34%
$465,639	Pearson	$465,639	66%

* Assessment amounts based on lineal footage along Riverdale Drive Pearson and Capstone

Capstone Tree Preservation Credit (Pearson)	$	239,875	HRA	Pay for Capstone Assessment (above)
Additional City Contribution (to Capstone)	$	110,125	PIR	Payment to Capstone
Tree Preservation Reconcilliation	**$**	**350,000**		

			Difference from 1.26.21
Total City Contribution**	$	911,361	**$235,841**
Total Grant Contribution	$	612,000	**$ (638,000)**
ROW Cost Estimate	$	283,000	**$ (667,000)**
Project Costs Less County ROW	$	1,706,000	**$ 31,000**

** This includes 350 K Tree Preservation

PWC and CC Approved Framework (6a Approved via motion on 1/26/21 by CC)

City/Grant Fully Funding County Parc	Project Costs (including ROW)
Area Description	Cost Allocation
County Parcel	$628,125
County ROW Estimate	**$950,000**
Pearson Parcel	$971,500
Bowers Drive Modifications	$75,375
Total	$2,625,000

Note: utilities not included - paid for by Trunk Fees

Sources of Funds						
	County Parcel	Pearson Parcel	%	Bowers Drive	Total	Project %
MnDOT Grant	$1,250,000	$0			$1,250,000	47.6%
City Contribution	$328,125	$272,020	28.0%	$75,375	$675,520	25.7%
Pearson Contribution		$349,740	36.0%		$349,740	13.3%
Capstone Contribution		$349,740	36.0%		$349,740	13.3%
	$1,578,125	$971,500	100.0%		$2,625,000	100.0%
Uses (Project Costs)						
Portion of Overall Project	37.5%	58.0%		4.5%	100.0%	
Road, Trail, Storm	$628,125	$971,500		$75,375	$1,675,000	
ROW	**$950,000**				$950,000	
	$1,578,125	$971,500		$75,375	$2,625,000	

County Parcel + ROW =	$1,578,125		1/3 of funding gap
	Funding Gap	**$0**	*$0.00*

Public vs. Private Dollars		
Private (Capstone + Pearson)	$699,480	27%
Public (City + MnDOT)	$1,925,520	73%
	$2,625,000	

Capstone / Pearson Agreement *	**Party**	**Assessment Amt**	**%**
Private Pearson Parcel Total	Capstone	$237,823	34%
$699,480	Pearson	$461,657	66%

* Assessment amounts based on lineal footage along Riverdale Drive Pearson and Capstone

Talking Points

But for this development, the City would wait until other funding sources closed the gap.

If the Developer desires to accelerate the schedule, the Developer should bring additional dollars to the table.

This project derives a direct benefit to the connection to Highway 10 and associated improvements.

While not technically the Developer's responsibility, the Development relies on a connection through the County Property.

It is not feasible to phase the project.

If the Developer desires to not contribute to off site improvements, the City has less dollars to allocate to the Pearson Frontage.

Minnesota Statute allows the City to assess costs for off-site improvements that are necessary due to development impacts.

~~*Considering contribution to Riverdale Drive + acquisition for open space preservation, City should review financials*~~

Public Works recommended that review of financials (above) is not necessary.

Total City Contribution	$	675,520
Total Grant Contribution	$	1,250,000
ROW Cost Estimate	$	950,000
Project Costs Less County ROW	$	1,675,000

10.19.21 PWC New Baseline Information 36%, 36%, 28% - No Tree Preservation

City/Grant Fully Fund County Parcel **Project Costs (including ROW)**

Area Description	Cost Allocation	Lineal Footage	%	City %	Capstone %	Pearson%
County Parcel	$612,226	1532	35.89%	100%	0	0
County ROW DRAFT	**$283,000**	0	0	100%		
Pearson Parcel	$979,881	2452	57.44%	28.0%	36.0%	36.0%
Bowers Drive Modifications	$113,893	285	6.68%	100%	0	0
Total	**$1,989,000**	4269	100.00%			

Note: utilities not included - paid for by Trunk Fees

Sources of Funds						
	County Parcel	Pearson Parcel	%	Bowers Drive	Total	Project %
MnDOT Grant	$612,000	$0			$612,000	30.8%
City Contribution (HRA)	$283,226	$274,367	28.0%	$113,893	**$671,486**	33.8%
Pearson Contribution		$352,757	36.0%		$352,757	17.7%
Capstone Contribution		$352,757	36.0%		$352,757	17.7%
	$895,226	$979,881	100.0%		$1,989,000	100.0%
Uses (Project Costs)						
Portion of Overall Project	35.9%	57.4%		6.7%	100.0%	
Road, Trail, Storm	$612,226	$979,881		$113,893	$1,706,000	
ROW	**$283,000**				$283,000	
	$895,226	$979,881		$113,893	$1,989,000	

County Parcel + ROW =	$895,226			1/3 of funding gap
		Funding Gap	**$0**	*$0.00*

Public vs. Private Dollars

Private (Capstone + Pearson)	$705,514	35%
Public (City + MnDOT)	$1,283,486	65%
	$1,989,000	

Capstone / Pearson Agreement *	**Party**	**Assessment Amt**	**%**
Private Pearson Parcel Total	Capstone	$239,875	34%
$705,514	Pearson	$465,639	66%

* Assessment amounts based on lineal footage along Riverdale Drive Pearson and Capstone

		Difference from 1.26.21
Total City Contribution	$ 671,486	**($4,034)**
Total Grant Contribution	$ 612,000	**$ (638,000)**
ROW Cost Estimate	$ 283,000	**$ (667,000)**
Project Costs Less County ROW	$ 1,706,000	**$ 31,000**

Assessment' Amount			Lineal Footage	% Cost			
Roadway	$	1,186,000	1,532	35.89%	$ 612,226	County Parcel	By % of linear foot
Storm	$	211,000	2,452	57.44%	$ 979,881	Pearson Parcel	
Interim Sanitary	$	121,000	285	6.68%	$ 113,893	Bowers Drive/Trunk Highway Improvements	
TH 10 Access	$	188,000	4,269	100%	$ 1,706,000		
Total	$	1,706,000					

Trunk Sewer and Water Costs not included

High-level, non-scientific planning level division of costs.

Alternative 6a

Capstone Proposal w/City Modifications - Capstone Pearson Even Split

	Project Costs (including ROW)
County Parcel	$1,578,125
Pearson Parcel	$971,500
Bowers Drive Modifications	$75,375
Total	$2,625,000

Note: utilities not included - paid for by Trunk Fees

Sources of Funds

	County Parcel	Pearson Parcel	%	Bowers Drive	Total	
Sources						
MnDOT Grant	$1,250,000				$1,250,000	
City Contribution	$328,125	$272,020	28.0%	$75,375	$675,520	
Pearson Contribution		$349,740	36.0%		$349,740	
Capstone Contribution		$349,740	36.0%		$349,740	
			100.0%		$2,625,000	

Uses (Project Costs)

Portion of Overall Project	37.5%	58.0%		4.5%	100.0%	
Road, Trail, Storm	$628,125	$971,500		$75,375	$1,675,000	$1,675,000
ROW	$950,000					
	$1,578,125	$971,500		$75,375	$2,625,000	

Public vs. Private Dollars					
Private (Capstone + Pearson)	$0	$699,480	72%	$0	$699,480
Public (City + MnDOT)	$1,578,125	$272,020	28%	$75,375	$1,925,520
					$2,625,000

Talking Points

But for this development, the City would wait until other funding sources closed the gap.

If the Developer desires to accelerate the schedule, the Developer should bring additional dollars to the table.

This project derives a direct benefit to the connection to Highway 10 and associated improvements.

While not technically the Developer's responsibility, the Development relies on a connection through the County Property.

It is not feasible to phase the project.

If the Developer desires to not contribute to off site improvements, the City has less dollars to allocate to the Pearson Frontage.

Minnesota Statute allows the City to assess costs for off-site improvements that are necessary due to development impacts.

~~Considering contribution to Riverdale Drive + acquisition for open space preservation, City should review financials~~

Public Works recommended that review of financials (above) is not necessary.

Talking Points 9.29.21

- History: In November of 2019 Capstone Homes approached City Staff to discuss the interest level to develop a residential development to be known as Riverstone South. The City Staff recommended and supported to move forward with the planning process South of Hwy 10.

- City Council approved, by motion, Cost Share Framework (6a) on January 26, 2021. 6a Framework has project costs of $2,625,000 and 1.25M in MNDOT Grant.

- Development west of Llama St NW relies on the Extension of Riverdale Drive and utilities through the Anoka County parcel.
- With the development of the Pearson Farm property and the extension of Riverdale Drive the city has the opportunity for more businesses to locate along Hwy 10 between Armstrong Blvd and Bowers Drive.

- The development of the Pearson Farm property and the extension Riverdale Drive will allow the Anoka County remaining land parcels to be marketable.

- With this development, the City and County Road infrastructure would improve the connections to Hwy 10 and reduce safety concerns south of Hwy 10.

- With this development, it allows the City to Master Plan surrounding properties for future development and re-development of existing neighborhoods to provide water / sewer extensions and other road improvements.

- The reduction of the MNDOT LPP Grant of $638,000 and revised project costs results in additional public/private funds needed to complete the project.

- City of Ramsey HRA funds are an eligible funding source for the City contribution to the Riverdale Drive Road Project. They cannot be used for Tree Preservation.

- If the Developer desires to not contribute to off site improvements, the City has less dollars to allocate to the Pearson Frontage.

- Minnesota Statute allows the City to assess costs for off-site improvements that are necessary due to development impacts.

- It is not financially feasible/responsible to build Riverdale Drive in two phases.

- With this development, it provides a connection through the Anoka County property to complete the City's network road system to Armstrong Blvd.

- Riverstone South will bring 244 units of residential development improving demographics for retail and provides for future workforce.

- With this development, the City can seek funding sources to improve this area of town that would solve many infrastructure issues and provide additional Economic Development opportunities.

- Review of Financials from Developer is not needed - PWC Recommendation.

Councilmember Specht introduced the following resolution and moved for its adoption:

RESOLUTION #21-101

RESOLUTION DETERMINING THAT AN ENVIRONMENTAL IMPACT STATEMENT (EIS) IS NOT NECESSARY AND GRANTING PRELIMINARY PLAT FOR RIVERSTONE SOUTH ADDITION

WHEREAS, Riverstone Development LLC, hereafter referred to as "Developer", properly applied for Preliminary Plat approval of the following described property located in the City of Ramsey:

That part of Northwest Quarter of Northwest Quarter, Section 29, Township 32, Range 25 lying northeaster of northeasterly right of way line of Burlington Northern Rail Road and lying westerly and southerly of the north 60 feet of east 40 feet of said Quarter Quarter, except road subject to easement of record, Anoka County, Minnesota

-and-

The Northwest Quarter of Southwest Quarter of Section 20, township 32, Range 25 except east 40 feet of said Quarter Quarter lying southerly of southerly right of way line of Alpine Drive NW and except north 40 feet of south 100 feet of west 40 feet of east 80 feet of said Quarter Quarter, except road subject to easement of record, Anoka County, Minnesota

-and-

The Southwest Quarter of Southwest Quarter of Section 20, Township 32, Range 25 lying west of east 40 feet thereof, except road subject to easement of record, Anoka County, Minnesota

(the 'Subject Property');

WHEREAS, the City and Developer have been working on a long-range land use plan for the Subject Property since the end of 2019; and

WHEREAS, the City approved a cost share framework in concept for the extension of Riverdale Drive on March 24, 2020; and

WHEREAS, the City approved a planning framework for the Subject Property on June 23, 2020; and

WHEREAS, the City reviewed the Sketch Plan for the project on August 6, 2020; and

WHEREAS, the City received an Application for Preliminary Plat Approval for Riverstone South Addition on December 3, 2020, which includes 243 detached single-family homes; and

WHEREAS, Minnesota Rules 4410.4300, Subp. 19.C, requires that an EAW be prepared for this project as the project requires a Comprehensive Plan Amendment; and

WHEREAS, by February 9, 2021, copies of the EAW were distributed to all persons and agencies on the official Environmental Quality Board (EQB) distribution list and other interested parties; and

WHEREAS, on February 9, 2021, the EAW was publicly noticed in the EQB Monitor, commencing the 30-day public comment period; and

WHEREAS, a press release and public notice for the EAW was submitted to the Anoka County Union Herald and published on February 5, 2021, announcing the completion of the EAW, its availability to interested parties, and the process for submitting comments on the EAW; and

WHEREAS, the Planning Commission held a Public Hearing and reviewed the Preliminary Plat on January 7, 2021; and

WHEREAS, the Planning Commission denied a Variance to change the street name for Unicorn Street.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RAMSEY, ANOKA COUNTY, STATE OF MINNESOTA, as follows:

1. That the Ramsey City Council hereby grants preliminary plat contingent approval of Riverstone South Addition in accordance with relevant City Codes, contingent upon the following conditions:
    a. Plat/Subdivision - Plans subject to current Staff Review Comments and final approval by City Engineer
    b. Riverdale Drive - City Approval of a contract for the Riverdale Drive Extension along with Cost Share Agreement consistent with previous City Council Direction
        i. Current cost share agreement is based on current estimates. Final cost share agreement is subject to final costs based on an awarded contract for construction.
        ii. Must also include an Assessment/Petition and Waiver Agreement to assess the Property Owner and Developer shares back to benefiting properties.
        iii. In lieu of a Petition and Waiver Agreement/Assessment Agreement, the City may consider an assessment project consistent with Minnesota Statutes Chapter 429.
    c. Park Dedication – Park Dedication shall be satisfied through a combination of 1 Acre Land Dedication and a Park Dedication Fee of $350,000.
    d. Tree Preservation – Developer shall convey a 7 acre parcel to preserve a portion of the existing forest as indicated on the Preliminary Plat.
        i. The City will work to secure $350,000 from an outside funding source for the acquisition of the Tree Preservation Area.
            1. The City Council authorizes Staff to submit a funding request to the Anoka County Housing and Redevelopment Authority (ACHRA) for this purpose.
            2. The City Council directs Staff to find a City funding source for this purpose if the ACHRA request is unsuccessful.
        ii. The City does not support an additional credit to Park Dedication Fees to fund this $350,000 expenditure.

e. Street Name Change – the City Council establishes for this area only.
    i. Quintana Street NW in lieu of Quagga Street NW
    ii. Snowy Owl Street NW in lieu Sloth Street NW
    iii. Pearson Street NW in lieu of Unicorn Street NW
f. Eave Overhangs in Easements – except as otherwise agreed to, no part of any structure, including eave overhangs, shall be located in any easement.

2. That the Ramsey City Council hereby determines that an Environmental Impact Statement is not required for the Riverstone South Addition based on the following.
    a. The EAW was prepared in compliance with the procedures of the Minnesota Environmental Policy Act and Minnesota Rules, Parts 4410.1000 to 4410.1700 (2015),
    b. The EAW satisfactorily addressed the environmental issues for which existing information could have been reasonably obtained,
    c. Based on the criteria established in Minnesota Rules 4410.1700, the project does not have the potential for significant environmental effects,
    d. The City makes a "Negative Declaration,"
    e. The City adopts the Response to Comments, Findings of Fact, and Record of Decision for Riverstone Addition Environmental Assessment Worksheet (Record of Decision) and directs the Community Development Director to maintain the Record of Decision and to distribute it in accordance with the EQB rules.

The motion for the adoption of the foregoing resolution was duly seconded by Councilmember Howell, and upon vote being taken thereon, the following voted in favor thereof:

Mayor Kuzma
Councilmember Musgrove
Councilmember Woestehoff
Councilmember Heineman
Councilmember Howell
Councilmember Riley
Councilmember Specht

and the following voted against the same:

None

and the following abstained:

None

and the following were absent:

None

whereupon said resolution was declared duly passed and adopted by the Ramsey City Council this13th day of April, 2021.

Mayor

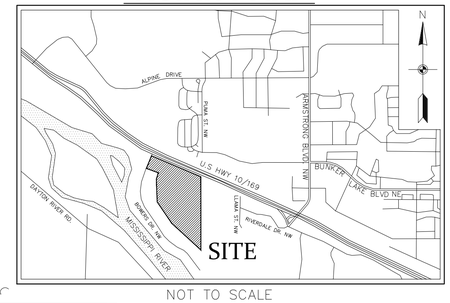
ATTEST:

City Clerk

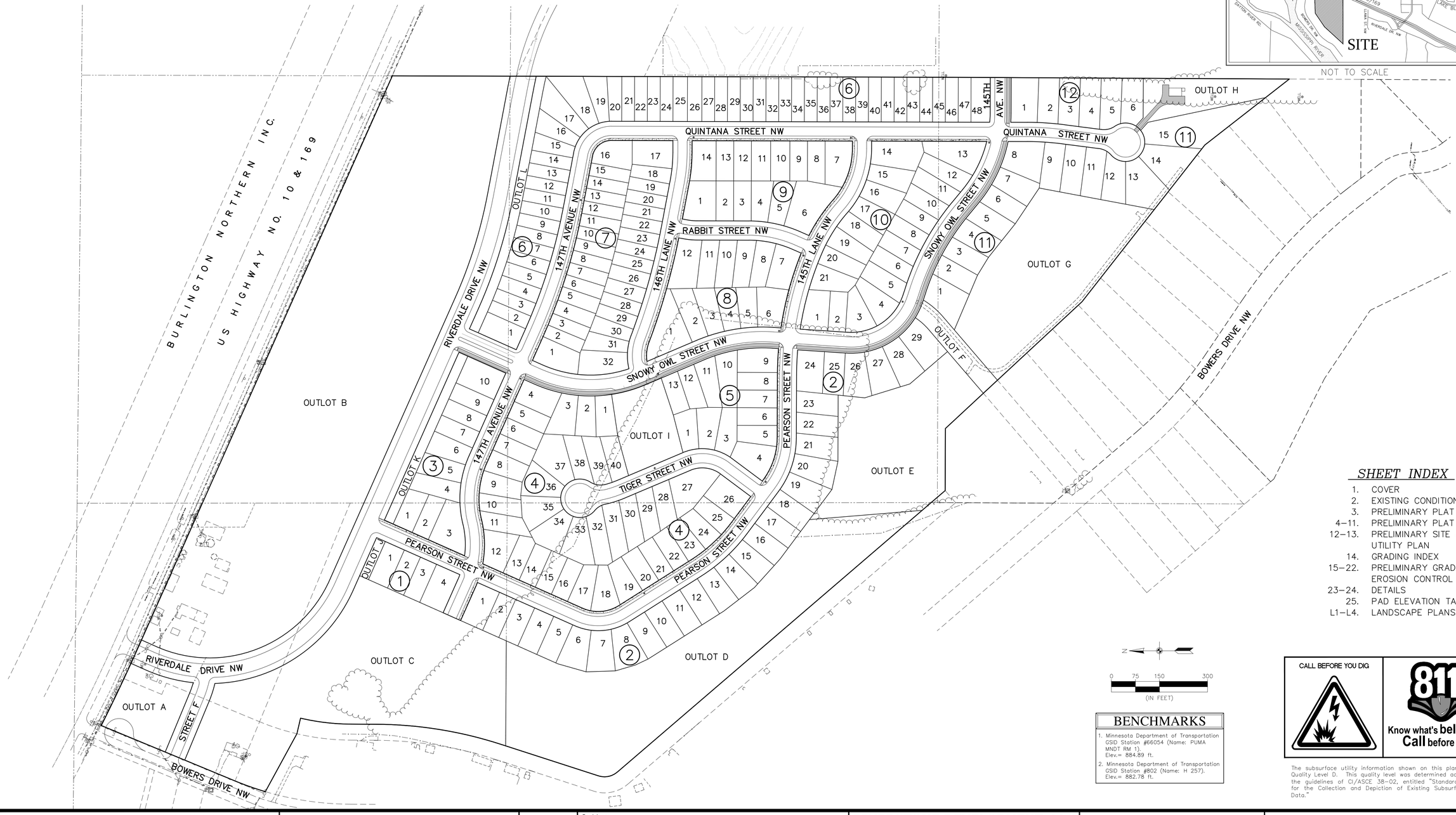
RIVERSTONE SOUTH

RAMSEY, MINNESOTA

VICINITY MAP



NOT TO SCALE



SHEET INDEX

BENCHMARKS

1. Minnesota Department of Transportation GSID Station #66054 (Name: PUMA MNDT RM 1). Elev.= 884.89 ft.
2. Minnesota Department of Transportation GSID Station #802 (Name: H 257). Elev.= 882.78 ft.

CALL BEFORE YOU DIG

811 Know what's **below.** **Call** before you dig.

The subsurface utility information shown on this plan is utility Quality Level D. This quality level was determined according to the guidelines of CI/ASCE 38-02, entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data."

CARLSON McCAIN ENGINEERING SURVEYING ENVIRONMENTAL

3890 PHEASANT RIDGE DR NE
SUITE 100
BLAINE, MN 55449
TEL 763.489.7900
FAX 763.489.7959
CARLSONMCCAIN.COM

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name: Brian J. Krystofiak, P.E.
Signature:
Date: 11/25/20 License #: 25063

Drawn: ADB
Designed: BJK
Date: 11/25/20

Revisions:
1. 7/21/21 per City Comments

RIVERSTONE DEVELOPMENT, LLC
14015 Sunfish Lake B, Suite 400
Ramsey, MN 55303

RIVERSTONE SOUTH
Ramsey, MN

COVER SHEET

Save Date: 07/20/21 | F:\Jobs\8481 - 8500\8494 - pearson place 2nd\cad c3d\engineering\prelim plans\8494_cover.dwg

#8494

PUBLIC WORKS COMMITTEE
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Public Works Committee conducted a regular meeting on Tuesday, January 19, 2021, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present: Chairperson Chris Riley
Councilmember Debra Musgrove
Councilmember Matt Woestehoff

Also Present: City Engineer Bruce Westby
Deputy City Administrator Tim Gladhill
Councilmember Chelsea Howell

1. CALL TO ORDER

Acting Chairperson Riley called the regular meeting of the Public Works Committee to order at 5:30 p.m.

2. CITIZEN INPUT

There was none.

3. APPROVE AGENDA

Motion by Councilmember Woestehoff, seconded by Councilmember Musgrove, to approve the agenda, as presented.

Motion carried. Voting Yes: Acting Chairperson Riley, Councilmembers Woestehoff and Musgrove. Voting No: None.

4. APPROVE MINUTES

4.01: Approve November 17, 2020, Meeting Minutes

Acting Chairperson Riley acknowledged that the other members were not present at the meeting but commented that the minutes accurately reflect the discussion.

Councilmember Musgrove was unsure that the motion could be passed as the members not present would need to abstain.

Deputy City Administrator Gladhill confirmed that the group could approve the minutes even though not present.

Motion by Acting Chairperson Riley, seconded by Councilmember Woestehoff, to approve the following minutes:

Regular Meeting Minutes dated November 17, 2020.

Motion carried. Voting Yes: Acting Chairperson Riley and Councilmembers Woestehoff. Voting No: None. Abstain: Councilmember Musgrove.

5. COMMITTEE BUSINESS

5.01: Appoint Chair and Vice Chair of the Public Works Committee

City Engineer Westby noted that a Chairperson and Vice Chairperson would need to be elected.

Acting Chairperson Riley recommended appointing the Chair and Vice Chair at the first Public Works Committee meeting of the year in future years.

Motion by Councilmember Woestehoff, seconded by Councilmember Musgrove, to appoint Councilmember Riley as Chairperson and Councilmember Musgrove as Vice Chairperson of the Public Works Committee.

Motion carried. Voting Yes: Acting Chairperson Riley, Councilmembers Woestehoff and Musgrove. Voting No: None.

5.02: Receive Update on Cost Share Alternatives for Riverdale Drive Extension Improvement Project Related to Riverstone South; Case of Capstone Homes and Pearson Properties of Ramsey

Deputy City Administrator Gladhill provided an update on a potential cost share framework for the Riverdale Drive Extension Improvement Project.

Councilmember Musgrove asked for additional input on the timeframe planned for Riverdale Drive and the projected funding sources.

Deputy City Administrator Gladhill stated that the original study from MnDOT and Anoka County for Highway 10 and the corridor had Riverdale Drive labeled as an opportunity or development driven project with no specific timeframe, therefore it would move forward when development occurred, or funding was available. He noted that if the project were not development driven the extension would be linked to grant funding, similar to the other phases of Riverdale Drive, which would have estimated that about five or ten years out. He provided additional details on grant funding, noting that typically a project of this scope would have a five-year planning process in order to successfully obtain grants.

Councilmember Musgrove asked for more clarity related to the developer and assurance that the contribution of the City for this project would not financially benefit the developer's project.

Deputy City Administrator Gladhill explained that the City looks at the project as a whole and the benefit that it provides. He noted that all contributions to the project are valid, but the City is concerned that its contribution could be considered above industry standards and therefore it would make sense to have underwriting done.

Councilmember Musgrove asked if the $350,000 would not be paid in addition to the preserve land.

Deputy City Administrator Gladhill provided background information on the park dedication for the Riverstone South property, noting that park dedication focused on the one acre of park and cash contribution of $350,000. He noted that the City will look for outside funding to assist in the price for the preserved area.

Chairperson Riley asked if the reason this has changed is related to the County parcel.

Deputy City Administrator Gladhill confirmed that is a large portion of the discussion but noted that the developer also offered a counteroffer.

Chairperson Riley asked if the offer would be to buy the entire County parcel.

Deputy City Administrator Gladhill stated that there are three parcels that make up the property in discussion, noting that the County purchased that in 2008 in attempt to preserve that for a future river crossing. He stated that the parcel is split in three pieces because the County used different funding sources to purchase the property. He noted that the City would not be purchasing the entire County owned parcel, but the entire parcel outlined in the case.

Chairperson Riley asked and received confirmation that the road would take up about one third of that proposed parcel.

Deputy City Administrator Gladhill believed that a user could be found for the remainder of the parcel outside of the road.

Councilmember Woestehoff asked if there is contingency planned if the funds are not received from MnDOT.

Deputy City Administrator Gladhill stated that the deal would not move forward without that funding from MnDOT, therefore when action is taken on the preliminary plat, the City will be well protected.

Tom Bakritges, Capstone Homes, commented that this has been a 13-month process thus far and a lot of different iterations to the plan have occurred, to the good. He commented that they have been cooperative with all the necessary parties, noting that by the time construction would begin they would be more than two years into the planning process. He commented on the seven acres of wooded area that will be preserved, the one acre of wooded park land, the buffering that would occur along Riverdale Drive, and the variety of housing that would be provided through their development. He stated that there are 15 acres of open space on the south side that provide

buffering between the Riverstone development and adjacent Bowers Drive neighborhood. He stated that the seven acres plus one acre equate to over 10 percent of the site which is above the required park dedication with only land contributions. He referenced the original framework for Riverdale Drive that used one third contributions that everyone agreed to, acknowledging that there was a gap. He stated that they do not agree to spend their funds on a public improvement on County property. He stated that the mechanism of the dollar amounts, and percentages do not change by much, but they do not want to contribute to the County property. He commented that things were added to the project which add cost and they do not want to contribute to. He stated that staff was able to develop the new framework which they agree to. He stated that they cost-shared on the construction of Puma with the City in Riverdale North and is an example of how this can work. He stated that they agreed to the recommendation of staff to provide the seven acres of wooded area, one acre of park land and a cash park dedication of $350,000 for Riverstone South as long as the City purchases the seven acres of wooded land for $350,000. He stated that they have not discussed about opening books throughout this process and would not agree to that. He stated that they are not asking for TIF or anything above what is typically done for public improvement projects. He commented that they realize that the City and County are going through the appraisal process for the County parcel and that potential purchase would provide the City with benefit down the road when development of that site occurs. He stated that if Capstone had to put more dollars into this improvement, they would not move the project forward. He stated that the goal would be for the City to have its third-party financing in order to move forward in spring of 2022 when Capstone is ready to move forward on Riverstone South. He stated that they want to continue working with and collaborating with staff and agree to the framework but do not agree with the underwriting component.

John Dobbs, representing the Pearson family, commented that they have had direct conversations with staff which he appreciates. He commented that there are two things different in this framework, than the original which split it into thirds. He stated that the land value is different and not accounted for. He stated that if grant funds are allocated for land purchase that provides the City with land that would be improved as it would have both right-of-way and road access and could be sold for development, therefore he struggles with the premise that the entire cost for the land is shown on the sheet, but the future value is not accredited to offset that. He stated that the other difference from the original framework is the Bowers Drive extension, cul-de-sac, and access point. He commented that the Pearson family is donating the right-of-way for Riverdale Drive and would also be asked to provide the right-of-way and cul-de-sac area for Bowers Drive, which is not their responsibility to donate. He stated that the associated details and costs were not shown in the original framework and it is the opinion that the Bowers Drive right-of-way and cul-de-sac for Bowers Drive is the responsibility of Bowers Drive residents and not the Pearson family. He stated that the original framework agreed to each of the three parties contributing one third of the cost, with an acknowledgement that there was a gap on the County contribution. He stated that the new framework does not show the value of the land that the City would purchase with grant funds and also shows the Bowers Drive requirements as a credit on the City portion. He stated that the Pearson's agreed to the one third split and do not agree to the Bowers Drive components.

Steve Bona, Capstone Homes, commented that the original framework included the one third split of costs between the parties and Capstone still agrees to that. He stated that the framework then allowed the negotiation of the park dedication and tree preservation, which was then approved.

He noted that those two elements were approved, and Capstone proceeded with the preliminary plat in order to reach this point. He stated that they are concerned because there is now a discussion about underwriting and that is being used in a manner to say that if Capstone does not want to go through underwriting, it could forego the $350,000 the City offered to pay for the tree preservation area or could pay $272,000 for Riverdale Drive. He stated that means that the framework originally approved as significantly changed. He noted that the initial funding gap in the original framework for the County was $117,000.

Chairperson Riley thanked Capstone for being present as they have been a great partner and developer in the community. He stated that it appears that Capstone agrees to the framework but is concerned with the tree preservation dollars and the Ehlers underwriting. He stated that it appears the Pearson family is concerned with the land value.

Mr. Dobbs commented that he understands the land value is an estimate but there is no estimate for the potential return on investment for the City owning the land if the grant funds will all be used for that acquisition. He noted that the Bowers Drive portion also reduces the City contribution and was not included in the original framework.

Councilmember Musgrove commented that she feels that she understands both sides after hearing input. She asked if there would be time to gain additional outside funds associated with the tree preservation land.

Deputy City Administrator Gladhill stated that staff has been discussing opportunities with different outside groups that are providing input to the City.

Councilmember Musgrove stated that it sounds like these issues were perhaps unknowns and they are now fitting them into the framework. She stated that she would like to stick to the original framework to the extent possible and encouraged staff to continue to look for funding with the option of perhaps using the County HRA funds as well.

Deputy City Administrator Gladhill stated that if the road wants to be built, it has been the input from the County that the City would need to purchase that parcel. He noted that staff continues to have discussions with the County to investigate options that would not include purchase of the parcel.

Councilmember Musgrove stated that it appears there is still time to move forward with the original framework split and continue to look for funds to use for tree preservation and the County portion. She stated that the consensus throughout this discussion has included the preserved trees and the developer presented that plan.

Deputy City Administrator Gladhill noted that staff is attempting to stay close to the original framework and provided details.

Councilmember Musgrove asked if a cul-de-sac is needed at the end of Bowers Drive.

Deputy City Administrator Gladhill stated that MnDOT is not going to allow two access points that close together and if that cul-de-sac is not provided, the $1,250,000 grant will not be provided from MnDOT.

Councilmember Musgrove asked if the road could be stubbed rather than a cul-de-sac.

City Engineer Westby commented that a shared driveway or something of that nature could be considered but that comes with other issues.

Deputy City Administrator Gladhill stated that a second connection to Bowers Drive was already foregone and therefore he would find it hard to believe that public works and public safety would agree to less than a cul-de-sac.

Councilmember Woestehoff asked the density for the County parcel.

Deputy City Administrator Gladhill stated that currently the parcel is zoned R-2, medium density residential. He stated that part of this exercise would be to determine the highest and best use of the parcel adjacent to the solar farm.

Chairperson Riley stated that it appears that everyone agrees to the one third split for the framework as presented and reviewed some of the other assumptions. He stated that it appears the consensus is to continue to look for outside funds for tree preservation purchase. He stated that underwriting is often done for the EDA but was unsure if that was typically done for public works.

Deputy City Administrator Gladhill confirmed that it would be at the discretion of the City as to whether to require that underwriting. He stated that the underwriting does not have to be done and was provided as a tool.

Chairperson Riley stated that two uses of funds were identified that could remove the underwriting recommendation.

Mr. Bakritges stated that the mention of underwriting is new. He stated that the dollars for the approved framework and this framework are essentially the same and therefore he does not see a need for underwriting. He stated that the County parcel was not part of the framework before and now it is, and they agree that if funds are received the City can use them in that way. He stated that they do not see any additional enrichment of dollars to the developer which would justify underwriting.

Mr. Bona stated that Capstone would never open their books for private development. He stated that the seven acres of tree preservation is something the City asked them to do. He stated that Riverdale is a collector road and traditionally both the City and developers contribute. He stated that they are not asking for public assistance that would justify underwriting.

Chairperson Riley stated that underwriting is typically done for the EDA and it would essentially be the same idea but recognized that it is not typically done.

Councilmember Musgrove commented that she does not see the developer gaining anything differently because the City would be acquiring land in order to construct a road through that parcel.

Deputy City Administrator Gladhill stated that underwriting is not recommended because of the new version but more related to the more known costs.

Councilmember Musgrove commented that she does not fully understand the implications of underwriting.

Chairperson Riley provided additional details on the underwriting process and rate of return on the investment related to the City contribution.

Mr. Bona commented that they did two assessment projects that included City contributions, Bunker Lake and Puma, and there was never a discussion of underwriting or Capstone opening its books. He stated that they would like to continue to follow that process.

Councilmember Woestehoff stated that he was unsure that underwriting is the right process for this. He acknowledged that without the County property, this project would die because the collector road cannot go through.

Mr. Dobbs stated that when the original framework was done the required right-of-way was not known and so they understand that more details are known at this time. He stated that he has a lot of residential, commercial, and industrial development experience and while it makes sense to use underwriting to show benefit on commercial development it would be unrealistic to do that for residential development. He stated that he does not speak for Capstone but based on his experience in development it would not make sense for Capstone to open its books for underwriting.

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to recommend City Council approve the alternate cost share framework without the underwriting.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

5.03: Consider Water Treatment Plant Site Selection Recommendation

City Engineer Westby reviewed the staff report and stated that engineering and public works staff recommend locating the proposed water treatment plant (WTP) on the Public Works Site due to that site having the lowest estimated construction cost; the ability to maintain control over the cemetery access road; the ability to most cost-effectively share security infrastructure, an emergency generator, and garage space; and significant operational efficiencies and cost savings of the life of the WTP. Staff also recommends proceeding with the proposed WTP construction in as timely a manner as possible to ensure the City is able to continue to provide water in compliance with Minnesota Department of Health (MDH) health based values (HBV) for manganese, The City has been running only two to four municipal wells to supply water to the City since the summer of 2019, meaning these wells are constantly in operation and are not able

to be rested or taken off-line for routine maintenance. If the City elects to move forward with constructing a WTP in a timely manner, it could be operational by spring of 2023. On January 7th, the Planning Commission unanimously recommended City Council approval of the Public Works Site for the proposed WTP. On January 14th, the Economic Development Authority unanimously recommended approval of the Public Works Site for the proposed WTP.

Deputy City Administrator Gladhill stated that public works prefer the east side of the site for access to the cemetery. He stated that in terms of EDA this is the best site for economic development, but the economy is in a much different position than it was, and this site provides the most overall benefit.

Councilmember Musgrove commented that this seems to be well thought out and this site seems to be the best location. She agreed that it would make the most sense to use the public works site because of the efficiencies identified in the report. She referenced the funding for the added project costs and whether that could come from the same funding source even though those are ancillary uses.

City Engineer Westby stated that this would all be part of constructing the WTP and therefore all the funding could be used for that purpose.

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to recommend City Council approval of the Public Works Site for the proposed Water Treatment Plant.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

5.04: Consider Recommending City Council Approval of Plans and Specifications and Authorization to Advertise for Bids for Riverdale Drive Reconstruction, Improvement Project #21-00

City Engineer Westby reviewed the staff report and recommendation to recommend approval of plans and specifications and authorization to advertise for bids for Riverdale Drive Reconstruction, Improvement Project #21-00. Staff recommendations include not constructing concrete sidewalk south of Riverdale Drive as part of this project, and not constructing the Mississippi River observation deck as part of this project.

Councilmember Musgrove asked for additional details as it relates to the Ramsey Gateway Highway 10 improvements.

City Engineer Westby provided additional details noting that design alternatives are being reviewed for the Ramsey Gateway project, and identified the construction limits on the east end of Riverdale Drive, which could then be tied into the Highway 10 project in the future.

Councilmember Musgrove commented that the Highway 10 plans are still being finalized.

City Engineer Westby noted that the proposed termination of the road would align as closely as possible with the Ramsey Gateway Highway 10 plans.

Councilmember Musgrove referenced the section of road for the townhome section, west of Feldspar Street, and asked the width of that segment and whether that would match in terms of width and lanes to the new road east of Feldspar Street.

City Engineer Westby replied that is a narrower segment and this segment would be about four feet wider. He identified the placement of the trail and noted that the lanes would align even with the different widths.

Chairperson Riley asked the amount of MSA funds the City has been receiving.

City Engineer Westby replied that the City received around $1,600,000 last year in total for construction and maintenance. He confirmed that all previous loans have been paid back and therefore any MSA funds received moving forward will be available for projects. He noted that they are estimating less in MSA funds this year because the calculation is based on road usage and there were less people on the road in 2020 due to the pandemic.

Chairperson Riley commented that 15 or 20 years ago the City borrowed money against future MSA to construct specific improvements. He noted that those funds have been paid back and the funds therefore are available for use on projects.

Councilmember Musgrove asked if the plans and specifications are typically included in cases or only upon request.

City Engineer Westby commented that if the plans and specifications are complete they could be included in the case, but he explained that if the plans are included in the case, they become public and anyone can access that information. He explained that if changes are made to the plans after that time, a contractor could then incorrectly base their bid on the plans that were included in the case. He stated that the plans can be presented and shared with the Council once they are fully prepared. He acknowledged that the plan development process has been hurried the past few years so Council approvals were requested while plans were being finalized but he hoped that this would be the last year because of the change in funding, which will allow Staff to start developing projects earlier in the year. He noted that the most relevant plans would be included in the presentation to the full Council when the process reaches that step.

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to recommend City Council approval of plans and specifications and authorization to advertise for bids for Riverdale Drive Reconstruction, Improvement Project #21-00.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

5.05: Consider Recommending City Council Approval of Plans and Specifications and Authorization to Advertise for Bids for 2021 Crack Seal Improvements, Improvement Project #21-06

City Engineer Westby reviewed the staff report and recommendation to recommend approval of plans and specifications and authorization to advertise for bids for 2021 Crack Seal Improvements, Improvement Project #21-06 as crack sealing remains the most cost-effective maintenance operation available.

Chairperson Riley noted that it is scheduled to crack seal the rejuvenated section in Stanhope and asked if that would be the intended process.

City Engineer Westby noted that the projects are unrelated. He explained when the rejuvenation would typically occur and noted that once that is completed crack sealing could occur anytime.

Councilmember Musgrove stated that within the case she noticed similar lengths of area with different materials proposed and asked if that is related to the age of the street.

City Engineer Westby replied that the pounds of the material are adjusted based on the condition of the road. He stated that staff estimate the pounds that will be needed in order to address the disparity of the cracking.

Councilmember Musgrove referenced areas within the Riverstone development, noting that those are new streets and asked how those roads would already need crack sealing. She stated that when she has driven on the roads, they look really nice and she was surprised to see them on the list.

City Engineer Westby replied that staff attempts to crack seal pavements three years after construction and these roads were constructed in 2017. He commented that the cracking should be minimal, but they are attempting to be proactive in maintenance.

Councilmember Musgrove asked if other areas of the City would be more in need than this newer area.

City Engineer Westby replied that the primary focus is to be proactive with maintenance in order to keep the good streets good. He commented that some streets in the City are past the point of maintenance and staff will do something if they can, but the priority will remain on extending the lifespan of the new roads.

Councilmember Howell asked how staff determines that quality work will be received from bids.

City Engineer Westby replied that experience is the best teacher, noting that typically the City receives bids from the same contractors that they know to do a good job. He stated that if a contractor is not known, staff reaches out for input from other municipalities to determine if there have been past issues. He stated that very rarely does the City find a contractor they do not want to work with. He stated that the City is typically required to award to the low bidder. He noted that there are specifications and the minimum requirements that a low bidder must meet.

Chairperson Riley stated that the City has become strict on inspections to ensure that road is built to specification.

Councilmember Musgrove referenced the MSA roads included for crack seal and asked if that would be funded through crack seal or MSA funds.

City Engineer Westby replied that crack seal funds budgeted are historically used for crack sealing, regardless of whether a road is an MSA road. He stated that the intent is to use MSA funds for reconstruction or overlay projects.

Councilmember Musgrove asked if additional crack seal work would be anticipated later this year using MSA maintenance dollars.

City Engineer Westby replied that the budget for this year uses the MSA funds for reconstruction and overlay projects.

Councilmember Musgrove asked for details on the 14 percent indirect costs associated in the case. She also asked for details on the consortium that exists for road improvements.

City Engineer Westby replied that he could bring additional information back to the group related to the consortium. He stated that Ramsey is not a partner city, but he is on the email list and receives shared information. He believed there were currently 11 members in the consortium with Coon Rapids leading the group and organized maintenance activities. He stated that Ramsey has been watching the consortium to determine if they should join for maintenance, but thus far Ramsey has received lower bids, including the 14 percent indirect costs which includes plan preparation and inspection. He noted that being independent also allows for greater flexibility in scheduling the work, which can benefit abutting property owners.

Motion by Councilmember Woestehoff, seconded by Councilmember Musgrove, to recommend City Council approval of plans and specifications and authorization to advertise for bids for 2021 Crack Seal Improvements, Improvement Project #21-06.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Woestehoff and Musgrove. Voting No: None.

5.06: Consider Recommending City Council Approval of Resolution Adopting Minimum Requirements for Public Utilities Installed in Public Right-of-Ways and Easements

City Engineer Westby reviewed the staff report and recommendation to approval of a resolution adopting minimum requirements for public utilities installed in public right-of-way and easements.

Chairperson Riley stated that he likes where this is headed. He asked if this were in place would it be hamstringing the City and future developers.

City Engineer Westby replied that the City prefers gravity sewer, and the Riverwalk site was too low to make that work. He reviewed the different options that could be used and noted that the developer chose the cheapest route with the intent of the developer maintaining that line. He stated that if that option were chosen in a future development, one lift station would need to be created with a pressurized system going to the gravity system. He recognized that there would be additional cost to a developer for that.

Councilmember Woestehoff asked if this is something that should be run by EDA and the Planning Commission before going before the Council.

Chairperson Riley commented that this is more of a policy decision.

Councilmember Woestehoff stated that there are sites that may fall into this category and as a previous member of the Planning Commission he did not recall this being an issue when Riverwalk was proposed.

Deputy City Administrator Gladhill explained that the core function of the EDA is business retention and subsidy, and this level of detail is not intended to be a function of the Planning Commission. He commented that additional feedback could be gathered from those groups, but Public Works Committee would be the appropriate group to review this and make a recommendation to the Council.

Councilmember Musgrove commented that as part of this draft resolution, perhaps the excluded areas of the City should be listed. She asked if Riverwalk would be the only development of that nature.

City Engineer Westby replied that there are numerous undeveloped parcels that would fall into this category and require some level of a pressurized system to reach the City system.

Councilmember Musgrove clarified that she did not want to misconstrue that this action would make the City responsible for any other systems.

Chairperson Riley stated that the language is generic in utility and trunk lines and asked if that would accurately cover water and sewer.

City Engineer Westby replied that it is his understanding that it is the intent of the City to maintain infrastructure under the roadway and/or right-of-way and therefore the City would want to ensure that the pipes are adequately sized.

Chairperson Riley asked if there would be a downside.

City Engineer Westby replied that he did not notice a downside but would double check with Public Works Superintendent Riemer before bringing this forward to Council. He noted that this was intended to be a starting point and therefore broad language was used and confirmed that staff would verify to ensure that the City would not be at risk.

Councilmember Musgrove asked if a resolution is needed or whether the City simply needs to update the policy/designs.

Deputy City Administrator Gladhill stated that having the backing of the Council through resolution helps with developer discussions. He stated that the language is broad enough yet specific enough for negotiations and code enforcement.

City Engineer Westby replied that the Council does not adopt the design standards per se, therefore the resolution provides the policy direction to guide those standards.

Deputy City Administrator Gladhill explained that this direction and policy from the Council is helpful on the front end to prevent a situation like Riverwalk from occurring.

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to recommend City Council approval of a resolution adopting minimum requirements for public utilities in public right-of-way and easements as discussed.

Further discussion: Chairperson Riley commented that if staff feels that additional language is needed for the resolution it should be added as discussed. Councilmember Woestehoff commented that he would be comfortable with staff making the amendments in line with the discussion.

Motion carried. Voting Yes: Chairperson Riley, Councilmembers Musgrove and Woestehoff. Voting No: None.

6. COMMITTEE / STAFF INPUT

6.01: Staff Updates on Improvement Projects and Items of Interest

City Engineer Westby provided an update on current and proposed City, County and MnDOT improvement projects and studies and other items of interest to the Committee.

6.02: Review Future Topics Calendar

City Engineer Westby stated that staff is doing its best to reach the topics on the list once other projects are cleared off.

Councilmember Musgrove asked if any of the projects on the list would qualify for Watershed Based Funding.

City Engineer Westby stated that staff will look through the CIP to determine if any of the projects would qualify.

7. ADJOURNMENT

Motion by Councilmember Musgrove, seconded by Councilmember Woestehoff, to adjourn the Public Works Committee meeting.

Motion carried.

The regular meeting of the Public Works Committee adjourned at 8:23 p.m.

Respectfully submitted,

Grant Riemer
Public Works Superintendent

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

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CITY COUNCIL
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Ramsey City Council conducted a regular meeting on Tuesday, January 26, 2021, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present: Mayor Mark Kuzma
Councilmember Chelsee Howell
Councilmember Debra Musgrove
Councilmember Chris Riley
Councilmember Dan Specht
Councilmember Matt Woestehoff

Members Absent: None

Also Present: City Administrator Kurtis Ulrich
Police Chief Jeff Katers
Deputy City Administrator Timothy Gladhill
City Engineer Bruce Westby
Economic Development Manager Sean Sullivan

1. CALL TO ORDER

Mayor Kuzma called the regular meeting of the Ramsey City Council to order at 7:10 p.m., followed by the Pledge of Allegiance led by Mayor Kuzma.

City Administrator Ulrich read a statement related to the COVID-19 pandemic and local state of emergency. In declaring this Local State of Emergency, the City of Ramsey has determined that in person meetings and meetings conducted under Minnesota Statutes Section 13D.02 are not practical or prudent because of the declared health pandemic emergency.

2. PRESENTATION

There were none.

3. CITIZEN INPUT

None.

4. APPROVE AGENDA

Motion by Councilmember Riley, seconded by Councilmember Musgrove, to approve the agenda as presented.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Riley, Musgrove, Howell, Specht, and Woestehoff. Voting No: None.

5. CONSENT AGENDA

Motion by Councilmember Woestehoff, seconded by Councilmember Howell, to approve the following items on the Consent Agenda:

5.01: Note the Following Boards, Commissions and Committee Meeting Minutes:
- Planning Commission Meeting Minutes dated November 5, 2020
- Planning Commission Meeting Minutes dated December 3, 2020
- Economic Development Authority Meeting Minutes dated November 12, 2020
- Park and Recreation Commission Meeting Minutes dated November 12, 2020
- Public Works Committee Meeting Minutes dated November 17, 2020

5.02: Approve the following Meeting Minutes:
1) City Council Work Session dated January 12, 2021
2) City Council Regular dated January 12, 2021

5.03: Approve Rental Licenses

5.04: Award Sign Addition for Loral I Armstrong Delaney Ramsey Central Park

5.05: Adopt Resolution #21-033 Approving Cash Disbursements Made and Authorizing Payment of Accounts Payable Invoicing Received During the Period of January 7, 2021 through January 20, 2021

5.06: Adopt Resolution #21-014 Approving an Interim Use Permit for Storage Containers and Gravel Parking at 8049 146th Avenue NW (Project 20-137); Case of JBR Ramsey, LLC on behalf of Richard Lee

5.07: Adopt Resolution #21-024 Prohibiting Parking on Riverdale Drive between Feldspar Street and Sunfish Lake Boulevard for Improvement Project #21-00

5.08: Adopt Resolution #21-025 Approving Second Amendment to Purchase Agreement and Right of Re-Entry Agreement with Gigi's Salon and Spa, Inc. (Portions of case may be closed to the public)

5.09: Adopt Resolution #21-028 Authorizing Partial Payment #4 to RJM Construction for Improvement Project #20-07 New Public Works Facility

5:10: Adopt Resolution #21-029 Authorizing Final Payment to Northern Lines Contracting, Inc. for Improvement Project #18-09, COR Infiltration Basin Improvements

5:11: Adopt Resolution #21-032 Authorizing Partial Payment #6 to Park Construction for Improvement Project #20-01, Variolite Street Reconstruction Project

5:12: Adopt Resolution #21-034 to Approve the City's 2021 Union Contracts for LELS Patrols and LELS Sergeants

5:13: Adopt Resolution #21-035 Directing Staff to Subject the 2021 Pay Equity Report

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Woestehoff, Howell, Musgrove, Riley, and Specht. Voting No: None.

6. PUBLIC HEARING

There were none.

7. COUNCIL BUSINESS

7.01: Adopt Resolution #21-027 Approving Request for Interest (RFI) for a Dynamic Display Billboard for Retail Advertising on Highway 10 Near The COR

Economic Development Manager Sullivan reviewed the staff report and recommendation of the EDA that the City Council begin a process seeking interest in construction of a dynamic display billboard on Highway 10.

Councilmember Riley referenced the cost of the sign and asked if that would be funded through private investment rather than by the City.

Economic Development Manager Sullivan confirmed that the City would ask the developer to incur the cost.

Councilmember Woestehoff asked if the sign would meet the current requirements for average signage if it were located on private property.

Economic Development Manager Sullivan stated that included in the RFI there is language related to adjusting or working within the sign ordinance. He commented that he would imagine that the City would need to potentially tweak the regulation if it makes sense.

Councilmember Musgrove stated that she believes this action would be premature. She asked if the plan would be for this to be located on private or public land.

Economic Development Manager Sullivan commented that the City would be asking these companies to provide suggestions as to the best placement of the sign. He stated that the goal would be to have companies present information that the City could evaluate, and this would not commit the City to any action.

Deputy City Administrator Gladhill stated that the design process for Highway 10 will provide a better understanding of the right-of-way needs, which could also create opportunities. He stated that he understands the concern but recognized that this process would take time and the right-of-way needs should be known by that time.

Mayor Kuzma commented that he saw the presentation at the EDA meeting, and this would really help the businesses in Ramsey to have that additional exposure opportunity and therefore he would be interested in receiving proposals.

Councilmember Musgrove asked if it would be more favorable to change the restrictions for business signage rather than having those businesses pay for space on a billboard. She asked if the sign ordinance is too restrictive.

Mayor Kuzma stated that the EDA did not discuss that and instead focused on what the dynamic sign could bring. He commented that the sign would sell to national chains but would also make advertising available on a scale that small businesses could support. He stated that this process

would identify opportunities that the City could review, and it would not bind the City to any action.

Councilmember Specht stated that he likes that the RFI states that space must be reserved for City and local advertising and asked for details on the type of advertising that the City may do.

Economic Development Manager Sullivan replied that they are open to any and all City messaging that could enhance the message the City is attempting to spread, using the example of local events that the City advertises. He stated that if the City is going to move forward, it would be important to identify City input and restrictions along with the time and space that would be reserved for Ramsey businesses. He used the example of the sign in Champlin, which identifies a minimum amount of time and space for local Champlin businesses. He stated that the City can also prohibit content that it does not feel appropriate through ordinance.

EDA Chairperson Steffen commented that bringing retail and restaurants to The COR has been a long-term goal of the EDA and Council. He stated that in the past six years the City has added rooftops and therefore he does not believe that lack of rooftops is a continued barrier that the City once faced. He noted that the Armstrong Interchange has also not been the golden ticket in attracting those types of businesses. He stated that the issue at this time seems to be related to visibility and lack of exposure. He stated that RDH has contacted almost every national retailer and restaurant in the country and continues to hear that the businesses are not interested because of the lack of exposure. He stated that this process is simply a request for information for something that would have zero cost to the City. He stated that many businesses do not have the ability to have a sign on their property, if located on the interior of The COR, that could be visible from the highway. He stated that this request for interest will answer some of the questions that have been brought forward tonight.

Councilmember Specht stated that originally, he was not a fan of this idea based on how this would look, but as he hears the feedback from staff, the EDA, and businesses, he would respect the idea of gathering more information. He stated that he will support this effort to gather additional information.

Councilmember Woestehoff stated that he agrees with the comments of Councilmembers Specht and Musgrove. He stated that he has hesitations because of the current sign regulations which do not allow billboards but is happy to entertain what this might look like and how it could help and attract businesses.

Councilmember Howell stated that she was also hesitant about this idea. She asked the radius of local businesses that would be allowed to advertise on the sign.

Economic Development Manager Sullivan commented that the sign would be available to all Ramsey businesses and not just those within The COR. He stated that whatever the design of the sign, it would be complimentary to the existing signage.

Motion by Councilmember Riley, seconded by Councilmember Woestehoff, to Adopt Resolution #21-027 Approving Request for Interest for a Dynamic Display Billboard for Retail Advertising Along Highway 10 Near the COR.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Riley, Woestehoff, Howell, and Specht. Voting No: Councilmember Musgrove.

7.02: Adopt Resolution #21-022 Approving Plans and Specifications and Authorizing Advertisement for Bids for Riverdale Drive Reconstruction, Improvement Project #21-00

City Engineer Westby reviewed the staff report and recommendation to adopt Resolution #21-022 approving plans and specifications and authorizing advertisements for bids for Riverdale Drive Reconstruction, Improvement Project #21-00 in accordance with the approved 2021-2030 CIP.

Councilmember Musgrove asked if it is normal to have 90 percent plans.

City Engineer Westby replied that staff would love to have 100 percent plans every time it presents to Council, but they are trying to expedite the process. He stated that typically the best bids are received during the winter (January/February) before contractors have filled their project slate for the year as that relates to better pricing. He stated that if the City waits until March/April to bid projects, it typically receives higher bids. He stated that staff is comfortable presenting these plans tonight and will have plans 100 percent complete by the bid time.

Councilmember Riley commented that the repair crew spent about three weeks on this section of road and about three weeks on Variolite, which has already been reconstructed. He stated that the rest of the City will benefit by having this section of road reconstructed as well as that frees up six weeks for patch work in other areas of the community.

Motion by Councilmember Specht, seconded by Councilmember Musgrove, to Adopt Resolution #21-022 Approving Plans and Specifications and Authorizing Advertisements for Bids for Riverdale Drive Reconstruction, Improvement Project #21-00.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Specht, Musgrove, Howell, Riley, and Woestehoff. Voting No: None.

7.03: Adopt Resolution #21-023 Approving Plans and Specifications and Authorizing Advertisements for Bids for 2021 Crack Seal Improvements, Improvement Project #21-06

City Engineer Westby reviewed the staff report and recommendation to adopt Resolution #21-023 approving plans and specifications and authorizing advertisements for bids for 2021 Crack Seal Improvements, Improvement Project #21-06.

Motion by Councilmember Howell, seconded by Councilmember Specht, to Adopt Resolution #21-023 Approving Plans and Specifications and Authorizing Advertisements for Bid for 2021 Crack Seal Improvements, Improvement Project #21-06.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Howell, Specht, Musgrove, Riley, and Woestehoff. Voting No: None.

7.04: Introduce Ordinance #21-01 Amending City Code Sections 117-111 (R-1 Residential District) and 117-112 (R-2 Residential District) Clarifying Sub-Districts Based on Lot Size

Deputy City Administrator Gladhill reviewed the staff report and recommendation of the Planning Commission to adopt Ordinance #21-01.

Councilmember Riley asked for additional information as this would appear to move 50 foot lots from R-2 to R-1.

Deputy City Administrator Gladhill replied that the Council would still dictate where the subdistrict would go through rezoning. He stated that staff was finding that the 50-foot-wide lots were not reaching the density range in R-2 and therefore it better fits in the density allowed in R-1. He confirmed that the Planning Commission held a public hearing on this issue and recommended approval.

Councilmember Musgrove asked the difference between R-1-1 and R-1-3.

Deputy City Administrator Gladhill recognized that there was a typo noting that it should state MUSA-80, MUSA-65, and MUSA-50. He stated that staff would make that correction before the ordinance comes back for adoption. He stated that by default, R-1 would remain at 80-foot-wide lots and if something less is requested, the developer would still need to go through a rezoning request.

Councilmember Musgrove stated that this references residential MUSA areas and asked if there are areas outside of that.

Deputy City Administrator Gladhill confirmed that there are other areas outside of residential MUSA that would remain unchanged.

Councilmember Specht asked if this change would make it easier for developers to request this smaller lot size.

Deputy City Administrator Gladhill stated that this change would not impact the City's ability to remain more restrictive, it simply provides another tool in the box for the City.

Councilmember Woestehoff commented that this change would clean up the zoning map and would not change anything. He noted that R-1 would become all single family, R-2 would be

townhomes, and R-3 would be condominiums. He commented that this would then be a cleaner way to describe the different zones.

Motion by Councilmember Woestehoff, seconded by Councilmember Riley, to Introduce Ordinance #21-01 Amending Article II Division 4 Section 117-89 (Districts), 117-111 (R-1 Residential District), and 117-112 (R-2 Residential District).

Further discussion: Councilmember Musgrove asked if this would be a housekeeping item to better clarify the areas. Councilmember Woestehoff stated that he views this as updating the glossary of terms. Deputy City Administrator Gladhill confirmed that this would not make any changes and would simply be more tools and placing things in the right area. He confirmed that the Council would still hold control over the ultimate land use.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Woestehoff, Riley, Howell, and Musgrove. Voting No: Councilmember Specht.

7.05: Introduce Ordinance #21-02 Amending City Code Section 117-148 Entitled Mississippi River Corridor Critical Area

Deputy City Administrator Gladhill reviewed the staff report and recommendation of the Planning Commission to adopt Ordinance #21-02.

Councilmember Riley commented that there is a whole neighborhood that was colored green and asked if that area would become lawful nonconforming.

Deputy City Administrator Gladhill replied that the neighborhood already conforms with the rules as it is developed under rural character. He stated that if there was a deficiency that would create lawful nonconforming, a subdistrict would be applied.

Councilmember Riley stated that he would not be ready to move forward until there is more time to digest the information and the ramifications of these decisions.

Councilmember Musgrove asked if the timing for this is part of the DNR timing or whether it is needed for Riverstone South.

Deputy City Administrator Gladhill replied that the City is required to have this adopted by the end of 2022, as he believed Ramsey is part of the second wave. He stated that the City originally did not anticipate a project coming forward, therefore Riverstone is a driving factor. He noted that the ordinance and development are under review by the DNR. He stated that staff is attempting to meet the schedule of the developer.

Councilmember Musgrove stated that she would also have concerns moving forward tonight and would like additional time to review the information and what it would mean for the City of Ramsey and the impacted developments. She stated that she does not want to deter development but wants to ensure the best decisions are made.

Deputy City Administrator Gladhill confirmed that staff would welcome additional time for review. He stated that the Council could postpone this discussion and forward this to a future worksession.

Motion by Councilmember Riley, seconded by Councilmember Musgrove, to postpone Ordinance #21-02 Amending City Code Section 117-148 Entitled Mississippi River Corridor Critical Area and forward it to a future worksession.

Further discussion: Councilmember Specht asked if postponing this action would impact the Riverstone South development. Deputy City Administrator Gladhill provided an update on the case on tonight's agenda and noted that action could still occur tonight. He stated that there is additional time before the Council reviews the Preliminary Plat.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Riley, Musgrove, Howell, and Specht. Voting No: Councilmember Woestehoff.

7.06: Receive Request from Planning Commission to Reconsider Bowers Drive Connection

Planning Commissioner Randy Bauer reviewed the staff report and stated that upon a vote of 3-2, the Planning Commission recommended that the City Council reconsider the connection to Bowers Drive, at some form, for public safety reasons. He asked for input from members of public safety and/or public works related to their concerns for not having a second access on Bowers Drive because that was the driving force behind the Planning Commission recommendation.

Police Chief Katers replied that public safety has been consistent in their recommendations for access. He stated that for police, two accesses are better than one and connection between neighborhoods is good. He believed that fire also requires adequate turning radius and dedication of fire access roads. He commented that for public works it is easier to plow a through street rather than a dead end. He stated that he fully understands that this is a nonconforming existing residential neighborhood and that the residents are opposed to this connection.

Councilmember Musgrove stated that she appreciates the concern from the members of the Planning Commission, but when this previously came forward to the City Council through a public hearing, the Council agreed that the development should move forward without that second access. She asked how many Bowers Drive residents are aware that this is up for discussion tonight, noting that she would hate to make a decision on this without allowing those residents to again provide input. She commented that her position on this issue has not changed.

Deputy City Administrator Gladhill stated that the steps prior to this point have been concept planning and setup for Preliminary Plat review. He stated that the Planning Commission held the full public hearing and its last review of the project, therefore the Commission can make that recommendation as they are a recommending body. He stated that staff did not choose to notify the public for this discussion. He stated that if the decision of the Council changes, the residents would again be notified for the next review. He stated that if the Council chooses to take no action and move forward without that additional connection, that would be fine.

Councilmember Specht commented that he has received phone calls with concern over a second connection and many residents spoke at the last public meeting expressing their concerns. He stated that his position remains unchanged.

Motion by Councilmember Specht, seconded by Councilmember Howell, to affirm the previous direction of the Council to not require a second connection to Bowers Drive.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Specht, Howell, Musgrove, Riley, and Woestehoff. Voting No: None.

Deputy City Administrator Gladhill confirmed that this action reaffirms the previous direction of the Council and would most likely satisfy the Bowers Drive residents that may be present at the meeting tonight.

Councilmember Specht acknowledged that residents took time out of their night to attend and welcomed any input they may wish to provide.

Carol Larson, 14480 Bowers Drive, commented that she has been a resident on Bowers Drive for nearly 57 years and has seen many changes. She stated that adding 12 homes to Bowers Drive has added a significant amount of traffic and many young children. She stated that she was concerned that level of traffic and pedestrian traffic would increase significantly if Bowers Drive were connected to Riverstone South which would create a safety issue. She was thankful that the Council is not accommodating that connection. She thanked the Council for its continued support.

7.07: Consider Preliminary Approvals Related to Riverstone South; Case of Capstone Homes/Riverstone Development

1. **Adopt Resolution #21-015 Approving Comprehensive Plan Amendment from Low Density Residential to Medium Density Residential for Detached Townhome Section**
2. **Introduce Ordinance #21-03 Approving Zoning Amendment from R-1 Residential (MUSA – 80) District to R-1 Residential (MUSA – 65) District, R-1 Residential (MUSA – 50) District and R-2 Residential (Detached Townhome) District**

Deputy City Administrator Gladhill reviewed the staff report and recommendation of the Planning Commission to approve the Comprehensive Plan Amendment and Zoning Amendment. For future reference, the Planning Commission recommends approval of the Preliminary Plat at a future date following completion of the required EAW and with the contingencies noted in the case.

Councilmember Specht commented that this is a good plan and an area that can accommodate smaller lots, especially in the area near the solar farm. He believed that this is a good compromise for the adjacent residents of Bowers Drive and supports the changes.

Councilmember Howell stated that she is concerned with the smaller lot sizes. She commented that she recognizes that this is a compromise and likes the acreage that would be set aside but is concerned with the City's ability to maintain that and therefore is hesitant to support this.

City Administrator Ulrich clarified that the second action would be to introduce the ordinance rather than adopt it tonight.

Motion by Councilmember Specht, seconded by Councilmember Riley, to Introduce Ordinance #21-03 Amending Section 117-90 "Map" of Chapter 117 of the City Code of Ramsey, Minnesota, and Adopt Resolution #21-015 Granting Comprehensive Plan Amendment Approval, Preliminary Plat Approval and Determining that an Environmental Impact Statement is not Necessary for Riverstone Addition.

Further discussion: Councilmember Musgrove asked if the right action would be to introduce both items. Deputy City Administrator Gladhill confirmed that the recommended action in the case and as proposed is correct, to introduce the ordinance and adopt the resolution.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Specht, Riley, Musgrove, and Woestehoff. Voting No: Councilmember Howell.

7.08: Approve Revised Cost Share Framework for Riverdale Drive Extension Improvement Project Related to Riverstone South; Case of Capstone Homes and Pearson Properties of Ramsey

Deputy City Administrator Gladhill reviewed the staff report and recommendation of the Public Works Committee to approve the revised Cost Share Framework without the need for financial underwriting. The Public Works Committee feels that a contribution to a collector roadway has a broader public benefit and that the revised cost share framework is close to the original framework originally approved (non-binding) by the City Council and that additional underwriting is unnecessary.

Councilmember Riley commented that Public Works Committee had a robust discussion on this item. He noted that the previous concept split the cost into thirds between the three parties. He stated that the only change is related to the County parcel, but the cost still remains close to the one third split with the potential grant funds that could be used for that purpose. He stated that all parties continue to support the framework split as proposed.

Councilmember Musgrove asked if the City must purchase the property rather than having a right-of-way.

Deputy City Administrator Gladhill replied that the property was purchased through the RALF program with the County as the lead party for the purpose of a potential river crossing. He stated that the reaction of the County is if improvements are made to that property that aren't related to the river crossing those RALF dollars would need to be paid back. He stated that staff will continue to push on that and continue discussions.

Councilmember Musgrove asked how the solar garden interplays with that. She commented that she has a hard time with the County land being a hurdle. She recognized that if the parcel is required to be purchased, the City could have additional revenue potential from development in the future.

Deputy City Administrator Gladhill replied that the solar farm is a lease, similar to City leases that exist within properties the City purchased with RALF funds. He stated that right-of-way would be acquisition, which is different than a lease. He stated that the County does not have funds to contribute through its capital improvement plan and therefore their solution was that the City purchase the land to provide that connection for the roadway.

City Administrator Ulrich noted that the draft resolution was not included in the case and the motion would actually be to approve the revised Cost Share Framework as outlined in alternative 6A.

Councilmember Specht asked if more details for the road layout would be identified in the future.

Deputy City Administrator Gladhill confirmed that this is a conceptual higher level planning layout and details would be determined as this continues to progress.

Motion by Councilmember Specht, seconded by Councilmember Woestehoff, to Approve the Revised Cost Share Framework for the Riverdale Drive Extension Related to Riverstone South as described in alternative 6A.

Motion carried. Voting Yes: Mayor Kuzma, Councilmembers Specht, Woestehoff, Musgrove, and Riley. Voting No: Councilmember Howell.

8. MAYOR, COUNCIL AND STAFF INPUT

City Administrator Ulrich announced upcoming meetings and events.

Councilmember Specht encouraged people to try the Police Citizens Academy, noting that it is an amazing opportunity.

9. ADJOURNMENT

Motion by Councilmember Musgrove, seconded by Councilmember Howell, to adjourn the meeting.

Motion carried.

The regular meeting of the City Council adjourned at 9:02 p.m.

Respectfully submitted,

Kurtis G. Ulrich
City Administrator

ATTEST:

Katie M. Schmidt
Deputy City Clerk

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

A recording of this meeting is available for viewing online at www.qctv.org <http://www.qctv.org>. Recordings are available for 36 months after the date of the meeting.

Public Works Committee **5. 3.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Receive Sound Wall Request Letter from Residents East of State Highway 47, North of Xkimo Street

Purpose/Background:

Attached is a copy of an email recently received by the City Engineer/Interim Community Development Director from residents along Xkimo Court NW, east of State Highway 47 and north of Xkimo Court, after meeting with the residents on site. The email respectfully requests the following items be pursued by the City of Ramsey:

· Partner with MNDOT to determine if building an appropriate, effective noise wall would be their responsibility or the City's

· If MNDOT has the responsibility, then to partner and advocate for them to seek funding to build an effective noise wall on par with the height above street level of, and extending to, the existing noise wall further north along cty 47

· If the City has the responsibility, pursue approval and prioritize allocating funding to build an effective noise wall on par with the height above street level of, and extending to, the existing noise wall further north along cty 47

· Establish a noise ordinance to discourage vehicles from excessive acceleration or jake-breaking at the 47/5 intersection

· Seek partnership with Ramsey PD and/or the Anoka County Sheriff, to establish a presence in the area [even if simply parking in-between calls or completing paperwork] to discourage the above behavior

· Post signs on Hwy 47 to notify drivers of the noise ordinance and that it is enforced by the City of Ramsey

· Provide a plan timeline, along with regular communication on progress, regarding the above to the residents of Xkimo Ct. Nw.

Staff has not yet begun to work on a response letter, and is awaiting Committee direction.

If the Committee would like an estimate of the costs to construct sound walls as requested, Staff can prepare an estimate and present it at the next regular Public Works Committee meeting.

Attached is an email from MnDOT with responses to Staff's questins regarding external funding sources. At this time it does not apprea that external funds are available to extend the sound wall. However, Staff will continue to explore external funding sources for such sound wall improvements.

It is too late in the year to begin construction of a sound wall in 2021, so at best this work could be completed in 2022. This would require the collection of topo survey this fall or next spring to determine where a sound wall could effectively be constructed along this corridor. In order for a sound wall to be affective it should be constructed at a height extending at least 6-feet above the pavement of northbound Highway 47.

Attached is a figure showing how long the sound wall would need to extend to the north of the Ramsey Villas North plat to connect to the existing sound wall approximately 900 feet north.

Timeframe:

Staff estimates 25 minutes will be needed to present this case and respond to questions.

Observations/Alternatives:

Observations:

Staff informed the residents that submitted the email that this case would be presented at this evening's Public Works Committee meeting so Staff anticipates there will be several residents in attendance.

Alternatives:

Alternative #1 – Motion directing Staff to prepare a response letter addressing the requested actions per the email received from the residents of Xkimo Court NW, and to present a draft response letter for action at the next regular Public Works Committee meeting.

Alternative #2 – Motion of other.

Funding Source:

To be determined based on the Committee's direction to Staff.

Recommendation:

Staff does not have a recommendation to offer at this time.

Action:

Motion directing Staff to prepare a response letter addressing the requested actions per the email received from the residents of Xkimo Court NW, and to present a draft response letter for action at the next regular Public Works Committee meeting.

Attachments

Xkimo Court Residents email

MnDOT Sound Wall email

Staff email to Xkimo Court residents

Sound Wall Gap Figure

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	10/14/2021 04:08 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 04:13 PM
Form Started By: Bruce Westby		Started On: 10/14/2021 02:51 PM
Final Approval Date: 10/14/2021		

From: Richardx.Bailey
To: Bruce Westby
Cc: Ted Blakley; Megan Blakley; angel.hughes129@gmail.com; Bertin Chabene; Richardx.Bailey
Subject: Xkimo Ct Nw Noise Wall Follow up and letter
Date: Friday, October 8, 2021 4:41:41 PM
Attachments: RE EXTERNAL RE Project 20-117.msg
Noise Wall 4.jpg
Noise Wall 1.jpg
Noise Wall 2.jpg
Noise Wall 3.jpg

Hi Bruce,

Thanks again for stopping out last week to discuss the ongoing noise issues we've been experiencing and for offering to take forward a letter highlighting our concerns, to help move towards resolution. Please find this letter below. Attached you'll find the email we referred to during our discussion regarding the originally communicated noise wall length as well as photos of what was built.

Please let us know if you have any questions…

****

Hello,

First off, thank you for taking the time to review the below concern and related requests from us, the residents of Xkimo Court Nw.

The chief concern, which we have raised before, is the increased noise levels in our cul-de-sac, which directly affects the 20+ people that call Xkimo Ct Nw 'home'.

We first began noticing the increased traffic noise when the city approved the construction of Stoney River directly across, and elevated above, Highway 47 from us; as there exists no noise barrier on our side of 47, we feel the effects of traffic noise deflected from Stoney River directly into our neighborhood.

Last year we were notified of the approved sale of the land on the west side of the cul-de-sac to a third party home builder. Since this meant the removal of what little natural noise protection [mature trees/growth] we had on those lots, we raised our concerns regarding the noise impact we anticipated and, unfortunately, have since realized. The cumulative traffic noise level is so high at times that it can be heard clearly inside homes and even requires pausing conversations when outside.

Prior to the development being approved, we had inquired regarding having a noise wall included with the construction on the site, and were subsequently provided a plat drawing/photo [see attached email] which indicated a noise wall *would* be built and *would* extend for a considerable length of the property as well as mirror the size the noise wall farther north along 47. Since we were advised this was the plan, we were satisfied with the accommodations to protect the interests of our families.

Unfortunately this accommodation was not followed through upon, to the detriment of our neighborhood and directly affects our quality of life. We were advised after the sale was approved, that a 'mistake' was made and the drawing shared wasn't actually correct; the noise wall would not equal the length we were told it would, but instead be less than ½ as long. In addition the "noise wall" that was constructed by the builder is completely ineffective and quite frankly, unacceptable. As shown by the photographs attached, the wall was not built using the street level as the baseline, but instead followed the undulating topography of the land itself; this resulted in an inferior "noise wall" who's top, in places, is below street level and can be described, at best, as an exercise in futility and who's appearance doesn't do any favors for the aesthetics or reputation of the city.

To rectify the above we respectfully request the following items be pursued by the City of Ramsey:

· Partner with MNDOT to determine if building an appropriate, effective noise wall would be their responsibility or the City's

  · If MNDOT has the responsibility, then to partner and advocate for them to seek funding to build an effective noise wall on par with the height above street level of, and extending to, the existing noise wall further north along cty 47

  · If the City has the responsibility, pursue approval and prioritize allocating funding to build an effective noise wall on par with the height above street level of, and extending to, the existing noise wall further north along cty 47

  · Establish a noise ordinance to discourage vehicles from excessive acceleration or jake-breaking at the 47/5 intersection

    · Seek partnership with Ramsey PD and/or the Anoka County Sheriff, to establish a presence in the area [even if simply parking in-between calls or completing paperwork] to discourage the above behavior

    · Post signs on Hwy 47 to notify drivers of the noise ordinance and that it is enforced by the City of Ramsey

  · Provide a plan timeline, along with regular communication on progress, regarding the above to the residents of Xkimo Ct. Nw.

Thank you in advance for your review and partnership on this matter that is of high importance to us; please let us know how we can support you in this pursuit.

From: Ries, Natalie (DOT)
To: Bruce Westby
Cc: Barnes, Melissa (DOT); Wiltgen, Jennifer (DOT)
Subject: RE: TH 47 noisewall extension north of Xkimo Street in Ramsey
Date: Tuesday, July 13, 2021 4:56:21 PM
Attachments: image002.png
image003.png

Hi Bruce,

There could be an option to build the wall within MnDOT's ROW. But I think the preference would be for the wall to be on the private property, especially if there is still an opportunity for the developer to build the wall as part of a new development. Here's the official language:
If a municipality wishes to construct a barrier on MnDOT's right of way, they must submit plans certified by a registered engineer or landscape architect to be reviewed by MnDOT before constructing. Per State Statute 429.021 subdivision 1, the municipalities are given the power to make these improvements.

I'm not aware of any funding availability for this type of work. Residential developments must be built prior to 1997 in order to be eligible for the Metro Standalone Noise Wall Program (aka retrofit program/ranking list), so a new development wouldn't be eligible for program funding. The only other time MnDOT would analyze noise abatement for this area is if we had a Type 1 federally-funded project on TH 47 that expanded capacity or significantly shifted the roadway.

Just to clarify – I don't think that either of the walls you mentioned are MnDOT noise walls, correct? I'm not seeing any MnDOT-owned assets along this stretch of TH 47 in or asset database. The older wall looks like it could be on MnDOT property but it doesn't look like our typical noise wall design: https://www.google.com/maps/@45.234705,-93.3998485,3a,75y,125.04h,75.4t/data=!3m6!1e1!3m4!1sAlTVzXq8Gsdfdz4QlIpBRQ!2e0!7i13312!8i6656

Thanks!

Natalie Ries
Noise/Air Quality Program Supervisor
MnDOT Metro District
Address: 1500 West County Road B2 • Roseville, MN 55113
Email: Natalie.Ries@state.mn.us
Phone: (651) 234-7681

DEPARTMENT OF TRANSPORTATION

From: Bruce Westby <bwestby@ci.ramsey.mn.us>
Sent: Monday, July 12, 2021 4:09 PM
To: Ries, Natalie (DOT) <natalie.ries@state.mn.us>
Subject: TH 47 noisewall extension north of Xkimo Street in Ramsey

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Natalie:

Some residents are asking for the noisewall that was constructed along Highway 47 north of Xkimo Street as part of the Ramsey Villas North development this spring/summer to connect to the existing wall located over 900-feet north of Xkimo Street. I am wondering if MnDOT would allow the wall to be constructed within their right-of-way, or whether the wall would need to be constructed on private property. Also, are you aware of any funding that might exist for such work?

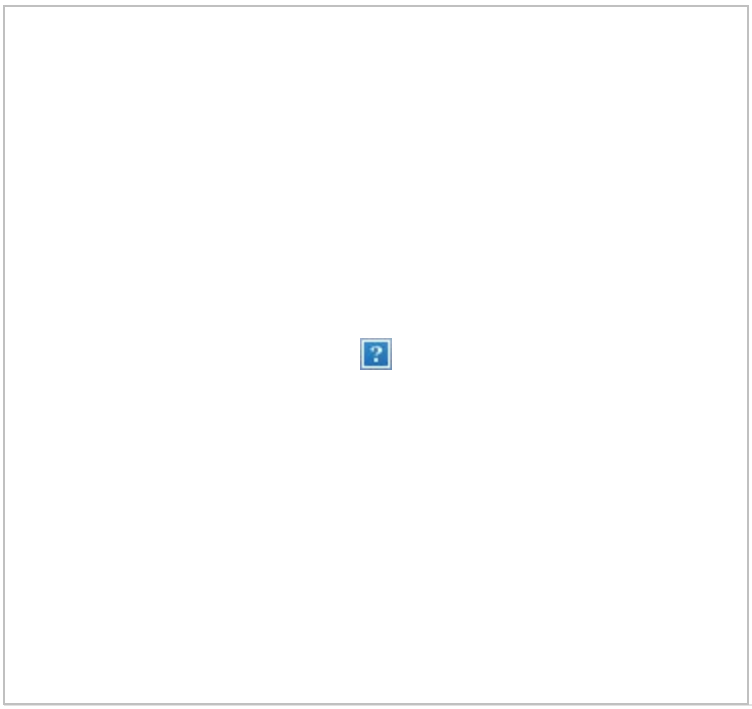
Thanks, Bruce

Bruce Westby, P.E., City Engineer
7550 Sunwood Drive NW | Ramsey, MN 55303
763-433-9825 (Direct) | 763-647-4485 (Cell)
bwestby@cityoframsey.com
www.cityoframsey.com

Our Mission: To work together to responsibly grow our community, and to provide quality, cost-effective, and efficient government services.

From: Chloe McGuire Brigl
To: Richardx.Bailey
Cc: "rjeo13@gmail.com"; Ted Blakley; Tim Gladhill
Subject: RE: [EXTERNAL] RE: Project 20-117
Date: Monday, March 22, 2021 1:24:26 PM
Attachments: image004.png
image001.jpg
image003.png

I've cc'd Tim Gladhill, Deputy City Administrator, to see what that process would be to request it from the City Council or see if it's in any of our current plans!
The good news is that the noise wall should cover your homes, it will extend along the blue property line on the west along 47, which extends a bit north of your homes. However, I do understanding having it the full length of 47 would help as well.



From: Richardx.Bailey <Richardx.Bailey@target.com>
Sent: Monday, March 22, 2021 1:13 PM
To: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>; Bruce Westby <bwestby@ci.ramsey.mn.us>; Marsha Weidner <MWeidner@ci.ramsey.mn.us>; Ted Blakley <tblakley7@hotmail.com>; Richardx.Bailey <Richardx.Bailey@target.com>
Subject: RE: [EXTERNAL] RE: Project 20-117
Thanks Chloe,
What would be the process to request the city continue the noise barrier from the edge of the property line to where the existing noise barrier is [I believe it's about a block further up 47]? The reason I ask is we've continued to experience a significant amount of road noise since the Stoney River facility was built up across 47 [assuming due to reverberation], so would like to request the city take the opportunity to improve this too.
Thank you~

From: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>

Sent: Monday, March 22, 2021 10:46 AM
To: Richardx.Bailey <Richardx.Bailey@target.com>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>; Bruce Westby <bwestby@ci.ramsey.mn.us>; Marsha Weidner <MWeidner@ci.ramsey.mn.us>; Ted Blakley <tblakley7@hotmail.com>
Subject: RE: [EXTERNAL] RE: Project 20-117

Great question –

We will require it be the same treatment, height, and size as the adjacent noise wall to the north so it will look consistent to the adjacent properties. The noise wall adjacent to this project measures at: approximately 69" tall posts, with 6 foot long seconds of 3 inch deep panels. It will extend to the edge of the property line for this project (we can't require that they build outside the property lines).

Best,

Chloe

From: Richardx.Bailey <Richardx.Bailey@target.com>
Sent: Monday, March 22, 2021 10:40 AM
To: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>; Bruce Westby <bwestby@ci.ramsey.mn.us>; Marsha Weidner <MWeidner@ci.ramsey.mn.us>; Ted Blakley <tblakley7@hotmail.com>; Richardx.Bailey <Richardx.Bailey@target.com>
Subject: RE: [EXTERNAL] RE: Project 20-117

Thanks Chloe! One added question regarding the noise barrier- has the height/length/type been shared yet? I'm assuming it will extend further north along 47 beyond just where the new homes will be built, but wanted to confirm too. [I'm cc'ing my neighbor Ted whose property is directly next to the new builds as well].

Thanks!

From: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>
Sent: Monday, March 22, 2021 10:36 AM
To: Richardx.Bailey <Richardx.Bailey@target.com>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>; Bruce Westby <bwestby@ci.ramsey.mn.us>; Marsha Weidner <MWeidner@ci.ramsey.mn.us>
Subject: RE: [EXTERNAL] RE: Project 20-117

Hi Rick –

Thanks for reaching out, and good timing. Tomorrow night, the development agreement for this project is slated to be approved by the City Council. This agreement gives the City an assurance that the project will be completed to City standards, and we hold a financial security to ensure that. After that is approved, our Engineering Team holds an internal pre-construction meeting to talk through some of the items you've noted below.

I've cc'd our City Engineer, Bruce Westby, on this email, who hosts those meetings for the City.

I will work to get some preliminary answers to your questions, and then after our pre-construction meeting, we will have more firm answers for you.

Thanks,

Chloe

From: Richardx.Bailey <Richardx.Bailey@target.com>
Sent: Monday, March 22, 2021 10:02 AM
To: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>

Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>; Richardx.Bailey <Richardx.Bailey@target.com>
Subject: RE: [EXTERNAL] RE: Project 20-117

Hi Chloe,

I hope you're doing well! I was wondering if you could provide an overall update regarding the below project. I also am wondering specifically regarding:

- Expected start date/duration
- Anticipated hours/days of work— I wanted to make sure with the nice weather there is some balance so we're not hearing construction early in the morning until late at night.
- Sequence of activity if able [one house @ a time, or all three @ once, when is the Noise Barrier going in etc]
- How traffic/congestion within the cul de sac will be handled during construction, or will construction vehicles be able to park on the CTY 47 side vs. within the cul de sac?

Thanks!

From: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>
Sent: Wednesday, July 8, 2020 8:21 AM
To: Richardx.Bailey <Richardx.Bailey@target.com>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>
Subject: [EXTERNAL] RE: Project 20-117

This Rick –

Thanks for your email. There is an agenda item for this project here, which you may find helpful. It answers a lot of your questions. But I'll also answer them specifically below.

- **Noise:** Staff has recommended a noise barrier along 47 included in the next step.
- **Traffic:** I will request that something is considered to this end with the preliminary plat submittal. Likely this number of homes is not enough to trigger a traffic study, but we could request a stacking diagram to ensure that the cul-de-sac functions properly. Staff has recommended a reduction in the number of homes from 4 to 3, which may help alleviate some of your concerns in terms of morning traffic.
- **Home Type:** Proposed at this time are 4 detached villa (single family) patio homes. The grading plan isn't completed yet, but the engineer for the project indicated that it is likely one or two of the homes will have basements to help accommodate the sloping onsite. The homes will be held to the same standards as a home like yours in terms of height, building materials, etc. These are not multi-unit properties – but instead single family homes on slightly smaller lots.
- **Is the final review/approval something that citizens have a vote regarding:** Short answer is no. Development projects like this are reviewed by Staff, then they are reviewed by the Planning Commission (Thursday's meeting) who makes a recommendation to the City Council. The City Council makes the final decision. For a project like this where the zoning isn't changing, if the project meets all of our standards, we approve it. This site is zoned for R-2 residential and guided for Medium Density Residential (4-7 units per acre) which is typically attached townhomes or detached villas.
- **Is this city owned property or privately held:** Privately held.
- **What is the timing of the development:** We are in the first stage of the project, and the project has no approvals yet. Land is subdivided through a three step process:
    1. Sketch Plan (this step) – high level drawing so the City can identify red flags, and

note items that should be included in the full plan set submitted in the next step. So far, the items Staff has identified are noise, as you noted, as well as a recommendation to reduce the number of lots onsite from 4 to 3 to better match the neighborhood.

2. Preliminary Plat – engineering plans
3. Final Plat – construction documents and legal agreements

Best,
Chloe

Chloe McGuire Brigl, AICP | cmcguire@cityoframsey.com
Senior Planner
City of Ramsey | Community Development
P: 763-433-9821 | F: 763-433-9848
7550 Sunwood Drive NW | Ramsey, MN 55303
www.cityoframsey.com

Our Mission: To work together to responsibly grow our community, and to provide quality, cost-effective, and efficient government services.

From: Richardx.Bailey <Richardx.Bailey@target.com>
Sent: Monday, July 6, 2020 4:26 PM
To: Chloe McGuire Brigl <CMcGuire@ci.ramsey.mn.us>
Cc: 'rjeo13@gmail.com' <rjeo13@gmail.com>
Subject: Project 20-117

Hi Chloe,

My name is Rick Bailey, and I live @ 5021 Xkimo Ct. Nw. We received the notice of the sketch plan application for Project #20-117 in our cul-de-sac, and had a few questions/concerns I'm hoping you can assist with.

The biggest question/concern around the project for us is a potential increase to an already problematic noise level. Since the building of Stoney River across County 47 (which seems to deflect traffic noise in our direction), coupled with a noticeable increase in traffic in general, noise volumes are already undesirably high. The only noise buffer we have between us and 47 are the woods on the property being discussed for development. Regarding this, could there be included a requirement of any developer to preserve some of the woods as well as have them be responsible for building a high quality noise barrier, similar to what exists farther up 47 towards Alpine? I'm hoping something of this nature would both help control the noise issue as well as preserving a balance of urban and rural/nature that Ramsey values.

A second question/concern, would be around the increase in traffic. Xkimo St., which we intersect with, has a particularly high level of traffic given the presence of Holiday, and as it's used as a thoroughfare for other neighborhoods, causing a bottleneck near the traffic lights. What this means for us, is that it can be a challenge to get out of the cul-de-sac because traffic actually blocks our street depending on the time of day. Adding 4 more households seems like it would exacerbate the issue, not to mention the morning traffic may cause the driveways of the new homes to be blocked while others in the cul-de-sac wait to enter traffic onto Xkimo St.

I also wanted to find out more on the type of homes that are being considered. Is there a photo/ nearby development that could be a reference for what these would look like? Can you confirm if these will be single family owned homes vs. multi-unit or rented properties?

Other questions would be:

Is the final review/approval something that citizens have a vote regarding?

Is this city owned property or privately held?

What is the timing of the development?

Thanks in advance!

Rick

Rick Bailey | ⊙Target | Sr. Manager | Planning, Alignment, & Program Management |FRS Operations and Product Team

Office 612.696.0878 | **Email RichardX.Bailey@Target.com**

TH 47 Sound Wall Gap

7/12/2021, 3:59:38 PM

0 0.0175 0.035 0.07 0.105 0.14 mi

Public Works Committee **5. 4.**

Meeting Date: 10/19/2021

Submitted For: Joe Feriancek, Engineering/Public Works

By: Joe Feriancek, Engineering/Public Works

Title:

Consider Recommending City Council Authorization to Prepare Plans and Specifications for 2022 Pavement Management Program Projects.

Purpose/Background:

Purpose:

The purpose of this case is to consider recommending City Council authorization to prepare plans and specifications for 2022 Pavement Management Program Projects.

Background:

The proposed 2022 – 2031 Capital Improvement Program (CIP) identifies three reconstruction projects and two overlay improvements for 2022;

IP 22-01 Sunwood Drive and Waco Street Reconstruction (MSA)
IP 22-02 Autumn Heights Street Reconstructions
IP 22-03 2022 MSA Pavement Overlay Improvements (MSA)
IP 22-04 2022 Neighborhood Pavement Overlay Improvements
IP 22-06 Wood Pond Hills 2nd – 5th Street Reconstructions

Street segments summaries and an Improvement Project Map are attached to this case.

Preliminary Design

On July 13, 2021, City Council passed Resolution #21-194, Ordering the City Engineer to request proposals for Topographic Surveys, Geotechnical Evaluations and Utility Testing for 2022 Pavement Management Program Projects.

Topographic Surveys

City Council awarded four proposals for topographic surveys to Hakanson Anderson on August 8, 2021. Staff has since received the surveys and performed a basic review which confirmed the requested surveys are complete and thorough. The surveys will be used to create an existing ground surface and locate features once project design begins.

Geotechnical Reports

City Council awarded three proposals for geotechnical reports to Haugo Geotechnical Services on August 8, 2021. The reports were for each reconstruction project and will be used to help determine the required pavement section, if any soil corrections will be anticipated, and if utility work will require special backfill or groundwater considerations. Staff has received all three reports and has done an initial review, which determined the reports were complete and met the requirements of the proposals.

Sewer Cleaning and Televising

City Council awarded two proposals to Hydro-Klean, LLC for cleaning and televising sanitary sewer and storm sewer on August 24, 2021. The proposals were for Improvement Projects 22-01 and 22-04, both of which are urban section roadways with sanitary and storm sewer. Autumn Heights is a rural section, and the existing street crossing culverts are anticipated to be replaced, therefore cleaning and televising would not be beneficial. To date Staff has received approximately 95 percent of the televising reports, which are being reviewed. Based upon the initial

review some minor storm sewer pipe repairs will be required on Sunwood Drive. More review of the sanitary sewer is required to determine if repairs will be necessary.

Watermain Leak Testing

City Council awarded two proposals to Water Conservation Services, Inc. for watermain leak testing on August 24, 2021. The proposals were for Improvement Projects 22-01 and 22-04, both of which have city water throughout. The leak testing has been complete and no leaks were discovered.

Anticipated Project Scopes

IP 22-01 Sunwood Drive and Waco Street Reconstruction: This project proposes reconstruction of Sunwood Drive between Trunk Highway 47 and Waco Street and Waco Street between Sunwood Drive and 150th Avenue. The streets are 45 feet wide urban section, and total 0.48 miles in length. Sunwood Drive has an Average Daily Traffic (ADT) count of 1,800, Waco Street has an ADT of 600. Staff is anticipating using the full-depth reclamation process for both street segments, however, Staff recommends reducing the width of Waco Street to 32 feet wide, to match Waco Street to the south of Sunwood Drive. Waco Street to the north of 150th Avenue is a 24-foot wide rural section. To conform to MSA Standards, reducing the width of the street would require no parking on one side of the road. Storm sewer repairs are anticipated, however, sanitary sewer and watermain repairs are not anticipated. Estimated project costs are $405,000 ($368,000 MSA Funds, and $37,000 Storm Water Funds).

IP 22-02 Autumn Heights Street Reconstructions: This project proposes reconstruction of the streets within the Autumn Heights subdivision, which is generally located in the northwest corner of the city, spanning both sides of Armstrong Boulevard. The streets are 24 feet wide rural section, and total 1.61 miles in length. Staff performed 5 traffic counts, focusing on streets leading into and out of the neighborhood. Counts ranged from 71 to 160 ADT, which is typical for residential streets. Staff is anticipating using the full-depth reclamation process where possible. Staff has further review of the geotechnical report to perform, but is anticipating a portion of the project to require soil corrections to remove undesirable materials from below the street. No sewer and water exist in the project area and is not proposed. The existing drainage ditches along the roadway are performing well to Staff's knowledge, this will be explored further during project design. Staff is proposing to replace the existing street crossing culverts with the project. Estimated project costs are $984,000 ($895,000 Pavement Management Funds, and $89,000 Storm Water Funds).

IP 22-03 2022 MSA Pavement Overlay Improvements: This project proposes mill and overlay of Riverdale Drive between the Armstrong Boulevard Interchange and Llama Street. Staff will determine the exact project end point during design, but anticipates the project limits stopping east of Llama Street to accommodate the Riverdale Drive extension to Bowers Street. Riverdale Drive is 0.24 miles in length, urban section with bituminous curb. Traffic counts were taken west of the interchange and found an ADT of 450. Staff is not proposing any repairs to watermain or sanitary sewer with this project, minor storm sewer structure repairs, typically re-grouting catch basins, is proposed. Estimated project costs are $69,000 ($63,000 MSA Funds, and $6,000 Storm Water Funds).

IP 22-04 2022 Neighborhood Pavement Overlay Improvements: This project proposes mill and overlay of four subdivisions within the City; Sunfish Lake Business Park 2nd, Sunflower Ridge, The Ponds of Ramsey, and Tiger Meadows. The project totals 2.69 miles in length, all proposed areas are urban sections with varying street widths. Staff is not proposing any repairs to watermain or sanitary sewer with this project, minor storm sewer structure repairs, typically re-grouting catch basins, is proposed. Additionally, any pedestrian ramps will be brought up to current ADA compliance. Estimated project costs are $624,000 ($567,000 Pavement Management Funds, and $57,000 Storm Water Funds).

IP 22-06 Wood Pond Hills 2nd – 5th Street Reconstructions: This project proposes reconstruction of the streets within the Wood Pond Hills 2nd, 3rd, 4th, and 5th subdivisions, which are generally located southwest of Nowthen Boulevard and Sunwood Drive. The streets are 32 feet wide urban section, and total 0.88 miles in length. Staff performed four traffic counts, and found ADT ranging from 175 to 300. Staff is anticipating using the full-depth reclamation process and performing spot concrete curb and gutter repairs for the majority of the project. Staff is aware of more severe curb and gutter damage within the Junkite Street cul-de-sac, south of 145th Court, and will determine the best treatment during the design process. Minor storm sewer repairs are proposed, typically

re-grouting catch basins. Watermain repairs and sanitary sewer repairs are not currently proposed. Further review of the televising reports is required before final determination if sanitary sewer repairs are required. Estimated project costs are $550,000 ($500,000 Pavement Management Funds, and $50,000 Storm Water Funds). Any sanitary sewer repairs would be proposed to be paid with Sewer Utility Funds, and are not included in the current cost estimate.

Project Timelines
City Staff is proposing to prepare plans and specifications for 2022 pavement management program projects in-house, as part of their normal duties. The following are the proposed general project timelines:

October 26, 2021 City Council Authorization to prepare plans and specifications
Nov. 2021 - Jan. 2022 Staff prepares plans and specifications
Jan. - Feb, 2022 City Council approve plans, authorize bidding
Feb. - Mar. 2022 Bid opening, City Council award contracts
May - June, 2022 Begin Construction
September 2022 Finish Construction

Staff proposes to bid projects separately, but to bid and award projects as close together as practical, which generally allows for a better bidding environment for the City.

Timeframe:

Staff anticipates this case will take approximately 10 minutes to present and respond to questions.

Observations/Alternatives:

Observations:
Estimates are CIP level and will be updated during the design process.

Alternatives:
Alternative #1: Motion to recommend City Council authorization to prepare plans and specifications for 2022 Pavement Management Program projects.

Alternative #2: Motion of other.

Funding Source:

Funding for these projects is proposed to be a combination of Pavement Management Funds, Municipal State Aid Funds, and Storm Water Funds as identified in this case and within the proposed 2022 – 2031 Capital Improvement Program.

Recommendation:

Staff recommends alternative #1.

Action:

Motion to recommend City Council authorization to prepare plans and specifications for 2022 Pavement Management Program projects.

Attachments

2022 PMP Project Map
22-01 Street Summary
22-02 Street Summary
22-03 Street Summary
22-04 Street Summary

22-06 Street Summary

Form Review

Inbox	Reviewed By	Date
Bruce Westby	Bruce Westby	10/14/2021 11:45 AM
Grant Riemer	Grant Riemer	10/14/2021 01:03 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:38 PM
Form Started By: Joe Feriancek		Started On: 10/12/2021 12:53 PM
Final Approval Date: 10/14/2021		

2022 Proposed
Pavement Management Program Projects

I.P. 22-04
2022 NEIGHBORHOOD PAVEMENT OVERLAYS
TIGER MEADOWS

I.P. 22-02
AUTUMN HEIGHTS STREET RECONSTRUCTIONS

I.P. 22-04
2022 NEIGHBORHOOD PAVEMENT OVERLAYS
SUNFLOWER RIDGE

I.P. 22-03
2022 MSA PAVEMENT OVERLAY
RIVERDALE DRIVE (ARSTRONG INTERCHANGE / LLAMA ST)

I.P. 22-06
WOOD POND HILLS 2ND - 5TH
STREET RECONSTRUCTIONS

I.P. 22-01
MSA WACO STREET & SUNWOOD DRIVE
STREET RECONSTRUCTION

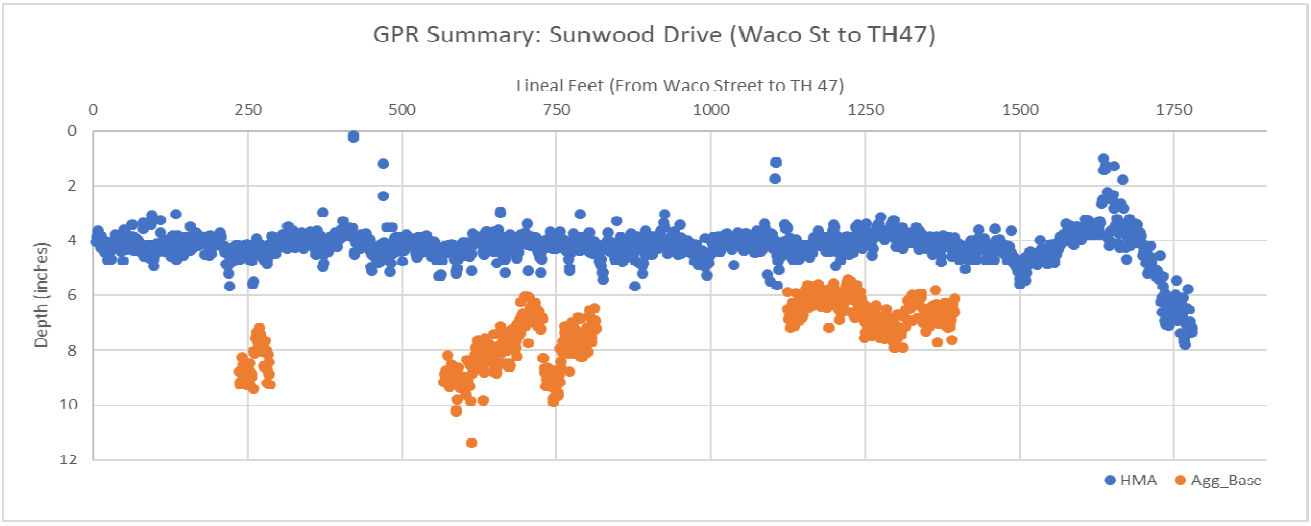
I.P. 22-04
2022 NEIGHBORHOOD PAVEMENT OVERLAYS
SUNFISH LAKE BUSINESS PARK 2ND

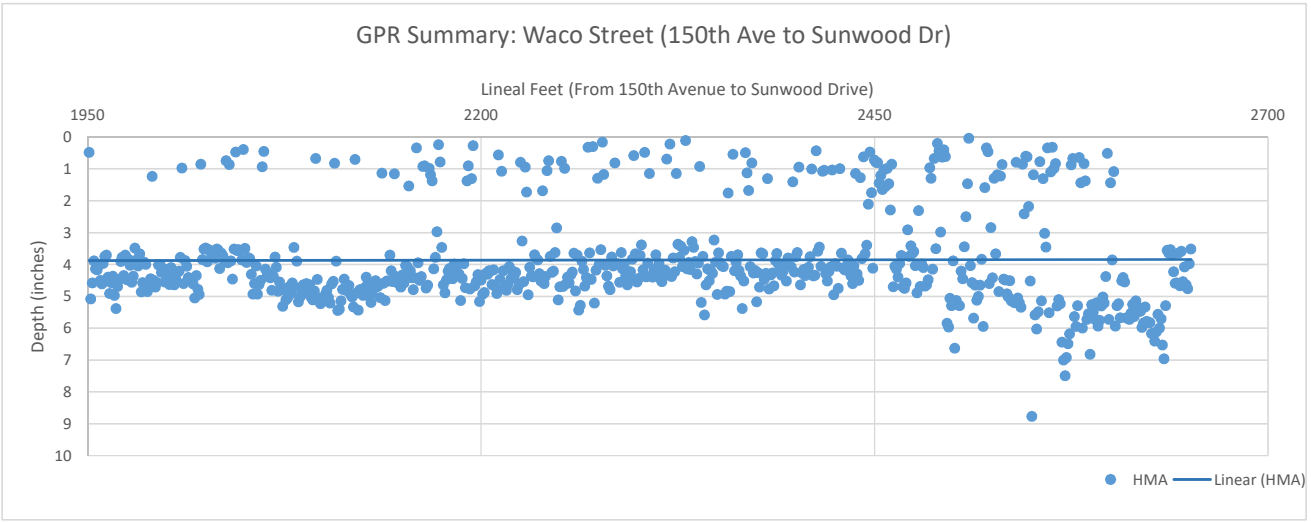
I.P. 22-04
2022 NEIGHBORHOOD PAVEMENT OVERLAYS
THE PONDS OF RAMSEY

Legend

- 2022 Overlay
- 2022 Reconstruction
- Street Centerlines
- ScoutCamp
- Golf_Courses
- Parks
- Rivers
- Lakes_Ponds
- Creeks

IP 22-01 Sunwood Drive & Waco Street Reconstruction Street Segment Summary											
Street Description				Street History					GPR Summary		
Street	Segment Description	Length (feet)	Curb	2020 PASER	Year Built	Maint. 1	Maint. 2	Maint. 3	Avg HMA (inches)	Avg Agg. Base (inches)	Avg Section (inches)
Sunwood Drive	TH 47 / Waco Street	1,826	conc.	4	1985	SC 1992	SC 2006	SC 2013	4.20	3.25	7.38
Waco Street	Sunwood Drive / 150th Avenue	705	conc.	3	1992	SC 2006			3.86	n/a*	n/a*
				** GPR not able to detect Agg. Base*							
	Total Length	**2,531**	**0.48 mi.**								





IP 22-02 Autumn Heights Street Reconstructions
Street Segment Summary

Street Description				Street History						GPR Summary		
Street	**Segment Description**	**Length (feet)**	**Section (Urban / Rural)**	**2020 PASER**	**Year Built**	**Maint. 1**	**Maint. 2**	**Maint. 3**	**Maint. 4**	**Avg HMA (inches)**	**Avg Agg. Base (inches)**	**Avg Section (inches)**
167th Lane	Armstrong Boulevard / 168th Lane	1494	Rural	2	1984	SC 1991	OL 1998	SC 1997	SC 2004	3.5	3.5	7.0
167th Lane	Puma Street / Armstrong Boulevard	919	Rural	2	1977	SC 1983	OL 1990	SC 1997	SC 2004	3.5	3.7	7.2
167th Lane	W EOP / Puma Street	1191	Rural	2	1983	SC 1990	OL 1997	SC 1997	SC 2004	3.9	4.0	7.9
168th Avenue	Puma Street / CDS	331	Rural	2	1985	SC 1992	OL 1999	SC 1997	SC 2004	3.5	3.4	6.9
168th Avenue	Rabbit Street / CDS	386	Rural	2	1981	SC 1988	OL 1995	SC 1997	SC 2004	3.5	3.4	6.9
168th Avenue	Rabbit Street / Puma Street	457	Rural	2	1980	SC 1987	OL 1994	SC 1997	SC 2004	3.5	3.4	6.9
168th Lane	167th Lane / N EOP	1387	Rural	2	1978	SC 1985	OL 1992	SC 1997	SC 2004	3.6	3.1	6.7
168th Lane	Nutria Street / 167th Lane	355	Rural	2	1979	SC 1986	OL 1993	SC 1997	SC 2004	3.6	3.1	6.7
169th Avenue	W EOP / Rabbit Street	640	Rural	2	1977	SC 1984	OL 1991	SC 1997	SC 2004	3.5**	3.4**	6.9**
Nutria Street	168th Lane / CDS	401	Rural	3	1986	SC 1993	OL 2000	SC 1997	SC 2004	3.4	n/a *	n/a *
Nutria Street	N EOP / 168th Lane	242	Rural	3	1982	SC 1989	OL 1996	SC 1997	SC 2004	3.4	n/a *	n/a *
Puma Street	167th Lane / 168th Avenue	226	Rural	2	1987	SC 1994	OL 2001	SC 1997	SC 2004	3.9	n/a *	n/a *
Rabbit Street	168th Avenue / Armstrong Boulevard	473	Rural	2	1988	SC 1995	OL 2002	SC 1997	SC 2004	3.3	3.1	6.4
	Total Length	**8,502**	**1.61 mi.**									

** GPR not able to detect Agg. Base*

*** Estimated Depths, GPR not available*

IP 22-03 2022 MSA Pavement Overlay Improvements
Street Segment Summary

Street Description				Street History						GPR Summary		
Street	**Segment Description**	**Length (feet)**	**Section (Urban / Rural)**	**2020 PASER**	**Year Built**	**Maint. 1**	**Maint. 2**	**Maint. 3**	**Maint. 4**	**Avg HMA (inches)**	**Avg Agg. Base (inches)**	**Avg Section (inches)**
Riverdale Drive	W PC / Llama Street	1279	Urban	6	1997	SC 2002	SC 2012			3.6	4.8	8.4
	Total Length	**1,279**	**0.24 mi.**									

** GPR not able to detect Agg. Base*

*** Estimated Depths, GPR not available*

IP 22-04 2022 Neighborhood Pavement Overlay Improvements
Street Segment Summary

Street Description						Street History							GPR Summary		
Subdivision	**Street**	**Segment Description**	**Length (feet)**	**Section (Urban / Rural)**	**Curb (Bit / Conc.)**	**2020 PASER**	**Year Built**	**Maint. 1**	**Maint. 2**	**Maint. 3**	**Maint. 4**	**Maint. 5**	**Avg HMA (inches)**	**Avg Agg. Base (inches)**	**Avg Section (inches)**
Sunfish Lake Business Park 2nd	Azurite Street	Bunker Lake Boulevard / Sunwood Drive	2123	Urban	Conc.	8	2002	SC 2009	SC 2016				3.5*	6.0*	9.5*
	Sunfish Lake Business Park 2nd Total		*2123*	*0.4 mi.*											
Sunflower Ridge	154th Avenue	Iodine Street / W EOP	305	Urban	Conc.	8	2003	SC 2008	SC 2017				3.9	5.4	9.3
	154th Lane	Iodine Street / E EOP	488	Urban	Conc.	8	2007	SC 2008	SC 2017				3.7	5.3	9.0
	Germanium Street	Iodine Street / E EOP	434	Urban	Conc.	8	2003	SC 2008	SC 2017				3.9	4.5	8.4
	Iodine Street	Alpine Drive / 155th Lane	1613	Urban	Conc.	8	2003	SC 2008	SC 2017				3.8	5.7	9.5
	Sunflower Ridge Total		*2840*	*0.54 mi.*											
Tiger Meadows	Rabbit Street	170th Avenue / Nutria Street	1230	Urban	Conc.	8	2003	SC 2008	SC 2017				4.2	3.6	7.8
	Rabbit Street	170th Avenue / N EOP	409	Urban	Conc.	8	2003	SC 2008	SC 2017				4.2	3.6	7.8
	170th Avenue	Tiger Street / Rabbit Street	1240	Urban	Conc.	8	2003	SC 2008	SC 2017				4.2	4.4	8.6
	Tiger Meadows Total		*2879*	*0.55 mi.*											

**GPR not available, depth based off asbuilts*

IP 22-04 2022 Neighborhood Pavement Overlay Improvements
Street Segment Summary

Street Description						Street History							GPR Summary		
Subdivision	**Street**	**Segment Description**	**Length (feet)**	**Section (Urban / Rural)**	**Curb (Bit / Conc.)**	**2020 PASER**	**Year Built**	**Maint. 1**	**Maint. 2**	**Maint. 3**	**Maint. 4**	**Maint. 5**	**Avg HMA (inches)**	**Avg Agg. Base (inches)**	**Avg Section (inches)**
The Ponds of Ramsey	144th Avenue	Iodine Street / CDS	210	Urban	Conc.	7	2002	SC 2007	SC 2013	SC 2018			2.5*	4.0*	6.5*
	144th Avenue	Iodine Street / Fluorine Street	731	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	144th Avenue	Iodine Street E / Fluorine Street	203	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	144th Court	144th Avenue / CDS	223	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	144th Way	Iodine Street N / Iodine Street S	806	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	145th Avenue	Fluorine Street / CDS	157	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	145th Avenue	Iodine Street / Fluorine Street	615	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Fluorine Court	145th Avenue / 144th Avenue	486	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Iodine Street	144th Avenue E / 144th Avenue W	1769	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Iodine Street	144th Avenue W / W EOP	313	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Iodine Street	144th Way S / 144th Way E	258	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Iodine Street	145th Avenue / 144th Way	327	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	Iodine Street	Nowthen Boulevard / 145th Avenue	242	Urban	Conc.	7	2002	SC 2007	SC 2018				2.5*	4.0*	6.5*
	The Ponds of Ramsey Total Length		*6340*	*1.2 mi.*		**GPR not available, depth based off asbuilts*									

Wood Pond Hills 2nd, 3rd, 4th & 5th Street Reconstructions
Street Segment Summary

Street Description				Street History						GPR Summary		
Street	**Segment Description**	**Length (feet)**	**Section (Urban / Rural)**	**2020 PASER**	**Year Built**	**Maint. 1**	**Maint. 2**	**Maint. 3**	**Maint. 4**	**Avg HMA (inches)**	**Avg Agg. Base (inches)**	**Avg Section (inches)**
145th Circle	Iodine Street / CDS	425	Urban	5	1996	SC 1998	SC 2005		SC 2013	2.4	5.3	7.4
145th Court	Junkite Street / W EOP	625	Urban	5	1994	SC 1998	SC 2005		SC 2013	2.7	3.6	6.3
146th Circle	Junkite Street / CDS	226	Urban	3	1993	SC 1998	SC 2005			4.0	3.0	7.0
Helium Court	146th Avenue / CDS	301	Urban	7	1996	SC 1998	SC 2005		SC 2013	2.0	5.7	7.7
Iodine Street	145th Circle / S EOP	92	Urban	7	1996	SC 1998	SC 2005		SC 2013	2.0	3.6	5.6
Iodine Street	146th Avenue / 145th Circle	569	Urban	7	1996	SC 1998	SC 2005		SC 2013	3.1	3.6	6.7
Iodine Street	Sunwood Drive / CDS	612	Urban	3	1992	SC 1998	SC 2005			3.1	4.4	7.5
Junkite Street	145th Court / 146th Avenue	164	Urban	3	1994	SC 1998	SC 2005			2.8	4.4	7.2
Junkite Street	145th Court / CDS	197	Urban	3	1994	SC 1998	SC 2005		SC 2013	2.8	4.4	7.2
Junkite Street	146th Avenue / S EOP	39	Urban	3	1993	SC 1998	SC 2005	OL 2012		2.8	4.4	7.2
Junkite Street	146th Circle / 146th Avenue	521	Urban	3	1993	SC 1998	SC 2005			2.8	4.4	7.2
Junkite Street	Sunwood Drive / 146th Avenue	406	Urban	3	1993	SC 1998	SC 2005			2.8	4.4	7.2
Krypton Court	Sunwood Drive / CDS	466	Urban	3	1993	SC 1998	SC 2005			3.2	5.9	9.1
	Total Length	**4,643**	**0.88 mi.**									

** GPR not able to detect Agg. Base*
*** Estimated Depths, GPR not available*

Public Works Committee **5. 5.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Consider Recommending City Council Authorization for Flashing Yellow Arrow Study at the Intersection of Sunwood Drive and Ramsey Boulevard/CSAH 56

Purpose/Background:

Purpose:

The purpose of this case is two-fold. First, Staff will provide updates to the Committee on Anoka Counties plans for updating their signal systems to include flashing yellow arrow operations. Second, the Committee will consider a recommendation to the City Council to authorize a feasibility study for adding flashing yellow arrow operations to the existing signal system at the intersection of Sunwood Drive and Ramsey Boulevard/CSAH 56.

Background:

In December 2009, after extensive testing, the Federal Highway Administration authorized use of flashing yellow arrows nationwide. A study conducted by the National Cooperative Highway Research Program determined that drivers had fewer crashes with flashing yellow left-turn arrows than with traditional yield-on-green signal configurations.

Flashing yellow arrow traffic signals feature a flashing yellow arrow in addition to the standard red, yellow and green arrows. When illuminated, the flashing yellow arrow allows waiting motorists to make a left-hand turn after yielding to all oncoming traffic and to any pedestrians in the crosswalk. Oncoming traffic has a green light. Drivers must wait for a safe gap in oncoming traffic before turning. When not illuminated, signals with flashing yellow arrows work the same as traditional signals.

Flashing yellow arrows offer more opportunities to make a left turn than with the traditional three-arrow, red, yellow and green indications. They also provide traffic engineers with more options to handle variable traffic volumes. A flashing yellow arrow signal has the same meaning it always has: left turns may proceed with caution after yielding to oncoming traffic. In the past, flashing yellow arrows in Minnesota were only used when the entire traffic signal was in flash-mode. Use of the flashing yellow arrow has been shown to have several benefits including minimizing delays and enhancing safety by reducing driver errors.

The majority of newly installed traffic signals are constructed to allow flashing yellow arrow operations, though sometimes the flashing yellow arrow heads are not immediately installed. The flashing yellow arrow may be used at any intersection at any time but the most typical use will be at intersections and times-of-day that have lower volumes, lower speeds and other favorable conditions. Retrofitting existing signals to include flashing yellow arrows can be costly and are typically only done on a limited basis, when necessary.

Attached is two-page brochure produced by the Minnesota Department of Transportation with additional information on flashing yellow arrows.

<u>2022 Proposed Anoka County Flashing Yellow Arrow (FYA) Upgrades</u>

Anoka County typically budgets up to $200,000 each year to add flashing yellow arrow operations to their 200+ existing signal systems across the County, most of which were not constructed to accommodate FYA operations since they were constructed before FYA operations existed.

In 2022, Anoka County proposes to construct FYA improvements to their signal systems at 14 intersections in the

City of Coon Rapids as follows;

- CSAH 52/109th
- CSAH 52/Quail Creek
- CSAH 78/113th
- CSAH 18/131st
- CSAH 18/133rd
- CSAH 116/Rose St.
- CSAH 116/Heather St.
- CSAH 116/CR 18
- CSAH 116/Jay St.
- CSAH 51/91st
- CSAH 51/101st
- CSAH 51/Egret Blvd.
- CSAH 51/105th
- CSAH 51/109th

Anoka County is employing SEH, Inc. to prepare feasibility studies to evaluate the use of FYA operations at each of these intersections, including estimating costs to modify each signal system to include FYA operations, and to prepare plans and specifications for constructing the required FYA improvements. Anoka County expects to receive final studies for each intersection in early 2022 to allow construction to occur in the summer/fall of 2022.

Anoka County is not proposing to complete any FYA improvements to signal systems in the City of Ramsey in 2022. No improvements are currently proposed at the intersections of Alpine Drive & Sunfish Lake Boulevard/CSAH 57 and Alpine Drive & Nowthen Boulevard/CSAH 5, which have been a topic of discussion in recent years.

FYA Operations at Sunwood Drive & Ramsey Boulevard/CSAH 56

During the regular City Council meeting on September 22, 2020, the City Council received a request from a resident to install FYA's at the intersection of Sunwood Drive & Ramsey Boulevard/CSAH 56. The resident stated that he frequently waits at this signal system to turn left when no vehicles are approaching from the other direction.

In 2017, the City of Ramsey worked with Anoka County to install FYA improvements at the intersection of Armstrong Boulevard/CSAH 83 and Sunwood Drive. To start this process, the City was first instructed to hire SEH, Inc. to complete a feasibility study for modifying the signal system to include FYA operations, including estimating costs to modify the signal system to include FYA operations, and to prepare plans and specifications for constructing the required FYA improvements. This cost for this study was $1,700. The current estimated cost to complete a feasibility study for one intersection is around $1,800 if counts are available, and $3,500 if SEH, Inc. is required to collect traffic counts.

If Staff is directed to pursue this, City Staff will contact SEH to request a proposal to study the feasibility and costs of installing FYA improvements at the intersection of Sunwood Drive & Ramsey Boulevard/CSAH 56, similar to the process followed at Sunwood Drive & CSAH 83/Armstrong Boulevard, and will present the proposal to the City Council as soon as possible to request authorization to proceed. Staff will then work with Anoka County to add this work to Anoka County's 2022 FYA improvement projects.

Copies of SEH's study proposal and Feasibility Study are attached.

Timeframe:

Staff anticipates 20 minutes will be needed to present and discuss this case.

Observations/Alternatives:

Observations:
Below are a few other concerns and questions that have been raised regarding FYA improvements in the City of Ramsey.

Hours of FYA Operations
Over the last year or two one or more Planning Commission members have questioned the need to turn flashing yellow arrow operations off during rush hours. Anoka County does not routinely evaluate signal systems to determine if FYA's can be operated all hours of the day. Their standard process for evaluating FYA operations is to monitor all new FYA operations for a period of several years after FYA improvements are made, then to review crash data and traffic volumes to determine if FYA operation modifications are warranted. In general, most signal systems with FYA operations do not permit FYA operations during rush hours. Typically, the only intersections where FYA operations are permitted during rush hours are at intersections with low traffic volumes and low posted speed limits. City Staff will continue discussing options for allowing 24/7 FYA operations at signal systems in the City of Ramsey with Anoka County Staff.

FYA Operations at Sunwood Drive and Bunker Lake Boulevard/CSAH 116
The new signal system at this intersection will be equipped with FYA improvements, but as of today the County is not certain which legs will utilize FYA operations and/or what the timing of the FYA operations will be where FYA operations are utilized. In summary, a significant number of left turning traffic crashes are not anticipated and sight distance is good so it is anticipated that FYA operations can be utilized at this intersection during several hours of a typical day. Below are recommendations from the County's consultant related to time of day FYA operations for both roads.

- *CSAH 116 -* Due to higher posted speeds on CSAH 116, FYA operations are not recommended for CSAH 116 during peak traffic periods. During non-Trunk Highway 10 impacted traffic periods, their consultant is recommending that the signal system operate with protected left turns between the hours of 6:00 am - 9:00 am and also between 3:00 pm and 7:00 pm. During Trunk Highway 10 construction, their consultant is recommending that both CSAH 116 approaches operate with protected left turns for all hours between 6:00 am - 10:00 pm due to much higher anticipated traffic volumes on CSAH 116 and higher posted speeds.
- *Sunwood Drive -* If the County implements FYA operations for Sunwood Drive, these should be able to be operated all hours of the day given lower traffic volumes and lower posted speeds.

Alternatives:
Alternative #1 – Motion recommending City Council authorization to hire SEH, Inc. to analyze the feasibility of modifying the signal system at the intersection of Sunwood Drive and Ramsey Boulevard/CSAH 56to add flashing yellow arrow operations.

Alternative #2 – Motion of other.

Funding Source:
The final construction cost for the FYA modifications to the signal system at Armstrong Boulevard & Sunwood Drive/147th Avenue was $29,760. The estimated average cost to modify an existing signal system to include FYA operations is $20,000 to $50,000.

Plans and specifications would be required to advertise for bids for construction of any FYA modifications, which would require future City Council approval. Costs to prepare plans and specifications for the FYA improvements at Armstrong Boulevard & Sunwood Drive/147th Avenue were around $6,500.

Traffic volumes and patterns will likely change after the grade separation improvements occur at CSAH 56/Ramsey Boulevard & Highway 10 in 2024/2025, and after a signal system is installed at CSAH 116/Bunker Lake Boulevard and Sunwood Drive this fal/winter. These improvements will also likely have an impact on FYA operations at Sunwood Drive & CSAH 56/Ramsey Boulevard, which may result in a future Anoka County request to modify the FYA improvements. This will be addressed as part of the study.

The estimated cost for studying the feasibility of adding FYA operations to this intersection is $1,800 if the City

provides traffic counts, and $3,500 if SEH needs to provide traffic counts. The Public Improvement Revolving Fund is proposed to fund the study.

Recommendation:

Staff supports either alternative.

Action:

Motion recommending City Council authorization to hire SEH, Inc. to analyze the feasibility of modifying the signal system at the intersection of Sunwood Drive and Ramsey Boulevard/CSAH 56 to add flashing yellow arrow operations.

Attachments

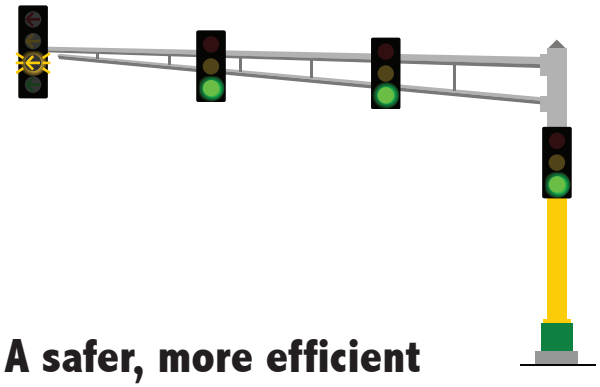
MnDOT FYA brochure

SEH Proposal CSAH 83 and Sunwood Dr

SEH Feas Study CSAH 83 and Sunwood Dr

Form Review

Inbox	Reviewed By	Date
Grant Riemer	Grant Riemer	10/14/2021 02:28 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:32 PM
Form Started By: Bruce Westby		Started On: 10/05/2021 12:02 PM
Final Approval Date: 10/14/2021		



A safer, more efficient left-turn signal

Safer

A national study demonstrated that drivers found flashing yellow left-turn arrows more understandable than traditional yield-on-green indications (individual traffic signal lights).

Less delay

There are more opportunities to make a left turn with the flashing yellow left-turn arrow than with the traditional three-arrow, red, yellow and green indications.

More flexibility

The new traffic signals provide traffic engineers with more options to handle variable traffic volumes..

Minnesota Department of Transportation
Office of Traffic, Safety and Technology
1500 West County Road B2
Roseville, MN 55113
Jerry Kotzenmacher
Phone: 651-234-7054

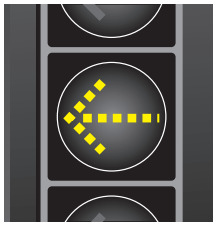
E-mail: jerry.kotzenmacher@state.mn.us

A safer, more efficient left-turn signal

What the arrows mean

Solid red arrow:
Drivers intending to turn left must stop and wait. They should not enter an intersection to turn when a solid red arrow is being displayed.

Solid yellow arrow:
The left-turn signal is about to change to red and drivers should prepare to stop or prepare to complete a left turn if they are legally within the intersection and there is no conflicting traffic present.



Flashing yellow arrow:
Drivers are allowed to turn left after yielding to all oncoming traffic and to any pedestrians in the crosswalk. Oncoming traffic has a green light. Drivers must wait for a safe gap in oncoming traffic before turning.

Solid green arrow:
Left turns have the right of way. Oncoming traffic has a red light.

Flashing yellow arrow benefits

A flashing yellow arrow signal has the same meaning it always has: left turns may proceed with caution after yielding to oncoming traffic.

In the past, flashing yellow arrows in Minnesota were only used when the entire traffic signal was in flash-mode. Use of the flashing yellow arrow has been shown to have several benefits including minimizing delays and enhancing safety by reducing driver errors. Flashing yellow arrow signals have been approved for widespread use by the Federal Highway Administration..

Where will the flashing yellow arrow be used?

The majority of newly installed MnDOT traffic signals will have the flashing yellow arrow option. The flashing yellow arrow may be used at any intersection at any time but the most typical use will be at intersections and times-of-day that have lower volumes, lower speeds and other favorable conditions.

A better left-turn signal

Flashing yellow arrow signals have been shown to help drivers make fewer mistakes. They keep motorists safer during heavy traffic and reduce delays when traffic is light.

SEH

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December 16, 2016

RE: Ramsey, Minnesota
Flashing Yellow Arrow Analysis
Armstrong Boulevard (CSAH 83) at
Sunwood Drive/147th Avenue
SEH No. RAMSY0000.00

Mr. Bruce Westby, PE
City Engineer
City of Ramsey
7550 Sunwood Drive NW
Ramsey, Minnesota 55303

Dear Mr. Westby:

Short Elliott Hendrickson Inc. (SEH®) appreciates the opportunity to submit this letter proposal to the City of Ramsey for up-front analysis of the existing signal system at Armstrong Boulevard (CSAH 83) and Sunwood Drive NW-147th Avenue NW with respect to potential implementation of flashing yellow left turn arrow operations.

Work required for this project will include a detailed site review of the signal system, review of existing signal plans to determine costs and ability to convert the signal system to flashing yellow left turn arrow operations for each approach, and final report preparation that will include the findings of our analysis as well as preliminary construction costs to implement flashing yellow arrow operations.

For your information, SEH has significant experience in all aspects relating to traffic signals. This experience includes study and analysis of the need for traffic signals, writing ICE-signal justification reports, design of new traffic signal systems, modifications of existing traffic signal systems, Emergency Vehicle Preemption (EVP) design, traffic signal timing and coordination, preparation of bid documents and construction inspection. Since 1978, SEH staff members have designed more than 900 traffic signals and more than 300 additional EVP system designs. A number of these designs have been within Anoka County and the City of Ramsey (including past design services for traffic signal and EVP systems along CSAH 5, CSAH 57 and CSAH 116). SEH has also completed several similar projects to address the potential for flashing yellow arrow operations, including for the Cities of Apple Valley, Burnsville, Golden Valley and Woodbury and for Anoka and Washington Counties.

This letter proposal can be the basis for an agreement for the work on this project and all subsequent services. As part of the project, we have put together the following work program for performing the services of this project. The work program is fairly well defined based on anticipated cooperative efforts of SEH, the City of Ramsey, and the Anoka County Highway Department for the complete project. The work program does, however, provide flexibility to make the most efficient use of SEH and City staff.

Background

With the recent opening of the new Armstrong Boulevard bridge to the north (over Trunk Highway 10), area traffic patterns will change significantly. With these changes, the City wishes to consider changes in the operation of the signal system at Sunwood Drive NW-147th Avenue NW with respect to left turn phasing. This signal system is located just south of the new Trunk Highway 10 East Ramps intersection and currently operates with protected left

turn phasing (left turns allowed on green arrow only) for all intersection approaches. In order to provide more efficient operations for these left turning movements (especially during non-peak traffic periods), the City is interested in considering modifications to this signal system to incorporate flashing yellow arrow operations on a time of day basis. The implementation of flashing yellow arrow operations generally allows for greater flexibility in how the left turn movements are operated throughout the day.

In order to analyze the potential for utilizing flashing yellow arrow operations, the City has requested that a qualified signal design consultant complete a comprehensive review of the signal system. This will help to determine if the signal system and corresponding left turn movements should be retrofitted with flashing yellow arrow operations or if the signal system should not be modified due to operational, geometric, or safety concerns (such as sight distance issues, crash history, intersection geometrics, etc.).

Items recommended to be considered in this analysis include:

- Review of intersection signal components (controller and cabinet equipment, signal head placement, vehicular detection, etc.) to determine what components will require upgrading to allow for flashing yellow arrow operations.

- Review of intersection geometrics to determine if there are conditions (such as dual left turn movements at highly traveled intersections, sight distance concerns, lack of dedicated left turn lanes, etc.) that might preclude the upgrading to flashing yellow arrow operations.

- Review of recent crash history at this intersection to determine if there are right angle crash histories that may preclude changes to the operation of the signal system.

- Review of recent traffic approach volumes to determine limitations of flashing yellow arrow operations and time of day operations.

SEH has previously completed analysis of flashing yellow arrow operations at several locations and has provided agencies such as the Anoka County Highway Department with a detailed memorandum listing criteria for consideration of flashing yellow arrow operations. These criteria are based on current State standards and guidelines along with consideration of specific intersection issues.

SEH will provide the City of Ramsey with analysis and review services needed for the City to be able to consider budgeting and scheduling for future flashing yellow arrow upgrades to this signal system. The City and County will be included in the ongoing analysis to ensure that the City and County are in agreement with this analysis and are able to provide input into proposed future budgeting and implementation recommendations.

Scope of Work

Field Review of Intersection

Using existing signal plans to be provided by the City or County, SEH will perform a brief site visit of this signal system to determine existing signal components, controller and cabinet capabilities, requirements for signal construction work needed to upgrade each left turn movement to FYA operations, and overall limitations on being able to implement FYA operations for any applicable intersection movement.

Analysis

Upon completion of the field review, SEH will compile crash history information for the most recent 5 years of available data (through the City and County and also through the State of Minnesota's crash website). SEH has already performed an updated AM and PM peak hour traffic count (7-9 am and 4-6 pm) at the intersection as part of nearby flashing yellow arrow analysis for the County and will use this information in order to determine current traffic patterns and peak hour intersection usage.

Using existing signal plans, site review information, and data compiled for this intersection, SEH will perform a brief but detailed analysis of the signal system to determine which movements are able to be upgraded to flashing yellow arrow operations. A preliminary cost estimate will also be prepared for the City to determine estimated costs to upgrade the individual signal system to have flashing yellow arrow operations. Equipment required to be upgraded will be briefly listed for City information and consideration.

A letter report will be prepared for City (and County) review and consideration that will include:

- Analysis of traffic counts to determine potential time of day implementation of flashing yellow arrow operations,
- Work recommended to be completed at this intersection,
- Limitations on implementation of flashing yellow arrow operations,
- Overall intersection estimated costs to upgrade to flashing yellow arrow operations,

Final FYA Design

As part of this analysis, no final design services for signal modifications are included in the proposed scope of work. If requested, SEH can provide the City with estimated design and construction administration costs for construction of FYA improvements for City consideration and budgeting. SEH can also provide the City with a separate proposal which would include all design, bidding, and construction observation services needed to fully implement the construction of these improvements.

Schedule

SEH proposes to begin work after a Notice-To-Proceed is issued by the City. We will complete a field review of the intersection in January-February 2017 and provide the City and County with our analysis findings by March 1, 2017.

Compensation

The proposed work program includes a detailed field review of the signal system, analysis and report preparation. We propose to be paid for the work we do on an hourly basis based on direct labor costs, plus the actual cost of reimbursable expenses.

The field review, intersection analysis, and report preparation work, as defined above, will be done on an hourly basis (plus reimbursable expenses) for a cost-not-to-exceed of **$1,700**. These costs will not be exceeded except as otherwise approved by the City.

Any additional tasks added to or deleted from this project (due to significant changes in the general scope of the project or its design including, but not limited to, changes in size, complexity of character or type of construction) shall be by written amendment to the contract signed by both parties.

This Agreement for Professional Engineering Services between SEH and the City of Ramsey may be terminated by either party upon seven (7) days written notice should the other party fail substantially to perform in accordance with its terms through no fault of the party initiating the termination. In the event of termination, SEH shall be compensated for services performed to termination date, including expenses and equipment costs then due and all terminal expenses. SEH will provide the City with reproducible copies of any plan, specification, or documents already completed at the time of termination.

We appreciate the opportunity to provide the City of Ramsey with a letter proposal for these services, and look forward to hopefully being able to work with you and the City on this project. Feel free to contact John Gray at 651.490.2073 if you have any questions or comments regarding any of the above mentioned information.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

John M. Gray, PE
Project Manager

SEH

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for All of Us®

March 21, 2017

RE: Ramsey, Minnesota
CSAH 83 at Sunwood Drive/147th Avenue NW Signal System
Flashing Yellow Arrow Considerations
SEH No. RAMSY 141224

Mr. Bruce Westby, PE
City Engineer
City of Ramsey
7550 Sunwood Drive Northwest
Ramsey, Minnesota 55303

Dear Mr. Westby:

As requested, we reviewed the intersection of CSAH 83 (Armstrong Boulevard) and Sunwood Drive/147th Avenue Northwest with regards to proposed modification of the existing intersection traffic signal left turn operations. Recently, the City has received requests to have flashing yellow arrow operation installed and activated at this intersection. In response to these requests, the City had SEH perform an analysis of the intersection to determine if flashing yellow arrow operation can be utilized here. The analysis would include review of the feasibility, cost, and safety of the intersection for flashing yellow arrow operations. Following is the results of our analysis.

This 4-legged intersection was signalized in January 2013 (prior to when the adjacent Trunk Highway 10-CSAH 83 intersection was reconstructed with an interchange), with protected left turn phasing installed for all approaches. The posted speed limit on CSAH 83 is 55 mph, while both Sunwood Drive and 147th Avenue Northwest are posted at 30 mph. The northbound and southbound CSAH 83 approaches and the eastbound 147th Avenue Northwest approaches each have a single left turn lane, while the westbound Sunwood Drive approach has a dual left turn lane. Single through lanes and separate right turn lanes exist on the side street approaches, while each CSAH 83 approach has two separate through lanes and a separate right turn lane approaching the intersection. The intersection is located approximately ¼ mile east of the Trunk Highway 10/CSAH 83 interchange area, with a significant east-to-south horizontal curve for northbound CSAH 83 traffic from the interchange area to where a full left turn lane exists for traffic approaching Sunwood Drive/147th Avenue Northwest.

SEH obtained peak hour turning movement traffic counts on September 29, 2016, several months after the Trunk Highway 10-CSAH 83 interchange area was opened and area traffic patterns were able to stabilize, in order to properly analyze existing traffic conditions. SEH

performed AM peak hour (6-9 am), mid-day (11-1 pm), and PM peak hour (3-7 pm) turning movement traffic counts to determine typical weekday traffic patterns at this intersection.

SEH also obtained crash data for the intersection for the 5 year period of 2011-2015 from the State's crash website. SEH then completed a brief field review of the signal system to confirm that the existing traffic signal plans correspond to the current installation of the signal system and take into account the current intersection geometrics. SEH also reviewed traffic signal cabinet components to determine if additional electrical equipment would be required to be provided in order to allow for flashing yellow arrow operation to be used.

As part of the signal system installation, each intersection approach was set up to operate with protected left turn phasing (3-section RLA-YLA-GLA signals). The intersection has a newer Econolite ASC-3 controller unit and Reno MMU-1600-GE conflict monitor, both of which are fully compatible with upgraded left turn (i.e. flashing yellow arrow) operations. The controller cabinet has sufficient load switch bays available to accommodate flashing yellow arrow operations. Thus, the existing controller and cabinet have the capacity and capability to accommodate future flashing yellow arrow operations for all four intersection approaches without requiring this equipment to be significantly upgraded or revised.

As part of our analysis, SEH utilized the Minnesota Department of Transportation's (MnDOT) flashing yellow arrow installation criteria from their "*Traffic Signal Timing and Coordination Manual*" to analyze extended usage of flashing yellow arrow operations for each intersection approach. A copy of this criteria is attached for your information. Based on comparison of available data with the MnDOT criteria, the following can be inferred:

> The design of this signal system included the initial recommendation of protected left turn phasing for each intersection approach due to the higher posted speed limit of 55 mph on CSAH 83 (as is typical Anoka County practice) and the presence of a dual left turn lane for the westbound Sunwood Drive approach.
>
> With regards to utilizing Flashing Yellow Arrow operations for each left turn movement, the following should be noted:
>
> - According to the current edition of the *AASHTO Geometric Design of Highways and Streets* manual, left-turning drivers "need sufficient sight distance to decide when it is safe to turn left across the lanes used by opposing traffic." This stopping sight distance along CSAH 83 for the design/posted speed of 55 mph is at least 495 feet of clear sight distance to the north and south. For both Sunwood Drive and 147th Avenue Northwest, the recommended stopping sight distance at 30 mph is as least 200 feet to the east and west. Based on a field review of intersection geometrics, the southbound, eastbound, and westbound intersection approaches are straight for several hundred feet in each direction with no impediments to the sight distance (other than possible sun issues for eastbound

traffic in the AM peak hour and for westbound traffic in the PM peak hour during fall-winter months).

For northbound CSAH 83, sight distance is somewhat limited due to a sweeping north-to-west horizontal curve that begins approximately 300 feet north of the intersection. However, there are no impediments to sight distance in the median area and no trees or other topography exist to the north on either side of the roadway that limit sight distance for northbound left turning traffic at the intersection (northbound left turning traffic can see oncoming traffic clearly for at least the minimum stopping sight distance required at the posted 55 mph speed limit).

Based on this information, **available stopping sight distance meets this criteria for each intersection approach**.

- Based on the recent crash history at this intersection, no crashes were reported on the State of Minnesota's crash web site between 2011 and 2015. **Thus, there does not appear to be a safety concern at this intersection with the presence of signalized operation**.

- One of the recommendations from the *MnDOT Traffic Signal Timing and Coordination Manual* is to utilize protected left turn phasing only either for situations where the posted speed limit exceeds 45 mph and the peak hour left turning volume is greater than 240 vehicles per hour, or for when the cross product between left turning traffic volume and opposing through traffic volume exceeds 80,000. With regards to the most recent available traffic counts:

  a. Between the hours of 4:00 pm-5:00 pm of the most recent traffic counts, westbound Sunwood Drive left turn volumes were near 130 vehicles per hour. No other intersection approach exceeded 65 left turning vehicles per hour during the PM peak period.

  b. For the midday and AM peak hour counts, no intersection approach had left turning traffic volumes that exceeded 70 vehicles per hour.

  c. The cross product between left turn traffic volumes and opposing through traffic volumes never exceeded 25,000 for any hour counted in 2016.

Following up against the flashing yellow arrow criteria from the *MnDOT Traffic Signal Timing and Coordination Manual:*

1. Left turn lanes line up well for each intersection approach with sufficient turning room in the intersection so that left turn paths were not conflicting. This was observed specifically for the westbound dual left turn lane/eastbound single left turn

movement, where protected left turn phasing was run together for these movements with no conflicts between either direction's left turn movements. Left turn movements are offset far enough such that no conflicts in left turn paths are occurring.

2. As mentioned, the westbound approach has two left turn lanes. For this approach, the MnDOT Manual suggests that protected operation be utilized during the higher volume periods of the day with Engineering judgment being used to determine if flashing yellow operation could be used for all other times of the day.

3. There are less than 3 opposing lanes of through traffic facing each intersection approach.

4. The intersection does not have a high crash rate and there is no significant history of right angle crashes involving left turning traffic.

In summary, as there is no significant crash history for left turning traffic and traffic volumes are likely lower for the entire intersection (outside of the peak traffic periods), the City should be able to consider using Flashing Yellow Arrow operations at this intersection throughout much of a typical weekday and throughout the weekend. In addition, any changes to the operation of the left turn signal phases are not anticipated to impact overall operations of the intersection in a negative way (and delays for left turning traffic will decrease with flashing yellow arrow operations which will improve the overall operation of the intersection). For peak traffic periods though (and for when sun becomes an issue for eastbound and westbound traffic), protected left turn operation is strongly recommended to be implemented.

Some modifications to the existing signal system installation will be required to revise the operation of this signal system and add flashing yellow arrows for each intersection approach. Both overhead end mounted and far left pole mounted left turn signals for each intersection approach will required having 3-section RLA-YLA-GLA signal heads replaced with 4-section RLA-YLA-FYLA-GLA signal heads. For the westbound approach (due to the dual left turn lane), a 5-foot extension will be required to be added to the mast arm facing this approach so that two 4-section overhead signals can be installed and centered on each left turn lane (requirement that each approaching left turn lane have its own flashing yellow arrow signal centered on each left turn lane). No additional through signal heads will be required to be installed facing any of the four approaches, as there are already separate through (RYG) signal heads centered on each through lane. Some additional cabling (6/c#14) will be required to be installed to operate new flashing yellow arrow signal heads on all four intersection approaches based on a review of the field wiring diagram. No new conduit will be required to be installed to accommodate installation of these new cables.

With regards to left turn lane detection, the *MnDOT Traffic Control Signal Design Manual* recommends that either four loop detectors be installed for proper detection (at 5', 20' 35' and 50' from the stop bar or crosswalk) or that two separately wired loop detectors be installed for

existing signal system retrofits at 10' and 40' from the stop bar or crosswalk. Recent County practice has been to have the four separate loop detectors installed in each left turn lane in order to be able to operate the left turn lanes on non-lock operation. For this signal system, left turn lane detection was installed at 10' and 40' from the stop bar for the northbound, southbound, and westbound approaches (each wired separately), while the eastbound approach has four loop detectors installed in the left turn lane. To meet current County practice, additional loop detectors will be required to be furnished and installed 25 feet and 55 feet from the stop bar in the northbound and southbound left turn lanes as well as in both westbound left turn lanes (for a total of 8 new loop detectors). No additional 2/c#14 cables or controller cabinet loop detector cards will be required to operate these new loop detectors since existing loop detectors are already wired separately in each left turn lane.

To allow for flashing yellow arrow operation, we estimate that these modifications (completed by an electrical signal contractor) will cost approximately $40,000. A detailed preliminary engineer's estimate of costs is attached to this letter for your information.

Overall, we do not see any issues with installation and operation of flashing yellow arrows for each intersection approach. However, should the City and County implement flashing yellow arrow modifications to this signal system, **we recommend that the signal system initially operate with protected left turns during both the AM peak period (6:00-9:00 am) and the PM peak period (3:00-7:00 pm) due to higher traffic volumes, higher posted speeds, and the presence of dual left turn lanes through this area**. For all other hours of the day and for all weekend hours, the City and County should be able to consider using flashing yellow arrow operations.

Note that any changes in the operation of this signal system should be monitored by the City and County, including annual review of crash data to ensure that crash frequency does not increase due to modified left turn signal operations.

Please review our analysis and feel free to contact me at 651.490.2073 with any questions or concerns that you may have related to our analysis.

We hope that this information provides you with insight needed to help evaluate and implement the appropriate left turn operations for this intersection.

Sincerely,
SHORT ELLIOTT HENDRICKSON INC.

John M. Gray, PE
Project Engineer

Enclosures
c: Jane Rose, Anoka County Highway Department

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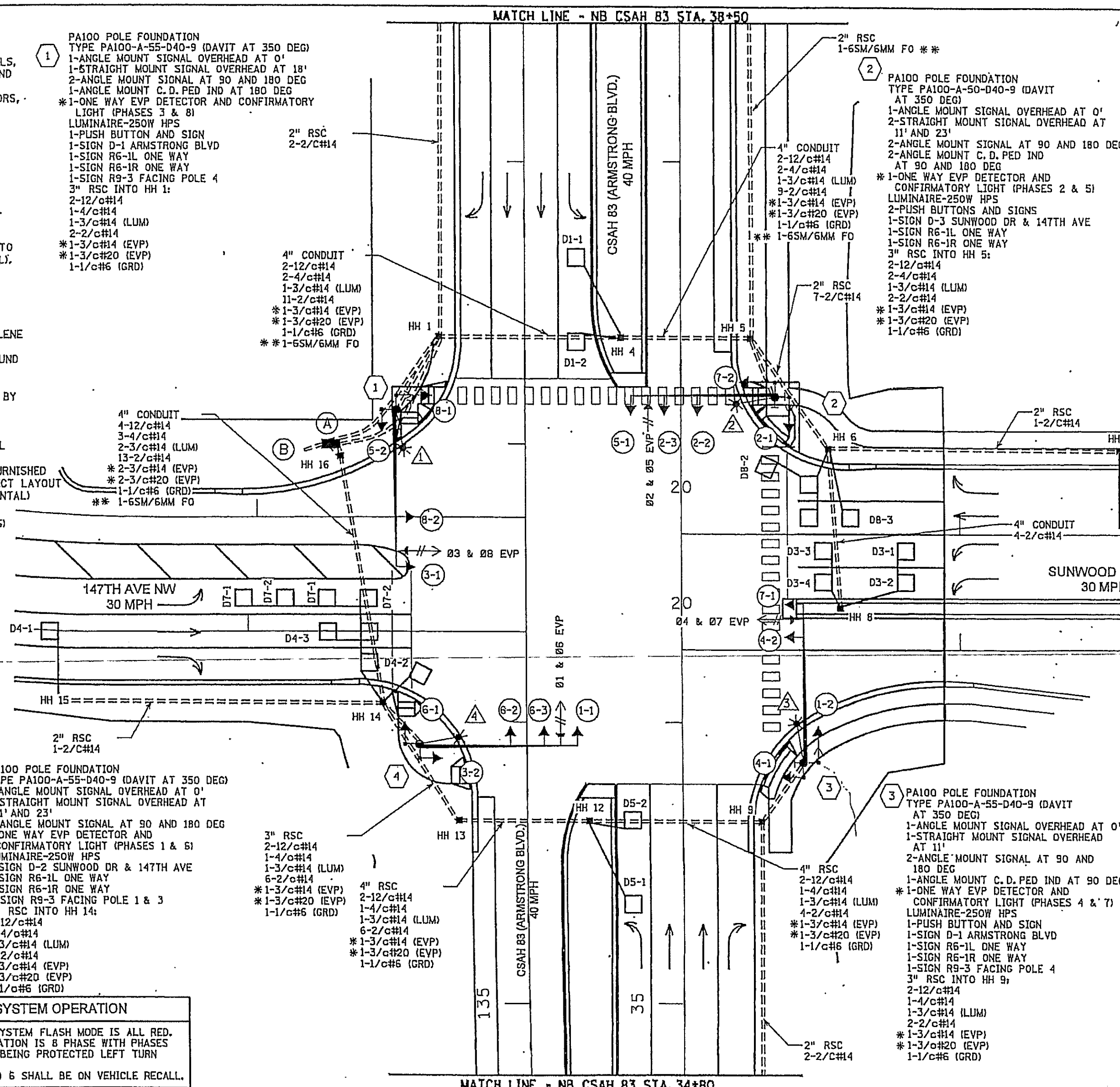
NOTES:

1) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS, COUNTDOWN PEDESTRIAN INDICATIONS, LED INDICATIONS, AND PAINTING OF SIGNAL SYSTEM.
2) THE EXACT LOCATION OF HANDHOLES, POLES, LOOP DETECTORS, AND EQUIPMENT PAD SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
3) NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS.
4) A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY FOR EMERGENCY VEHICLE PREEMPTION EQUIPMENT SHALL BE F&I 6' FROM THE END OF MAST ARM.
5) THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE POWER COMPANY TO ARRANGE FOR THE POWER CONNECTION.
6) THE CONTRACTOR SHALL LOCATE AND VERIFY INPLACE UTILITIES PRIOR TO COMMENCING WORK.
7) SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGNS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCIDENTAL).
8) EACH PEDESTRIAN INDICATION SHALL BE LED, ONE SECTION "FILLED" HAND/WALKING PERSON INDICATION.
9) ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE MOUNTED USING ONE-WAY SIGNAL HEAD MOUNTS. SEE DETAILS AND SPECIAL PROVISIONS.
10) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" NMC. SEE SPECIAL PROVISIONS.
11) ALL VEHICLES AND PEDESTRIAN SIGNAL HOUSINGS, BACKGROUND SHIELD, AND VISORS SHALL BE FABRICATED USING BLACK POLYCARBONATE MATERIALS. SEE SPECIAL PROVISIONS.
12) (* EVP) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR UNDER ITEM NO. 2565 (EMERGENCY VEHICLE PREEMPTION). SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
13) DISTANCE OFF SHOULDER OR CURB FOR EVP CONDUIT SHALL BE 1-2 FEET.
14) (** FIBER OPTIC) DENOTES INTERCONNECT FIBER TO BE FURNISHED AND INSTALLED WITH THE SIGNAL SYSTEM. SEE INTERCONNECT LAYOUT AND SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

(A) EQUIPMENT PAD - SEE DETAIL
SERVICE CABINET
CONTROLLER AND CABINET
4" RSC TO HH 1:
4-12/c#14
3-4/c#14
*2-3/c#14 (EVP)
*2-3/c#20 (EVP)
15-2/c#14
**1-6SM/6MM FO
3" RSC STUBBED OUT (THREAD AND CAP FOR FUTURE USE)
2" RSC STUBBED OUT (THREAD AND CAP FOR FUTURE USE)
1" NMC STUBBED OUT (CAP FOR FUTURE TELEPHONE LINE)

(B) SOP-TRANSFORMER (POWER BY CONNEXUS)
4" RSC TO HH 16:
4-12/c#14
3-4/c#14
*2-3/c#14 (EVP)
*2-3/c#20 (EVP)
13-2/c#14

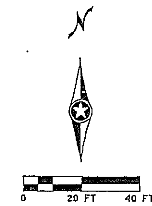
SIGNAL SERVICE CABINET
(SAME FOUNDATION AS CONTROLLER CABINET)
2" RSC INTO HH 1:
UNMETERED STREET LIGHT SERVICE
2-3/c#14 (LUM)
2" RSC INTO HH 16:
UNMETERED STREET LIGHT SERVICE
2-3/C#14 (LUM)
2" RSC STUBBED OUT (FOR POWER BY CONNEXUS)



SIGNAL FACE CHART

FACE	R	Y	G	Y	G
1-1, 1-2	←	←	←		
2-1, 2-2, 2-3	●	●	●		
3-1, 3-2	←	←	←		
4-1, 4-2	●	●	●		
5-1, 5-2	←	←	←		
6-1, 6-2, 6-3	●	●	●		
7-1, 7-2	←	←	←		
8-1, 8-2	●	●	●		

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

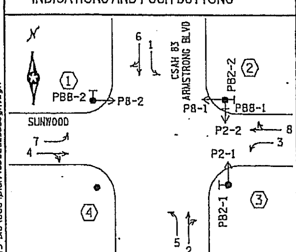


LOOP DETECTOR CHART

NUMBER	SIZE (FT)	LOCATION	FUNCTION
D1-1, 5-1	6x6	40	1
D1-2, D5-2	6x6	10	1
D2-1, D2-2	6x6	475	1
D3-1, 3-2	6x6	40	1
D3-3, D3-4	6x6	10	1
D4-1, D8-1	6x6	120	3, 8
D4-2	2-6x6	5 & -5	7
D4-3	2-6x6	5 & 20	1
D6-1, D6-2	6x6	475	1
D7-1	6x6	20 & 50	1
D7-2	6x6	5 & 35	1
D8-2	2-6x6	5 & -5	7
D8-3	2-6x6	5 & 20	1

-ALL LOOP DETECTORS SHALL BE PVC
-LOCATION: DISTANCE FROM CROSSWALK/STOP BAR IN FEET.
-LOOP DETECTOR FUNCTIONS:
(1) CALL AND EXTEND
(3) EXTEND ONLY
(7) DELAYED CALL, IMMEDIATE EXTEND
(8) CARRY OVER (STRETCH)

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE WITH PHASES 1, 3, 5 AND 7 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

NO.	DATE	BY	CHK	REVISIONS

Design By: SD
Plan By: MAS
Checked By: NEH
Approved By: SD

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE
DATE: 04/03/12 LIC. NO: 40945

WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
www.wsbeng.com
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City of RAMSEY
Armstrong Blvd at Sunwood Drive
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM INTERSECTION LAYOUT
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 125 OF 153 SHEETS

Date Printed: 6/25/2012
WSB Filename: K:\01973-010\cad\plan\CD020295_sgl7.dgn

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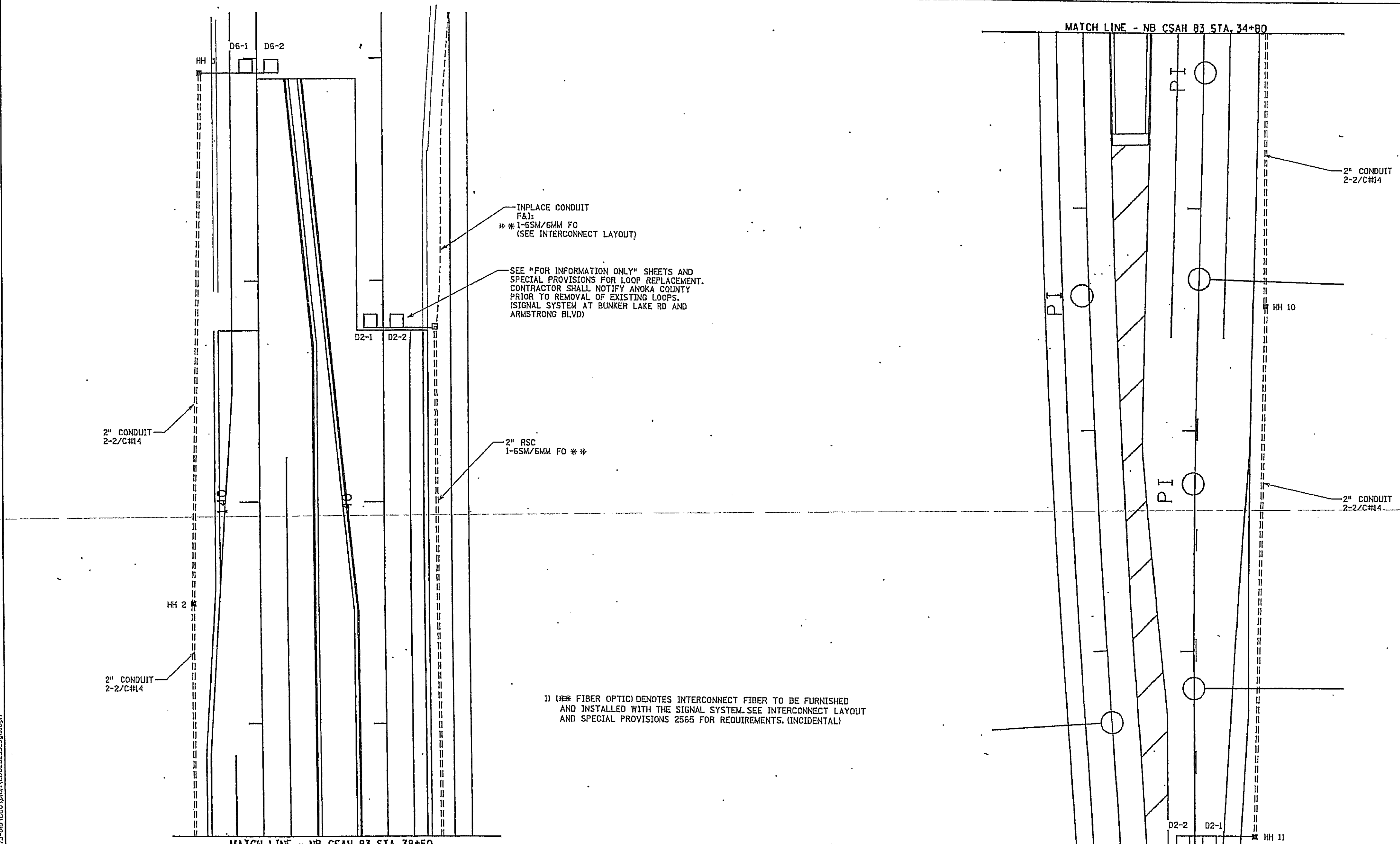

1) (✱✱ FIBER OPTIC) DENOTES INTERCONNECT FIBER TO BE FURNISHED AND INSTALLED WITH THE SIGNAL SYSTEM. SEE INTERCONNECT LAYOUT AND SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

NO.	DATE	BY	CHK	REVISIONS

Design By:	SD
Plan By:	MAS
Checked By:	NEH
Approved By:	SD

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DATE: 04/03/12 LIC. NO. 40945

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City of RAMSEY

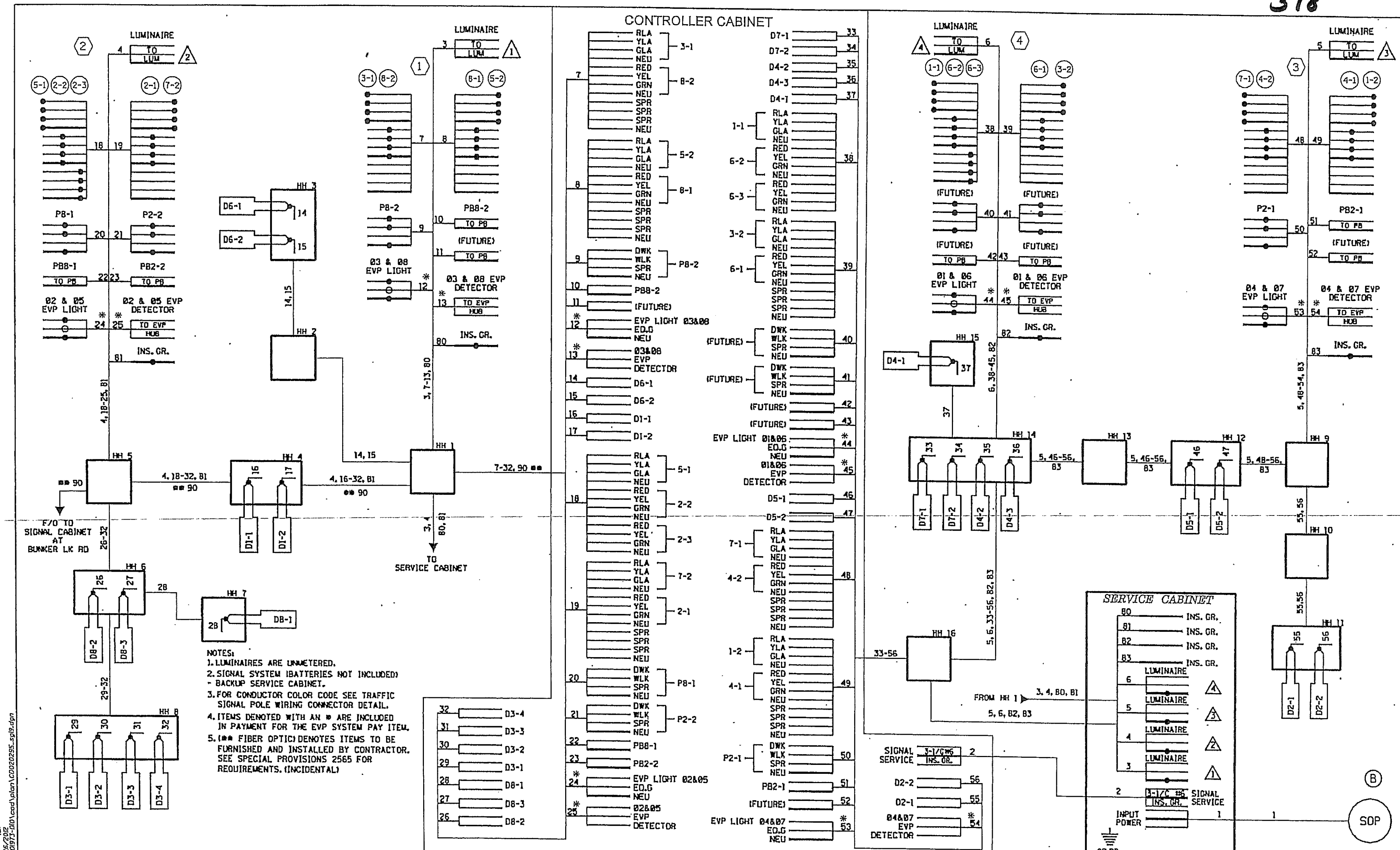
Armstrong Blvd at Sunwood Drive
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM MATCH LINE
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 126 OF 153 SHEETS

Date Printed: 6/25/2012
WSB Filename: X:\01973-010\cad\plan\CD020295_sg18.dgn

318



NOTES:
1. LUMINAIRES ARE UNMETERED.
2. SIGNAL SYSTEM (BATTERIES NOT INCLUDED) - BACKUP SERVICE CABINET.
3. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL POLE WIRING CONNECTOR DETAIL.
4. ITEMS DENOTED WITH AN * ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
5. (** FIBER OPTIC) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR. SEE SPECIAL PROVISIONS 2565 FOR REQUIREMENTS. (INCIDENTAL)

NO.	DATE	BY	CHK	REVISIONS

Design By: SD
Plan By: MAS
Checked By: NEH
Approved By: SD

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LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE
DATE: 04/03/12 LIC. NO: 40945

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City of RAMSEY

Armstrong Blvd at Sunwood Drive
City of Ramsey, Minnesota

CITY OF RAMSEY, MINNESOTA
TRAFFIC CONTROL SIGNAL SYSTEM WIRING DIAGRAM
SIGNAL PLAN
S.A.P. 199-020-010 / C.P. 12-20

SHEET 127 OF 153 SHEETS

Date Printed: 6/26/2012
WSB Filename: K:\01973-010\cad\plan\C0020295_sg19.dgn

Estimated Costs and Quantities
Revise Signal System (FYA Modifications)
CSAH 83 at Sunwood Drive/147th Avenue NW
Prepared by JMG (SEH) on March 21, 2017

Item	Estimated Quantity	Estimated Unit Cost	Estimated Total Cost
Remove 3-Section Signals	8	$300	$2,400
4-Section Signals (with LED)	9	$900	$8,100
5-Foot Extension	1	$2,500	$2,500
Strap-on Mid Mast Arm Mount	1	$1,000	$1,000
R10-X12 Sign Panels	4	$500	$2,000
Controller Cabinet Modifications	1	$2,000	$2,000
6 x 6 NMC Loop Detectors	8	$1,500	$12,000
6/c#14 Cable (to poles 1, 2, 3, 4)	800'	$2	$1,600
EVP detector modifications	1	$500	$500
Traffic Control	1	$2,500	$2,500
Sub Total			$34,600
Miscellaneous	approx. 15%		$5,400
Total Estimated Revise Signal System Costs			$40,000

Short Elliott Hendrickson Inc.

3535 Vadnais Center Drive
St. Paul, MN, 55110
Building a Better World for All of Us

2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
AM Peak
Ramsey, MN

File Name : 1-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 6AM-9AM.ASF
Site Code :
Start Date : 9/29/2016
Page No : 1

Groups Printed- Cars + - Trucks

	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
06:00 AM	0	74	10	0	0	84	3	0	7	0	0	10	10	11	0	0	0	21	0	0	0	0	0	0	115
06:15 AM	0	64	11	0	0	75	2	0	6	0	0	8	12	19	0	0	0	31	1	0	0	0	0	1	115
06:30 AM	0	77	12	0	0	89	2	1	5	0	0	8	9	21	0	0	0	30	0	0	0	0	0	0	127
06:45 AM	0	50	23	0	0	73	3	0	11	0	1	15	22	25	3	0	0	50	0	0	0	0	0	0	138
Total	0	265	56	0	0	321	10	1	29	0	1	41	53	76	3	0	0	132	1	0	0	0	0	1	495
07:00 AM	0	57	13	0	0	70	4	0	9	0	0	13	20	20	3	0	0	43	3	0	0	0	0	3	129
07:15 AM	0	65	18	0	0	83	5	0	9	0	1	15	40	24	0	0	0	64	0	0	0	0	0	0	162
07:30 AM	1	48	15	0	0	64	4	0	5	0	0	9	47	48	0	0	0	95	0	0	0	0	0	0	168
07:45 AM	1	57	18	0	0	76	3	0	11	0	0	14	38	30	1	0	0	69	0	0	1	0	0	1	160
Total	2	227	64	0	0	293	16	0	34	0	1	51	145	122	4	0	0	271	3	0	1	0	0	4	619
08:00 AM	1	32	19	0	0	52	8	0	13	0	0	21	24	18	0	0	0	42	2	0	0	0	0	2	117
08:15 AM	0	57	9	0	0	66	8	0	11	0	0	19	14	17	2	0	0	33	0	1	1	0	0	2	120
08:30 AM	0	46	15	0	0	61	7	1	12	0	1	21	18	21	1	0	0	40	0	0	0	0	0	0	122
08:45 AM	0	33	13	0	0	46	9	0	7	0	0	16	29	20	2	0	0	51	0	0	0	0	0	0	113
Total	1	168	56	0	0	225	32	1	43	0	1	77	85	76	5	0	0	166	2	1	1	0	0	4	472
Grand Total	3	660	176	0	0	839	58	2	106	0	3	169	283	274	12	0	0	569	6	1	2	0	0	9	1586
Apprch %	0.4	78.7	21	0	0		34.3	1.2	62.7	0	1.8		49.7	48.2	2.1	0	0		66.7	11.1	22.2	0	0		
Total %	0.2	41.6	11.1	0	0	52.9	3.7	0.1	6.7	0	0.2	10.7	17.8	17.3	0.8	0	0	35.9	0.4	0.1	0.1	0	0	0.6	
Cars +	2	650	172	0	0	824	57	2	101	0	2	162	271	258	12	0	0	541	5	1	1	0	0	7	1534
% Cars +	66.7	98.5	97.7	0	0	98.2	98.3	100	95.3	0	66.7	95.9	95.8	94.2	100	0	0	95.1	83.3	100	50	0	0	77.8	96.7
Trucks	1	10	4	0	0	15	1	0	5	0	1	7	12	16	0	0	0	28	1	0	1	0	0	2	52
% Trucks	33.3	1.5	2.3	0	0	1.8	1.7	0	4.7	0	33.3	4.1	4.2	5.8	0	0	0	4.9	16.7	0	50	0	0	22.2	3.3

Short Elliott Hendrickson Inc.

3535 Vadnais Center Drive
St. Paul, MN, 55110
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2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
Mid-Day Peak
Ramsey, MN

File Name : 2-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 11AM-1PM.ASF
Site Code :
Start Date : 9/29/2016
Page No : 1

Groups Printed- Cars + - Trucks

	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
11:00 AM	1	23	8	0	0	32	14	0	11	0	0	25	19	20	0	1	0	40	1	0	0	0	0	1	98
11:15 AM	1	19	11	0	0	31	10	1	17	0	0	28	24	19	1	0	0	44	1	0	0	0	0	1	104
11:30 AM	0	22	8	0	0	30	12	0	15	0	1	28	17	28	0	0	0	45	0	1	0	0	0	1	104
11:45 AM	0	16	12	0	0	28	11	0	8	0	0	19	20	16	1	0	0	37	0	1	0	0	0	1	85
Total	2	80	39	0	0	121	47	1	51	0	1	100	80	83	2	1	0	166	2	2	0	0	0	4	391
12:00 PM	0	27	11	0	0	38	12	0	12	0	0	24	22	31	0	0	0	53	0	0	0	0	0	0	115
12:15 PM	1	17	6	0	0	24	22	2	16	0	0	40	24	34	2	0	0	60	2	1	1	0	0	4	128
12:30 PM	0	24	9	0	0	33	11	0	15	0	0	26	33	18	5	0	0	56	0	1	2	0	0	3	118
12:45 PM	1	22	11	0	0	34	15	0	12	0	0	27	22	28	0	0	0	50	2	0	0	0	0	2	113
Total	2	90	37	0	0	129	60	2	55	0	0	117	101	111	7	0	0	219	4	2	3	0	0	9	474
Grand Total	4	170	76	0	0	250	107	3	106	0	1	217	181	194	9	1	0	385	6	4	3	0	0	13	865
Apprch %	1.6	68	30.4	0	0		49.3	1.4	48.8	0	0.5		47	50.4	2.3	0.3	0		46.2	30.8	23.1	0	0		
Total %	0.5	19.7	8.8	0	0	28.9	12.4	0.3	12.3	0	0.1	25.1	20.9	22.4	1	0.1	0	44.5	0.7	0.5	0.3	0	0	1.5	
Cars +	3	161	75	0	0	239	105	3	102	0	1	211	176	186	8	1	0	371	6	4	3	0	0	13	834
% Cars +	75	94.7	98.7	0	0	95.6	98.1	100	96.2	0	100	97.2	97.2	95.9	88.9	100	0	96.4	100	100	100	0	0	100	96.4
Trucks	1	9	1	0	0	11	2	0	4	0	0	6	5	8	1	0	0	14	0	0	0	0	0	0	31
% Trucks	25	5.3	1.3	0	0	4.4	1.9	0	3.8	0	0	2.8	2.8	4.1	11.1	0	0	3.6	0	0	0	0	0	0	3.6

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St. Paul, MN, 55110
Building a Better World for All of Us

2016 Anoka County Counts
Armstrong Blvd at Sundown Dr/147th St
PM Peak
Ramsey, MN

File Name : 3-CSAH 83 (Armstrong Blvd) at Sundown Drive_147th Avenue 3PM-7PM.ASF
Site Code :
Start Date : 9/29/2016
Page No : 1

Groups Printed- Cars + - Trucks

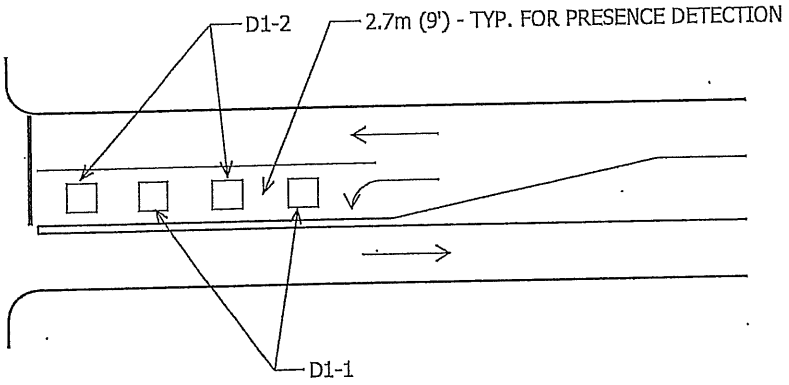
	Armstrong Blvd From North						Sundown Drive From East						Armstrong Blvd From South						147th Street From West						
Start Time	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Right	Thru	Left	UTrn	Peds	App. Total	Int. Total
BREAK																									
03:00 PM	0	27	10	0	0	37	23	0	14	0	1	38	29	36	0	1	0	66	0	0	0	0	0	0	141
03:15 PM	0	26	16	0	0	42	20	0	24	0	0	44	17	49	1	0	0	67	5	0	0	0	0	5	158
03:30 PM	0	47	17	0	0	64	31	0	22	0	0	53	30	57	2	0	1	90	0	0	0	0	1	1	208
03:45 PM	0	34	19	0	0	53	26	0	10	0	0	36	41	53	0	2	0	96	1	0	1	0	0	2	187
Total	0	134	62	0	0	196	100	0	70	0	1	171	117	195	3	3	1	319	6	0	1	0	1	8	694
04:00 PM	0	46	7	0	0	53	35	0	30	0	0	65	27	54	0	0	0	81	0	0	0	0	0	0	199
04:15 PM	1	29	22	0	0	52	33	0	29	0	0	62	29	58	0	0	0	87	0	0	1	0	0	1	202
04:30 PM	0	52	10	0	0	62	45	0	41	0	0	86	31	65	0	1	1	98	1	0	0	0	0	1	247
04:45 PM	1	33	18	0	0	52	32	1	29	0	0	62	32	73	1	0	0	106	1	0	0	0	0	1	221
Total	2	160	57	0	0	219	145	1	129	0	0	275	119	250	1	1	1	372	2	0	1	0	0	3	869
05:00 PM	2	38	20	0	0	60	47	0	23	0	0	70	35	73	0	1	0	109	4	0	0	0	0	4	243
05:15 PM	0	45	9	0	0	54	37	0	22	0	0	59	36	64	0	0	0	100	0	0	0	0	0	0	213
05:30 PM	0	49	14	0	0	63	34	0	20	0	2	56	26	56	2	0	0	84	1	0	1	0	0	2	205
05:45 PM	1	38	14	0	0	53	26	0	7	0	1	34	31	68	1	2	0	102	0	0	2	0	0	2	191
Total	3	170	57	0	0	230	144	0	72	0	3	219	128	261	3	3	0	395	5	0	3	0	0	8	852
06:00 PM	0	46	15	0	0	61	41	0	17	0	1	59	32	49	1	1	0	83	0	0	1	0	0	1	204
06:15 PM	0	38	16	0	0	54	34	0	19	0	3	56	24	54	0	1	0	79	0	0	0	0	0	0	189
06:30 PM	0	41	12	0	4	57	20	0	21	0	5	46	25	47	0	0	0	72	1	0	0	0	0	1	176
06:45 PM	0	24	17	0	0	41	25	0	13	0	0	38	26	31	0	0	0	57	0	0	0	0	0	0	136
Total	0	149	60	0	4	213	120	0	70	0	9	199	107	181	1	2	0	291	1	0	1	0	0	2	705
Grand Total	5	613	236	0	4	858	509	1	341	0	13	864	471	887	8	9	2	1377	14	0	6	0	1	21	3120
Apprch %	0.6	71.4	27.5	0	0.5		58.9	0.1	39.5	0	1.5		34.2	64.4	0.6	0.7	0.1		66.7	0	28.6	0	4.8		
Total %	0.2	19.6	7.6	0	0.1	27.5	16.3	0	10.9	0	0.4	27.7	15.1	28.4	0.3	0.3	0.1	44.1	0.4	0	0.2	0	0	0.7	
Cars +	5	602	233	0	0	840	508	1	339	0	2	850	460	866	4	9	1	1340	14	0	6	0	0	20	3050
% Cars +	100	98.2	98.7	0	0	97.9	99.8	100	99.4	0	15.4	98.4	97.7	97.6	50	100	50	97.3	100	0	100	0	0	95.2	97.8
Trucks	0	11	3	0	4	18	1	0	2	0	11	14	11	21	4	0	1	37	0	0	0	0	1	1	70
% Trucks	0	1.8	1.3	0	100	2.1	0.2	0	0.6	0	84.6	1.6	2.3	2.4	50	0	50	2.7	0	0	0	0	100	4.8	2.2

Exhibit 4-6 Protected Permissive and FYA Left Turn – Separate Left Turn Lane

LOOP DETECTOR PLACEMENT

PROTECTED/PERMISSIVE AND FLASHING YELLOW LEFT TURN

SEPARATE LEFT TURN LANE



LOOP DETECTOR FUNCTIONS
1 = CALL AND EXTEND

NUMBER	FUNCTION	SIZE	LOCATION
D1-1	1	2 - 1.7 x 1.7m (6' X 6')	6m (20') & 15m (50')
D1-2	1	2 - 1.7 x 1.7m (6' X 6')	1.5m (5') & 11m (35')

LOCATION = DISTANCE FROM STOP BAR TO LOOP DETECTOR

NOTES:

1) CONTROLLER PHASE AND DETECTOR FUNCTION SHALL BE NON-LOCK MEMORY WITH NO RECALL.
2) USE BACK UP PROTECTION TO PREVENT LEFT TURN TRAP IF THERE ARE OPPOSING LEFT TURNS.
3) DESIGN SPEED IS 25 MPH.
4) EACH NUMBERED LOOP DETECTOR SHALL HAVE A SEPARATE LEAD-IN CABLE AND SEPARATE AMPLIFIER.
5) IF USING NMC LOOPS, A SINGLE LARGER LOOP CAN REPLACE THE DUALS.
6) DETECTOR CROSS SWITCHING MAY BE USED.
7) USE THIS FIGURE IF INSTALLING A FLASHING YELLOW ARROW (FYA).

FIGURE 5

Metric				US Customary			
		Intersection sight distance				Intersection sight distance	
		Passenger cars				Passenger cars	
Design speed (km/h)	Stopping sight distance (m)	Calculated (m)	Design (m)	Design speed (mph)	Stopping sight distance (ft)	Calculated (ft)	Design (ft)
20	20	30.6	35	15	80	121.3	125
30	35	45.9	50	20	115	161.7	165
40	50	61.2	65	25	155	202.1	205
50	65	76.5	80	30	200	242.6	245
60	85	91.7	95	35	250	283.0	285
70	105	107.0	110	40	305	323.4	325
80	130	122.3	125	45	360	363.8	365
90	160	137.6	140	50	425	404.3	405
100	185	152.9	155	55	495	444.7	445
110	220	168.2	170	60	570	485.1	490
120	250	183.5	185	65	645	525.5	530
130	285	198.8	200	70	730	566.0	570
				75	820	606.4	610
				80	910	646.8	650

Note: Intersection sight distance shown is for a passenger car making a left turn from an undivided highway. For other conditions and design vehicles, the time gap should be adjusted and the sight distance recalculated.

Exhibit 9-67. Intersection Sight Distance—Case F—Left Turn from Major Road

If stopping sight distance has been provided continuously along the major road and if sight distance for Case B (stop control) or Case C (yield control) has been provided for each minor-road approach, sight distance will generally be adequate for left turns from the major road. Therefore, no separate check of sight distance for Case F may be needed.

However, at three-leg intersections or driveways located on or near a horizontal curve or crest vertical curve on the major road, the availability of adequate sight distance for left turns from the major road should be checked. In addition, the availability of sight distance for left turns from divided highways should be checked because of the possibility of sight obstructions in the median.

At four-leg intersections on divided highways, opposing vehicles turning left can block a driver's view of oncoming traffic. Exhibit 9-98, presented later in this chapter, illustrates intersection designs that can be used to offset the opposing left-turn lanes and provide left-turning drivers with a better view of oncoming traffic.

Varying Between Protected, Protected/Permissive, and Permissive Operation

As discussed above, the FYA can be considered a variable operation signal indication. Consider the following items:

- ✓ All FYA signals may vary operation between protected, protected/permissive, and permissive operation at various times of the day and night.
- ✓ Each signal approach will need to be analyzed individually to determine the time-of-day FYA operation by considering the following criteria:
  - a) Cross-product volumes of left turns and opposing throughs at various times of day
  - b) Speed limit
  - c) Sight distance limitations
  - d) Number of opposing through lanes
  - e) Double left turn lanes or single left turn lanes
  - f) Opposing left turn lane offset
  - g) Cross street or mainline approach
  - h) Comprehensive left turn crash analysis of approaches with similar characteristics

Test for Protected Only Operation 24 Hours per Day

In some cases, the left turn indication should run in the most restrictive Protected-Only mode 24 hours per day. Refer to Exhibit 3-13 for the Protected Only Left Turn Operation Guidelines. If the answer to question 1 or 2 is "yes", then protected operation should be used throughout the day.

Exhibit 3-13 Part 1: Protected-Only Left Turn Operation 24 Hours per Day

Part 1: Protected Only Operation - 24 hrs/day Guidelines

Question 1: Conflicting Left Turns

Do the opposing left turn paths conflict?

○ Yes
○ No

> If the answer is Yes, then use Protected Operation 24 hours/day.
> If the answer is No, proceed to the next question.

Question 2: Limited Sight Distance

Does the left turner have very limited sight distance as defined in the current AASHTO "A Policy on Geometric Designs of Highways and Streets"?

○ Yes
○ No

> If the answer is Yes, then use Protected Operation 24 hours/day.
> If the answer is No, proceed to part 2 to check for FYA by TOD.

> If the Answer is Yes to Question 1 or 2, use Protected Operation 24 hours/day
> If the Answer is No to all of the above, proceed to Part 2.

If the answer is "yes" to any of the questions in Part 1, then Protected-Only operation is suggested throughout the day. If the answer to all of the questions is "no", then proceed to Part 2 (Exhibit 3-14) to check for permissive FYA operation by time of day.

Test for FYA Operation by Time of Day

Part 2 (Exhibit 3-14) should be performed for each time of day interval. Typically, the evaluation would be for 4 or more intervals throughout the day (AM Peak, Mid-day Peak, PM Peak and Off Peak). Other intervals can be evaluated as warranted.

For the Cross-Product (Question 6) use the highest hourly cross product during the interval evaluated.

Exhibit 3-14 Part 2: Permissive FYA Operation by Time of Day

Part 2: Time of Day Operation of FYA

_____ Start Time

_____ End Time

Question 3: Number of Left Turn Lanes

Does the left turn have two (2) or more lanes?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** during the **high** volume times of the day (use Engineering Judgment if Decision to run FYA by TOD).

○ No
> If the answer is **No**, proceed to the next question.

Question 4: Number of Opposing Through Lanes

Does the left turn face three (3) or more opposing through lanes?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** during the **high** volume times of the day (use Engineering Judgment if Decision to run FYA by TOD).

○ No
> If the answer is **No**, proceed to the next question.

Question 5: Crash History

Is protected/permissive operation in place and is there a high number of left turn related collisions during this time interval over a 3-year period susceptible to correction by protected only phasing?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** for this TOD.

○ No
> If the answer is **No**, proceed to the next question.

Question 6: Speed and Cross Product

Is the Speed 45 MPH or greater and the Peak Hour left turn volume greater than 240 vph or is the peak hour cross product greater than 80,000 (100,000 if 2 opposing lanes)?

○ Yes
> If the answer is **Yes**, Protected Operation is **suggested** for this TOD.

○ No
> If the answer is **No**, FYA may be possible during this time period.

> If the answer is **Yes** to all Questions, Protected Only Operation is **Suggested** during this TOD (use Engineering Judgment if Decision to run FYA by TOD).

> If the answer is **No** to all Questions, FYA may be used during this TOD.

If the answer to all of the questions in Part 2 are "yes", protected only operation is suggested. Use engineering judgment if a decision to run FYA for the evaluated time period.

Question 6 does include a threshold volume of 240 vph for the subject left turn. However, if the opposing through volume is low, apply engineering judgment to determine if FYA operation could be used even if the left turn volume exceeds 240 vph.

If permissive FYA operation is allowed, protected/permissive operation may be investigated. The decision to use protected/permissive operation should be based on a capacity analysis.

Definitions

- ✓ **Protected only left turn operation:** signal phasing that allows left turn movements to only be made on an exclusive phase (green arrow).
- ✓ **Conflicting Left Turn Paths:** At some locations geometric constraints at the intersection cause the paths of opposing left turn vehicles to cross as overlap creating a conflict. An example is an approach that crosses a divided roadway with a wide median. In these locations, it may be necessary to operate the left turns in a lead-lag sequence or a split phase sequence, not allowing simultaneous opposing left turns. This operation will require protected left turns.
- ✓ **Opposing through lane (conflict):** The opposing through lanes are the lanes across from, and in conflict with, the left turning vehicle. Multiple lanes make it difficult for a driver to evaluate gaps in oncoming traffic. An opposing separate right turn lane will typically not be counted with opposing through lanes unless engineering judgment indicates that the lane configuration and number of right turns will cause conflicts with the left turn movement.
- ✓ **Limited Sight Distance (Requirements):** The minimum sight distance values necessary for the design vehicle volume to complete the turn movement. Distance should be calculated from the stop bar for the mainline left turning vehicle. Measurement is based on travel path, speed, and acceleration vehicle height. Both the sight distance for passenger vehicles and trucks should be checked using heights and distance requirements per the AASHTO Geometric Design Guide. The current reference at time this manual was prepared is the 2004 Guide, Chapter 9, Exhibit 9-67).
- ✓ **Dual Left Turn Lanes:** Multiple left turn lanes may consist of exclusive left turn lanes or a combination of exclusive left turn lanes and lanes that are shared by through and left turning traffic. Both the dual lane and the left turn lane opposing this operation are suggested to operate with protected phasing. Left turn lanes without opposing traffic, such as left turns off of a one- way street, does not require protected only phasing based upon this criteria. It might also be possible to run the FYA in permissive mode during low volume times of the day.
- ✓ **Protected/permissive left turn operation:** signal phasing that provides an exclusive phase (green arrow) followed by a permissive phase (flashing yellow arrow), time during the signal cycle where left turning traffic may make a left turn after yielding to oncoming traffic.
- ✓ **Left Turn Related Collisions:** These are Collisions that could be corrected by protected only phasing, such as those between those involving a left turning vehicle and an opposing through vehicle. At higher speeds the accidents collisions are likely to be more severe. Therefore, a lower number of collisions might be used as the parameter for consideration for high-speed approaches. Because of the variations in collisions overtime, an average number of collisions per year over a 3- year period should be used if the data is available.
- ✓ **Speed:** Because it can be difficult for a driver to accurately judge available gaps in traffic approaching at high speeds, the engineer must exercise discretion when considering permissive or protected permissive left turn phasing with opposing speeds of 45 MPH or above.

Use of posted speed limit is recommended. Non-arterial approaches may have lower speeds than the posted speed limit because they are often in a stop condition upon the arrival of traffic. Grades affect the acceleration rate of the left turner and the stopping distance and speed of the opposing through traffic and are therefore considered in conjunction with speeds.

✓ **Cross Product:** The left turn volume multiplied by the opposing through volume. The cross product values used are taken from the Wisconsin Department of Transportation (WisDOT) Traffic Signal Design Manual discussion on left turn conflicts analysis, Chapter 2, Section 3, Subject 4. Cross product used represents a high frequency of conflicts for left turners looking for gaps in through traffic.

FYA during Free Operation

With the variable-phasing operation of the FYA head, free operation will no longer have an assigned fixed phasing operation. Therefore, standard free operation will need to be set up in the signal controller so technicians can put signals quickly to FREE with a standard phasing operation desired at the specific time. Here is an example of the standard FREE operations that will need to be set up in the signal controller:

1. All left turns protected
2. All left turns protected/permissive
3. All left turns permissive
4. Mainline protected, cross street protected permissive
5. Mainline protected, cross street permissive
6. Mainline protected/permissive, cross street protected
7. Mainline protected/permissive, cross street permissive
8. Mainline permissive, cross street protected
9. Mainline permissive, cross street protected/permissive Minimum Green Times

Minimum Green Times

Mn/DOT currently sets the minimum green time based on the type of phasing operation where protected lefts have a 7 second minimum green and protected/permissive lefts have a 5 second minimum green. Given the FYA head is a variable phasing operation head, a decision will need to be made as to if there should be more than one minimum green value that changes with the phasing operation; or if a universal minimum green should apply to all phasing operations.

If one minimum green is used, and if a left turn phase will ever run protected, the left turn minimum green should be set at 7 seconds. If a left turn will never run protected (i.e. only run protected/permissive or permissive), then the left turn minimum green should be set at 5 seconds.

EVP Preemption Operation under FYA

A. Protected-only Operation

✓ When the FYA is not allowed (protected only), the pre-emption will bring up the protected left turn and the adjacent through phase. The opposing FYA will not be allowed during preemption (refer to Exhibit 3-15).

Public Works Committee **6. 1.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Receive Staff Updates on 148th Lane NW Cul-De-Sac and Easement Vacations

Purpose/Background:

In 2020, the property owners from 5805 148th Lane NW, Michael and Sarah St. Clair, constructed a pole barn on their property. In order to receive a permit to complete this work, the Planning Commission was asked to grant a variance on April 2, 2020, to allow construction of the pole building to encroach on the side corner setback due to an existing 33-foot wide road easement that encumbers the southern 33-feet of their property. Attached is a survey showing this easement. Attached is a copy of the meeting minutes from the April 2, 2020, Planning Commission meeting.

This led to a broader discussion about the likelihood of 148th Lane ever been extended. In the end, the Planning Commission directed Staff to initiate an easement vacation of the roughly 600 western most feet of this easement and to retain the existing turn around in its current configuration.

The driveway to the St. Clair's property is located off the north side of 148th Lane NW, which is a gravel road. See attached aerial pictures. The driveway is gravel and accesses the gravel 'cul-de-sac' that terminates just east of this property. This existing "cul-de-sac" is not large enough for use by snow plows or emergency vehicles. Staff would therefore prefer that a more standard cul-de-sac be provided on 148th Lane to allow these vehicles to safely turn around during the course of their duties.

On July 20, 2021, the St. Clair's attended the Public Works Committee. They inquired where the City was at in the easement vacation process, and reiterated that they do not want their road paved and that they still want to vacate the road easement.

On September 22, 2021, the City Administrator, Public Works Superintendent, and City Engineer met with Michael and Sarah St. Clair on their property at 5805 148th Lane NW from 9 - 10 AM to review the existing gravel road, driveways, trees and landscaping in considering a design concept for a permanent cul-de-sac/turnaround capable of accommodating Public Works and Public Safety vehicles, as well as school buses, trash trucks, and other service vehicles as needed. A concept design is needed to help guide the potential easement vacations on the west end of 148th Lane NW as discussed at the April 20, 2020, Planning Commission meeting, and also at the July 20, 2021, Public Works Committee meeting.

During the onsite meeting, the St. Clair's provided a layout to Staff showing areas of their property that they are willing to allow a cul-de-sac/turnaround to be constructed on. See attached. IN fact, the St. Clair's even offered to construct the turnaround if the City were to provide the surfacing materials.

The group also discussed the potential for vacating the road easements, which would require input and direction from their neighbor to the south, who has 33-feet of easement on the north edge of part of their property.

The purpose of this case is to provide an update to the Committee and discuss next steps. Public Works Staff are hoping to work with the property owners to construct a cul-de-sac/turnaround before winter.

Timeframe:

Staff anticipates 15 minutes will be required to present this case and respond to questions.

Observations/Alternatives:
N/A

Funding Source:
N/A

Recommendation:

Action:
Dependent on discussions.

Attachments

Planning Commission 040220 minutes
5805 148th Ln Survey
2020 Aerial 148th Ln NW
2020 Aerial cul de sac

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	10/14/2021 04:08 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 04:11 PM
Form Started By: Bruce Westby		Started On: 10/05/2021 12:07 PM
Final Approval Date: 10/14/2021		

PLANNING COMMISSION
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA

The Ramsey Planning Commission conducted a regular meeting on Thursday, April 2, 2020, at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present:	Chairperson Randy Bauer Commissioner Bruce Anderson Commissioner Cheri Gengler Commissioner Eric Peters Commissioner Gary VanScoy Commissioner Matt Woestehoff
Members Absent:	Commissioner Torrey Johnson
Also Present:	Senior Planner Chloe McGuire Brigl Deputy City Administrator Tim Gladhill City Planner Chris Anderson City Council Liaison Debra Musgrove

1. CALL TO ORDER

Chairperson Bauer called the regular meeting to order at 7:00 p.m.

Deputy City Administrator Gladhill explained that the City is under a declaration of emergency and therefore City Hall has been closed to the public and meetings are being held by telephonic means. He provided details on how members of the public can provide input and how the meeting will run.

2. PRESENTATIONS

2.01: Receive Update on COVID-19 Emergency Declaration and Public Meeting Impacts

Deputy City Administrator Gladhill provided board updates on the impacts of public meetings due to local, County, State and Federal Emergency Declarations as it pertains to the work of Boards and Commissions. He reported that City Hall is closed to the public through at least May 4th.

2.02: Receive Update on Postponed Land Use Applications and Impacts of Minnesota Statutes Chapter 15.99 (60 Day Rule)

City Planner McGuire Brigl reviewed the staff report and provided an update to the Commission on the current cases and the impact of the State of Emergency on ongoing functions and the 60 Day Rule.

Chairperson Bauer asked for an update on any changes the State may make.

Deputy City Administrator Gladhill stated that the development community is concerned that municipalities would use this as a tool to continually delay action. He provided an update on recent legislative activity, noting that the League of Minnesota Cities continues to work on the topic in attempt to find language that could satisfy both parties.

3. CITIZEN INPUT

None.

4. APPROVAL OF AGENDA

Motion by Commissioner Woestehoff seconded by Commissioner VanScoy, to approve the agenda as presented.

A roll call vote was conducted by the Deputy City Administrator:

Commissioner Peters	aye
Commissioner VanScoy	aye
Commissioner Gengler	aye
Commissioner Woestehoff	aye
Commissioner Anderson	aye
Chairperson Bauer	aye

Motion Carried.

5. CONSENT AGENDA

5.01: Approve the March 5, 2020 Planning Commission Meeting Minutes:

Chairperson Bauer noted a few typos on the minutes that he could provide to staff.

Motion by Commissioner VanScoy, seconded by Commissioner Gengler, to approve the consent agenda with the changes suggested by Chairperson Bauer.

Commissioner Anderson	abstain
Commissioner Woestehoff	aye
Commissioner Gengler	aye
Commissioner Peters	aye
Commissioner VanScoy	aye

Chairperson Bauer aye

Motion Carried.

6. PUBLIC HEARINGS/COMMISSION BUSINESS

6.01: Public Hearing: Consider Resolution #20-060 Approving a Variance for 5805 148th Ln NW (Project 20-106); Case of Mike and Sarah St Clair

Public Hearing

Chairperson Bauer called the public hearing to order at 7:20 p.m.

Presentation

Senior Planner McGuire Brigl presented the staff report stating that staff recommends that the Commission adopt Resolution #20-060 approving a Variance for a detached garage at 5805 148th Ln NW.

Commissioner VanScoy referenced the easement and asked if the City is considering vacating the easement.

Senior Planner McGuire Brigl stated that public works is open to walking through the process, but there has not been communication with the southern property owner. She stated that the St Clair family was open to vacating the easement. She explained that the process to vacate an easement is lengthy and may be an option for the future, but staff believed that this was the best option to move forward.

Commissioner VanScoy stated that this lot and adjacent lots along the road could be subdivided and if the road were constructed it could serve all the homes along 148th. He noted that if the property were developed, beyond this, and the road were put in, that could create major issues for future development. He asked if there is a way to put the structure on the property without a variance.

Senior Planner McGuire Brigl stated that it is unlikely that the road would ever be built in this area. She explained that the goal would be to vacate the easement in the future. She stated that the variance is an intermediate step that would allow this to move forward in the building season. She explained that once the easement is vacated, the variance would not be necessary. She stated that staff feels that the requests meets the variance criteria. She explained that the easement on the property is unique as it a road easement with a full cul-de-sac that has never, and likely will never, be built upon. She commented that the City Attorney felt that this was the cleanest way to move forward at this time.

Commissioner VanScoy asked where the full turnaround could occur to the west of this property.

Senior Planner McGuire Brigl provided additional details on the existing dead-end of the road that could be expanded to a cul-de-sac.

Citizen Input

Mr. St Clair, applicant, stated that this is the only location for the structure that would be accessible from the road because of the topography of the property and location of the mature trees. He stated that this also makes sense with the layout of the existing home and detached garage. He stated that the proposed location of the building is setback at least 53 feet from the property line. He stated that their front yard is the west side of the property, noting that the detached garage was approved without a variance. He explained that the 53 feet would include the 33-foot easement with an additional 20-foot setback. He stated that they have been beekeepers for three seasons and provided additional information on the bees and upkeep.

Commissioner Anderson commented that the site does have a lot of trees and hills and there is already sand in the area they would be constructed the pole barn. He stated that this appears to be the only location the structure could be built without tree removal. He noted that he would prefer to issue a variance than to lose trees.

Councilmember Musgrove thanked the applicants for reaching out to their neighbors for input. She commented that this seems to be a reasonable request. She stated that if the applicants had a vehicle with a trailer, she would prefer to see it parked in the pole barn as proposed, rather than in the driveway and therefore believes this to be a good fit.

Motion by Commissioner Anderson, seconded by Commissioner VanScoy, to close the public hearing.

Commissioner Gengler	aye
Commissioner Peters	aye
Commissioner Anderson	aye
Commissioner Woestehoff	aye
Commissioner VanScoy	aye
Chairperson Bauer	aye

Motion Carried.

Chairperson Bauer closed the public hearing closed at 7:54 p.m.

Commission Business

Commissioner VanScoy stated that it sounds like a lot of this presumes that the road would never be built. He stated that if the area is developed in the future there would be issues that arise with the accessory building. He believed that there are other locations on the property that could support the structure without a variance but recognized that would be less convenient. He stated

that he finds it difficult to support the variance because convenience is not an element of the variance criteria. He stated that all residential properties have easements and therefore does not find that unique.

Senior Planner McGuire Brigl stated that variances do not set precedent and are individual to the property. She recognized that while most residential properties have drainage and utility easements, those are not counted in setbacks. She explained that the drainage and utility easements are simply included in the setbacks required from the property line, whereas this is a road easement.

Commissioner VanScoy asked if there would never be any further development in this area, as he believed that is an opportunity in the future. He explained that if the area is developed, the screening would be removed.

Chairperson Bauer recognized that while the existing property owners may have no desire to subdivide, future property owners may. He asked if the Commission could suggest that the City strongly look to vacate the road easement.

Senior Planner McGuire Brigl stated that the Commission could choose to approve the variance if desired, and then direct staff to look into vacating the road easement and noted that she would not suggest making one action contingent upon the other. She noted that neither property can currently subdivide.

Deputy City Administrator Gladhill stated that if the goal is to vacate the easement, this is a step that would allow the applicants to move forward with their request and staff can continue to pursue the vacation of the easement.

Commissioner Anderson stated that the variance is required because the side yard is turning into the front yard. He asked if there is a way to make the side yard the actual side yard, as a variance would not be required.

Deputy City Administrator Gladhill confirmed that if the easement is vacated, that would provide that resolution but noted that is a lengthy process and therefore staff suggested this step to allow the applicants to move forward during the building season.

Chairperson Bauer noted that granting the variance would allow the applicants to move forward with construction while the City goes through the process of vacating the easement.

Motion by Commissioner VanScoy to Deny Resolution #20-060 Approving the Issuance of a Variance to Construct a Detached Accessory Building within the Required Front Yard Setback at the Property at 5805 148th Ln NW.

The motion failed for lack of a second.

Motion by Commissioner Anderson, seconded by Commissioner Gengler, to Adopt Resolution #20-060 Approving the Issuance of a Variance to Construct a Detached Accessory Building within the Required Front Yard Setback at the Property at 5805 148th Ln NW.

Commissioner Peters	aye
Commissioner Gengler	aye
Commissioner Woestehoff	aye
Commissioner Anderson	aye
Commissioner VanScoy	nay
Chairperson Bauer	aye

Motion Carried.

Motion by Commissioner VanScoy, seconded by Commissioner Anderson, to recommend City staff begin the process of vacating the road easement.

Commissioner Anderson	aye
Commissioner Woestehoff	aye
Commissioner Gengler	aye
Commissioner Peters	aye
Commissioner VanScoy	aye
Chairperson Bauer	aye

Motion Carried.

7. COMMISSION BUSINESS

Following the motion recommending that the city vacate the easement, there was a discussion regarding the construction of a turnaround as supported by Fire and Police for safety reasons. It was determined that the current width of the easement will allow sufficient room for a turnaround. Any action to vacate the easement should allow for room for the construction of the turnaround. The Commission and the applicant were all supportive of this proposal.
~~None~~.

8. COMMISSION / STAFF INPUT

8.01: Receive Staff Update

Senior Planner McGuire Brigl noted that residents can find updated information on the City website related to COVID-19 and development related updates. She reminded all residents to fill out their census forms.

9. ADJOURNMENT

Motion by Commissioner Anderson, seconded by Commissioner Woestehoff, to adjourn the meeting.

Commissioner Anderson	aye
Commissioner Woestehoff	aye
Commissioner Gengler	aye
Commissioner Peters	aye
Commissioner VanScoy	aye
Chairperson Bauer	aye

Motion Carried.

The regular meeting of the Planning Commission adjourned at 8:11 p.m.

Respectfully submitted,

CMcGuireBrigl

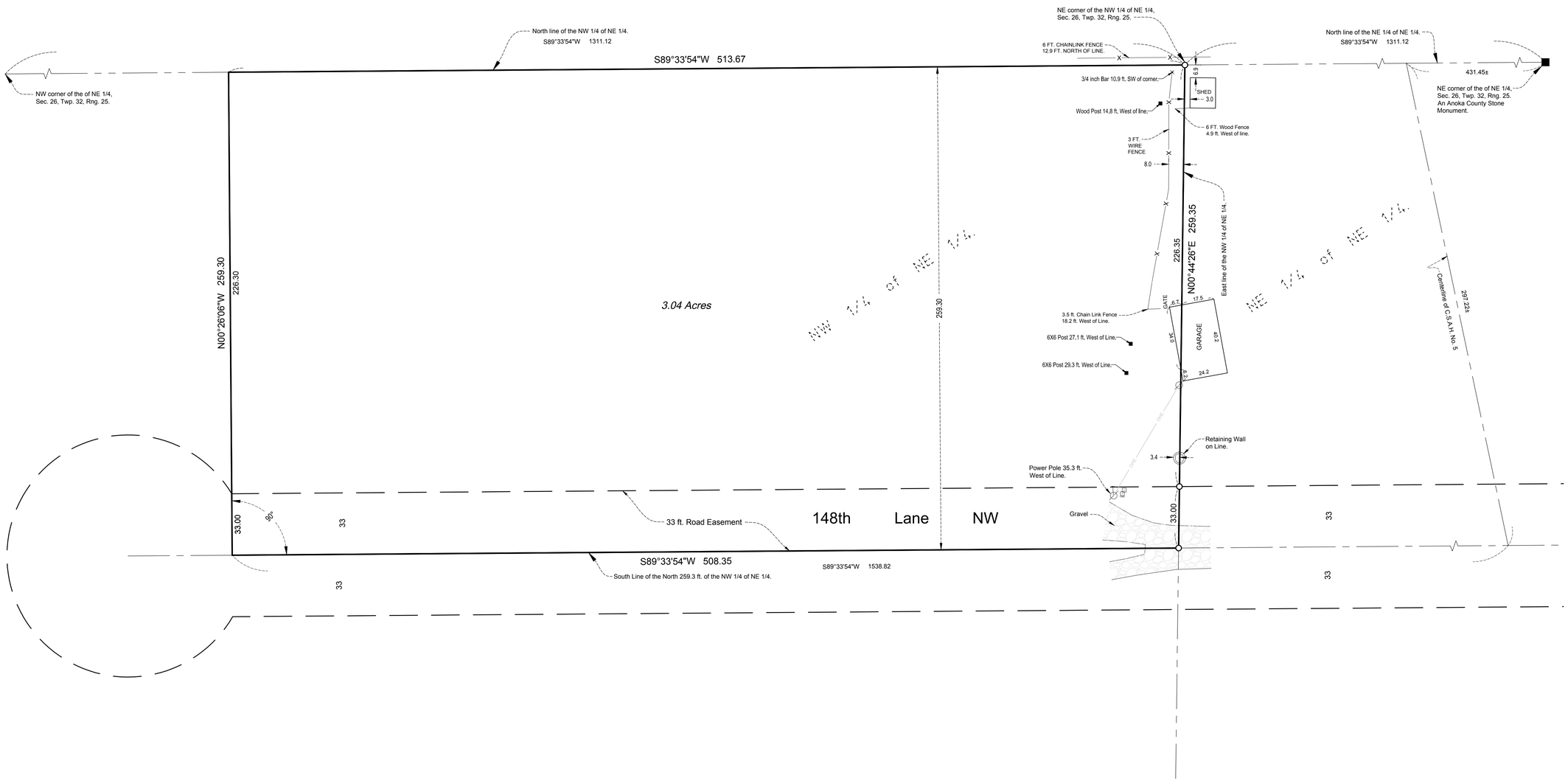
Chloe McGuire Brigl
Senior Planner

ATTEST:

JoAnn Shaw

JoAnn Shaw
Community Development Assistant

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.



PROPERTY DESCRIPTION

The North 259.30 feet of the Northwest Quarter of the Northeast Quarter of Section 26, Township 32, Range 25, Anoka County, Minnesota which lies easterly of the following described line: Commencing at the Northeast corner of said Section 26; thence westerly along the northerly line of the Northeast Quarter of said Section 26, a distance of 431.45 feet, more or less, to the centerline of County State Aid Highway No. 5; thence southeasterly, along said centerline, a distance of 297.22 feet, more or less, to a point which is 259.3 feet southerly of the said northerly line of the Northeast Quarter (as measured at right angles); thence westerly, on a line 259.30 feet southerly of, and parallel to, said northerly line of the Northeast Quarter, a distance of 1538.82 feet to the actual Point of Beginning of the line to be described; thence northerly, at right angles, a distance of 259.3 feet to the northerly line of said Northeast Quarter and there terminating. Subject to an easement for roadway purposes over the southerly 33.00 feet thereof.

NORTH

0 30 60

○ Denotes a 1/2 inch iron pipe monument set with a plastic plug stamped 13057.

CLIENT

Michael St. Clair
5805 148th Lane NW
Ramsey, MN 55303
TEL 763-600-9161

MUNICIPALITY

PROJECT

St. Clair Property

Anoka County, MN

SHEET INDEX

SHEET	TITLE
CX.X	XXXXXXXXXX

REVISION HISTORY

DATE	REVISION	REVIEW
XX. MON. 20XX	XXXXXXXXX	XXX

PROJECT MANAGER REVIEW

BY LC DATE 06.28.2019

CERTIFICATION

I hereby certify that this survey, plan, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the state of Minnesota.

Lynn R. Caswell

License No. 13057 Date: 06/17/2019

Signature shown is a digital reproduction of original. Wet signed copy of this plan on file at Landform Professional Services, LLC office and is available upon request.

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ENCROACHMENT SURVEY

SHEET NO. 1/ 1

2020 Aerial

9/17/2021, 10:59:42 AM

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mi

2020 Aerial

9/17/2021, 11:19:39 AM

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mi

Public Works Committee **6. 2.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Review Final Northwest Metro Regional Surface Water Supply Study

Purpose/Background:

Purpose:

The purpose of this case is to review the final version of the Northwest Metropolitan Area Regional Surface Water Supply Study.

Background:

Over the years, the City of Ramsey has explored the use of surface water to augment, or possibly replace, groundwater supply as the source of our municipal water supply system.

In 2018, the Metropolitan Council funded a study to explore the feasibility of constructing a regional surface water supply facility in the northwest metro area to serve the cities of Corcoran, Dayton, Ramsey and Rogers. This study was completed in the fall of 2020. Attached is a copy of the final study.

Per prior Committee direction, Staff will briefly summarize the findings of the final study. A copy of the final study is attached (even though the cover sheet of the attached study says "Draft", it is the final study).

Timeframe:

Staff anticipates approximately 10 minutes will be required to present and discuss this case.

Observations/Alternatives:

The primary objective of the study was to understand relative costs and implementation considerations of different surface water use approaches to long-term water sustainability within the study area. This study will support future planning of local area water supplies and water sustainability practices. As cities face increased demands on their water supplies in the future, this study may provide concept/planning level options for future consideration.

Funding Source:

This study was fully funded by the Metropolitan Council. The only cost to the City of Ramsey was Staff's time to participate in the study.

Recommendation:

Action:

No action required. The purpose of this case is simply to summarize the findings of the study at a high level.

Attachments

MCES NW Metro Regional Surface Water Study

SEH Next Steps Memo

Form Review

Inbox	Reviewed By	Date
Grant Riemer	Grant Riemer	10/14/2021 02:24 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 03:29 PM
Form Started By: Bruce Westby		Started On: 06/08/2021 08:23 AM
Final Approval Date: 10/14/2021		

NORTHWEST METRO AREA REGIONAL WATER SUPPLY SYSTEM STUDY

Draft

METROPOLITAN COUNCIL

October 2020

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Judy Johnson	District 1	Peter Lindstrom	District 10
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The Metropolitan Council is the regional planning organization for the seven-county Twin Cities area. The Council operates the regional bus and rail system, collects and treats wastewater, coordinates regional water resources, plans and helps fund regional parks, and administers federal funds that provide housing opportunities for low- and moderate-income individuals and families. The 17-member Council board is appointed by and serves at the pleasure of the governor.

On request, this publication will be made available in alternative formats to people with disabilities. Call Metropolitan Council information at 651-602-1140 or TTY 651-291-0904.

About this Report

The 2005 Minnesota Legislature directed the Metropolitan Council to “carry out planning activities addressing the water supply needs of the metropolitan area,” including the development of a Twin Cities Metropolitan Area Master Water Supply Plan (Minn. Stat., Sec. 473.1565). After completing that plan, the Council took on many technical and outreach projects that strengthen local and regional water supply planning efforts. These projects have also elevated the importance of water supply in local comprehensive planning, which is carried out by local communities.

This study is one of several being led by the Metropolitan Council to support activities identified by the Minnesota Legislature to address the water supply needs of the seven-county metropolitan area. This study is funded from the Clean Water Legacy Fund (Minn. Laws 2013 Ch. 137, Art. 2, Sec. 9).

The Metropolitan Council retained Short Elliott Hendrickson Inc. (SEH), in partnership with workgroup communities, to complete this technical assessment of different approaches to a regional water supply in the Northwest Metro regional area.

Recommended Citation

Metropolitan Council. 2020. *Northwest Metro Area Regional Water Supply System Study*. Prepared by Short Elliott Hendrickson Inc. Metropolitan Council: Saint Paul.

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Executive Summary

The primary source of drinking water in the Northwest Metro is the Tunnel City-Wonewoc (TCW) aquifer. Concerns with groundwater use in the region include naturally occurring manganese, a potential health concern, and aquifer drawdown due to increased future demands. It is possible that groundwater may not be able to meet all of the future drinking water demands.

The primary objective of this study is to understand the relative costs and implementation considerations of different approaches to long term water supply within the study area. The study area includes the Northwest Metro cities of Corcoran, Dayton, Ramsey and Rogers.

The study will be referenced to support future planning of metro area water supplies and water sustainability practices. As cities face increased demands on their water supplies in the future, this report provides concept level options for consideration.

This report meets the requirements of Minnesota Statutes, section 473, subdivision 1565, which calls for the Council to "carry out planning activities addressing the water supply needs of the metropolitan area". Special funding for this project was provided through the Clean Water Fund.

This study evaluates four approaches to meet future water demands in the study area:

- Approach 1: Regional Surface Water Treatment Plant
- Approach 2: Regional Groundwater Treatment Plant
- Approach 3: Conjunctive Use of Surface Water and Groundwater
- Approach 4: Status Quo – Individual Lime Softening Water Treatment Plants

This study provides communities concept level costs and considerations for various water supply approaches. It is not meant to prescribe specific solutions for implementation. Rather these approaches serve as examples to stimulate future planning that could involve a hybrid of the alternatives identified in this study or in combination with water conservation measures and other sustainability approaches.

Study Area Community Information

The communities in the study area represent different levels of development. All the communities have significant growth forecasted for 2040, with the study area population estimated to grow by 250%. The average day water demand for the study area is expected to increase from 3.3 million gallons per day (MGD) to 7.8 MGD in 2040. The maximum day demand for the four communities is estimated to increase from 7.4 MGD to 21.8 MGD. Community projections for ultimate buildout conditions for the study area predict an average day demand of 29 MGD and maximum day demand of 73 MGD.

Regional Water System Capacity

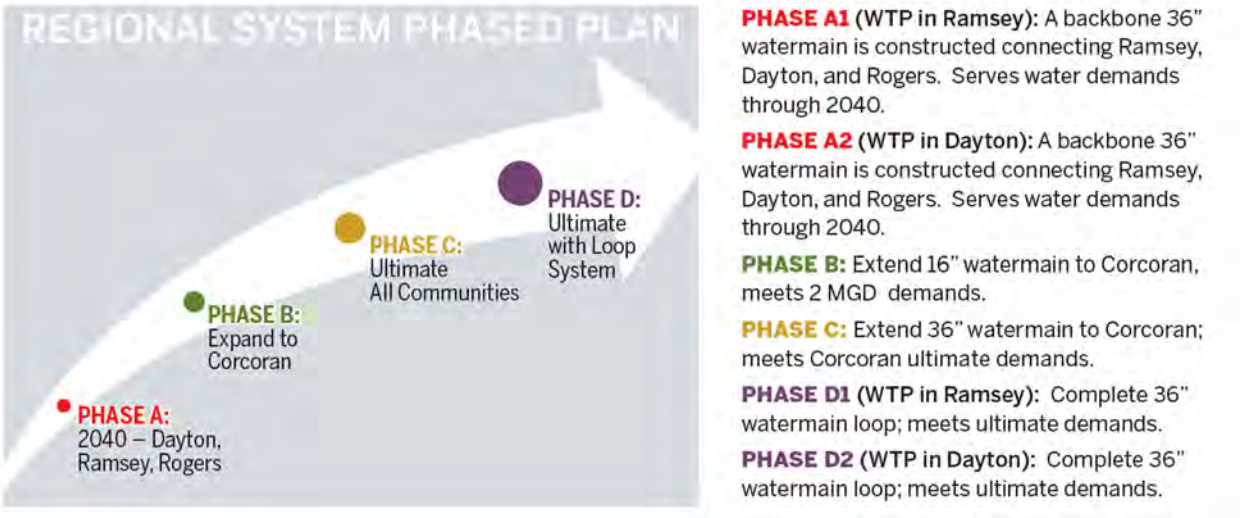
In planning for a regional water system with a single, centrally treated supply, the maximum day demand is the criteria used to establish the capacity of most system components. For approaches 1 and 2 with a central water treatment plant, the design capacity is assumed to be 25 MGD for 2040 and 75 MGD for ultimate conditions. For Approach 3, the central water treatment system capacity is based on the average day demand and peak day demands are served by each community's well system. The 2040 water treatment plant (WTP) capacity is assumed to be 12 MGD and the capacity serving ultimate demands would be 40 MGD.

Phased Approach

For water distribution systems, the trunk watermain is typically sized for the ultimate system capacity. To provide reliability of service, typically there is a "loop" trunk system. Given the different levels of development for the four communities and the distances involved, a looped trunk watermain sized for the ultimate capacity is a significant investment that would be underutilized for a long time.

The concept plan for the distribution system and WTPs is segmented into four phases for two different WTP location sites as demonstrated on Figure ES-1. The phased watermain and water treatment plant locations are shown on Figures ES-2 and ES-3.

Figure ES-1. Phased Approach to Trunk Watermain Construction



Approach 1 – Regional Surface Water Treatment Plant

Several Minnesota communities have the Mississippi River as their source of drinking water, including St. Cloud, St. Paul Regional Water Services, and Minneapolis. It was determined that the Mississippi River in the vicinity of the Northwest Metro has sufficient capacity and water quality to serve the ultimate water demands of the communities. Two locations were considered for a potential regional surface water treatment plant, including a location in Ramsey and a location in Dayton.

To protect public health from pathogens, surface water used for drinking water is required to follow the US EPA's Surface Water Treatment Rule. To meet maximum day demands, the 2040 capacity of the water treatment plant is 25 MGD and the ultimate capacity is 75 MGD.

Approach 2 – Regional Groundwater Treatment Plant

A regional groundwater treatment plant would utilize wells in a central wellfield for its source water. To reduce chlorides in wastewater from home softeners and compare the groundwater WTP against a lime softening surface WTP, it is assumed that the potential regional groundwater WTP is a lime softening WTP. The groundwater treatment plant is proposed to be located in Dayton because it is centrally located, less developed than Rogers or Ramsey, and the Tunnel City Wonewoc aquifer is available throughout the entire City.

The concept regional groundwater WTP is proposed to provide a capacity of 25 MGD and would serve the maximum day demands for the Northwest Metro communities through 2040. After 2040, the groundwater WTP will be expanded to 75 MGD to meet ultimate water demands.

Approach 3 – Conjunctive Use

A hybrid option for the Northwest Metro to utilize some of its groundwater infrastructure is to build a new water treatment facility with a surface water source for conjunctive use with the existing groundwater systems. Conjunctive use is using treated surface water to meet average day demands and peaking with existing groundwater wells.

Approach 3 consists of constructing a 12 MGD surface WTP to meet 2040 demands and a 28 MGD expansion (total of 40 MGD) to meet ultimate demands. The 2040 average day demand for the Northwest Metro is 7.8 MGD and the ultimate average day demand is 29 MGD. The WTP capacities are designed to be larger than the average day demands so that the water treatment plant does not need to be operated 24 hours per day.

Figure ES-2. Phased Regional Water System with a WTP in Ramsey.

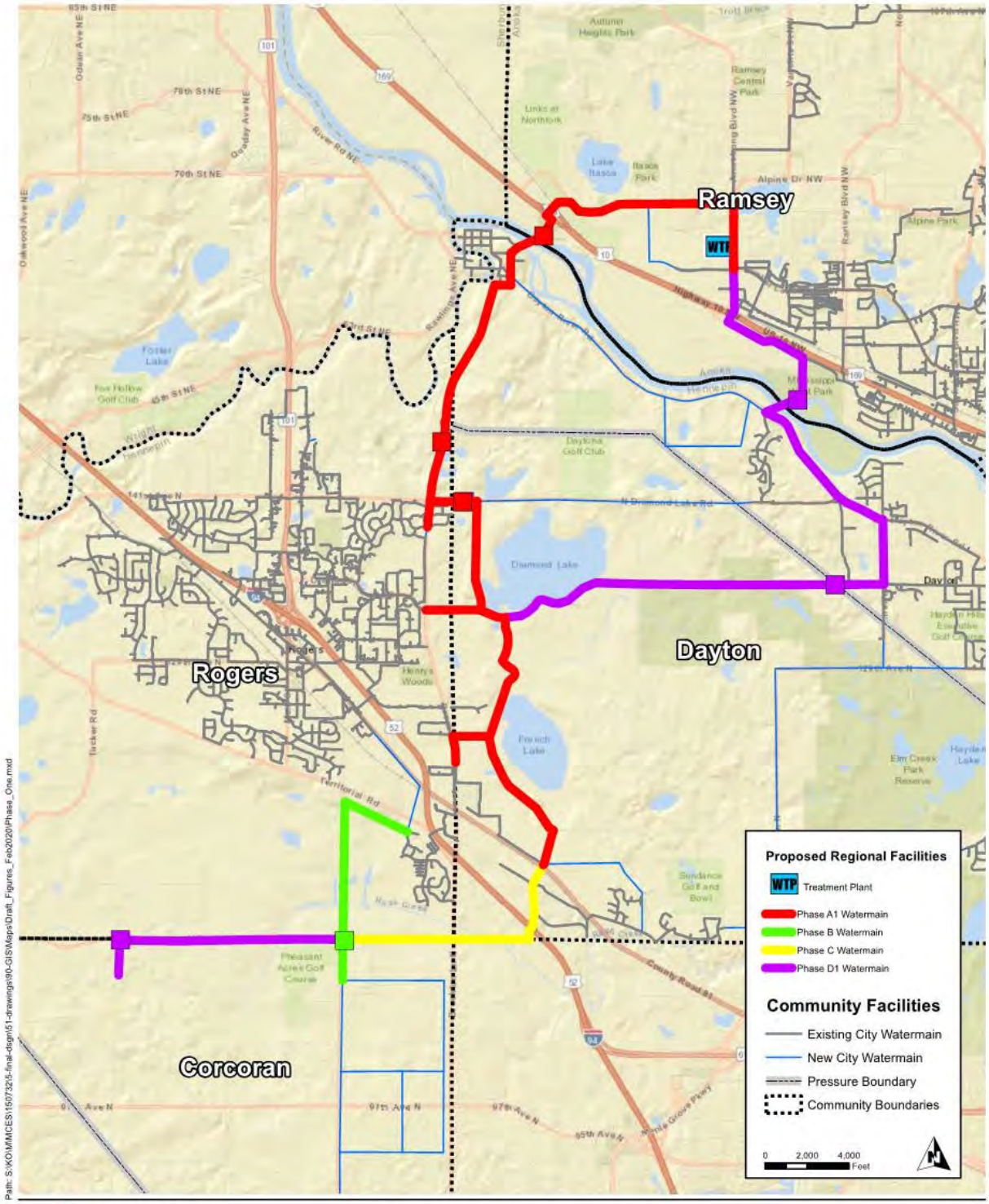
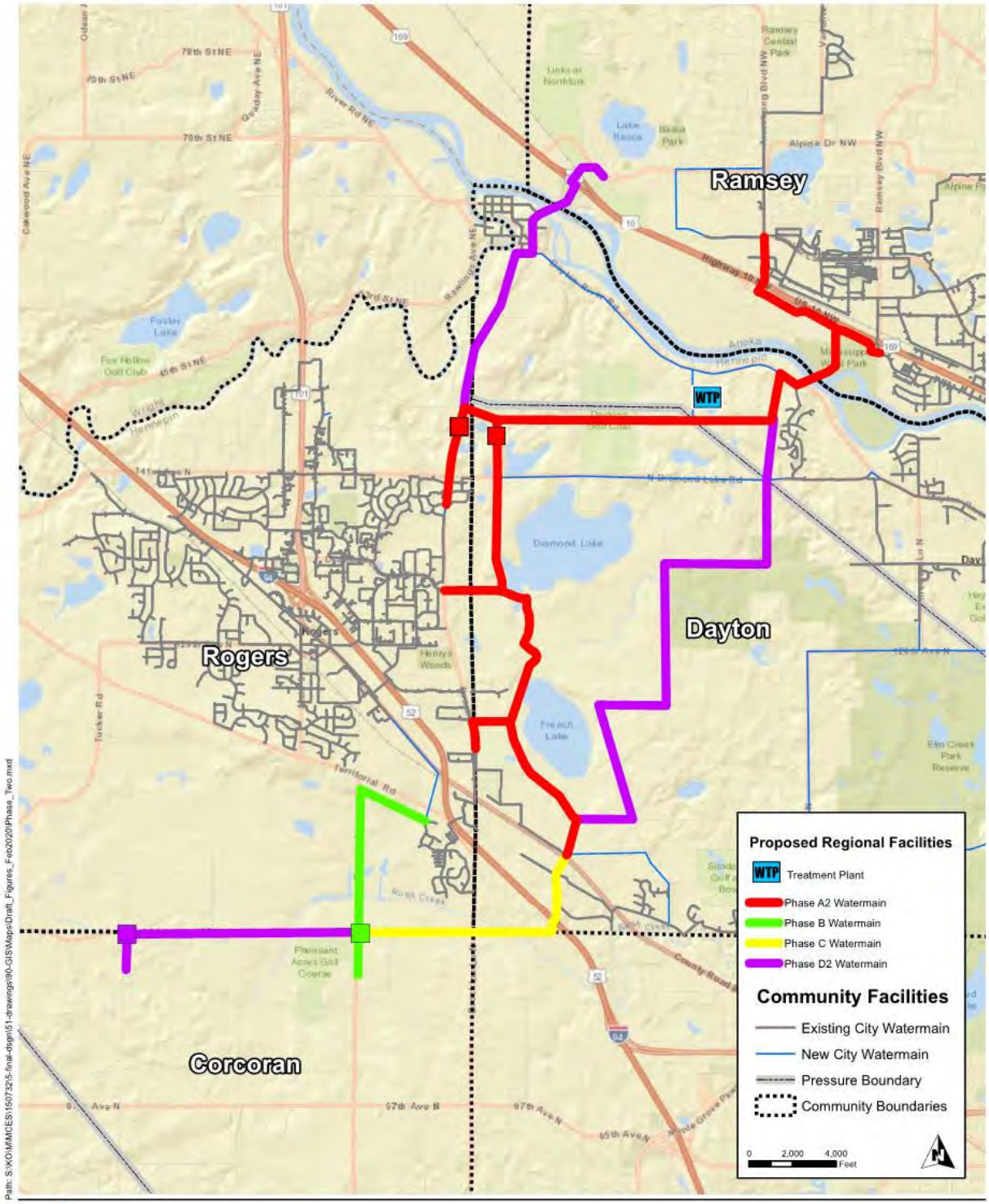


Figure ES-3. Phased Regional Water System with a WTP in Dayton.



Approach 4 – Status Quo – Individual Lime Softening Water Treatment Plants

In the absence of a project driver or an incentive to do something different, the Northwest Metro cities will most likely continue to utilize groundwater in separate water systems.

To provide an equivalent comparison to Approaches 1-3, it is assumed that the Northwest Metro cities will continue to drill wells as needed and construct lime softening WTPs. A potential driver for selecting a lime softening treatment process for community drinking water systems is a future wastewater discharge limit for chlorides in the Twin Cities metro area receiving waters. The majority of the chloride in wastewater comes from the regeneration process of home water softeners.

The number of new wells and the capacities of the lime softening water treatment plants in Approach 4 is based on the 2040 and ultimate water demands of the individual Northwest Metro cities. To meet ultimate demands using only groundwater, it is estimated that an additional 54 wells will be needed.

Approach Comparison

The four approaches are compared through an analysis using 20-year and 60-year planning horizons. The 2040 Regional System Plan is based on meeting the 2040 demands for Dayton, Ramsey and Rogers and assumes that the ultimate water trunk main is extended to Corcoran by 2040. For the 60-year planning period, the system capacity is expanded from 2040 to accommodate the ultimate or buildout conditions of all four communities.

Table ES-1 summarize the lifecycle costs for water system facilities to meet 2040 demands. The three regional drinking water system approaches and continuing with the ‘status quo’ of separate community systems are compared.

Table ES-1. Concept Level Capital and O&M Costs for 2040 Demand

Item	Approach 1 Regional Surface Water	Approach 2 Regional Groundwater Lime Softening	Approach 3 Conjunctive Use	Approach 4 Status Quo Lime Softening
Capital Costs				
Distribution System (Watermain/Booster Stations)				
Phase A, Scenario 1	$61,000,000		$61,000,000	
Phase A, Scenario 2		$59,300,000		
Phase B	$5,800,000	$5,800,000	$5,800,000	
Phase C	$18,600,000	$18,600,000	$18,600,000	
WTP and Wells	$132,000,000	$176,000,000	$102,000,000	$197,000,000
Capital Cost Total[1]	**$217,000,000**	**$260,000,000**	**$187,000,000**	**$190,000,000**
Annualized Capital Cost (20 year)	**$14,600,000**	**$17,500,000**	**$12,500,000**	**$12,700,000**
O&M Annual Costs				
WTP/Well O&M	$5,900,000	$5,500,000	$5,250,000	$6,100,000
Booster Station O&M	$100,000	$100,000	$100,000	
WTP/Well Repair & Replacement (2%)	$2,600,000	$3,500,000	$2,000,000	$3,900,000
Distribution Repair and Replacement (1%)	$900,000	$800,000	$900,000	
O&M Cost Total[1]	**$9,500,000**	**$9,900,000**	**$8,250,000**	**$10,000,000**
Total Annualized Cost[1]	**$24,100,000**	**$27,400,000**	**$20,750,000**	**$22,700,000**

[1] Costs based on 2020 dollars; no escalation to date of construction.

Table ES-2 summarizes the lifecycle costs for water system facilities to meet ultimate demands. The three regional drinking water system approaches and continuing with the ‘status quo’ of separate community systems are compared.

Table ES-2. Concept Level Capital and O&M Costs for Ultimate Demand

Item	Approach 1 Regional Surface Water	Approach 2 Regional Groundwater Lime Softening	Approach 3 Conjunctive Use	Approach 4 Status Quo Lime Softening
Capital Costs				
2040 Capital Costs	**$217,000,000**	**$260,000,000**	**$187,000,000**	**$190,000,000**
Distribution System				
Phase D, Scenario 1	$67,000,000		$67,000,000	
Phase D2, Scenario 2		$62,000,000		
WTP and Wells	$164,000,000	$272,000,000	$202,000,000	$410,000,000
Capital Cost Total[1]	**$448,000,000**	**$594,000,000**	**$456,000,000**	**$600,000,000**
Annualized Capital Cost (60 year)	**$16,100,000**	**$21,500,000**	**$16,400,000**	**$21,700,000**
O&M Annual Costs				
WTP O&M	$17,500,000	$16,400,000	$15,600,000	$18,100,000
Booster Station O&M	$440,000	$440,000	$440,000	
WTP Repair & Replacement (2%)	$5,900,000	$8,900,000	$6,000,000	$12,100,000
Distribution Repair and Replacement (1%)	$1,600,000	$1,300,000	$1,600,000	
O&M Cost Total[1]	**$25,000,000**	**$27,000,000**	**$24,000,000**	**$30,000,000**
Total Annualized Cost[1]	**$41,300,000**	**$48,500,000**	**$40,400,000**	**$51,700,000**

[1] Costs based on 2020 dollars; no escalation to date of construction.

Summary of Findings and Implementation Considerations

Key takeaways from this concept level study of alternative approaches to a Northwest Metro area regional drinking water supply system include:

- The average day water demand in the Northwest Metro is projected to increase from 3.3 MGD in 2015 to 7.8 MGD in 2040 (140% increase).
- The ultimate average day water demand in the Northwest Metro is 29 MGD (approximately 800% increase from 2015).
- If the Northwest Metro cities continue to utilize only groundwater to meet water demands, an additional 54 wells will likely be needed to meet ultimate demands. A 2016 MCES report indicated drawdown in the Tunnel City-Wonewoc aquifer in 2040 when demands are only 27% of the ultimate demands. It is possible that the aquifer cannot sustain the ultimate demands of the Northwest Metro.
- The Mississippi River has sufficient water quantity to serve the Northwest Metro communities. The water quality in the Mississippi River appears to be acceptable for a conventional surface water treatment plant. St. Could, St. Paul, and Minneapolis utilize the Mississippi River as their source of drinking water.
- A regional surface WTP has the advantages of being a cost effective approach, eliminates the need for numerous addition wells, increases groundwater sustainability, provides fully softened water, and reduces chloride discharges to the Mississippi River. The disadvantages of a regional surface WTP is that it changes water taste and odor and relies heavily on one water source.
- A regional lime-softening groundwater WTP has the advantages of providing fully softened water and reduces chloride discharges to the Mississippi River. The disadvantages of a regional lime softening groundwater WTP is that it is one of the most expensive approaches evaluated, may not be feasible due to groundwater drawdown, and relies heavily on one water source.

- A regional conjunctive use WTP has the advantages of being a cost effective approach, increases groundwater sustainability, provides mostly softened water, reduces chloride discharges to the Mississippi River, and does not rely on one water source. The disadvantages of a regional conjunctive use WTP is that it changes water taste and odor and does not provide fully softened water in the summer.
- Constructing individual lime softening groundwater WTPs (Status Quo) has the advantages of providing fully softened water and reduces chloride discharges to the Mississippi River. The disadvantages of individual lime softening WTPs is that it is the most expensive approach and relies on one water source.
- A cost of service example indicates that grant funding will be an integral part of implementing a regional surface water supply system to make the project viable.
- In the absence of a project driver, Northwest Metro cities are likely to continue to utilize groundwater and construct iron and manganese removal water treatment plants. At this point, none of the Northwest Metro cities have water treatment plants, although 2 are in the planning stages (Ramsey and Corcoran).
- The Northwest Metro communities are embarking on this study at an optimal time. The water systems are not fully developed and significant growth is planned.

Chapter 1 - Introduction

Metropolitan Council Environmental Services (MCES) has partnered with communities to study regional water supply sustainability initiatives in the Twin Cities metropolitan area. One of these initiatives is the Northwest Metropolitan Area Regional Surface Water Supply System Study (Study). This study is a collaborative and cooperative effort between MCES and the Cities or Corcoran, Dayton, Ramsey, and Rogers (Northwest Metro). The scope of this study was developed in conjunction with the Northwest Metro communities.

The approaches evaluated in the study are not meant to be prescriptive, but serve as examples to stimulate future planning that could involve a hybrid of alternatives identified in the study, or in combination with water conservation measures and other sustainability approaches.

1.1 Study Objectives

The primary objective of this study is to understand the relative costs and implementation considerations of different approaches to a regional water supply in the Northwest Metro regional area.

This study evaluates four approaches to water supply:

- Approach 1: Regional Surface Water Treatment Plant
- Approach 2: Regional Groundwater Treatment Plant
- Approach 3: Regional Conjunctive Use System (Surface Water Augmented with Groundwater)
- Approach 4: Status Quo

The approaches were selected in consultation with the study partner communities. The project components developed for each approach should be viewed as examples. The best option for moving forward may be a hybrid of the examples considered in this study and could involve approaches that were not considered in this study. The “status quo” approach assumes that all communities continue with separate water supply systems and provides a comparison to the three regional water supply approaches evaluated.

This study does not provide a “shovel-ready” project for implementation. The projects defined by each approach are at a concept-level, with the intent to compare relative differences in costs between approaches, and more importantly to explore the implementation issues associated with each approach.

Joint water system governance and cost sharing options are also explored as part of the implementation considerations evaluation.

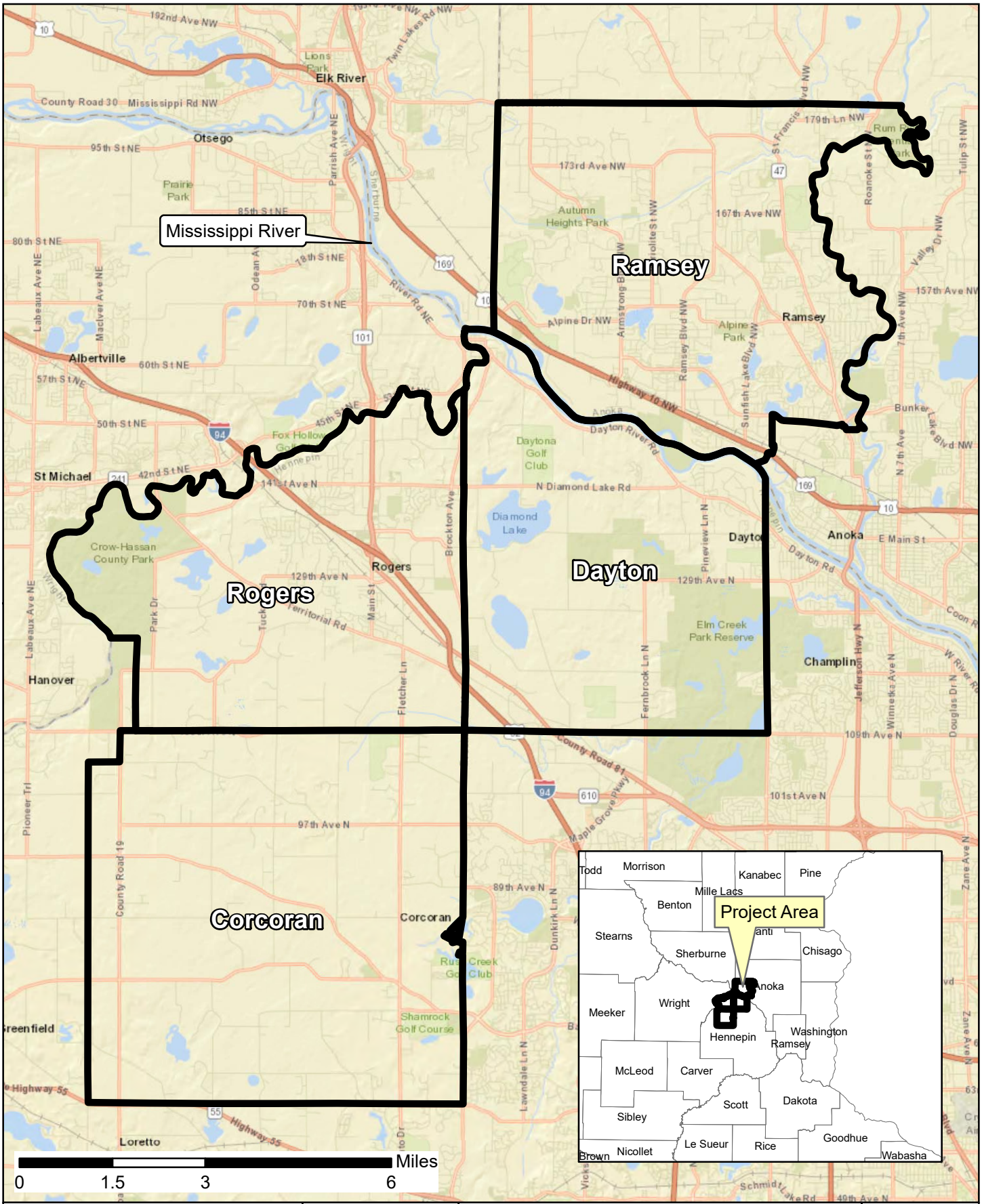
1.2 Evaluation Process

This study defines concept level water infrastructure systems to deliver the approaches identified in the study objectives. The basic elements of the evaluation include:

- Description of concept system alternatives
- Concept level costs
- Considerations for implementation
- Comparison of potential benefits of alternative / approach combinations to the sustainability of water resources and system reliability in the Northwest Metro area

1.3 Study Area

The Northwest Metro study area is delineated in Figure 1-1. The communities in the study area include the cities of Corcoran, Dayton, Ramsey and Rogers.



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Print Date: 3/12/2020

STUDY AREA

Ramsey, Dayton, Corcoran, and Rogers, Minnesota

Figure 1-1

1.4 Water Demand

Existing water and projected 2040 water demands for each of the study area communities is presented in Table 1-1. In 2040, projected average daily water use by the entire study area is estimated to be 8 million gallons per day (MGD), while maximum day water demand is expected to be 22 MGD.

The total study area population is expected to grow by about 250% by 2040. The 2040 projected water demands for Rogers are within their permitted well appropriation but Ramsey will exceed their current appropriation. Dayton and Corcoran are supplied water by Maple Grove and have water contracts through 2036 and 2038, respectively. Dayton has a current appropriation of 35 MGY and Corcoran currently has no permitted community drinking water wells.

Table 1-1. Historic and Projected Population and Drinking Water Demand for Northwest Metro Communities.

City	2015 Population[1]	2040 Population[1]	2015 Avg Day Demand (MGD)[2]	2040 Avg Day Demand (MGD)[3]	2015 Max Day Demand (MGD)[3]	2040 Max Day Demand (MGD)[3]
Rogers	9,400	20,050	1.3	2.5	2.9	6.2
Ramsey	13,774	26,988	1.8	3.5	4.5	10.3
Dayton	1,667	7,317	0.2	0.7	0.4	1.9
Corcoran	48	7,650	0.01	1.1	NA	3.4
Total	**24,899**	**62,005**	**3.3**	**7.8**	**7.4**	**21.8**

[1]Served by Municipal Water System (estimated) - [2]DNR Water Appropriations database – [3]Community comprehensive plans.

This concept level study requires projecting beyond the typical 20-year planning horizon. Communities provided their projections for buildout conditions and the potential "ultimate" water demand. The ultimate average annual demand is estimated to be around 30 MGD and the ultimate maximum day demand could be greater than 70 MGD. Table 1-2 provides the estimated ultimate demand provided by each community.

Table 1-2. Ultimate Water Demand for Northwest Metro Communities.

Year	Ultimate Avg Day Demand (MGD)	Ultimate Max Day Demand (MGD)
Rogers	4.8	12
Ramsey	8.0	20
Dayton	7.7	19.3
Corcoran	8.8	22
Total	**29**	**73**

Sources: Community provided based on ultimate growth projections.

An important water infrastructure planning criteria is the ratio of maximum day water use to average day use. Peak demands occur during warmer months, and are mainly attributed to irrigation and outdoor water use needs. This ratio provides one method of assessing a community's water use efficiency. Table 1-3 summarizes the projected 2040 water demand and peak ratios.

Table 1-3. 2040 Average and Maximum Day Demands by Community.

City	Avg Day[1] 2040 Demand (MGD)	Max Day[2] 2040 Demand (MGD)	Peak Ratio[3]	% Total Study Area Avg Day Demand
Rogers	2.5	6.2	2.5	32%
Ramsey	3.5	10.3	2.9	45%
Dayton	0.7	1.9	2.7	9%
Corcoran	1.1	3.4	3.1	14%
Total	**7.8**	**21.8**	2.8	

[1] Average day demand is defined as the total annual water use for a system divided by 365 days, thus the annual average demand.

[2] Maximum day demand is defined as the largest daily water use over the course of a calendar year. This is an important criterion for the sizing of infrastructure systems for reliable service.

[3] Peak Ratio is the maximum day demand divided by the average day demand.

1.5 Existing Water Infrastructure

There are 17 municipal wells listed within the study area. All of these wells draw from the Tunnel City-Wonewoc (TCW) aquifer. The sum appropriation for these wells is 1,635 MGY. Table 1-4 provides a summary of well information, along with storage capacity and distribution system interconnects for each community. Well locations and other water infrastructure are shown in Figure 1-2.

Table 1-4. Northwest Metro Municipal Wells and Supply System Features

City	No. of Wells	Aquifers	Total Capacity	Firm Capacity (MGD)	Storage (MG)	Interconnects
Rogers	7	TCW	7.8	6.3	3.15	Dayton
Ramsey	8	TCW	11	9	4	Anoka
Dayton	2	TCW	2.1	0	0.5	Rogers, Champlin, Maple Grove
Corcoran	0	-	-	-	-	Maple Grove, Medina

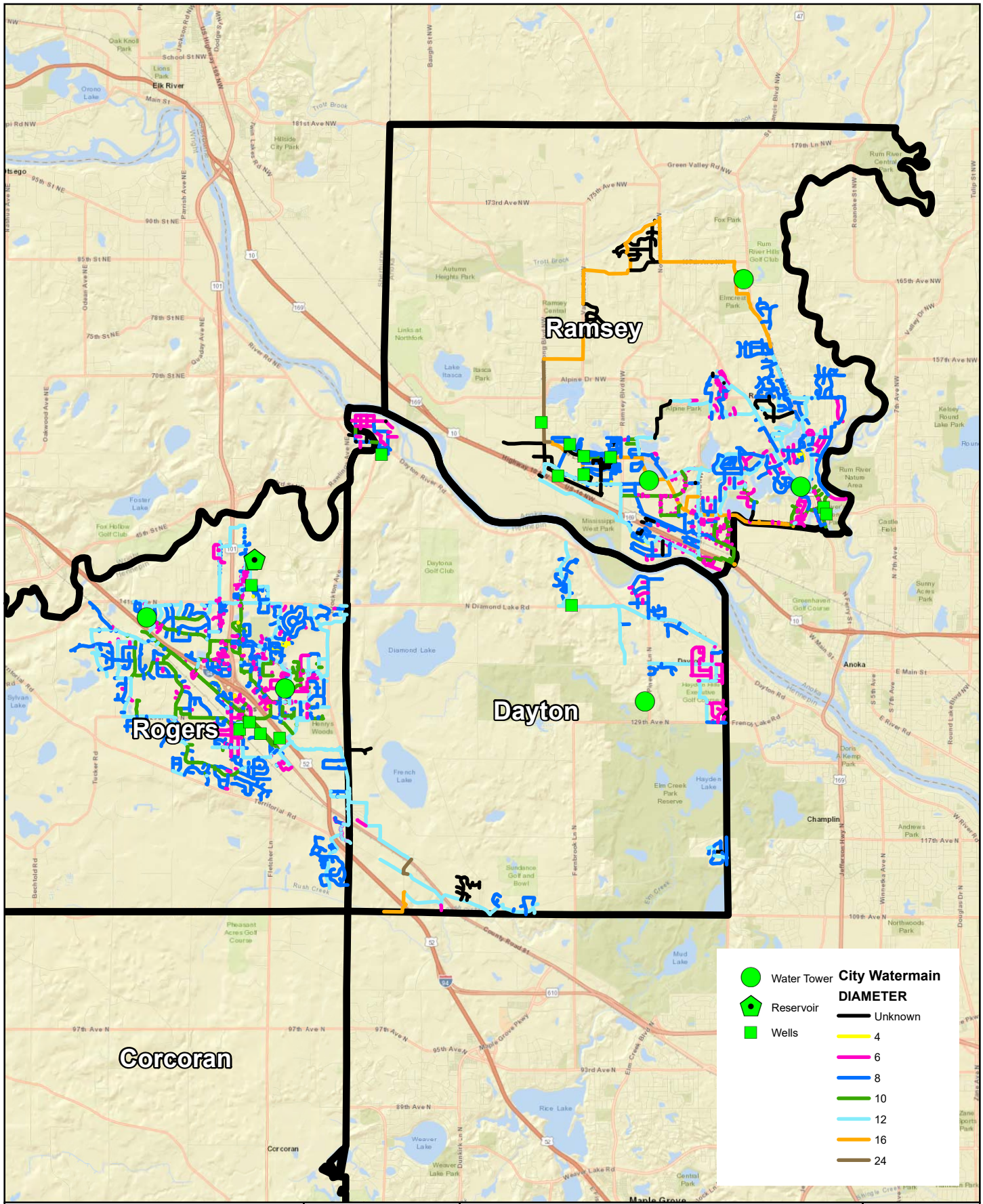
TCW = Tunnel City Wonewoc

Pressure zones across the communities range from a low of 1030 in Ramsey to a high of 1170 in a small high pressure zone in Rogers. New pressure zones are anticipated in the southern portion of Dayton and the City of Corcoran which are not currently served by those cities. Portions of Dayton and Corcoran are currently served by Maple Grove.

1.6 Community Development and System Capacity

The communities in this study represent different stages of development, as summarized in Figure 1-3. Using maximum day demand as an equivalent to drinking water system capacity, the capacity requirements of the communities can be compared. Rogers and Ramsey currently have community drinking water systems serving large portions of their population. It is estimated that the existing maximum day demand (based on 2015 data) for Rogers and Ramsey is approximately 25% of their projected ultimate demand. Dayton and Corcoran represent less developed communities. Dayton has a community water supply system serving a small portion of the city and Corcoran has none. Both currently purchase drinking water from Maple Grove. The existing maximum day demand for Dayton is estimated to be only 2% of the ultimate maximum day demand, and for Corcoran it is less than 0.2%.

Another way to look at it: the capacity of a regional drinking water system in operation today (based on 2015 data) would be based on Rogers and Ramsey at 95% of the capacity. In 2040, this decreases to 75%, and to less than 45% for buildout conditions represented by an ultimate study area demand.



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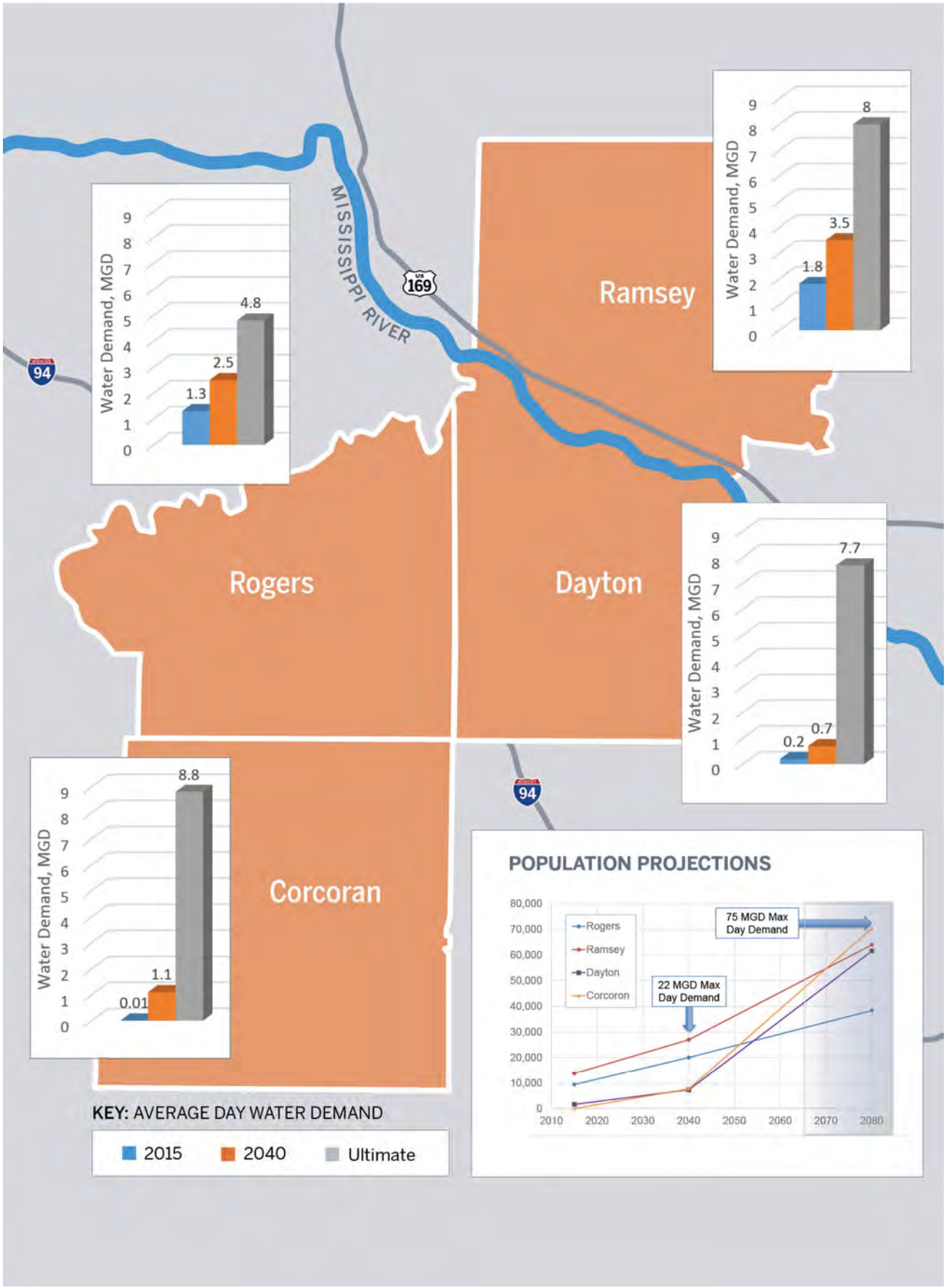
EXISTING WATER INFRASTRUCTURE

Northwest Metro Area Regional
Water Supply Study

Figure
1-2

Figure 1-3. Growth and Water Demand Projections for the Study Area.



Chapter 2 – Water Supply Quality and Quantity

The regional water supply approaches evaluate two sources of water: the Mississippi River and groundwater, focusing on the Tunnel City-Wonewoc aquifer. This section provides information about the water quality and quantity of each supply in the study area vicinity of relevance to designing a drinking water system.

2.1 Mississippi River

The following sections discuss Mississippi River water quality, constituents of concern, and regulated constituents.

2.1a Water Quality

In the Twin Cities metro area, the Mississippi River serves as the primary drinking water source for Minneapolis and St. Paul and the communities they serve with wholesale or retail water. These long-serving drinking water systems provide a historic record of water quality and treatment practices as a reference to define system components for a Northwest Metro area regional surface water treatment system. It is common practice to treat Mississippi River water using a lime softening process with various filtration methods.

The closest water quality monitoring site to a potential intake for a new regional water treatment plant is located in Anoka, less than 2 miles downstream of the Dayton/Ramsey border. MCES has been collecting field and laboratory analyzed samples at this site for over 45 years. The Anoka monitoring site is the primary reference source for water quality characterization in this study. Other data sources reviewed include data maintained by the Minnesota Department of Health (MDH) at Fridley, MCES' monitoring at Fridley and MDH data for St. Cloud, to provide a reference point upstream of the Crow River confluence.

This study focused on a subset of constituents important when considering surface water as a source for drinking water. Constituents of interest in planning for conventional drinking water treatment processes are categorized in this study as primary constituents of interest. This list is expanded to summarize the full list of constituents regulated for public drinking water supplies. Historic data is also reviewed for other monitored constituents not currently regulated for drinking water supplies to identify any constituents that may have been detected. Appendix A provides information on the data sources, monitoring site locations, data analysis methods, and a more comprehensive compilation of water quality data.

Surface water sources, including the Mississippi River, have a wider range of potential contaminants than groundwater due to intentional and unintentional discharges to the river. This could include runoff, wastewater treatment discharges, and accidental releases. A discussion of regulated contaminants and potential future regulations is presented in Section 2.1c.

2.1b Primary Constituents of Interest

Historic data for constituents of interest in selecting and designing drinking water treatment processes are listed in Table 2-1. The average concentrations and variability are generally similar to what is observed for other surface WTPs along this upper stretch of the Mississippi River. Conventional treatment processes with accepted best practices are able to treat these constituent concentration ranges.

Table 2-1. Primary Constituent Summary

Constituent	Unit	Avg	St Dev	Min	95th Percentile	Max	No. Samples
Alkalinity	mg/L CaCO3	178	31	90	227	374	296
Hardness	mg/L	208	37	86	274	332	145
Iron	mg/L	0.51	0.26	0.17	1.2	1.3	27
Manganese	mg/L	0.0001	0.00005	0.000045	NA	0.0002	12
Total Dissolved Solids	mg/L	269	48.3	119	348	720	972
Total Organic Carbon	mg/L	9.4	2.5	5.1	NA	14.5	20
Nitrate	mg/L	0.90	0.78	0	2.4	5.4	1313
Nitrite	mg/L	0.011	0.04	0	0.05	1	1314
Total Kjeldahl Nitrogen	mg/L	0.93	0.34	0	1.5	3.6	1109
Phosphorus, Total	mg/L	0.11	0.08	0	0.24	1	1349
Turbidity	NTU	6.6	7.2	1.3	15	200	1086
Total Suspended Solids	mg/L	16.7	14.2	0	40	165	1320
E. Coli	#/100mL	117	283	0	419	2420	$572/4^{ND}$
Giardia*	cysts/L	0.24	0.30	0	0.90	1.1	$43/16^{ND}$
Cryptosporidium*	cysts/L	0.06	0.10	0	0.30	0.30	$48/33^{ND}$

Sources:

Metropolitan Council Environmental Services, Conventional River Water Monitoring Program, Anoka site, data downloaded 8/29/2019.

*Minnesota Department of Health, Fridley site, water quality data request received 11/22/2019.

Notes:

NA=Not available/calculated given limited data set.

ND=no detection; example entry for E. Coli - $572/4^{ND}$ of 572 samples analyzed, 4 had no E. Coli detected.

Laboratory analysis: Use of unfiltered samples, except for TOC which included filtered samples.

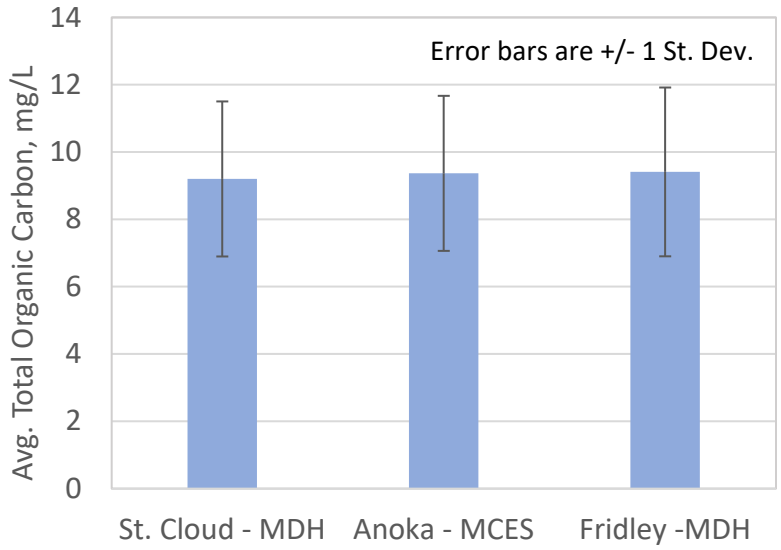
Refer to Appendix A for more detailed information.

Total organic carbon (TOC) is an key surface water treatment parameter because it can impact treatment processes, taste and odor, and disinfection byproducts. TOC measurement at the Anoka site has not had the frequency of sampling as at the intakes of the St. Cloud and Minneapolis WTPs. Table 2-2 and Figure 2-2 summarize the TOC along the Mississippi River, indicating the number of samples and range of dates characterizing the summary statistics. This set of data indicates the average TOC concentrations at the three sites are very similar, from 9.2 to 9.4 mg/L, and can range from 5 to 18 mg/L.

Table 2-2. Total Organic Carbon Summary at Multiple Sites

	St. Cloud - MDH	Anoka - MCES	Fridley - MDH
Avg, mg/L	9.20	9.37	9.41
St Dev	2.3	2.3	2.51
Min, mg/L	5.6	5.1	5.6
Max, mg/L	18	14.5	18
Num. Samples	122	20	115
95th Percentile	13.9	NA	14.0
Sample Start Date	1/6/2010	4/29/1996	1/5/2010
Sample End Date	11/4/2019	4/15/2019	11/5/2019

Figure 2-2. Average Total Organic Carbon at Multiple Sites



2.1c Drinking Water Regulated Constituents

None of the constituents measured in the Mississippi River at Anoka, except those treated by conventional treatment for solids and pathogens, exceed the Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL). MCES also analyzed the Mississippi River for other constituents as part of their priority pollutant monitoring requirements. There were no organic compounds or metals (not already reported for the SDWA list) present at levels that exceed the SDWA MCLs. Appendix A provides the summary statistics for the complete set of constituents analyzed at each of the MCES and MDH monitoring stations.

The US EPA maintains a Contaminant Candidate List (CCL) for contaminants that may need to be regulated, which is published every five years. The current CCL includes 97 chemicals or chemical

groups and 12 microbiological contaminants. The list includes chemicals used in commerce, pesticides, biological toxins, disinfection byproducts, and waterborne pathogens. The contaminants on the list are not currently regulated by existing Primary drinking water standards. The CCL should be reviewed when considering a surface water source for drinking water.

2.1d Water Quantity

The Mississippi River flow in the Northwest Metro study area averages 7,000 cfs and typically ranges between 4,800 cubic feet per second (cfs) and 8,700 cfs. The average WTP flow in 2040 is 12 cfs (7.8 MGD) and 45 cfs (29 MGD) at ultimate buildout. The proposed withdrawals for a regional surface WTP would be less than 1% of the seasonal flow. DNR begins to restrict water usage from the Mississippi River at 2,000 cfs near Ramsey.

2.2 Groundwater

The Northwest Metro communities currently gets the majority of its drinking water from 17 wells drilled in the Tunnel City-Wonewoc (TCW) aquifer. The remainder of the water is purchased from the City of Maple Grove.

2.2a Regional Aquifers

Several groundwater aquifers exist in the Northwest Metro study area including from shallowest to deepest; Quaternary aquifers, St. Peter, Prairie du Chien-Jordan, Tunnel City-Wonewoc, and the Mt. Simon-Hinckley. Only the TCW and Mt. Simon-Hinckley aquifers exist over the majority of the Northwest Metro area and can relied upon for municipal scale drinking water wells. The Mt. Simon-Hinckley aquifer is a protected resource in the Metro area and new high capacity wells are generally not permitted by Minnesota Law. If a communities does not have other viable options, a variance can be granted by the Minnesota Department of Natural Resources for Mt. Simon-Hinckley wells.

New wells in this report are assumed to be drilled in the TCW aquifer because it is the aquifer that is consistently available and legally allowed.

2.2b Regional Groundwater Supply

In 2016, the Metropolitan Council along with the support of HDR completed a study on the groundwater supply within the Northwest Metro regional area (*Regional Water Supply, Enhanced Groundwater Recharge, and Stormwater Capture and Reuse Study (Northwest Metro Study Area) Report*, December 2016). The study was one of several studies to support an update to the Twin Cities Metropolitan Area Master Water Supply Plan (Minn. Stat., Sec. 473.1565) and other activities identified by the 2005 Minnesota Legislature to address water supply needs of the seven-county metro area. As part of these activities, the Metropolitan Council modeled the existing source water aquifers to evaluate current and future drawdown of the aquifers and discussed the potential for using alternative water sources or increasing water recharge to the source water aquifers.

The 2016 study concluded that the existing source water aquifers are expected to see an increase in drawdown at existing municipal well sites under the predicted 2040 water demand. Areas within the Northwest Metro area could see drawdown in their bedrock aquifers between 10 - 40 feet. To compensate for the excessive drawdown, the report discusses the use of alternative water supplies such as surface water, stormwater reuse, and the potential for enhanced groundwater recharge.

Chapter 3 – Concept Regional Drinking Water Distribution System

Creating one overall water system from the four individual community systems will require a network of trunk watermain and booster stations to connect the systems and accommodate the different pressure zone elevations (hydraulic grade lines). Figure 1-2 in Section 1-5 shows the existing water infrastructure for the Northwest Metro communities.

The basis for the regional water system assumes that a regional system utility will own and operate the following infrastructure:

- Water supply and treatment plant
- Trunk watermain constructed to connect the member communities
- Booster stations

It is assumed the individual communities will continue to own and operate their water towers and water distribution systems (watermain, hydrants, services, etc.).

3.1 Assessment Methods

The following sections describe assessment methods for water modeling and cost estimating used in this report.

3.1.a Hydraulic Water Model

To determine the layout and sizes of trunk watermain and booster stations, a hydraulic water model was constructed using WaterCAD®. The existing water systems were imported into the water model and a future water supply, trunk watermain, and booster stations were added to create a functioning water system. Steady state scenarios were run to verify that system pressures and pipe velocities remained within acceptable limits.

3.1.b Basis for Concept Level Costs

The concept level costs for the water treatment plants were developed using the book *Cost Estimating Manual for Water Treatment Facilities, McGiveney and Kawamura, Wiley 2016.* The concept level watermain costs were developed based on bid tabs and experience with similar types of projects. All costs are based on 2020 dollars and no escalation is included for date of construction.

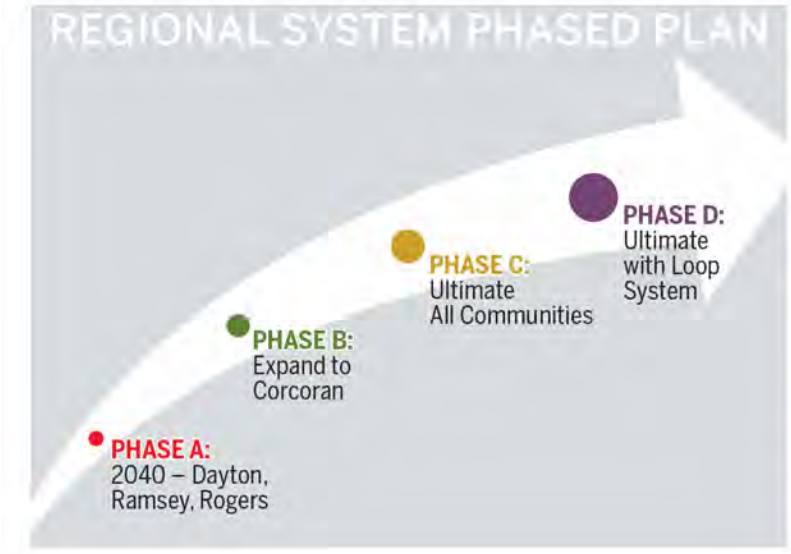
3.2 Phased Watermain Approach

Constructing the entire network of trunk watermain to meet ultimate demands for the Northwest Metro communities before it is needed would be very expensive and make a potential project not feasible. To spread the costs out so that the infrastructure is being constructed when it is needed, a phased approach was developed.

Four different phases (Phases A-D) were identified as summarized in Figure 3-1 for two different water treatment plant (WTP) location sites. In Scenario 1, the WTP is located in Ramsey and is only a surface WTP. The WTP in Scenario 1 can only be a surface WTP because it is assumed that the TCW aquifer in Ramsey cannot support enough wells for a regional groundwater WTP.

In Scenario 2, the WTP is located in Dayton and can either be a surface or a groundwater WTP. In Scenario 2 it is assumed that the TCW aquifer in Dayton could support a regional groundwater WTP through 2040. The phased plan developed for the regional trunk watermain is shown in Figure 3-2 for a WTP located in Ramsey and in Figure 3-3 for a WTP located in Dayton.

Figure 3-1. Phased Approach to Trunk Watermain Construction



PHASE A1 (WTP in Ramsey): A backbone 36" watermain is constructed connecting Ramsey, Dayton, and Rogers. Serves water demands through 2040.

PHASE A2 (WTP in Dayton): A backbone 36" watermain is constructed connecting Ramsey, Dayton, and Rogers. Serves water demands through 2040.

PHASE B: Extend 16" watermain to Corcoran, meets 2 MGD demands.

PHASE C: Extend 36" watermain to Corcoran; meets Corcoran ultimate demands.

PHASE D1 (WTP in Ramsey): Complete 36" watermain loop; meets ultimate demands.

PHASE D2 (WTP in Dayton): Complete 36" watermain loop; meets ultimate demands.

The following sections present components and estimated capital costs of the various watermain phases.

3.3 Lateral Benefit

When cities construct new trunk watermain in an area that was previously not served by municipal water, they often assess the cost of the trunk watermain to properties in the area. The assessments are legal because the new trunk watermain increases the value of the property in the area. This assessment is sometimes referred to as "*lateral benefit*."

The cost tables in this section assume that a portion of the new trunk watermain would be eligible for lateral benefit. The cost of the lateral benefit is assumed to be 12" watermain at a cost of $200 per foot.

3.4 Phase A – Scenario 1 Watermain – WTP in Ramsey

Phase A – Scenario 1 (Phase A1) watermain with the WTP in Ramsey consists of a 36" backbone watermain connecting the Ramsey, Dayton, and Rogers water systems. The WTP would provide water directly to the Ramsey system at an HGL of 1030 and the 36" watermain would be at an HGL of 1060 to match the northern Dayton pressure zone. Booster stations would be constructed to serve Rogers at an HGL of 1080 and Dayton's southern pressure zone at an HGL of 1110. The Phase A1 watermain and infrastructure is shown on Figure 1 in Appendix C. The trunk watermain is sized to meet ultimate demands, but the Phase A WTP is sized for 2040 demands. The booster stations are sized to meet 2040 demands.

Table 3-1 provides a concept level cost for Phase A1.

Figure 3-2. Phased Regional Water System with a WTP in Ramsey.

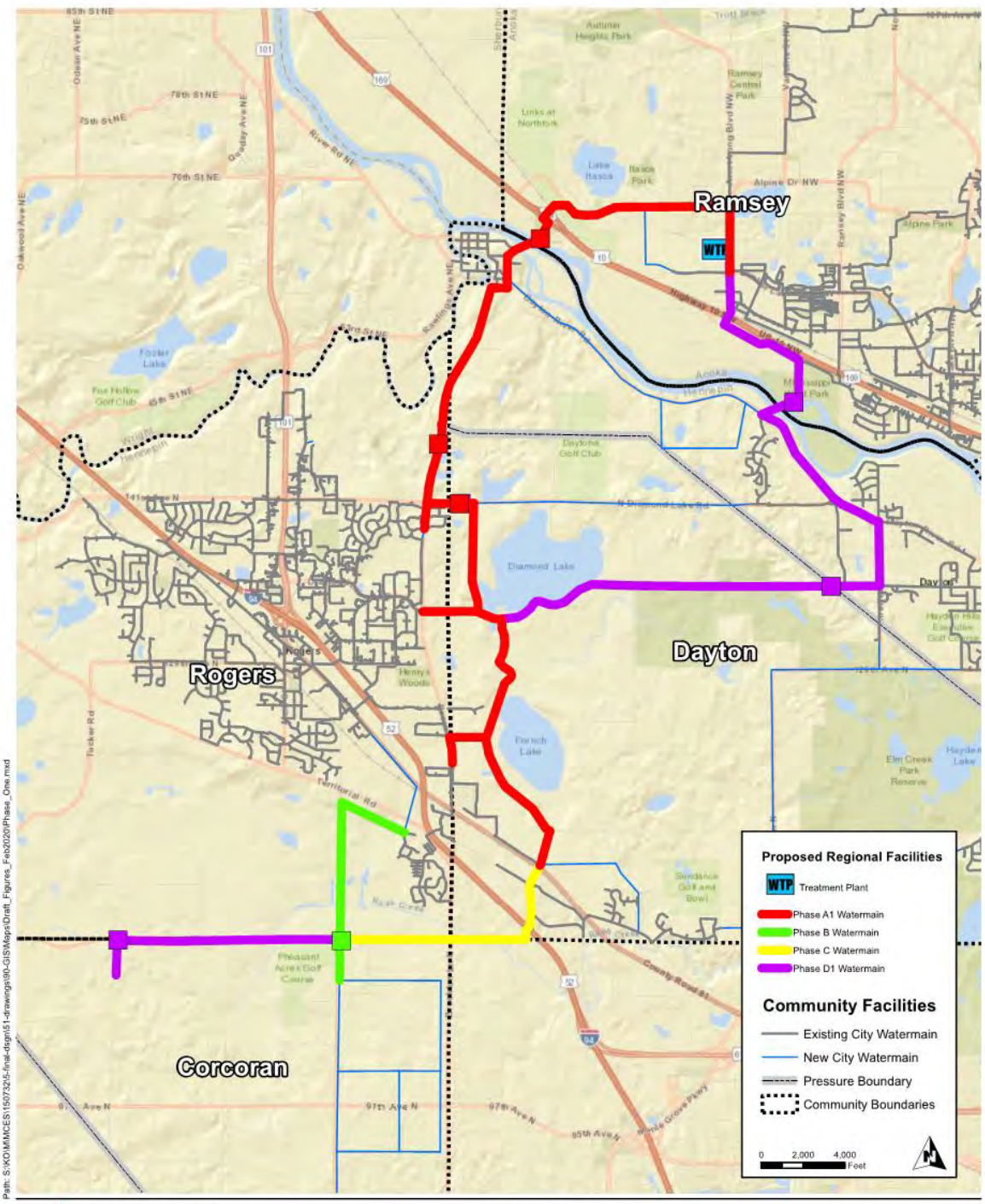


Figure 3-3. Phased Regional Water System with a WTP in Dayton.

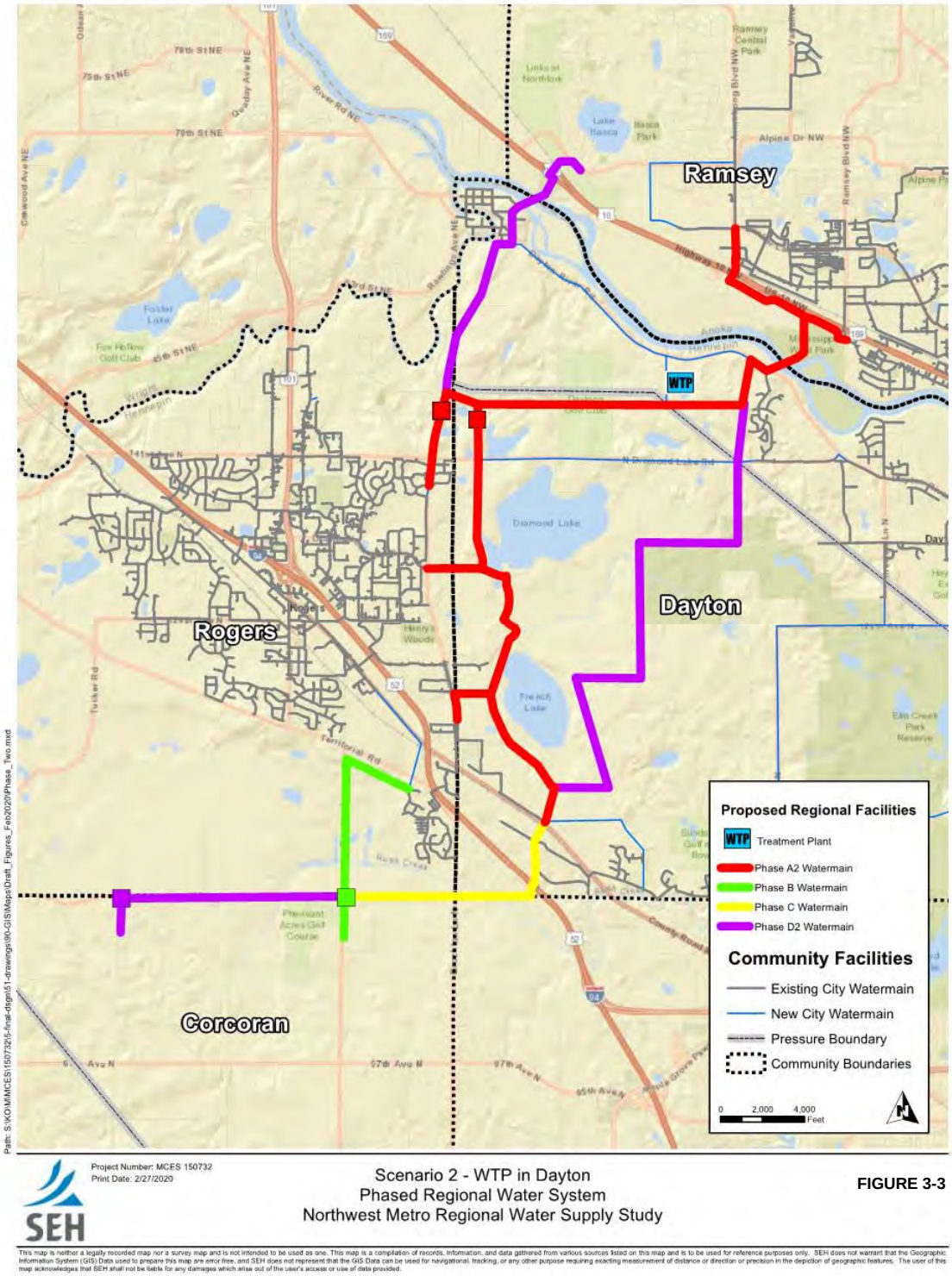


Table 3-1. Concept Level Cost for Phase A1 Watermain and Booster Stations with WTP in Ramsey.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
36” Open Cut DIP	51,000	Feet	$500	$25,500,000
Lateral Benefit	25,000	Feet	($200)	($5,000,000)
36” Jacked Road/River Crossing	2,000	Feet	$4,000	$8,000,000
24” Open Cut DIP	6,900	Feet	$400	$2,760,000
Booster Stations				
15 MGD (Rogers, Dayton)	1	Each	$2,500,000	$2,500,000
10 MGD (Rogers, Dayton High Zone)	1	Each	$2,000,000	$2,000,000
2 MGD (Dayton High Zone)	1	Each	$800,000	$800,000
Easements/Land Acquisition	300,000	Square Feet	$6	$1,800,000
Environmental	11	Miles	$50,000	$550,000
			Subtotal	**$38,910,000**
			Contingency (30%)	$11,700,000
			Eng/Admin/Legal (20%)	$10,100,000
			Total Phase A1	**$61,000,000**

3.5 Phase A - Scenario 2 Watermain – WTP in Dayton

Phase A, Scenario 2 (Phase A2) watermain with the WTP in Dayton consists of a 36” backbone watermain connecting the Ramsey, Dayton, and Rogers water systems. The WTP would provide water directly to the Dayton northern pressure zone at HGL 1060 and the southern pressure zone at HGL 1110. The WTP would also provide water directly to Ramsey at an HGL of 1030. Booster stations would be provided on the 36” watermain to the west to provide water to the Dayton southern zone at HGL 1110 and Rogers at HGL 1080. The Phase A2 watermain and infrastructure is shown on Figure 2 in Appendix C.

Table 3-2 provides a concept level cost for Phase A2.

Table 3-2. Concept Level Cost for Phase A2 Watermain and Booster Stations with WTP in Dayton.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
36” Open Cut DIP	53,500	Feet	$500	$26,750,000
Lateral Benefit	26,000	Feet	($200)	($5,200,000)
36” Jacked Road/River Crossing	1,450	Feet	$4,000	$5,800,000
24” Open Cut DIP	10,200	Feet	$400	$4,080,000
Booster Stations				
10 MGD (Rogers)	1	Each	$2,000,000	$2,000,000
10 MGD (Dayton High Zone, Rogers)	1	Each	$2,000,000	$2,000,000
Easements/Land Acquisition	325,000	Square Feet	$6	$1,950,000
Environmental	12	Miles	$50,000	$600,000
			Subtotal	**$37,980,000**
			Contingency (30%)	$11,400,000
			Eng/Admin/Legal (20%)	$9,900,000
			Total Phase A2	**$59,300,000**

3.6 Phase B – Extend Watermain to Corcoran

Phase B consists of extending a 16” watermain from Rogers to serve Corcoran. The 16” watermain would provide up to 2 MGD of water to Corcoran which is the total amount of water that the Rogers system can provide without adverse pressure effects. A booster station is required to take the water from Rogers at an HGL of 1080 and provide it to Corcoran at an HGL of approximately 1130. The Phase B watermain and booster station are shown on Figure 3 in Appendix C using the Ramsey WTP configuration.

The timing of the Phase B watermain is dependent upon the need for water in northern Corcoran. The watermain could be constructed before or after the Phase A1 or A2 watermain. If the Phase B watermain and booster station were constructed ahead of Phase A1 or A2, Corcoran could receive water from Rogers’ existing wells until the regional treatment plant was constructed.

Table 3-3 provides a concept level cost for Phase B.

Table 3-3. Concept Level Cost for Phase B Watermain and Booster Stations.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
16” Open Cut DIP	9,900	Feet	$250	$2,475,000
Lateral Benefit	5,000	Feet	($200)	($1,000,000)
16” Jacked Road	100	Feet	$800	$80,000
Booster Stations				
5 MGD Expansion (Rogers)	1	Each	$1,000,000	$1,000,000
5 Expansion MGD (Corcoran)	1	Each	$1,000,000	$1,000,000
Easements/Land Acquisition	10,000	Square Feet	$6	$60,000
Environmental	2	Miles	$50,000	$100,000
			Subtotal	**$3,715,000**
			Contingency (30%)	$1,100,000
			Eng/Admin/Legal (20%)	$960,000
			Total Phase B	**$5,800,000**

3.7 Phase C – Extend 36” Watermain to Corcoran

Phase C consists of extending the 36” watermain from Dayton to Corcoran. The 36” watermain would serve Corcoran’s ultimate water demand of 22 MGD. A booster station is required to take the water from Dayton at an HGL of 1110 and provide it to Corcoran at an HGL of approximately 1130. The Phase C watermain and booster station are shown on Figure 4 in Appendix C. The Phase C watermain would be constructed when Corcoran’s demands exceed the 2 MGD being provided by the Phase B watermain. The ultimate demands for the remaining communities would be met by the Phase D Scenario 1 or Scenario 2 watermain discussed in Sections 3.8 and 3.9.

Table 3-4 provides a concept level cost for Phase C.

Table 3-4. Concept Level Cost for Phase C Watermain and Booster Station.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
36” Open Cut DIP	14,800	Feet	$500	$7,400,000
Lateral Benefit	7,500	Feet	($200)	($1,500,000)
36” Jacked Road/River Crossing	450	Feet	$4,000	$1,800,000
Booster Stations				
10 MGD Expansion (Dayton High Zone, Corcoran)	1	Each	$2,000,000	$2,000,000
10 MGD Expansion (Corcoran)	1	Each	$2,000,000	$2,000,000
Easements/Land Acquisition	15,300	Square Feet	$6	$92,000
Environmental	3	Miles	$50,000	$150,000
			Subtotal	**$11,900,000**
			Contingency (30%)	$3,600,000
			Eng/Admin/Legal (20%)	$3,100,000
			Total Phase C	**$18,600,000**

3.8 Phase D – Scenario 1 – Complete 36” Watermain Loop - WTP in Ramsey

Phase D – Scenario 1 (Phase D1) consists of completing the 36” watermain loop with additional watermain in Dayton and Ramsey, which also includes a second Mississippi River crossing. The Phase D watermain is hydraulically necessary to supply ultimate water demands. The Phase D watermain also provides redundancy and reliability because it completes a loop and can supply water from two directions. A booster station from Ramsey to Dayton would be required. The Phase D1 watermain and booster station are shown on Figure 5 in Appendix C. The Phase D1 watermain would be constructed after 2040 and would meet the ultimate demands of the Northwest Metro communities.

Table 3-5 provides a concept level cost for Phase D1.

Table 3-5. Concept Level Costs for Phase D1 Watermain and Booster Station.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
36" Open Cut DIP	52,200	Feet	$500	$26,100,000
Lateral Benefit	26,000	Feet	($200)	($5,200,000)
36" Jacked Road/River Crossing	1,450	Feet	$4,000	$5,800,000
Booster Stations				
New 30 MGD (Dayton, Rogers, Corcoran)	1	Each	$5,000,000	$5,000,000
New 25 MGD (Rogers, Dayton High Zone, Corcoran)	1	Each	$4,500,000	$4,500,000
Expansion 10 MGD (Dayton High Zone, Corcoran)	1	Each	$2,000,000	$2,000,000
New 15 MGD (Corcoran)	1	Each	$2,500,000	$2,500,000
Easements/Land Acquisition	270,000	Square Feet	$6	$1,600,000
Environmental	10	Mile	$50,000	$500,000
			Subtotal	**$42,800,000**
			Contingency (30%)	$12,800,000
			Eng/Admin/Legal (20%)	$11,100,000
			Total Phase D1	**$67,000,000**

3.9 Phase D – Scenario 2 – Complete 36" Watermain Loop - WTP in Dayton

Phase D – Scenario 2 (Phase D2) consists of completing the 36" watermain loop with additional watermain in Dayton and Ramsey, which also includes a second Mississippi River crossing. The Phase D2 watermain and booster station are shown on Figure 6 in Appendix C. The Phase D watermain is hydraulically necessary to supply ultimate water demands. The Phase D watermain also provides redundancy and reliability because it completes a loop and can supply water from two directions. The Phase D2 watermain would be constructed after 2040 and would meet the ultimate demands of the Northwest Metro communities.

Table 3-6 provides a concept level cost for Phase D2.

Table 3-6. Concept Level Cost for Phase D2 Watermain and Booster Station.

Item	Quantity	Units	Unit Cost	Total Cost
New Water Main				
36” Open Cut DIP	59,700	Feet	$500/ft	$29,850,000
Lateral Benefit	30,000	Feet	($200/ft)	($6,000,000)
36” Jacked Road/River Crossing	2,000	Feet	$4,000/ft	$8,000,000
Booster Stations				
20 MGD Expansion (Dayton High Zone, Rogers, Corcoran)	1	Each	$3,000,000	$3,000,000
New 15 MGD (Corcoran)	1	Each	$2,500,000	$2,500,000
Easements/Land Acquisition	310,000	Sf	$6/sf	$1,860,000
Environmental	12	Miles	$50,000/mile pipe	$600,000
			Subtotal	**$39,800,000**
			Contingency (30%)	$11,900,000
			Eng/Admin/Legal (20%)	$10,300,000
			Total Phase D1	**$62,000,000**

3.10 Operation and Maintenance Costs

Booster station O&M was estimated by calculating the annual pumping power required and estimated labor. The repair and replacement costs are assumed to be 1% of the pipeline capital cost, with the costs accounted for in the total O&M costs when comparing the different approaches in Chapter 8.

Table 3-7. 2040 Booster Station O&M Costs.

Item	Quantity	Units	Unit Cost ($)	Total Cost ($)
Electrical Power				
Booster Stations	950,000	kWh	$0.075	$71,000
Labor	0.25	FTE	$100,000	$25,000
			Total	**$97,000**

Table 3-8. Ultimate Booster Station O&M Costs.

Item	Quantity	Units	Unit Cost ($)	Total Cost ($)
Electrical Power				
Booster Stations	5,200,000	kWh	$0.075	$390,000
Labor	0.5	FTE	$100,000	$50,000
			Total	**$440,000**

Chapter 4 – Regional Surface Water Treatment Plant (Approach 1)

4.1 Overview

Several Minnesota communities have the Mississippi River as their source of drinking water, including St. Cloud, St. Paul Regional Water Services (SPRWS), and Minneapolis. An advantage to using the Mississippi River is that a large quantity of water can be accessed from one spot (versus numerous wells).

4.2 Surface WTP Locations

Two locations are being considered for a potential surface water treatment plant, including a location in Ramsey and a location in Dayton. These WTP locations are meant to serve as examples only and specific parcels and/or property owners were not identified. Figure 4-1 identifies the potential WTP locations.

The City of Ramsey is in the feasibility stage of constructing a water treatment plant to remove manganese (See Section 5.3a). The proposed location of the Ramsey water treatment plant is the same location shown on Figure 4-1.

4.3 River Withdrawal Options

Two options were considered for withdrawal from the river including collector wells and a direct withdrawal from the river through an intake structure.

4.3a Collector Wells

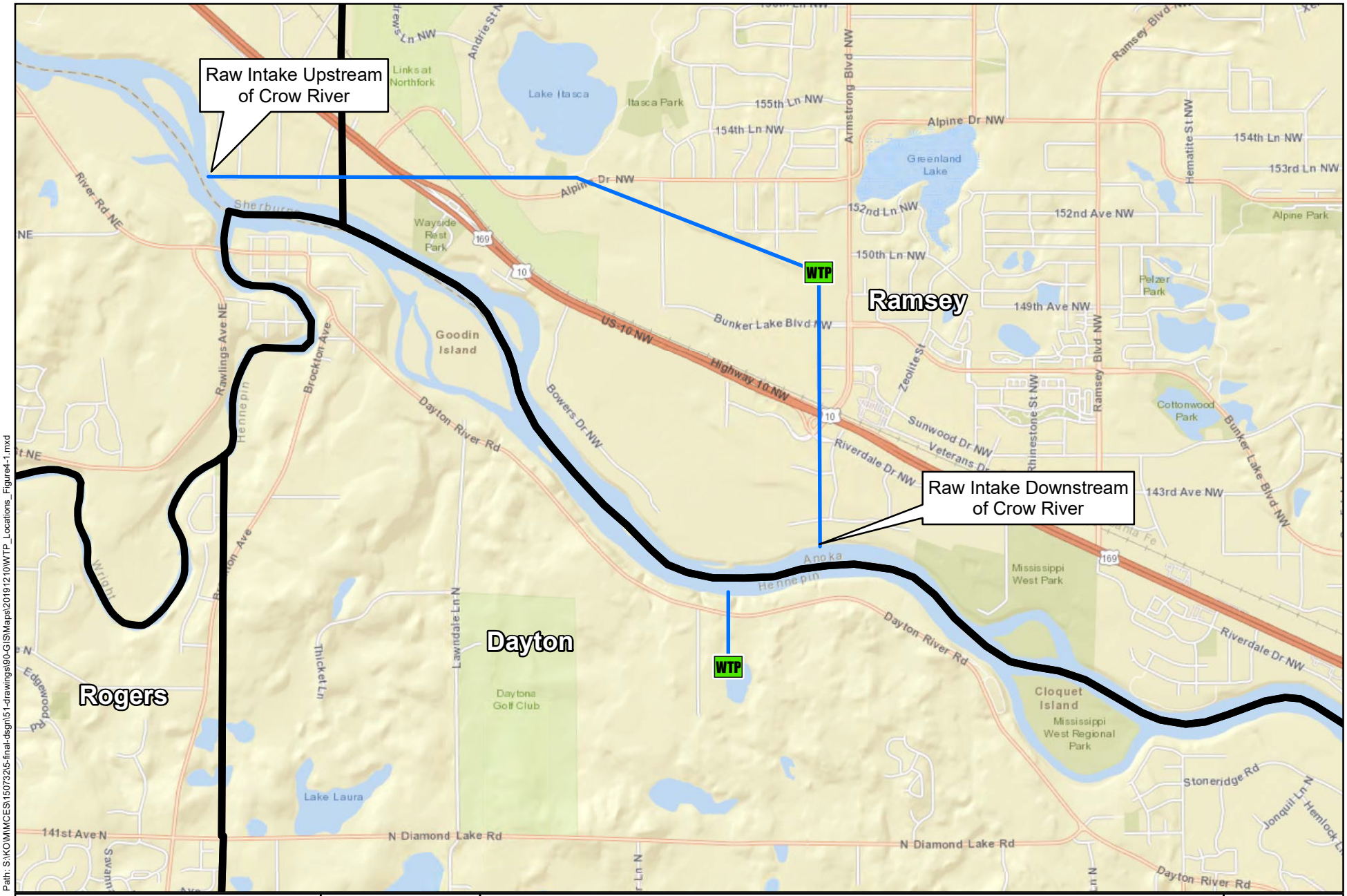
Collector wells are large capacity horizontal wells that take water from a shallow sand layer in the vicinity of the river. Because the water from a collector well has travelled through the surrounding sand, the water quality is often better than water taken directly from a surface water source.

This requires a significant thickness of sand and gravel with limited clay or silt. A previous MCES report (*Regional Water Supply, Enhanced Groundwater Recharge, and Stormwater Capture and Reuse Study, Northwest Metro Area, MCES, 2016)* reviewed the geology along the Mississippi River in Dayton and Ramsey. It was determined that relatively few locations in the area would be suitable for horizontal collector wells. It is assumed that horizontal collector wells are not a suitable option for this study.

4.3b Direct River Withdrawal Location

The selection of a river withdrawal location will depend on several factors, including: type of withdrawal system, river profile and geology, and proximity of known dischargers to the withdrawal location. The river depths along a portion of the study area is generally 9 feet to 12 feet deep.

This stretch of the river in the study area has no permitted dischargers, but there are several WWTPs on the Crow River and upstream on the Mississippi River (refer to Figure A in Appendix A). The water quality was compared for sites upstream and downstream of the Crow River confluence. The preliminary analysis did not identify significant differences to suggest locating the intake upstream of the Crow River. However, with the ever growing concern for emerging contaminants that are not routinely tested or not yet identified, there may be merit in further evaluation of an intake location.



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POTENTIAL SURFACE WTP LOCATIONS

Northwest Metro Area Regional Water Supply Study

Figure 4-1

4.4 Surface Water Treatment

To protect public health from pathogens, surface water used for drinking water is required to follow the Surface Water Treatment Rule. The Surface Water Treatment Rule and recommended treatment processes for a Northwest Metro surface WTP are included in Appendix D.

4.5 Estimate of Probable Capital Costs

The following tables provide concept level capital costs for surface WTPs that would meet 2040 demands (25 MGD) and ultimate demands (75 MGD). The capital costs for a surface WTP that would meet ultimate demands is included to provide a planning horizon beyond 20 years.

Table 4-2 provides a concept level cost estimate for a 25 MGD surface WTP. A layout for a 25 MGD lime softening surface WTP is included in Appendix E. It is assumed that 20 acres of land would be required to construct a 25 MGD surface WTP (includes room for expansion) plus easements for the raw water line and that the WTP is constructed in Ramsey. The difference in cost to construct the water treatment plant in Dayton would be negligible. Table 4-2 presents costs in 2020 dollars.

Table 4-2. Concept Level Cost for 25 MGD Surface Water Treatment Plant.

Item	Quantity	Units	Unit Cost	Total Cost
25 MGD Surface WTP	1	Lump Sum	$73,000,000	$73,000,000
River Intake	1	Lump Sum	$2,000,000	$2,000,000
48” Raw Watermain	7,500	Feet	$700	$5,250,000
Road Crossing	400	Feet	$5,000	$2,000,000
Easements/ Land Acquisitions	20	Acres	$100,000	$2,000,000
Environmental	2	Miles	$50,000	$100,000
			Subtotal	**$84,350,000**
			Contingency (30%)	$25,000,000
			Eng/Admin/Legal (20%)	$22,700,000
			Total	**$132,000,000**

Table 4-3 provides a concept level cost estimate for a 50 MGD expansion of the 25 MGD surface WTP to bring the capacity to 75 MGD. Although it is presented as one large expansion, it is likely that the expansion would take place over multiple steps. It is assumed that a second raw water line and road crossing would be required. Table 4-3 presents costs in 2020 dollars.

Table 4-3. Concept Level Cost for 50 MGD Surface Water Treatment Plant Expansion.

Item	Quantity	Units	Unit Cost	Total Cost
50 MGD Surface WTP Expansion	1	Lump Sum	$98,000,000	$98,000,000
48” Raw Watermain (2nd)	7,500	Feet	$700	$5,250,000
Road Crossing (2nd)	400	Feet	$5,000	$2,000,000
Environmental	2	Miles	$50,000	$100,000
			Subtotal	**$105,350,000**
			Contingency (30%)	$31,600,000
			Eng/Admin/Legal (20%)	$27,400,000
			Total	**$164,000,000**

4.6 Estimated Operation and Maintenance Costs

Operation and maintenance (O&M) costs for major surface WTPs vary considerably with the types of unit processes and water quality characteristics. To develop O&M costs for a surface WTP, O&M costs from Moorhead, Minnesota (a 10 MGD lime softening surface WTP), were used as the basis for this study and proportioned based on the size of the new surface WTPs. The costs include labor, chemicals, electricity, building costs, residual byproduct disposal, and administrative costs.

Table 4-4. Annual Operation and Maintenance Costs for Surface WTPs.

Alternative	Treatment Plant O&M
Approach 1 – 2040 Demands (7.8 MGD Water Provided)	$5,900,000
Approach 1 – Ultimate Demands (29 MGD Water Provided)	$17,500,000

Chapter 5 – Regional Groundwater Treatment Plant (Approach 2)

5.1 Overview

Groundwater is the most common source of drinking water in Minnesota, including the Northwest Metro communities. To reduce chlorides in wastewater from home softeners and compare the groundwater WTP against a lime softening surface WTP, it is assumed that the potential regional groundwater WTP is a lime softening WTP.

The concept regional groundwater WTP is proposed to provide capacity of 25 MGD and would serve the maximum day demands for the Northwest Metro communities through 2040. After 2040, the groundwater WTP will be expanded to 75 MGD to meet ultimate water demands.

5.2 Groundwater Treatment Plant Location

A potential groundwater treatment plant location is the same as the surface water treatment plant location in Dayton (Figure 4-1). The water treatment is proposed to be located in Dayton because it is centrally located, less developed than Rogers or Ramsey, and the Tunnel City Wonewoc aquifer is available throughout the entire City.

5.3 Constituents of Interest

The primary constituents of interest in groundwater are iron, manganese, and hardness. The following sections describe the potential health and aesthetic effects of these constituents.

5.3.a Manganese

Manganese occurs naturally in rocks and soil across Minnesota and is often found in Minnesota groundwater. Your body needs some manganese to stay healthy, but too much can be harmful.

The Minnesota Department of Health (MDH) has set a Health Based Guidance Value (HBV) for manganese of 0.1 milligrams per liter (mg/L, equivalent to parts per million). Children and adults who drink water with high levels of manganese for a long time may have problems with memory, attention, and motor skills. Infants (babies under one year old) may develop learning and behavior problems if they drink water with too much manganese in it.

The City of Ramsey has manganese in its drinking water above the MDH HBV of 0.1 mg/L. To reduce the level of manganese, Ramsey is currently evaluating the construction of a WTP (separate from this report).

5.3.b Aesthetic Standards

Iron and manganese cause red and black staining in toilets and on fixtures and hardness causes scaling. Table 5-1 identifies the secondary (aesthetic) standards for iron, manganese, and hardness. It is very common to have iron, manganese, or hardness above the secondary standards in groundwater wells in Minnesota.

Table 5-1. Secondary Standards for Iron, Manganese, and Hardness.

Constituent	Secondary Standard (mg/L)
Iron	0.3
Manganese	0.05
Hardness	80

5.4 Treatment Processes

Iron and manganese are removed from water by adding oxidants, typically chlorine and sodium permanganate, which convert the iron and manganese from soluble compounds to filterable solids. The iron and manganese are subsequently removed in the filtration process.

The lime softening, recarbonation, and filtration processes are the same as surface water treatment described in Section 4.4. A chlorine contact tank is not necessary for groundwater treatment due to the lack of pathogens.

5.5 Wells

The average Tunnel City-Wonewoc well in the Northwest Metro communities produces about 800 gpm, except Rogers where the assumed well capacity is 500 gpm. This production rate will be used in establishing the supply for a regional groundwater treatment plant. It is assumed that the wells will be spaced at least 0.25 miles apart. It is assumed that the permitting, testing, drilling, and building costs for each new well is $1,500,000.

5.6 Estimate of Probable Capital Cost

The following tables provide capital costs for a lime softening groundwater treatment plant that would meet 2040 demands (25 MGD) and ultimate demands (75 MGD).

Table 5-2 provides a concept level cost estimate for a 25 MGD lime softening groundwater treatment plant. A layout for a 25 MGD lime softening groundwater WTP is included in Appendix D. It is assumed that 20 acres of land would be required to construct a 25 MGD surface WTP (including room for future expansion) plus easements for the raw water line (total of 23 acres). To meet 2040 demands, 22 new wells in Dayton would be required. Table 5-2 presents costs in 2020 dollars.

Table 5-2. Concept Level Cost for 25 MGD Lime Softening Groundwater Treatment Plant.

Item	Quantity	Units	Unit Cost	Total Cost
25 MGD Lime Softening Groundwater Treatment Plant	1	Lump Sum	$68,000,000	$68,000,000
New Wells	22	Each	$1,500,000	$33,000,000
Raw Watermain	30,000	Feet	$300	$9,000,000
Easements/ Land Acquisitions	23	Acres	$100,000	$2,300,000
Environmental	6	Miles	$50,000	$300,000
			Subtotal	**$112,600,000**
			Contingency (30%)	$33,800,000
			Eng/Admin/Legal (20%)	$29,300,000
			Total	**$176,000,000**

Table 5-3 provides a concept level cost estimate for a 50 MGD expansion of the 25 MGD lime softening groundwater treatment plant to bring the capacity to 75 MGD. Although it is presented as one large expansion, it is likely that the expansion would take place over multiple steps. Table 5-3 presents costs in 2020 dollars.

Table 5-3. Concept Level Cost for 50 MGD Lime Softening Groundwater Treatment Plant Expansion.

Item	Quantity	Units	Unit Cost	Total Cost
50 MGD Lime Softening Groundwater WTP Expansion	1	Lump Sum	$90,000,000	$90,000,000
New Wells	44	Each	$1,500,000	$66,000,000
Raw Watermain	58,000	Feet	$300	$17,400,000
Easements/ Land Acquisitions	7	Acres	$100,000	$700,000
Environmental	11	Miles	$50,000	$550,000
			Subtotal	**$174,650,000**
			Contingency (30%)	$52,400,000
			Eng/Admin/Legal (20%)	$45,400,000
			Total	**$272,000,000**

5.7 Estimated Operation and Maintenance Costs

O&M costs for the lime softening groundwater treatment plants were estimated based on pumping costs, chemicals, labor, residuals handling and disposal, and maintenance expenses.

Table 5-4. Annual O&M Costs for Lime Softening Groundwater Treatment Plants.

Alternative	Treatment Plant O&M
2040 Demands (7.8 MGD WaterAnnual Average)	$5,500,000
Ultimate Demands (29 MGD Water Annual Average)	$16,400,000

5.8 Implementation Considerations

To provide the groundwater necessary to supply the four Northwest Metro communities would require approximately 66 wells. Having 66 wells in one community could cause unsustainable aquifer drawdown. This would need to be evaluated further before constructing a regional groundwater treatment plant.

Chapter 6 – Conjunctive Use System (Surface Water Augmented with Groundwater – Approach 3)

A hybrid option for the Northwest Metro to utilize some of its groundwater infrastructure is to build a new water treatment facility with a surface water source for conjunctive use with the existing groundwater systems.

6.1 Conjunctive Use Overview

All of the Northwest Metro communities utilize groundwater as their source of drinking water. The intent with Approach 3 is that there is conjunctive use of surface water and groundwater. Conjunctive use is using groundwater and treated surface water in the distribution system at the same time. Approach 3 evaluates options for converting a portion of the drinking water for various communities in the study area from groundwater to treated surface water.

The surface water treatment plant capacity for the conjunctive use system will be based on the average day demands for the Northwest Metro communities. Groundwater wells will be utilized for peaking. Communities typically only exceed average day demands in the summer (since the annual average takes into account summer months).

6.2 Conjunctive Use Water Quality

A previous desktop study was conducted to identify water quality impacts associated with delivering treated surface water to groundwater communities and the possibility of conjunctive use of surface water and groundwater (*Feasibility Assessment of Water Sustainability Approaches in the Northeast Metro Area,* Metropolitan Council Environmental Services, 2014). The analysis was qualitative in nature. Preliminary conjunctive use water quality findings are as follows:

- Communities may need to switch disinfection methods from chlorine to chloramines with a conversion to conjunctive use with surface water.
- Mixing groundwater and surface water is predicted to be feasible.
- Customers can expect taste and odor properties to be different with conjunctive use of surface water. A public education program would be recommended.
- Lead, copper, and iron solution chemistry will be different with a conversion to conjunctive use of surface water. These constituents will need to be monitored closely and practices to control levels may need to be modified, including corrosion control.

6.3 Conjunctive Use Water Treatment Plant

The surface WTP for a conjunctive use system is assumed to be located in Ramsey at the location shown on Figure 4-1. The Ramsey location provides a suitable surface water treatment plant location, along with close proximity to 6 of Ramsey's wells that could be used for conjunctive use blending.

Approach 3 consists of constructing a 12 MGD surface WTP to meet 2040 demands and a 28 MGD expansion (total of 40 MGD) to meet ultimate demands. The 2040 average day demand for the Northwest Metro is 7.8 MGD and the ultimate average day demand is 29 MGD. The WTP capacities are designed to be larger than the average day demands because filter backwashing and plant downtime needs to be considered over the course of a year. In addition, most unit processes must consider standby capacity with the largest unit out of service.

6.4 Wells

Additional wells will be necessary to meet 2040 and ultimate peaking demands in some of the communities. Table 6-1 identifies additional wells that will be needed in each community.

Table 6-1. Additional Wells Necessary for the Conjunctive Use System.

Community	Additional Wells needed for 2040 Conjunctive Use Approach	Additional Wells needed after 2040 for Ultimate Conjunctive Use Approach
Rogers	0	1
Ramsey	0	5
Dayton	2	10
Corcoran	2	12

6.5 Blending

Blending stations located in each distribution system would allow for suitable mixing of treated surface water with groundwater from municipal wells into the distribution systems. This applies to Rogers and Ramsey where several wells exist in close proximity to each other.

New wells would also be located in the vicinity of the water treatment plant. The groundwater wells could be blended into the surface water ahead of the water treatment plant during periods of lower demand, or bypassed around the water treatment plant during periods of high demand.

6.6 Estimate of Probable Capital Cost

The following tables provide capital costs for conjunctive use surface WTPs that would meet 2040 demands (12 MGD) and ultimate demands (40 MGD). The tables also include wells that would be needed to meet peak demands.

Table 6-2. Concept Level Costs for a 12 MGD Conjunctive Use Surface WTP.

Item	Quantity	Units	Unit Cost	Total Cost
12 MGD Surface WTP	1	Lump Sum	$45,000,000	$45,000,000
River Intake	1	Lump Sum	$2,000,000	$2,000,000
30” Raw Watermain	7,500	Feet	$450	$3,375,000
Road Crossing	400	Feet	$4,000	$1,600,000
Additional Wells	4	Each	$1,500,000	$6,000,000
Blending Stations	4	Each	$1,500,000	$6,000,000
Easements/ Land Acquisitions	10	Acres	$100,000	$1,000,000
Environmental	2	Miles	$50,000	$100,000
			Subtotal	**$65,100,000**
			Contingency (30%)	$19,500,000
			Eng/Admin/Legal (20%)	$16,900,000
			Total	**$102,000,000**

Table 6-3 provides a concept level cost estimate for a 28 MGD expansion of the 12 MGD surface WTP to bring the capacity to 40 MGD. Although it is presented as one large expansion, it is likely that the expansion would take place over multiple steps. Table 6-3 presents costs in 2020 dollars.

Table 6-3. Concept Level Costs for 28 MGD Conjunctive Use Surface WTP Expansion.

Item	Quantity	Units	Unit Cost	Total Cost
28 MGD Surface WTP Expansion	1	Lump Sum	$78,000,000	$78,000,000
30" Raw Watermain (2nd)	7,500	Feet	$450	$3,375,000
Road Crossing (2nd)	400	Feet	$4,000	$1,600,000
Additional Wells	24	Each	$1,500,000	$36,000,000
Raw Watermain for Wells	32,000	Feet	$300	$9,600,000
Easements/ Land Acquisitions	4	Acres	$100,000	$400,000
Environmental	6	Miles	$50,000	$300,000
			Subtotal	**$129,300,000**
			Contingency (30%)	$38,800,000
			Eng/Admin/Legal (20%)	$33,600,000
			Total	**$202,000,000**

6.7 Estimated Operation and Maintenance Costs

Operation and maintenance (O&M) costs for major surface WTPs vary considerably with the types of unit processes and water quality characteristics. To develop O&M costs for Approach 3, O&M costs from Moorhead, Minnesota (a lime softening surface WTP), were used as the basis for this study and proportioned based on the size of the new surface WTPs. The costs include labor, chemicals, electricity, building costs, residuals handling and disposal, and administrative costs.

Table 6-4. Annual Operation and Maintenance Costs for Conjunctive Use WTPs for Approach 3.

Alternative	Treatment Plant O&M
Approach 3 – 2040 Demands (7.8 MGD Water Provided)[1]	$5,250,000
Approach 3 – Ultimate Demands (29 MGD Water Provided)[1]	$15,600,000

[1] – Assumes that 80% of the water annually is provided from surface WTP.

Chapter 7 – Status Quo – Approach 4 - Individual Lime Softening Water Treatment Plants

In the absence of a project driver or an incentive to do something different, the Northwest Metro cities will most likely continue to utilize groundwater as their source of drinking water. This section identifies infrastructure that may be necessary in the future with individual community continued reliance on groundwater.

7.1 Lime Softening

To provide an equivalent comparison to Approaches 1-3, it is assumed that the Northwest Metro cities will construct lime softening WTPs. A potential driver for selecting a lime softening treatment process for community drinking water systems is a future wastewater discharge limit for chlorides in the Twin Cities metro area receiving waters.

The majority of the chloride in wastewater comes from the regeneration process of home water softeners. A sodium chloride solution (salt brine) is used to displace calcium and magnesium (hardness compounds) from ion-exchange softening resin. The waste product is discharged to the sanitary sewer.

The only practical way to eliminate chloride from wastewater is to eliminate home water softeners and provide a water supply that is softened at a municipal lime softening water treatment plant. The lime softening process does not add chloride to wastewater. This follows best practices currently recommended by the state to reduce chlorides in wastewater treatment plant discharge.

In addition to hardness, the lime softening process and subsequent filtration process would also remove iron and manganese.

7.2 2040 Water Infrastructure

The Northwest Metro communities will need to add additional wells to meet 2040 demands. It is also assumed that lime softening water treatment plants are also added. Table 7-1 identifies the water infrastructure needed to meet 2040 demands and estimated costs.

Table 7-1. Water Infrastructure Needed to Meet 2040 Demands and Estimated Costs.

Item	Quantity	Units	Unit Cost	Total Cost
Rogers				
7 MGD Lime Softening WTP	1	Lump Sum	$30,000,000	$30,000,000
Wells	1	Each	$1,500,000	$1,500,000
Raw Watermain	10,000	Feet	$300	$3,000,000
Ramsey				
12 MGD Lime Softening WTP	1	Lump Sum	$40,000,000	$40,000,000
Wells	2	Each	$1,500,000	$3,000,000
Raw Watermain	5,000	Feet	$300	$1,500,000
Dayton				
2 MGD Lime Softening WTP	1	Lump Sum	$15,000,000	$15,000,000
Wells	1	Each	$1,500,000	$1,500,000
Raw Watermain	1,000	Feet	$300	$3,000,000
Corcoran				
4 MGD Lime Softening WTP	1	Lump Sum	$20,000,000	$20,000,000
Wells	4	Each	$1,500,000	$6,000,000
Raw Watermain	5,000	Feet	$300	$1,500,000
Easements/ Land Acquisitions	12	Acres	$100,000	$1,200,000
Environmental	4	Miles	$50,000	$200,000
			Subtotal	**$126,300,000**
			Contingency (30%)	$37,900,000
			Eng/Admin/Legal (20%)	$32,800,000
			Total	**$197,000,000**

7.3 Ultimate Water Infrastructure

The Northwest Metro communities will need to add additional infrastructure after 2040 to meet ultimate demands. Table 7-2 identifies the water infrastructure and estimated costs needed to meet ultimate demands. It should be noted that this infrastructure is in addition to what was included in Table 7-1.

Table 7-2. Water Infrastructure Needed to Meet Ultimate Demands and Estimated Costs.

Item	Quantity	Units	Unit Cost	Total Cost
Rogers				
5 MGD Lime Softening WTP Expansion	1	Lump Sum	$25,000,000	$25,000,000
Wells	7	Each	$1,500,000	$10,500,000
Raw Watermain	5,300	Feet	$300	$1,590,000
Ramsey				
8 MGD Lime Softening WTP Expansion	1	Lump Sum	$32,000,000	$32,000,000
Wells	8	Each	$1,500,000	$12,000,000
Raw Watermain	10,600	Feet	$300	$3,180,000
Dayton				
8 MGD Lime Softening WTP Expansion (north zone)	1	Lump Sum	$32,000,000	$32,000,000
10 MGD Lime Softening WTP (south zone)	1	Lump Sum	$36,000,000	$36,000,000
Wells	15	Each	$1,500,000	$22,500,000
Raw Watermain	20,000	Feet	$300	$6,000,000
Corcoran				
18 MGD Lime Softening WTP Expansion	1	Lump Sum	$53,000,000	$53,000,000
Wells	16	Each	$1,500,000	$24,000,000
Raw Watermain	22,000	Feet	$300	$6,600,000
Easements/ Land Acquisitions	35	Acres	$100,000	$3,500,000
Environmental	11	Miles	$50,000	$550,000
			Subtotal	**$268,400,000**
			Contingency (30%)	$80,500,000
			Eng/Admin/Legal (20%)	$69,800,000
			Total	**$419,000,000**

7.4 Estimated Operation and Maintenance Costs

O&M costs for the lime softening groundwater WTPs were estimated based on pumping costs, chemicals, labor, residuals handling and disposal, and maintenance expenses.

Table 7-3. Total Annual O&M Costs for Lime Softening Groundwater WTPs for Each Community (Status Quo).

Alternative	Treatment Plant O&M
Approach 4 – 2040 Demands (7.8 MGD Water Provided)	$6,100,000
Approach 4 – Ultimate Demands (29 MGD Water Provided)	$18,100,000

Chapter 8 – Approach Comparison

The four approaches are compared through an analysis using 20-year and 60-year planning horizons. The 2040 Regional System Plan is based on meeting the 2040 demands for Dayton, Ramsey and Rogers and assumes that the ultimate water trunk main is extended to Corcoran by 2040. For the 60-year planning period, the system capacity is expanded from 2040 to accommodate the ultimate or buildout conditions of all four communities.

The concept regional water supply distribution system features are defined in Chapter 3. The treatment facilities for regional surface water, groundwater, and conjunctive use systems are described in Chapters 4-6. Chapter 7 defines the future water supply systems for each community assuming continued reliance on groundwater. Complete regional water systems are formulated for each of the four approaches for 2040 and Ultimate Plans.

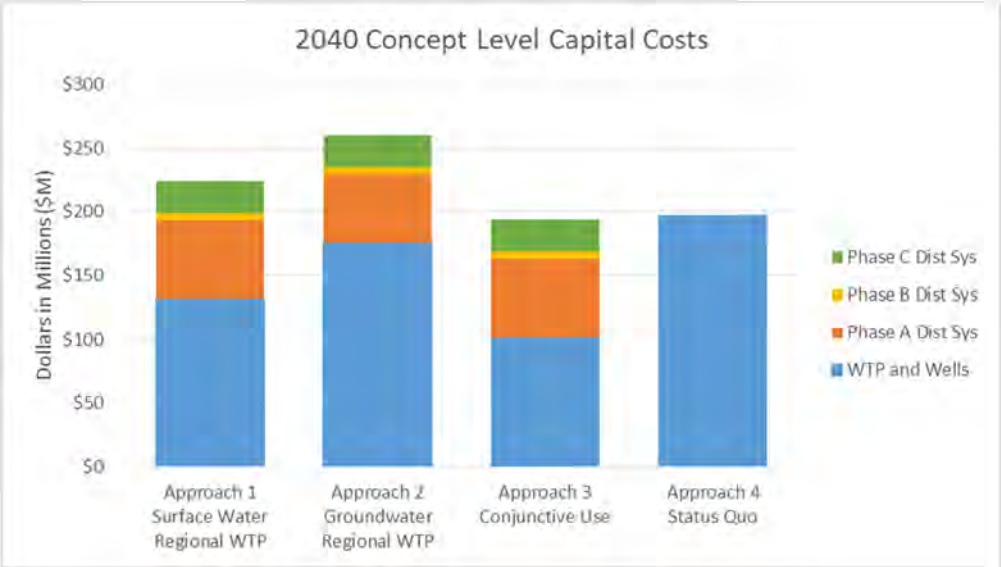
Table 8-1 and Figure 8-1 summarize the lifecycle costs for water system facilities to meet 2040 demands. The three regional drinking water system approaches and continuing with the 'status quo' of separate community systems are compared.

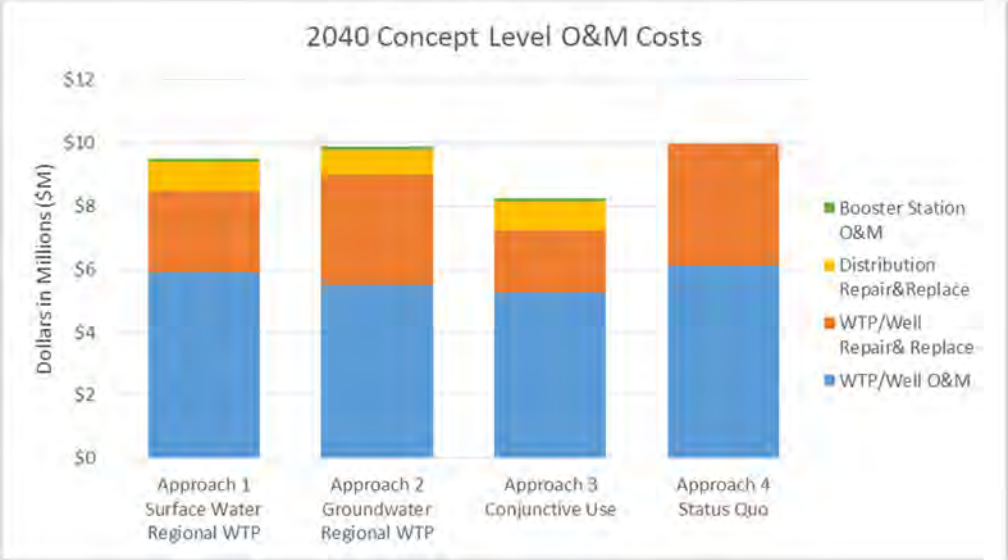
Table 8-1. Concept Level Capital and O&M Costs for 2040 Demand

Item	Approach 1 Regional Surface Water	Approach 2 Regional Groundwater Lime Softening	Approach 3 Conjunctive Use	Approach 4 Status Quo Lime Softening
Capital Costs				
Distribution System (Watermain/Booster Stations)				
Phase A, Scenario 1	$61,000,000		$61,000,000	
Phase A, Scenario 2		$59,300,000		
Phase B	$5,800,000	$5,800,000	$5,800,000	
Phase C	$18,600,000	$18,600,000	$18,600,000	
WTP and Wells	$132,000,000	$176,000,000	$102,000,000	$197,000,000
Capital Cost Total[1]	**$217,000,000**	**$260,000,000**	**$187,000,000**	**$190,000,000**
Annualized Capital Cost (20 year)	**$14,600,000**	**$17,500,000**	**$12,500,000**	**$12,700,000**
O&M Annual Costs				
WTP/Well O&M	$5,900,000	$5,500,000	$5,250,000	$6,100,000
Booster Station O&M	$100,000	$100,000	$100,000	
WTP/Well Repair & Replacement (2%)	$2,600,000	$3,500,000	$2,000,000	$3,900,000
Distribution Repair and Replacement (1%)	$900,000	$800,000	$900,000	
O&M Cost Total[1]	**$9,500,000**	**$9,900,000**	**$8,250,000**	**$10,000,000**
Total Annualized Cost[1]	**$24,100,000**	**$27,400,000**	**$20,750,000**	**$22,700,000**

[1] Costs based on 2020 dollars; no escalation to date of construction.

Figure 8-1. 2040 Concept Level Capital, O&M, and Lifecycle Annualized Costs





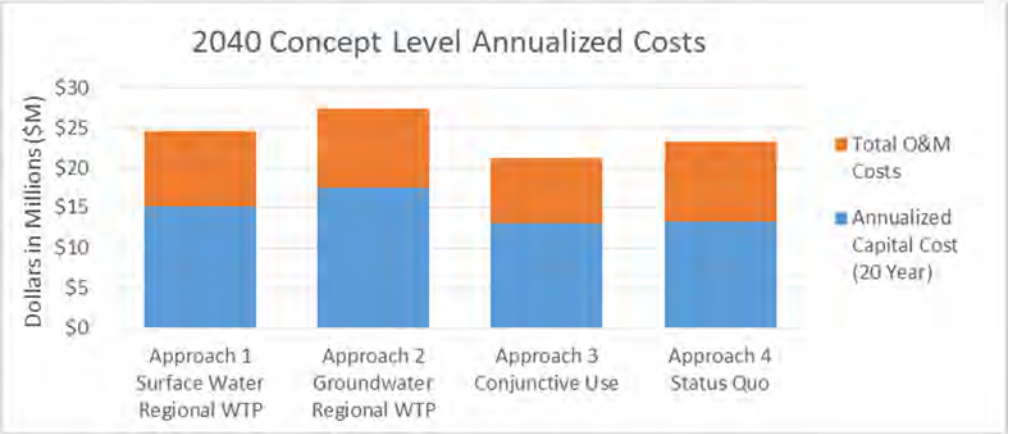


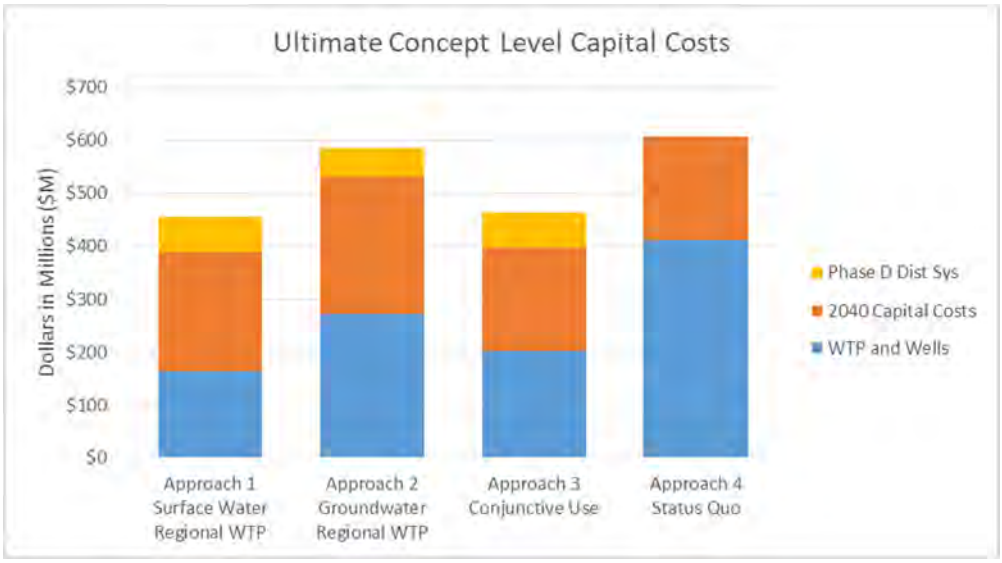
Table 8-2 and Figures 8-1 and 8-2 summarize the lifecycle costs for water system facilities to meet ultimate demands. The three regional drinking water system approaches and continuing with the 'status quo' of separate community systems are compared.

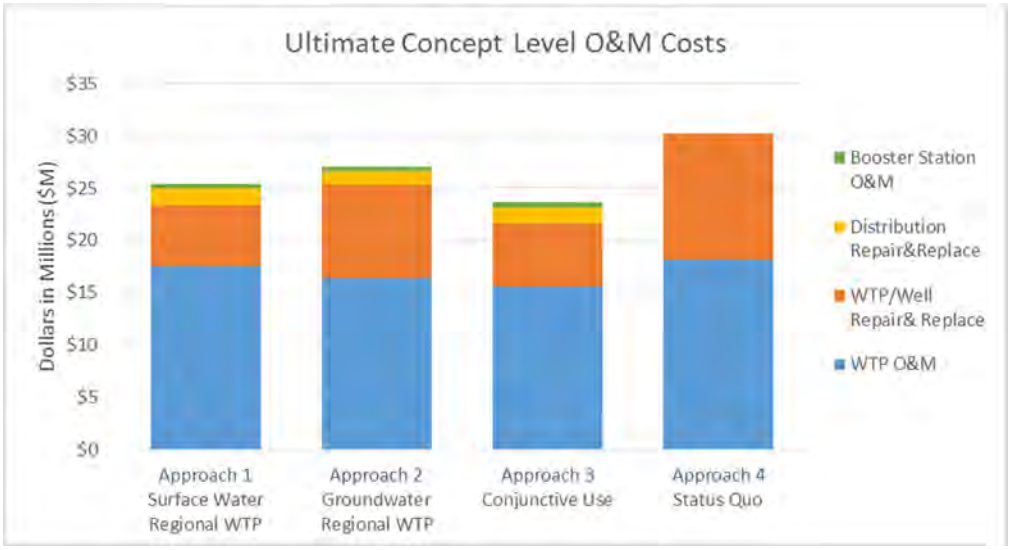
Table 8-2. Concept Level Capital and O&M Costs for Ultimate Demand

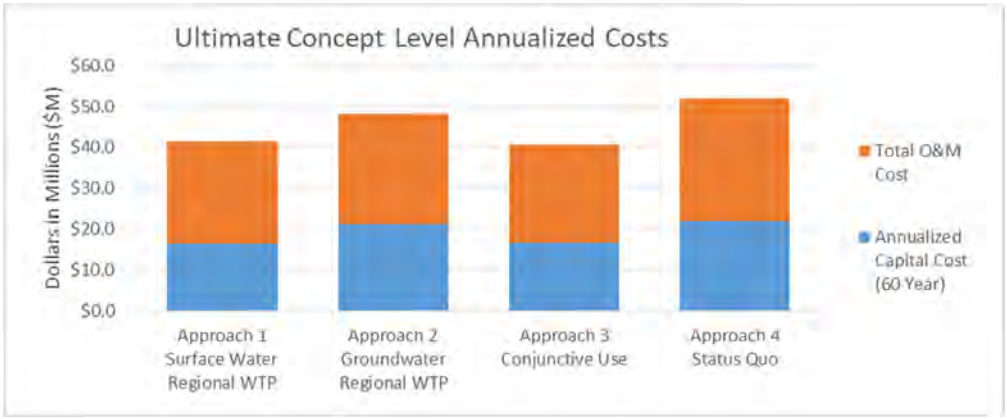
Item	Approach 1 Regional Surface Water	Approach 2 Regional Groundwater Lime Softening	Approach 3 Conjunctive Use	Approach 4 Status Quo Lime Softening
Capital Costs				
2040 Capital Costs	**$217,000,000**	**$260,000,000**	**$187,000,000**	**$190,000,000**
Distribution System				
Phase D, Scenario 1	$67,000,000		$67,000,000	
Phase D2, Scenario 2		$62,000,000		
WTP and Wells	$164,000,000	$272,000,000	$202,000,000	$410,000,000
Capital Cost Total[1]	**$448,000,000**	**$594,000,000**	**$456,000,000**	**$600,000,000**
Annualized Capital Cost (60 year)	**$16,100,000**	**$21,500,000**	**$16,400,000**	**$21,700,000**
O&M Annual Costs				
WTP O&M	$17,500,000	$16,400,000	$15,600,000	$18,100,000
Booster Station O&M	$440,000	$440,000	$440,000	
WTP Repair & Replacement (2%)	$5,900,000	$8,900,000	$6,000,000	$12,100,000
Distribution Repair and Replacement (1%)	$1,600,000	$1,300,000	$1,600,000	
O&M Cost Total[1]	**$25,000,000**	**$27,000,000**	**$24,000,000**	**$30,000,000**
Total Annualized Cost[1]	**$41,300,000**	**$48,500,000**	**$40,400,000**	**$51,700,000**

[1] Costs based on 2020 dollars; no escalation to date of construction.

Figure 8-2. 2040 Concept Level Capital, O&M, and Lifecycle Annualized Costs







Chapter 9 – Regional Water System Governance and Cost Sharing

The practice of shared utility services across municipal boundaries has been increasing as municipalities face pressures of increasing costs, and in the case of drinking water, look to address reliability concerns because of supply limitations and to provide backup sources as part of their resiliency plan. This chapter provides an overview of governance structure options and applies concept cost sharing strategies to fund a Northwest Metro regional water system.

9.1 Governance

The drivers influencing the type of governance structure selected for a shared utility system are many but center around the following items each municipality must consider:

- Degree of community autonomy
- Extent of legal and formal institutional structure
- Cost sharing and financing

There are four general models to consider in the governance of a regional water treatment system:

- Regional Utility
- Inter-Municipal Agreements
  - Cooperative agreement for joint investment
  - Smaller agreements as needed
- Public – Private Partnership
- Privatization

9.1a Regional Utility

A new or expanded utility is formed that owns and operates the water treatment and infrastructure system. The decision-making authority for the regional utility is a board or commission. The term Joint Water Utility, Joint Powers, Water Commission are typical titles for regional water utilities. Board members are nominated by the municipalities served by the water system and the representation can vary as decided upon with the founding of the regional utility. A regional water utility can own all or a portion of the assets related to a water system. Typically a regional water utility owns the treatment plant, wells (if supplying groundwater), trunk water main and water towers. In this case, individual municipalities served by the utility own the distribution system infrastructure that serves their community members. However, some regional utilities may own all the water infrastructure, or may provide wholesale water to a portion of their customers that own and maintain their own distribution system.

One example of a regional water utility in close proximity to the Northwest Metro study area is the Joint Powers Water Board of Albertville, Hanover and St. Michael (Joint Powers). Founded in 1977, Joint Powers owns and operates the water treatment plant, wells, water towers, and trunk water main that supplies water to the three communities. Each community owns and maintains the distribution system within its city boundaries. The Board consists of the mayor and one council member from each city. This provides for equal representation from each community and is not based on the community size or water use. Joint Powers bills each city and the cities bill their customers. Joint Powers also receives a portion of the connection fees assessed through the water availability charge (WAC).

9.1b Inter-Municipal Agreements

Another model is for municipal utilities to remain separate but jointly fund new infrastructure and/or operations and maintenance and have rights to a certain share of the water through cooperative agreements. These agreements can vary in complexity and have flexibility in establishing coordination among partners. Inter-municipal agreements have been used to share drinking water infrastructure assets and services in numerous ways. The agreements may be as simple as sharing a contract for bulk supply of chemicals for smaller, more remote communities to large metropolitan-area water supply agreements.

9.1c Public – Private Partnership

A public-private partnership, also called a P3, is a cooperative agreement between a private company and a unit of government to provide a service. There are community water and wastewater facilities across the U.S. that are based on a public-private partnership, ranging from large design-build-operate projects to shared functions such as administration and billing. There is flexibility in the roles and responsibilities of the public and private partners.

9.1d Privatization

In a completely privatized model, a corporation owns and operates the utility and in context of this study, is the water service provider for a municipality or group of municipalities. Privatization of drinking water service transfers all ownership, operations, and management responsibilities to a private entity. Municipalities may sell their existing water utility to a private entity, or elect to fund the construction of a new utility owned by a private entity. In this model, the role of the municipal government(s) is to establish policies and provide oversight in addition to the oversight and regulation administered by the state.

9.1e Application for Northwest Metro Communities

For the purposes of evaluating cost sharing strategies, this study assumes that the governance structure for a Northwest Metro regional water system will be an independent Joint Utility. At this concept level, a Joint Utility structure provides a clear demarcation of shared facilities and associated costs for the member communities. With continued planning and development of regional system features, the questions associated with governance structure and the related funding of the system will evolve and can be explored in more detail.

9.2 Cost Sharing

A simple cost sharing strategy was applied to the concept level system developed for a Northwest Area regional surface water supply system (Approach 1). This is meant to serve as an example and only extends through 2040.

9.2a Funding

The funding sources available include:

- WAC (the joint utility receives a portion of WAC for each new connection)
- Lateral Benefit (assessment already considered in the capital costs)
- Trunk Charges
- State/Federal Grants
- PFA Loan
- Water Rates

9.2b Concept System Features

The features of the concept regional surface water system for this cost sharing example include:

- Phase A1, B, C Trunk Watermain
  - 36” pipeline meeting 2040 demands for all communities
  - Pump stations/storage to meet 2040 demand for all communities
- 25 MGD surface WTP – meeting 2040 demand

9.2c Cost of Service

To estimate the water rates that a regional utility would charge for the concept system defined in this example, the following assumptions apply:

- WAC
  - 20,100 additional WAC by 2040

  - $3,500 fee to Joint Utility per WAC
  - Total WAC of $70,350,000
- Bonding at 3% interest rate over 20 years, $61,650,000 amortized
- Grant – assume a grant provided to fund trunk watermain and booster stations (approximately $90 million)
- Capital and O&M costs as summarized in Chapter 8 of this report

The concept level cost of service estimate assuming a grant of $80M are presented in Table 9-1.

Table 9-1. Concept Level Cost of Service Estimate.

2040 Cost of Service - Preliminary			
Item	**Annual Cost**	**Water Used (thousand gallons)**	**Cost per 1,000 gallons**
Annualized Payment	$2,250,000	2,847,000	$0.79
Joint Utility O&M	$6,000,000	2,847,000	$2.10
Repair and Replacement	$3,500,000	2,847,000	$1.22
Cities Existing O&M	$1.00/1,000 gal	2,847,000	$1.00
		Total:	**$5.13**

The impact of the up-front grant funding on cost of service was evaluated. The cost of service would be $6.13 per 1,000 gallons without any grant funding. To achieve a cost of service in line with water systems treating a Mississippi River supply ($4 per 1,000 gallons), grant funding of approximately $200M would be required.

Existing water rates in the Northwest Metro range from $2.08 to $4.58 per 1,000 gallons based on 8,000 gallons of water used per month.

Chapter 10 – Summary of Findings and Implementation Considerations

Key takeaways from this concept level study of alternative approaches to a Northwest Metro area regional drinking water supply system include:

- The average day water demand in the Northwest Metro is projected to increase from 3.3 MGD in 2015 to 7.8 MGD in 2040 (140% increase).
- The ultimate average day water demand in the Northwest Metro is 29 MGD (approximately 800% increase from 2015).
- If the Northwest Metro cities continue to utilize only groundwater to meet water demands, an additional 54 wells will likely be needed to meet ultimate demands. A 2016 MCES report indicated drawdown in the Tunnel City-Wonewoc aquifer in 2040 when demands are only 27% of the ultimate demands. It is possible that the aquifer cannot sustain the ultimate demands of the Northwest Metro.
- The Mississippi River has sufficient water quantity to serve the Northwest Metro communities. The water quality in the Mississippi River appears to be acceptable for a conventional surface water treatment plant. St. Could, St. Paul, and Minneapolis utilize the Mississippi River as their source of drinking water.
- A regional surface WTP has the advantages of being a cost effective approach, eliminates the need for numerous addition wells, increases groundwater sustainability, provides fully softened water, and reduces chloride discharges to the Mississippi River. The disadvantages of a regional surface WTP is that it changes water taste and odor and relies heavily on one water source.
- A regional lime-softening groundwater WTP has the advantages of providing fully softened water and reduces chloride discharges to the Mississippi River. The disadvantages of a regional lime softening groundwater WTP is that it is one of the most expensive approaches evaluated, may not be feasible due to groundwater drawdown, and relies heavily on one water source.
- A regional conjunctive use WTP has the advantages of being a cost effective approach, increases groundwater sustainability, provides mostly softened water, reduces chloride discharges to the Mississippi River, and does not rely on one water source. The disadvantages of a regional conjunctive use WTP is that it changes water taste and odor and does not provide fully softened water in the summer.
- Constructing individual lime softening groundwater WTPs (Status Quo) has the advantages of providing fully softened water and reduces chloride discharges to the Mississippi River. The disadvantages of individual lime softening WTPs is that it is the most expensive approach and relies on one water source.
- A cost of service example indicates that grant funding will be an integral part of implementing a regional surface water supply system to make the project viable.
- In the absence of a project driver, Northwest Metro cities are likely to continue to utilize groundwater and construct iron and manganese removal water treatment plants. At this point, none of the Northwest Metro cities have water treatment plants, although 2 are in the planning stages (Ramsey and Corcoran).
- The Northwest Metro communities are embarking on this study at an optimal time. The water systems are not fully developed and significant growth is planned.

Appendix A: Mississippi River Water Quality

Building a Better World for All of Us®

MEMORANDUM

TO: Ali Elhassan, MCES

FROM: Amy Prok, Patti Craddock

DATE: March 12, 2020

RE: Mississippi River Water Quality Summary
MCES Contract No. 16P135E, PO 19006941
SEH No. MCES 150732 14.00

A. Introduction

The primary objective of this analysis is to characterize the water quality of the Mississippi River as a potential drinking water source for the Northwest metro area communities of Corcoran, Dayton, Ramsey, and Rogers. In addition, the analysis includes a preliminary comparison of water quality upstream and downstream of the Crow River in consideration of the location of the water supply intake structure.

B. Database Sources

The primary source of data utilized in this analysis was collected by Metropolitan Council Environmental Services as part of their Conventional River Water Monitoring Program. The data were obtained from the MCES' Environmental Information Management Systems (EIMS) database. This online resource provides water quality data for waterbodies in the region. The MCES database for the Anoka site (river mile 871.6) is very complete and covers a wide range of constituents starting in 1976 for some constituents.

Data from other monitoring sites are also included in the analysis to compare water quality at several points along the Mississippi River, including upstream and downstream of the Crow River confluence. The downstream sites reviewed are the MCES' Conventional River Water Monitoring Program in Fridley (river mile 862.8) and the Fridley site in the Minnesota Department of Health's database. The upstream site is represented by the St. Cloud site from the MDH's database. The MDH database is not as comprehensive as the data available from the MCES monitoring program, but provides a larger dataset for some constituents of interest for drinking water, such as TOC, Cryptosporidium, and Giardia.

Figure 1 presents the location of the sampling sites and Table 1 summarizes the databases and sites used in this analysis.

Table 1 – Water Quality Source Information by Site

Monitoring Site	Agency	Source	Site ID	Location	Data Collection Dates
St. Cloud	MDH	Email Transfer	1730027	St. Cloud Treatment Plant Intake	01/06/2010 to 11/04/2019
Anoka	MCES	EIMS Portal	UM8716	River Mile 871.6	01/07/1976 to 8/26/2019
Fridley	MCES	EIMS Portal	UM8628	River Mile 862.8	08/19/1976 to 04/29/2019
Fridley	MDH	Email Transfer	1270024	Fridley Treatment Plant Intake	01/05/2010 to 11/05/2019

C. Methods

Statistics were performed on each of the water quality constituents measured at the monitoring sites. For each parameter, the minimum, maximum, 95th percentile, average, standard deviation, total sample count, number of non-detects were calculated, and the sampling date range were identified. In the MCES and MDH databases, values less than the detection limit were demarked by a “less than” (<) sign. Data such as this was treated as a non-detect and the value was represented as zero (0). These statistics were then summarized by constituent in tabular form. The statistical summary information is based on all individual data reported by MCES and MDH. There has been no deletion of data to account for statistically significant outliers. Time series plots were also created in review of conventional constituents.

D. Results

Anoka, MCES

MCES has been sampling at the Anoka site since the mid-1970s and the list of constituents analyzed has grown over the years. Table A located in the appendix provides the full list of constituents analyzed and available in the MCES’ EIMS for the Anoka and Fridley sites. The data analysis and subsequent results for this study focused on a sub-set of constituents important to surface water treatment. These constituents are characterized in Tables 2 and 3.

Table 2 summarizes water quality constituents of concern in planning and design of drinking water treatment facilities. Table 3 broadens the list to include all those parameters regulated under the Safe Drinking Water Act (SDWA) and also lists the regulatory maximum contaminant limit (MCL) and public health goals for each constituent.

MCES also monitors for other priority pollutants beyond those found in the Safe Drinking Water Act. Some of these monitored constituents are emerging pollutants of concern. A full list of pollutants with and the number of samples with detections can be found in Table A in the Appendix.

Multiple Site Water Quality Comparison

Sites upstream and downstream of the confluence of the Crow River with the Mississippi River were evaluated to assess the optimum location for a northwest metro area regional surface water treatment plant (WTP) intake. This preliminary assessment is based on limited data from the MDH databases and additional evaluation is necessary to fully assess water quality variations along the river. The preliminary assessment compared conventional constituents at the four sites including: total organic carbon, alkalinity, suspended solids, and turbidity. The following Figures 2 through Figure 5 demonstrate the results of these water quality constituents compared between monitoring sites.

The selection of a river withdrawal location will depend on several factors, including: type of withdrawal system, river profile and geology, and proximity of known dischargers to the withdrawal location. The river depths along a portion of the study area is generally 9 feet to 12 feet deep.

This stretch of the river in the study area has no permitted dischargers, but there are several WWTPs on the Crow River and upstream on the Mississippi River (refer to Figure A in the Appendix). The water quality was compared for sites upstream and downstream of the Crow River confluence. The preliminary analysis did not identify significant differences to suggest locating the intake upstream of the Crow River. However, with the ever growing concern for emerging contaminants that are not routinely tested or not yet identified, there may be merit in further evaluation of an intake location.

E. Gap Analysis

For future water supply characterization, additional historic data can be reviewed to better assess the optimum location for a water supply intake. The impact of the Crow River on the water supply intake location could be evaluated more closely by analyzing the water quality of the Mississippi River in a location more directly upstream of the Crow River confluence than the St. Cloud monitoring station. Pathogens of interest in planning a drinking water supply that are not monitored in the MCES program are *Cryptosporidium* and *Giardia*. Since these our routinely monitored for the WTPs treating Mississippi River water and are readily available in the MDH database, future data reviews should coordinate use of both databases. Additional information on the sample collection and analysis methods for the different monitoring programs is recommended and should be considered when comparing and utilizing multiple databases. For the purposes of this concept level study, this effort was not expended.

F. Conclusion

The water quality of the Mississippi River as a source for a northwest metro area regional WTP was characterized using the MCES Anoka site. The MCES database provided sampling data over a wide period of time and a large range of constituents, making it very comprehensive. The data for several constituents related to drinking water quality were analyzed statistically and, in some cases, compared with data from other monitoring sites. The analysis characterized water quality constituents of interest in determining treatment requirements and adherence to regulatory requirements. With the more than 45,800 samples analyzed, constituents with concentrations exceeding SDWA limits were limited to those that are removed through conventional treatment processes. Additional assessment is needed to better define the optimum intake location for a WTP, but general indications are that conventional constituents are not expected to have statistically significant variation along that reach of the Mississippi River, assuming best practices are used in the location of a site and method of water withdrawal from the river.

Table 2 – Primary Constituent Summary

Constituent	Unit	Avg	St Dev	Min	95th Percentile	Max	No. Samples
Alkalinity	mg/L CaCO3	178	31	90	227	374	296
Hardness	mg/L	208	37	86	274	332	145
Iron	mg/L	0.51	0.26	0.17	1.2	1.3	27
Manganese	mg/L	0.0001	0.00005	0.000045	NA	0.0002	12
Total Dissolved Solids	mg/L	269	48.3	119	348	720	972
Total Organic Carbon	mg/L	9.4	2.5	5.1	NA	14.5	20
Nitrate	mg/L	0.90	0.78	0	2.4	5.4	1313
Nitrite	mg/L	0.011	0.04	0	0.05	1	1314
Total Kjeldahl Nitrogen	mg/L	0.93	0.34	0	1.5	3.6	1109
Phosphorus, Total	mg/L	0.11	0.08	0	0.24	1	1349
Turbidity	NTU	6.6	7.2	1.3	15	200	1086
Total Suspended Solids	mg/L	16.7	14.2	0	40	165	1320
E. Coli	#/100mL	117	283	0	419	2420	$572/4^{ND}$
Giardia*	cysts/L	0.24	0.30	0	0.90	1.1	$43/16^{ND}$
Cryptosporidium*	cysts/L	0.06	0.10	0	0.30	0.30	$48/33^{ND}$

Sources:

Metropolitan Council Environmental Services, Conventional River Water Monitoring Program, Anoka site, data downloaded 8/29/2019.

*Minnesota Department of Health, Fridley site, water quality data request received 11/22/2019.

Notes:

NA=Not available/calculated given limited data set.

ND=no detection; example entry for E. Coli - $572/4^{ND}$ of 572 samples analyzed, 4 had no E. Coli detected.

Laboratory analysis: Use of unfiltered samples, except for TOC which included filtered samples.

Refer to Appendix for more detailed information.

Table 3 - SDWA Constituent Summary

Constituent	Unit	MCL or TT (mg/L)	Public Health Goal	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects
1,1,1-Trichloroethane	mg/L	0.2	0.2	0	0	0	0	0	27	27
1,1,2-Trichloroethane	mg/L	0.005	0.003	0	0	0	0	0	27	27
1,2,4-Trichlorobenzene	mg/L	0.07	0.07	0	0	0	0	0	26	26
1,2-Dichloroethane	mg/L	0.005	0	0	0	0	0	0	27	27
1,2-Dichloropropane	mg/L	0.005	0	0	0	0	0	0	27	27
Antimony	mg/L	0.006	0.006	5.67E-06	3.54E-05	0	0	0.0003	194	189
Arsenic	mg/L	0.01	0	1.45	0.85	0	3	4.70	222	26
Barium	mg/L	2	2	75.50	24.89	41	NA	100	8	0
Benzo(a)pyrene	mg/L	0.0002	0	0	0	0	0	0	26	26
Beryllium	mg/L	0.004	0.004	0.000051	0.000695	0	0	0.01	206	198
Cadmium	mg/L	0.005	0.005	0.000053	0.00017	0	0.0003	0.001	222	181
Carbon Tetrachloride	mg/L	0.005	0	0	0	0	0	0	27	27
Chlordane	mg/L	0.002	0	0	0	0	0	0	26	26
Chlorine Residual	mg/L	MRDL = 4.0[1]	MRDLG = 4[1]	0.042	0.1	0	0.14	0.64	46	0
Chlorobenzene	mg/L	0.1	0.1	0	0	0	0	0	27	27
Chromium	mg/L	0.1	0.1	0.00078	0.0017	0	0.002	0.013	222	85
Copper	mg/L	TT[2]; Action Level = 1.3	1.3	0.00186	0.0033	0	0.0043	0.05	222	25
Cryptosporidium*	cysts/L	TT[4]	0	0.0598	0.10	0	0.30	0.30	48	33
Cyanide	mg/L	0.2	0.2	0.00041	0.0036	0	0	0.04	220	217
E. Coli	#/100mL			117.46	282.78	0	419.40	2420	572	4
Endrin	mg/L	0.002	0.002	0	0	0	0	0	26	26
Ethyl Benzene	mg/L	0.7	0.7	0	0	0	0	0	27	27
Fecal Coliform Bacteria	#/100mL	MCL[3]	0[3]	150.75	402.44	0	537.60	10400	1811	4
Fecal Strep Bacteria	#/100mL	MCL[3]	0[3]	433	864.89	0	3580	3900	49	1
Fluoride*	mg/L	4.0	4.0	0	0	0	NA	0	1	1
Giardia*	cysts/L	TT[4]	0	0.243	0.295	0	0.90	1.10	43	16
Heptachlor Epoxide	mg/L	0.0002	0	0	0	0	0	0	26	26
Heptachlor	mg/L	0.0004	0	0	0	0	0	0	26	26
Hexachlorobenzene	mg/L	0.001	0	0	0	0	0	0	26	26
Hexachlorocylopentadiene	mg/L	0.05	0.05	0	0	0	NA	0.00	25	25
Lead	mg/L	TT[2]; Action Level=0.015	0	0.0010	0.0033	0	0.0045	0.043	221	85
Mercury	mg/L	0.002	0.002	0.0000076	0.000045	0	0.00001	0.0004	220	196
Nitrate N	mg/L	10	10	0.90	0.78	0	2.44	5.42	1313	47
Nitrite N	mg/L	1	1	0.011	0.041	0	0.05	1.00	1314	873
Pentachlorophenol	mg/L	0.001	0	0	0	0	0	0	26	25
Selenium	mg/L	0.05	0.05	0.00043	0.0021	0	0.0012	0.023	207	154
Thallium	mg/L	0.002	0.0005	0.000014	0.000066	0	0.000115	0.00077	209	194
Toluene	mg/L	1	1	0	0	0	0	0	27	27
Toxaphene	mg/L	0.003	0	0	0	0	0	0	26	26
Turbidity (NTU)	NTU	TT[4]	n/a	6.55	7.24	1.30	14.97	200	1086	0
Vinyl Chloride	mg/L	0.002	0	0	0	0	0	0	27	27

Sources:
Metropolitan Council Environmental Services. Conventional River Water Monitoring Program, data downloaded 8/29/2019.
*Minnesota Department of Health. Water quality data request received 11/22/2019.
Refer to Table A for the different analytical methods used to characterize these constituents

Table 3 - SDWA Constituent Summary (cont.)

Footnotes

1. Definitions

   Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals

   Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards

   Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

   Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants

   Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

2. Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L

3. A routine sample that is fecal coliform-positive or E. coli-positive triggers repeat samples - if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or E. coli-negative triggers repeat samples - if any repeat sample is fecal coliform-positive or E. coli-positive, the system has an acute MCL violation. See also Total Coliforms.

4. EPA's surface water treatment rules require systems using surface water or ground water under the direct ifnluence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the followign contaminants are controlled a tht efollowing levels:

   Cryptosporidium: 99 percent removal for systems that filter. Unfiltered systems are required to include Cryptosporidium in their existing watershed control provisions.

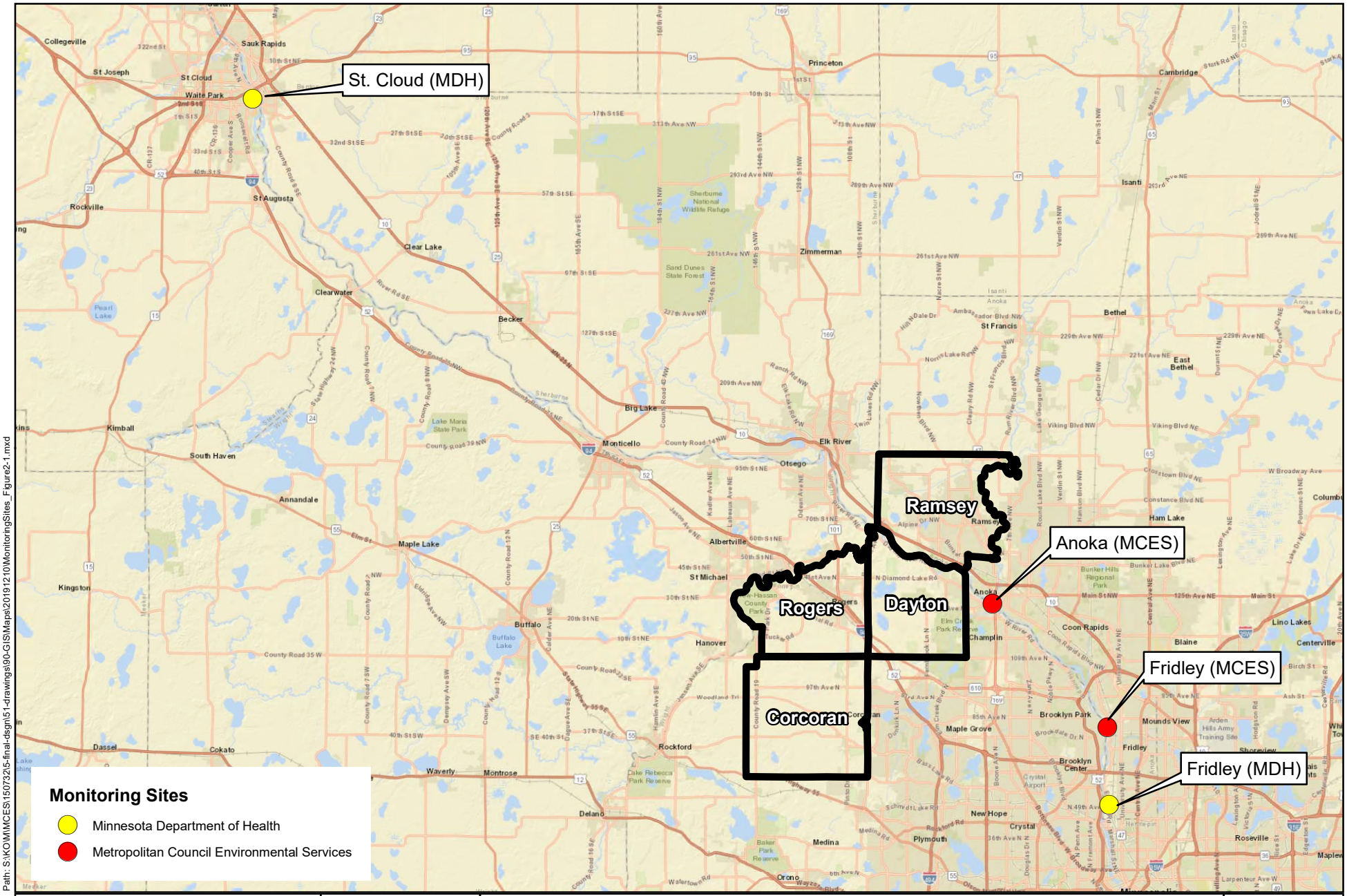
   Giardia lamblia: 99.9 percent removal/inactivation

   Viruses: 99.9 percent removal/inactivation

   Legionella: No limit, but EPA believes that if Giardia and viruses are removed/inactivated, according to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.

   Turbidity: For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelometric turbidity unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than the conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.

5. All data retreived from: Anoka MCES (2019), except Cryptosporidium, Flouride, Giardia, which were retreived from: Fridley MDH (2019)



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Project: MCES 150732
Print Date: 1/17/2020

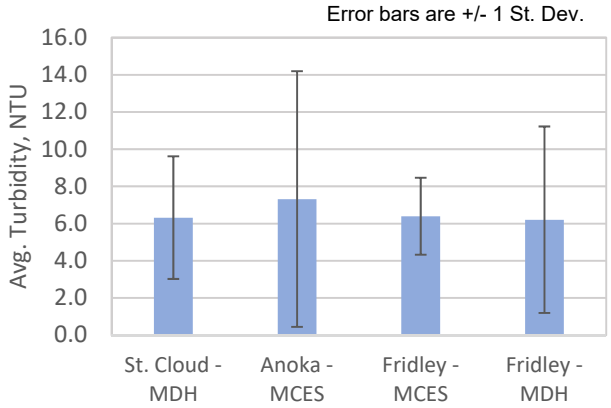
WATER QUALITY MONITORING SITES

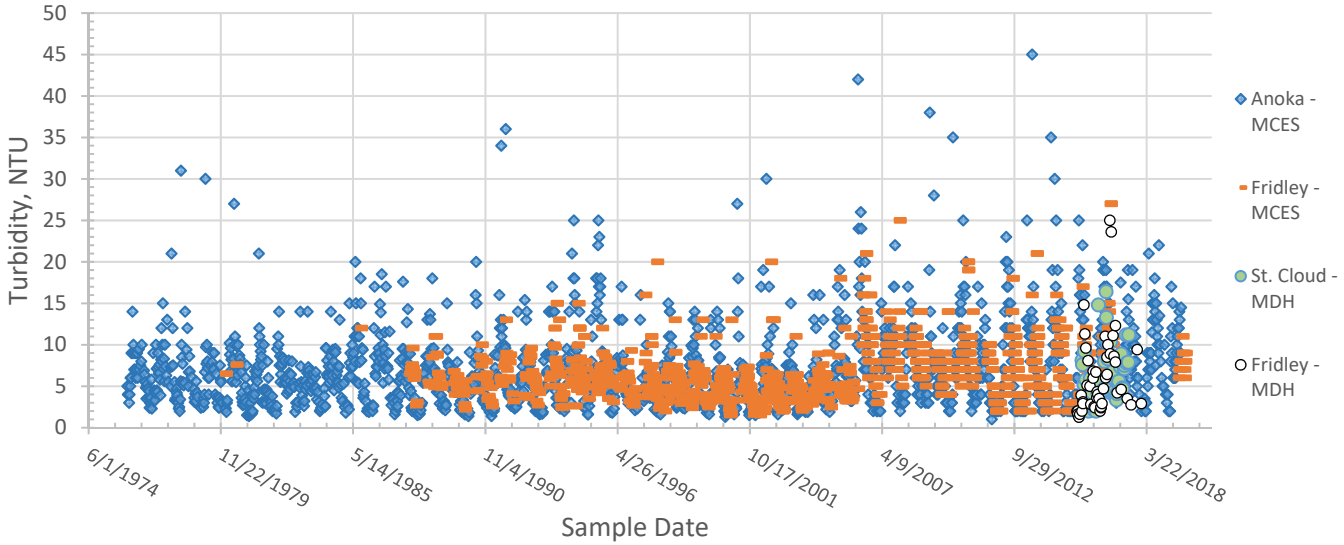
Northwest Metro Area Regional Water Supply Study

Figure 1

Figure 2 - Turbidity

	Units	St. Cloud - MDH	Anoka - MCES	Fridley - MCES	Fridley - MDH
Avg	NTU	6.3	7.3	6.4	6.2
St Dev	NTU	3.3	6.9	2.1	5.0
Min	NTU	2.0	1.0	6.0	1.3
Max	NTU	16.4	200.0	27.0	25.0
95th Percentile	NTU	14.0	17.0	12	19.6
Num. Samples		50	1767	1365	48
Sample Start Date		7/21/2015	9/4/1909	5/30/1978	1/6/2015
Sample End Date		6/26/2017	1/7/1976	8/26/2019	12/20/2016





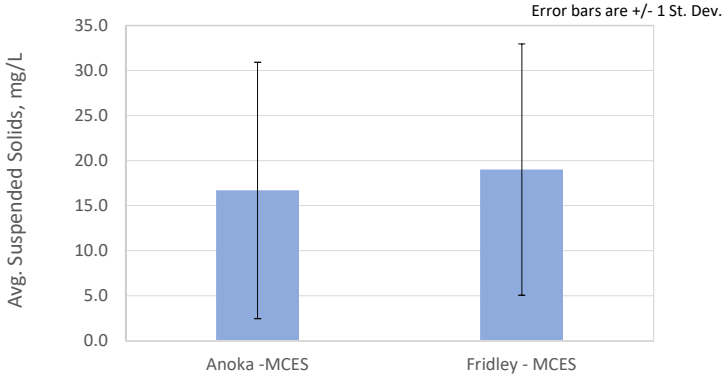
Note:
1) Two points fall above plot, 1) 12/19/1994, 200 mg/L, Anoka-MCES, and 2) 5/26/2015, 65 mg/L, Anoka-MCES
2) Refer to Table A for the different analytical methods used to characterize turbidity at Anoka

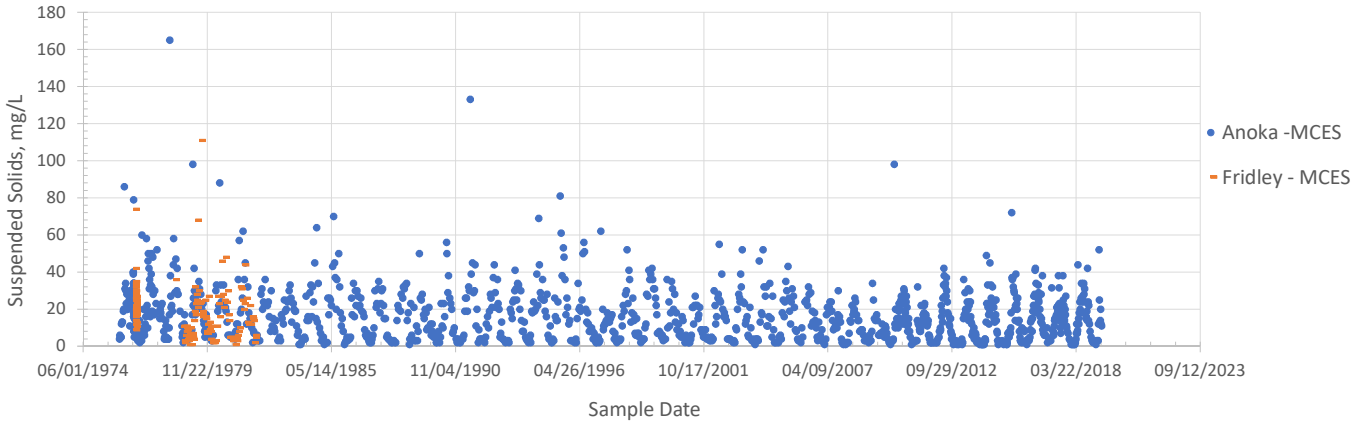
Metropolitan Council Environmental Services, August 2019. Conventional River Water Monitoring Program, data downloaded 8/29/2019.

Minnesota Department of Health, August 2010. Water quality data request received 11/22/2019.

Figure 3 - Total Suspended Solids

	Units	Anoka - MCES	Fridley - MCES
Avg, mg/L	mg/L	16.7	19.0
St Dev	mg/L	14.2	14.0
Min, mg/L	mg/L	1.0	1.0
Max, mg/L	mg/L	165.0	111.0
95th Percentile	mg/L	40.0	36.6
Num. Samples		1320	157
Sample Start Date		1/7/1976	8/19/1976
Sample End Date		5/6/2019	12/14/1981



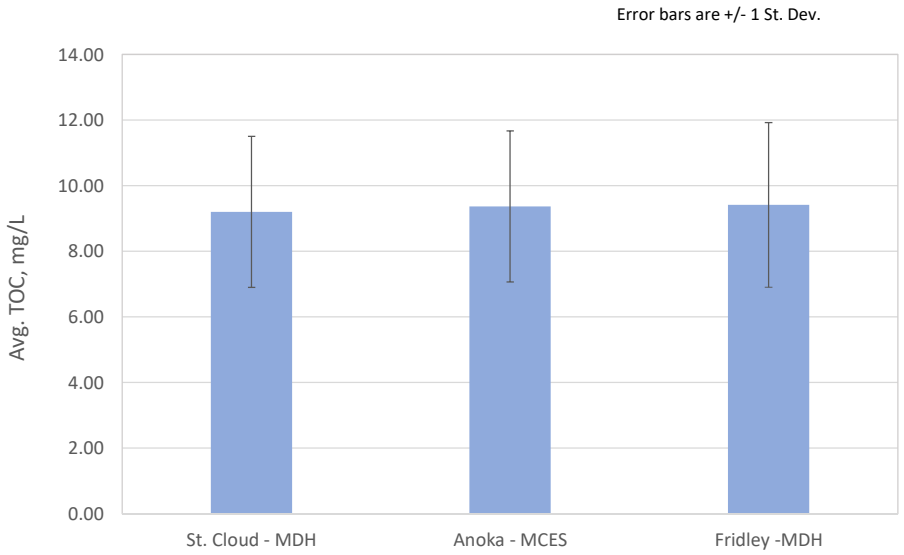


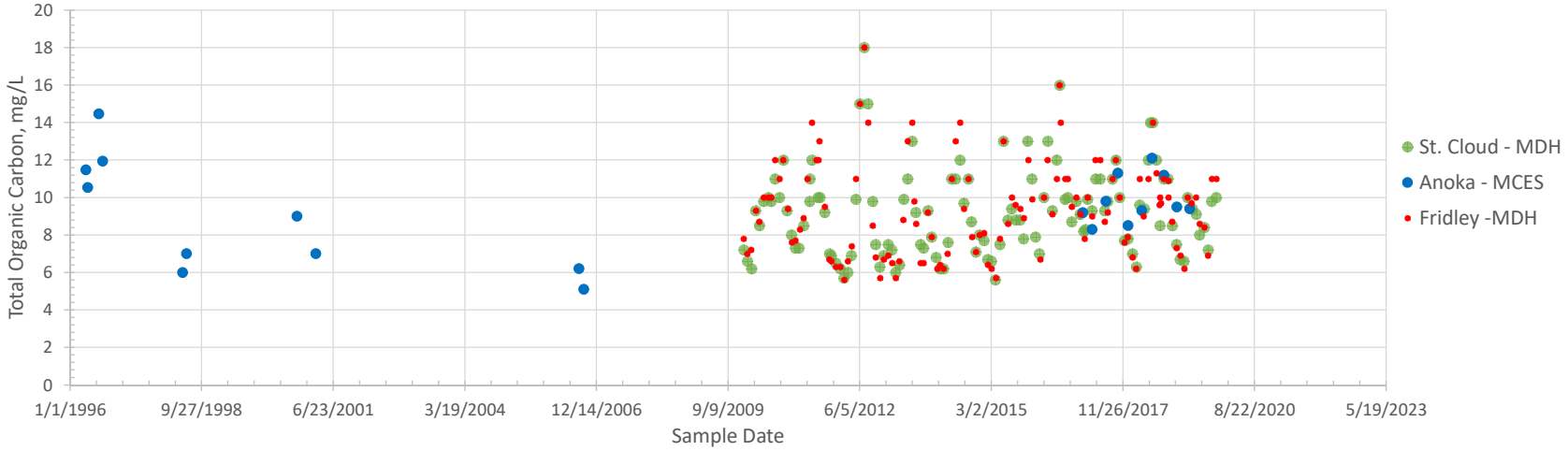
Metropolitan Council Environmental Services, August 2019. Conventional River Water Monitoring Program, data downloaded 8/29/2019.

Minnesota Department of Health, August 2010. Water quality data request received 11/22/2019.

Figure 4 - Total Organic Carbon

	Units	St. Cloud - MDH	Anoka - MCES	Fridley - MDH
Avg	mg/L	9.20	9.37	9.41
St Dev	mg/L	2.3	2.3	2.51
Min	mg/L	5.6	5.1	5.6
Max	mg/L	18	14.5	18
95th Percentile	mg/L	13.9	NA	14.0
Num. Samples		122	20	115
Sample Start Date		1/6/2010	4/29/1996	1/5/2010
Sample End Date		11/4/2019	4/15/2019	11/5/2019

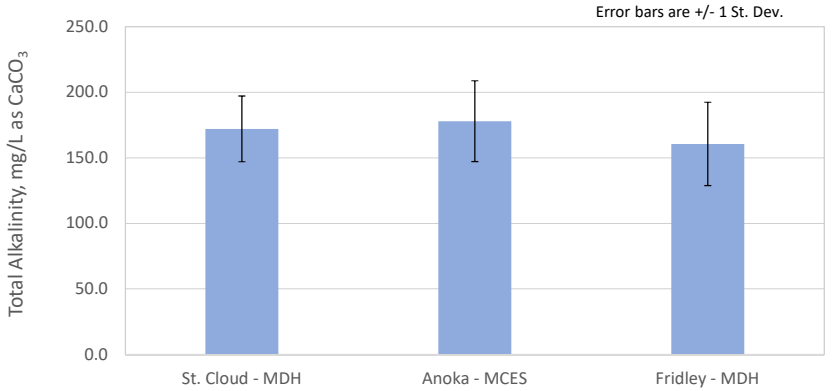


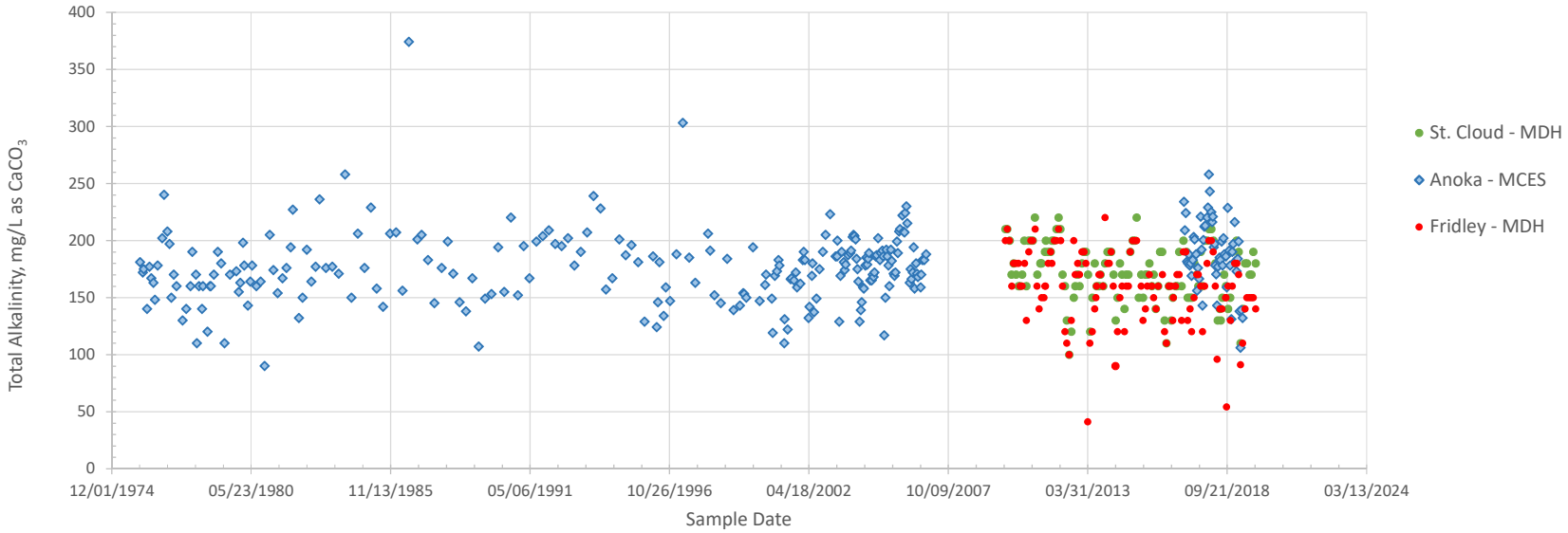


Metropolitan Council Environmental Services. Conventional River Water Monitoring Program, data downloaded 8/29/2019.
Minnesota Department of Health. Water quality data request received 11/22/2019.

Figure 5 - Alkalinity

	Units	St. Cloud - MDH	Anoka - MCES	Fridley - MDH
Avg	mg/L as CaCO3	172.1	177.9	160.6
St Dev	mg/L as CaCO3	25.0	30.8	31.7
Min	mg/L as CaCO3	100.0	90.0	41.0
Max	mg/L as CaCO3	220.0	374.0	220.0
95th Percentile	mg/L as CaCO3	210.0	227.2	200.0
Num. Samples		121	296	112
Sample Start Date		1/6/2010	1/14/1976	1/5/2010
Sample End Date		11/4/2019	4/29/2019	2/6/2019





Metropolitan Council Environmental Services. Conventional River Water Monitoring Program, data downloaded 8/29/2019.
Minnesota Department of Health. Water quality data request received 11/22/2019.

Appendix
Supporting Information for Mississippi River Water Quality Summary Memorandum

Table A - Mississippi River Water Quality Summary by Station

Constituent	Unit	Anoka, MCES							Fridley, MCES							Fridley, MDH							St Cloud, MDH						
		Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects
% Chlorophyll-a, Particulate	%	27.38	8.21	11	41.2	46	55	0	22.82	6.60	9	36.3	39	56	0														
1,1,1-Trichloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,1,2,2-Tetrachloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,1,2-Trichloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,1-Dichloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,1-Dichloroethene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,2,4-Trichlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
1,2-Dichlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	29	29																					
1,2-Dichloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,2-Dichloropropane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
1,2-Diphenylhydrazine, Unfiltered	mg/L	0.00	0.00	0	NA	0	25	25																					
1,3-Dichlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	29	29																					
1,4-Dichlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	29	29																					
2,4,6-Trichlorophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2,4-Dichlorophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2,4-Dimethylphenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2,4-Dinitrophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2,4-Dinitrotoluene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
2,6-Dinitrotoluene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
2-Chloroethylvinylether, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
2-Chloronapthalene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
2-Chlorophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2-Methyl-4,6-Dinitrophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
2-Nitrophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
3,3'-Dichlorobenzidine, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4,4'-DDD, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4,4'-DDE, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4,4'-DDT, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4-Bromophenyl Phenyl Ether, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4-Chloro-3-Methylphenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
4-Chlorophenyl Phenyl Ether, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
4-Nitrophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
a-BHC, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Acenaphthylene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Acenapthene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Aldrin, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Alkalinity, Bicarbonate	mg/L															150.00	0	150	NA	150	1	0	180.00	0	180	NA	180	1	0
Alkalinity, Carbonate	mg/L																						1.60	0	1.6	NA	1.6	1	0
Alkalinity, Total	mg/L															160.63	31.74	41	200	220	112	0	172.07	25.0262	100	210	220	121	0
Aluminum, Unfiltered	mg/L	0.17	0.13	0.038	NA	0.495	15	0																					
Ammonia Nitrogen, Filtered	mg/L	0.04	0.07	0	0.156	0.37	107	63																					
Ammonia Nitrogen, Total	mg/L															0.00	0	0	NA	0	2	2	0.00	0	0	NA	0	1	1
Ammonia Nitrogen, Unfiltered	mg/L	0.08	0.16	0	0.34	3	1808	733	0.07	0.12	0	0.3	2.33	1504	635														
Anthracene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Antimony, Filtered	mg/L	0.00	0.00	0	NA	0	1	1																					
Antimony, Unfiltered	mg/L	5.6701E-06	3.54E-05	0	0	3.00E-04	194	189																					
Arsenic	ug/L															1.41	0	1.41	NA	1.41	1	0	0.00	0	0	NA	0	1	1
Arsenic, Filtered	mg/L	0.0020	0.00	0.00060	0.0037	0.0039	48	0																					
Arsenic, Unfiltered	mg/L	0.00	0.00	0	0.003	0.0047	222	26																					
Barium	ug/L															52.30	0	52.3	NA	52.3	1	0	54.50	0	54.5	NA	54.5	1	0
Barium, Unfiltered	mg/L	0.08	0.02	0.041	NA	0.1	8	0																					
b-BHC, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Benzine, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Benzidine, Unfiltered	mg/L	0.00	0.00	0	NA	0	25	25																					
Benzo(a)anthracene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Benzo(a)pyrene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Benzo(b)fluoranthene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Benzo(g,h,i)perylene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Benzo(k)fluoranthene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Beryllium, Filtered	mg/L	0.00	0.00	0	NA	0	2	2																					
Beryllium, Unfiltered	mg/L	0.00	0.00	0	0	0.01	206	198																					
Bicarbonate, Unfiltered	mg/L	244.93	282.72	110	284.95	2880	90	0																					
Bis (2-chloroethoxy) Methane, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Bis (2-chloroethyl) Ether, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Bis (2-chloro-Isopropyl) Ether, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Bis(2-ethylhexyl)phthalate, Unfiltered	mg/L	0.00	0.01	0	0.02393	0.03329	26	19																					

Table A - Mississippi River Water Quality Summary by Station

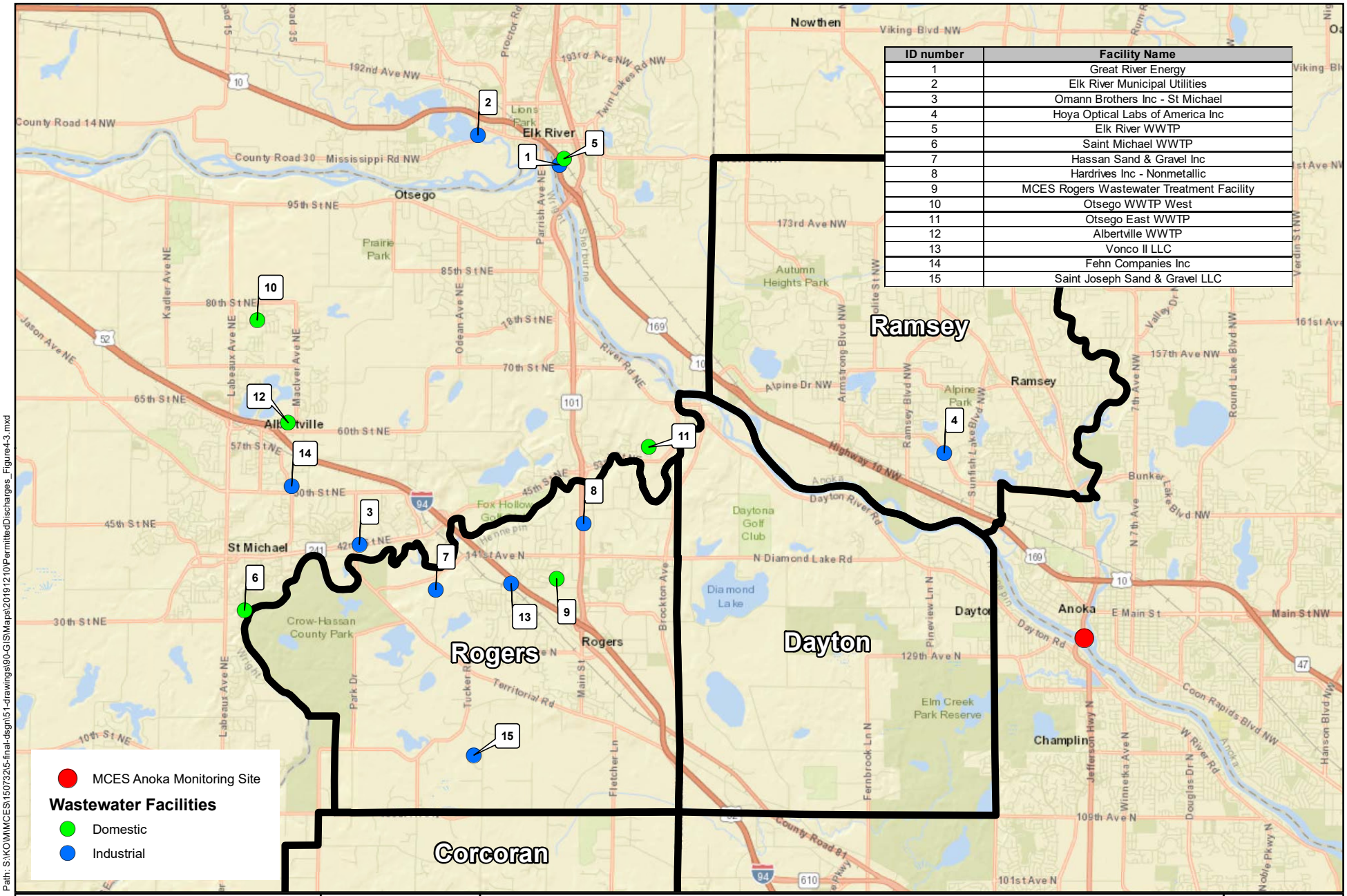
Constituent	Unit	Anoka, MCES							Fridley, MCES							Fridley, MDH							St Cloud, MDH						
		Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects
BOD 5-day, Filtered	mg/L	2.01	1.60	0	5.15	5.5	54	8	1.87	1.13	0.2	4.18	4.5	27	0													
BOD 5-day, Unfiltered	mg/L	2.47	1.65	0	5.3	18.2	1111	76	3.81	2.00	0.9	7.46	14	101	0													
BOD K-rate, Filtered	/day	0.01	0.00	0.006	0.0150667	0.0156667	28	0																				
BOD K-rate, Unfiltered	/day	0.02	0.00	0.009	0.02495	0.026	28	0																				
BOD Ultimate K-rate, Filtered	/day	0.01	0.00	0.004	NA	0.009	8	0																				
BOD Ultimate K-rate, Unfiltered	/day	0.02	0.00	0.012	NA	0.017	8	0																				
BOD Ultimate, Filtered	mg/L	6.71	2.17	3.9	11.405	13.7	36	0																				
BOD Ultimate, Unfiltered	mg/L	11.08	3.56	5.4	19.535	20.3	36	0																				
Boron, Unfiltered	mg/L	0.08	0.03	0.05	NA	0.13	4	0																				
Bromide	mg/L															8.08	11.81	0	NA	30.4	5	3	10.00	0	10	NA	10	1	0
Bromodichloromethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Bromoform, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Bromomethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Butylbenzylphthalate, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Ca as CaCO3	mg/L as CaCO3															110.00	0	110	NA	110	1	0							
Cadmium, Filtered	mg/L	0.00	0.00	0	0.00021	0.00046	48	43																				
Cadmium, Unfiltered	mg/L	0.00	0.00	0	0.0003	0.001	222	181																				
Calcium	mg/L																						53.00	0	53	NA	53	1	0
Calcium, Filtered	mg/L	53.19	20.05	4	70.115	425	496	0																				
Carbon Tetrachloride, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Carbonate, Unfiltered	mg/L CO3	0.18	0.80	0	2	6	73	0																				
CBOD 5-day, Filtered	mg/L	0.32	0.42	0	NA	1.2	15	9																				
CBOD 5-day, Unfiltered	mg/L	1.73	1.58	0	4.8	18	968	180	4.99	1.54	2.35	7.505	12	58	0													
CBOD K-rate, Filtered	/day	0.01	0.01	0.006	0.016775	0.017	28	0																				
CBOD K-rate, Unfiltered	/day	0.02	0.00	0.008	0.025875	0.027	28	0																				
CBOD Ultimate K-rate, Filtered	/day	0.01	0.00	0.007	NA	0.018	4	0																				
CBOD Ultimate K-rate, Unfiltered	/day	0.02	0.00	0.018	NA	0.022	3	0																				
CBOD Ultimate, Filtered	mg/L	5.06	1.24	3.2	8	7.766667	32	0																				
CBOD Ultimate, Unfiltered	mg/L	8.30	2.02	4.65	12.8	14	31	0																				
Chlordane, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Chloride	mg/L															16.70	0	16.7	NA	16.7	1	0	14.50	0	14.5	NA	14.5	1	0
Chloride, Filtered	mg/L	14.93	4.84	0	22	36	373	1	8.95	0.95	6.75	11.15	12	53	0													
Chloride, Unfiltered	mg/L	16.23	4.58	4	23.41	37.4	318	0	10.38	6.38	5.5	NA	22.9	5	0													
Chlorine Residual, Lab	mg/L	0.04	0.10	0	0.14	0.64	46	0	0.02	0.04	0.00	NA	0.12	11	0													
Chlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Chloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Chloroform, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Chloromethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Chlorophyll-a Trichromatic Uncorrected	mg/L	0.03	0.02	0	0.072	0.15	1280	3	0.04	0.02	0.003	0.077	0.103	183	0													
Chlorophyll-a, % Pheo-Corrected	%	79.64	14.87	0	99	110	1222	1	79.67	13.52	33	99	100	127	0													
Chlorophyll-a, Pheo-Corrected	mg/L	0.02	0.02	0	0.05405	0.12	598	1																				
Chlorophyll-a/Pheophytin-a Abs. Ratio	Ratio	1.62	0.23	1.2	2.0205	3.66	598	0																				
Chlorophyll-b	mg/L	0.003252926	0.01	0	0.011	0.14	598	184																				
Chlorophyll-c	mg/L	0.01	0.01	0	0.018	0.044	598	20																				
Chromium, Filtered	mg/L	0.000294271	0.00	0	0.0010043	0.0054	48	25																				
Chromium, Unfiltered	mg/L	0.00	0.00	0	0.002	0.013	222	85																				
Chrysene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Cis-1,3-Dichloropropene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Conductivity, Field	umho/cm	431.17	70.77	165	543.2	789	857	0	370.07	60.22	0.000	455.05	540	578	0													
Conductivity, Lab	umho/cm	374.82	71.07	159	517.7	600	288	0	328.55	68.71	180	511.5	600	76	0													
Copper, Filtered	mg/L	0.00	0.00	0	0.00312	0.0036	48	5																				
Copper, Unfiltered	mg/L	0.00	0.00	0	0.00427	0.047	222	25																				
Cryptosporidium	cysts/L															0.06	0.1	0	0.3	0.3	48	33	0.01	0.03312	0	0.081	0.17	48	40
Cyanide, Unfiltered	mg/L	0.00	0.00	0	0	0.04	220	217																				
d-BHC, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Dibenzo(a,h)anthracene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Dibromochloromethane, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																				
Dieldrin, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Diethylphthalate, Unfiltered	mg/L	0.00	0.00	0	0.000728	0.00112	26	25																				
Dimethylphthalate, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Di-N-butyl-phthalate, Unfiltered	mg/L	0.00	0.00	0	0.0033365	0.00341	26	18																				
Di-N-octylphthalate, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																				
Dissolved Organic Carbon	mg/L															12.10	2.7	9.4	NA	14.8	2	0	13.90	0	13.9	NA	13.9	1	0
Dissolved Oxygen, Field	mg/L	9.28	1.94	5.31	13	17.03	887	0	9.80	1.98	5.93	13.795	19.94	789	0													

Table A - Mississippi River Water Quality Summary by Station

Constituent	Unit	Anoka, MCES							Fridley, MCES							Fridley, MDH							St Cloud, MDH						
		Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects
Dissolved Oxygen, Lab	mg/L	10.90	2.22	5.2	14.1	15.6	959	0	11.19	2.28	6.2	14.4	16.6	693	0														
Dissolved Oxygen	mg/L															7.72	0	7.72	NA	7.72	2	0							
E. Coli Bacteria Count	#/100mL	117.46	282.78	0	419.4	2420	572	4	98.65	210.08	0	365	1986	475	4	116.40	315.3	0	699.195	1986	48	1	72.64	77.7484	6.3	286.9	365.4	47	0
Endosulfan I, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Endosulfan II, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Endosulfan Sulfate, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Endrin Aldehyde, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Endrin, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Ethyl Benzene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Fecal Coliform Bacteria Count	#/100mL	150.75	402.44	0	537.6	10400	1811	4	134.24	276.27	2	512.8	4400	1503	0														
Fecal Strep Bacteria Count	#/100mL	433.00	864.89	0	3580	3900	49	1	748.33	827.60	0	NA	2040	15	1														
Fluoranthene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Fluorene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Fluoride, Total	mg/L															0.00	0	0	NA	0	1	1	0.00	0	0	NA	0	1	1
g-BHC, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Giardia	cysts/L															0.24	0.295	0	0.9	1.1	43	16	0.12	0.15987	0	0.467	0.83	48	17
Hardness, Unfiltered	mg/L	208.28	37.41	86	274	332	145	0																					
Heptachlor Epoxide, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Heptachlor, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Hexachlorobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Hexachlorobutadiene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Hexachlorocylopentadiene, Unfiltered	mg/L	0.00	0.00	0	NA	0	25	25																					
Hexachloroethane, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Hex-chromium, Filtered	mg/L	0.00	0.00	0	0	0	30	30																					
Indeno (1,2,3-c-d)pyrene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Iron	ug/L															569.00	0	569	NA	569	1	0	302.00	0	302	NA	302	1	0
Iron, Filtered	mg/L	0.01	0.01	0	NA	0.025	2	1																					
Iron, Unfiltered	mg/L	0.51	0.26	0.17	1.212	1.3	27	0																					
Isophorone, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Lead, Filtered	mg/L	0.00	0.00	0	0.000676	0.003	48	40																					
Lead, Unfiltered	mg/L	0.00	0.00	0	0.00452	0.0428	221	85																					
m&p-Xylenes, Unfiltered	mg/L	0.00	0.00	0	NA	0	23	23																					
Magnesium	mg/L																						18.50	0	18.5	NA	18.5	1	0
Magnesium	mg/L as CaCO3															62.00	0	62	NA	62	1	0							
Magnesium, Filtered	mg/L	19.39	4.49	8.64	26.83	61.4	496	0																					
Manganese	ug/L															130.00	0	130	NA	130	1	0	48.70	0	48.7	NA	48.7	1	0
Manganese, Filtered	mg/L	0.00	0.00	0.002	NA	0.005	2	0																					
Manganese, Unfiltered	mg/L	0.10	0.05	0.045	NA	0.21	12	0																					
Mercury, Filtered	mg/L	0.00	0.00	0	9.773E-05	0.0002	46	33																					
Mercury, Unfiltered	mg/L	0.00	0.00	0	1.395E-05	0.0004	220	196																					
Methylene Chloride, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Molybdenum	mg/L	0.00	0.00	0	NA	0	6	6																					
m-Xylenes, Unfiltered	mg/L	0.00	0.00	0	NA	0	3	3																					
Naphthalene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Nickel, Filtered	mg/L	0.00	0.00	0	0.00271	0.0044	48	4																					
Nickel, Unfiltered	mg/L	0.00	0.00	0	0.00456	0.0097	221	27																					
Nitrate + Nitrite Nitrogen, Total	mg/L															0.24	0	0.24	NA	0.24	1	0	0.23	0	0.23	NA	0.23	1	0
Nitrate N, Unfiltered	mg/L	0.90	0.78	0	2.436	5.42	1313	47	0.28	0.38	0	0.98	2.54	157	30														
Nitrite N, Unfiltered	mg/L	0.01	0.04	0	0.05	1	1314	873	0.01	0.03	0	0.052	0.21	157	76														
Nitrite Nitrogen, Total	mg/L															0.02	0	0.02	NA	0.02	2	0	0.04	0	0.04	NA	0.04	1	0
Nitrobenzene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
N-Nitrosodimethyl Amine, Unfiltered	mg/L	0.00	0.00	0	NA	0	25	25																					
N-Nitrosodi-N-Propylamine, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
N-Nitroso-Diphenylamine, Unfiltered	mg/L	0.00	0.00	0	NA	0	25	25																					
Oil and Grease	mg/L	1.53	3.52	0	NA	14	15	10																					
Ortho Phosphate as P, Filtered	mg/L	0.05	0.05	0	0.139	0.464	1123	87	0.06	0.06	0	0.16605	0.354	140	6														
Ortho Phosphate as P, Unfiltered	mg/L	0.05	0.05	0	0.1499	0.313	641	17	0.09	0.06	0.01	NA	0.25	18															
Oxidation Reduction Potential	mV															30.30	0	30.3	NA	30.3	2	0	192.60	0	192.6	NA	192.6	1	0
Oxygen Demand, Particulate	mg/L	12.82	2.89	7	17.503	20.9	57	0	11.25	2.14	7.33	14.7525	16.6	58	0														
o-Xylenes, Unfiltered	mg/L	0.00	0.00	0	NA	0	23	23																					
p&o-Xylenes, Unfiltered	mg/L	0.00	0.00	0	NA	0	3	3																					
PCB: 1016, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
PCB: 1221, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
PCB: 1232, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
PCB: 1242, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					

Table A - Mississippi River Water Quality Summary by Station

Constituent	Unit	Anoka, MCES							Fridley, MCES							Fridley, MDH							St Cloud, MDH						
		Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects	Avg	St Dev	Min	95th Percentile	Max	Count	# of Non-Detects
PCB: 1248, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
PCB: 1254, Unfiltered	mg/L	0.00	0.00	0	3.185E-05	0.000049	26	24																					
PCB: 1260, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Pentachlorophenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
pH	units															8.30	0	8.3	NA	8.3	1	0	8.00	0	8	NA	8	1	0
pH, Field	units	8.06	0.32	7.02	8.6	9.2	1176	0	8.02	0.31	6	8.494	8.79	931	0														
pH, Lab	units	8.08	0.35	6.8	8.7	9.12	654	0	8.04	0.36	6.8	8.64	9.1	532	0														
Phenanthrene, Unfiltered	mg/L	0.00	0.00	0	0.001365	0.0021	26	25																					
Phenol, Unfiltered	mg/L	0.00	0.00	0	0	0	26	25																					
Pheophytin-a	mg/L	0.00	0.00	0	0.011	0.034	600	190																					
Phosphate, Total	mg/L															0.22	0	0.22	NA	0.22	1	0	0.17	0	0.17	NA	0.17	1	0
Potassium	mg/L															2.14	0	2.14	NA	2.14	1	0	2.46	0	2.46	NA	2.46	1	0
Potassium, Filtered	mg/L	2.96	0.79	0.8	4.505	8	494	0																					
Pyrene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Selenium, Filtered	mg/L	0.00	0.00	0	NA	0	2	2																					
Selenium, Unfiltered	mg/L	0.00	0.00	0	0.0012	0.023	207	154																					
Silica, Filtered	mg/L	12.13	4.14	1	20	26	221	0																					
Silver, Filtered	mg/L	0.00	0.00	0	NA	0	4	4																					
Silver, Unfiltered	mg/L	0.00	0.00	0	0	0.00036	217	211																					
Sodium	mg/L															10.00	0	10	NA	10	1	0	7.87	0	7.87	NA	7.87	1	0
Sodium, Filtered	mg/L	10.56	5.88	3.99	16.5	95	494	0																					
Specific Conductance	uS/cm															363.00	0	363	NA	363	2	0	354.00	0	354	NA	354	1	0
Strontium	ug/L															94.10	0	94.1	NA	94.1	1	0	103.00	0	103	NA	103	1	0
Sulfate	mg/L															9.96	0	9.96	NA	9.96	1	0	11.20	0	11.2	NA	11.2	1	0
Sulfate, Filtered	mg/L	21.80	9.04	3	37.79	96	493	0																					
Suspended Solids	mg/L	16.68	14.22	0	39.95	165	1320	9	19.00	13.96	1	36.6	111	157	0														
Temperature	deg C	12.99	9.22	-0.2	25.7725	30	1830	0	13.92	8.68	-0.21	25.44	28.9	1463	0	24.16	0	24.16	NA	24.2	2	0	18.20	0	18.2	NA	18.2	1	0
Tetrachloroethene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Thallium, Filtered	mg/L	0.00	0.00	0	NA	0	4	4																					
Thallium, Unfiltered	mg/L	0.00	0.00	0	0.000115	0.00077	209	194																					
Toluene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Total Alkalinity, Filtered	mg/L CaCO3	177.39	31.40	25	228.9	245	213	0																					
Total Alkalinity, Unfiltered	mg/L CaCO3	177.90	30.81	90	227.15	374	296	0																					
Total Dissolved Solids	mg/L	268.97	48.28	119	348	720	972	0	240.09	35.43	138	NA	309	22	0														
Total Kjeldahl Nitrogen, Filtered	mg/L	0.87	0.32	0.25	1.5	2.3	579	0																					
Total Kjeldahl Nitrogen, Particulate	mg/L	0.22	0.21	0	0.534	3.56	951	81	0.31	0.21	0.03	0.7	0.7	39	0														
Total Kjeldahl Nitrogen, Unfiltered	mg/L	0.93	0.34	0	1.5	3.55	1109	4	0.91	0.30	0.24	1.448	2	123	0														
Total Kjeldahl Nitrogen, Unfiltered, Low Level Detection	mg/L	0.93	0.22	0.67	NA	1.3	9	0																					
Total Nitrate/Nitrite N, Unfiltered	mg/L	1.07	0.56	0.21	2.383	2.68	37	0																					
Total Organic Carbon	mg/L															9.41	2.508	5.6	14	18	115	0	9.20	2.3042	5.6	13.85	18	122	0
Total Organic Carbon, Filtered	mg/L	9.37	2.30	5.1	NA	14.47	20	0																					
Total Organic Carbon, Unfiltered	mg/L	11.50	0.66	10.74	NA	12.44	4	0																					
Total Phenolics, Unfiltered	mg/L	0.00	0.00	0	0.003415	0.0086	218	123																					
Total Phosphorus, Filtered	mg/L	0.06	0.06	0	0.1606	0.59	895	151	0.07	0.08	0	0.282	0.34	66	10														
Total Phosphorus, Particulate	mg/L	0.05	0.04	0	0.10645	0.83	1030	7	0.06	0.04	0	0.12	0.17	104	1														
Total Phosphorus, Unfiltered	mg/L	0.11	0.08	0	0.24	1	1349	34	0.13	0.09	0.02	0.302	0.63	227	0														
Total Phosphorus, Unfiltered, Low Level Detection	mg/L	0.08	0.07	0.013	NA	0.259	9	0																					
Toxaphene, Unfiltered	mg/L	0.00	0.00	0	0	0	26	26																					
Trans-1,2-Dichloroethene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Trans-1,3-Dichloropropene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Trichloroethene, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Trichlorofluoromethane, Unfiltered	mg/L	0.00	0.00	0	0.000876	0.00146	27	26																					
Turbidity	NTU															6.21	5.016	1.26	19.64	25	48	0	6.32	3.29828	2	13.975	16.4	50	0
Turbidity (JTU)	JTU	6.62	3.78	2	12.95	31	120	0	4.12	1.09	2.7	NA	7.1	13	0														
Turbidity (NTRU)	NTRU	8.91	6.45	1	19	65	546	0	7.74	3.82	2	14	27	459	0														
Turbidity (NTU), Field	NTU	9.68	5.71	1	21.8	29	121	0	8.46	6.43	0	18	59	119	0														
Turbidity (NTU), Lab	NTU	6.55	7.24	1.3	14.965	200	1086	0	5.65	2.63	1.2	10.675	20	972	0														
UV Absorbance, 254 nm	units/cm															0.44	0.15	0.29	NA	0.59	2	0	0.53	0	0.53	NA	0.53	1	0
UV Absorbance, specific	L/mg-m															3.57	0.435	3.13	NA	4	2	0	3.83	0	3.83	NA	3.83	1	0
Vinyl Chloride, Unfiltered	mg/L	0.00	0.00	0	0	0	27	27																					
Volatile Suspended Solids	mg/L	5.05	3.96	0	12	31	1255	74	8.55	5.19	0	17.45	25	110	1														
Zinc, Filtered	mg/L	0.01	0.01	0	0.03325	0.06	48	15																					
Zinc, Unfiltered	mg/L	0.01	0.03	0	0.03925	0.32	222	50																					



ID number	Facility Name
1	Great River Energy
2	Elk River Municipal Utilities
3	Omann Brothers Inc - St Michael
4	Hoya Optical Labs of America Inc
5	Elk River WWTP
6	Saint Michael WWTP
7	Hassan Sand & Gravel Inc
8	Hardrives Inc - Nonmetallic
9	MCES Rogers Wastewater Treatment Facility
10	Otsego WWTP West
11	Otsego East WWTP
12	Albertville WWTP
13	Vonco II LLC
14	Fehn Companies Inc
15	Saint Joseph Sand & Gravel LLC

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SEH
3535 VADNAIS CENTER DR.
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Project: MCES 150732
Print Date: 1/16/2020

PERMITTED DISCHARGERS IN STUDY AREA VICINITY

Northwest Metro Area Regional Water Supply Study

Figure A

Appendix B: Groundwater Aquifer Information

Building a Better World for All of Us®

MEMORANDUM

TO: Chris Larson, PE

FROM: Mark Sherrill

DATE: March 12, 2020

RE: Northwest Metro Aquifers
SEH No. 150732 14.00

This memo presents a summary of the regional groundwater aquifers in the Northwest Metro area including the Cities of Corcoran, Dayton, Ramsey, and Rogers.

While variation and extent of bedrock aquifers occur, in general five regional aquifers support much of the potable water for the Twin Cities region, from oldest to youngest: (1) Mt Simon-Hinckley (2) Tunnel City-Wonewoc (3) Prairie du Chien-Jordan (4) St. Peter, and (5) Quaternary aquifers. These aquifers are hydrologically disconnected by a variety of interbedded confining layers.

In the Northwest Metro area, Quaternary deposits are highly variable in the types of materials present. Large areas of sand and gravel are required for high production municipal wells. For purposes of this report, Quaternary deposits will not be relied upon for drinking water wells.

Based upon the geologic bedrock map represented in Figure 1, the St. Peter aquifer only exists in a small portion of Corcoran and is largely not available as a bedrock aquifer.

Jordan Aquifer
The Jordan Aquifer is generally considered to be hydrologically connected to the Prairie Du Chien Unit. However, as evident from the geologic bedrock map (Figure 1) the Prairie Du Chien Unit was either not deposited or has been eroded through much of this area. The thickness and presence of this aquifer through this area is scarce and laterally disconnected. Where present, the thickness of the Jordan aquifer is generally around 70 feet, with some areas within the Cities of Corcoran and Dayton as thick as 170 feet. Within the City of Ramsey, the Jordan Sandstone thickness is minimal at around 20-30 feet and appears heavily eroded. Quaternary deposits directly overlay this unit and the Jordan Sandstone is likely recharged by these deposits.
Based on the geologic bedrock map and lack of existing Jordan wells, it assumed that the Jordan aquifer is not available for municipal wells throughout most of the study area.

Tunnel City – Wonewoc Aquifer
The Tunnel City Group and underlying Wonewoc Sandstone supply water for much of the Northwest Metro region. Presence and thickness of the Tunnel City is depicted on Figure 2 and for the Wonewoc on Figure 3. These units appear laterally continuous through much of this area and greater Twin Cities region aside from where it has been eroded away. Areas where the Aquifer is not present primarily occur within bedrock valleys where previous streams and surface water features carved away the bedrock unit.
The productivity of the Tunnel City – Wonewoc Aquifer is generally regarded as variable. Yields tend to be moderate to low with some of the highest yields reported where bedrock units are highly fractured.

The geologic maps (Figures 2 and 3) indicate that the Tunnel City – Wonewoc is present in most of the study area, with the exception of bedrock valleys in Ramsey and Rogers. This report assumes that all of the new wells will be in the Tunnel City – Wonewoc aquifer.

Mt. Simon-Hinckley Aquifer

The Mount Simon-Hinckley Aquifer is generally described as a high to moderate yield aquifer. New high capacity wells are generally not permitted by the Minnesota Department of Natural Resources as use has been restricted by Minnesota Law, therefore it is not discussed in this report in greater detail.

Regional Groundwater Supply

In 2016, the Metropolitan Council along with the support of HDR completed a study on the groundwater supply within the Northwest Metro regional area (*Regional Water Supply, Enhanced Groundwater Recharge, and Stormwater Capture and Reuse Study (Northwest Metro Study Area) Report*, December 2016). The study was one of several studies to support an update to the Twin Cities Metropolitan Area Master Water Supply Plan (Minn. Stat., Sec. 473.1565) and other activities identified by the 2005 Minnesota Legislature to address water supply needs of the seven-county metro area. As part of these activities, the Metropolitan Council modeled the existing source water aquifers to evaluate current and future drawdown of the aquifers and discussed the potential for using alternative water sources or increasing water recharge to the source water aquifers.
The 2016 study concluded that the existing source water aquifers are expected to see an increase in drawdown at existing municipal well sites under the predicted 2040 water demand. Areas within the Northwest Metro area could see drawdown in their bedrock aquifers between 10 - 40 feet. To compensate for the excessive drawdown, the report discusses the use of alternative water supplies such as surface water, stormwater reuse, and the potential for enhanced groundwater recharge.

Geology for The City of Ramsey
is from the Minnesota Geologic Survey Anoka County Atlas
Setterholm, Dale, R.. (2013). C-27 Geologic Atlas of Anoka County, Minnesota [Part A]. Minnesota Geological Survey.
Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/116119.

Geology for The City of Rogers, Corcoran, and Dayton
is from the Minnesota Geologic Survey Hennepin County Atlas
Steenberg, Julia R.; Bauer, Emily J; Chandler, V.W.; Retzler, Andrew J; Berthold, Angela J; Lively, Richard S. (2018). C-45, Geologic Atlas of Hennepin County, Minnesota. Minnesota Geological Survey. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/200919.

Anoka County

Hennepin County

Ramsey

Dayton

Rogers

Corcoran

169

10

94

494

Legend

Municipality Boundary

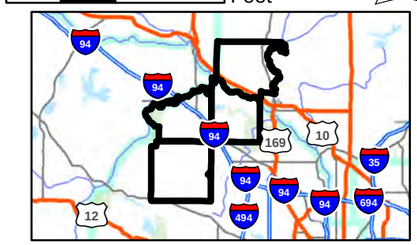
Anoka County Bedrock Geology

- Jordan Sandstone, Up. Camb.
- St. Lawrence Formation, Up. Camb.
- Tunnel City group,Up. Camb.
- Wonewoc Sandstone, Up. Camb.
- Eau Claire Formation, Mid. to Up. Camb.

Hennepin County Bedrock Geology

- Os, St. Peter Sandstone
- Cj, Jordan Sandstone
- Cs, St. Lawrence Fm
- Ctm, Tunnel City Grp, Mazomanie Fm
- Ctl, Tunnel City Grp, Lone Rock Fm
- Cw, Tunnel City Grp, Wonewoc Sandstone
- Ce, Eau Claire Fm

0 3,000 6,000 12,000
Feet



Bedrock Geology

Water Distribution Systems
Ramsey, Dayton, Rogers, and Corcoran

SEH

Project: MCES 150732
Print Date: 12/30/2019

Map by: Msherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi MnDOT, Minnesota Geologic Survey (MGS)

Figure 1

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Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/116119.

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Anoka County

Hennepin County

Ramsey

Dayton

Rogers

Corcoran

169

10

94

494

Legend

Municipality Boundary

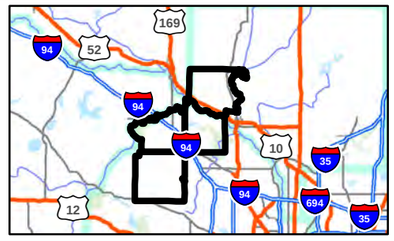
Thickness (ft) of the Tunnel City Aquifer

Value

185
165
145
125
110
90
70
55
35
15
0

0 3,000 6,000 12,000

Feet



Thickness of Tunnel City

Water Distribution Systems
Ramsey, Dayton, Rogers, and Corcoran

SEH

Project: MCES 150732

Print Date: 12/30/2019

Map by: Msherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi MnDOT, Minnesota Geologic Survey (MGS)

Figure 2

Path: S:\KOM\MCES\150732\5-final-dsn\51-drawings\90-GIS\Maps\GeobyReviewMetro_Regional_SplitFigure6.mxd

Geology for The City of Ramsey
is from the Minnesota Geologic Survey Anoka County Atlas
Setterholm, Dale, R.. (2013). C-27 Geologic Atlas of Anoka County, Minnesota [Part A]. Minnesota Geological Survey.
Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/116119.

Geology for The City of Rogers, Corcoran, and Dayton
is from the Minnesota Geologic Survey Hennepin County Atlas
Steenberg, Julia R.; Bauer, Emily J; Chandler, V.W.; Retzler, Andrew J; Berthold, Angela J; Lively, Richard S. (2018). C-45, Geologic Atlas of Hennepin County, Minnesota. Minnesota Geological Survey. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/200919.

Anoka County

Hennepin County

Ramsey

Dayton

Rogers

Corcoran

169

10

94

494

Legend

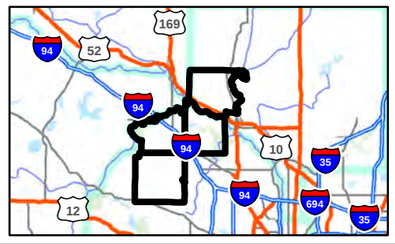
Municipality Boundary

Thickness of Wonewoc (ft)

195
170
155
135
115
100
75
60
40
20
0

0 3,000 6,000 12,000
Feet

N



Thickness of Wonewoc

Water Distribution Systems
Ramsey, Dayton, Rogers, and Corcoran

SEH

Project: MCES 150732
Print Date: 3/12/2020

Map by: Msherrill
Projection: UTM Zone 15N
Source: ESRI, SEH Digi MnDOT, Minnesota Geologic Survey (MGS)

Figure 3

Path: S:\KO\MMCES\150732\5-final-dsgn\51-drawings\90-GIS\Maps\Geology\Review\Metro_Regional_Split\Figure 2-6.mxd

Appendix C: Phased Regional Trunk Watermain Maps

HGL 1030

Highway Crossing

River Crossing

HGL 1060

Phase A1
24" Watermain

Phase A1
36" Watermain

Phase A1
24" Watermain

Phase A1
24" Watermain

HGL 1080

HGL 1110

Ramsey

Dayton

Rogers

WTP

Watermain

DIAMETER

- 4
- 6
- 8
- 10
- 12
- 16
- 24
- 36

- PRV
- Booster Station
- WTP Treatment Plant
- Pressure Boundary

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PHASE A1

Northwest Metro Area Regional Water Supply Study

Figure 1

HGL 1030

HGL 1060

HGL 1080

HGL 1110

Highway Crossing

Phase A2
24" Watermain

Phase A2
36" Watermain

Phase A2
24" Watermain

Phase A2
24" Watermain

River Crossing

WTP

Ramsey

Dayton

Rogers

Watermain

DIAMETER

- 4
- 6
- 8
- 10
- 12
- 16
- 24
- 36

WTP Treatment Plant

PRV

Pressure Boundary

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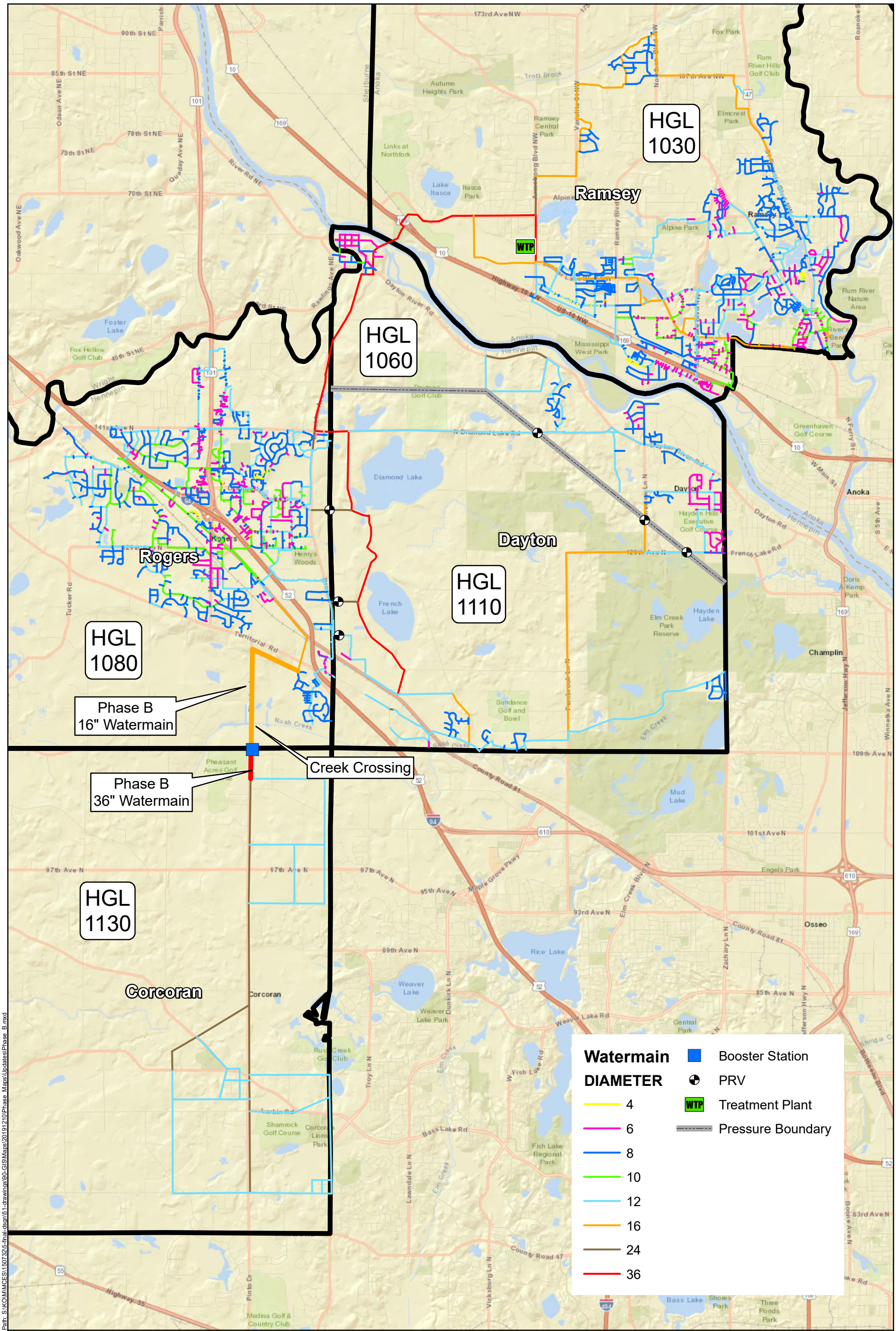
PHASE A2

Northwest Metro Area Regional
Water Supply Study

Figure
2



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PHASE B

Northwest Metro Area Regional Water Supply Study

Figure 3

HGL 1030

HGL 1060

HGL 1110

HGL 1080

HGL 1130

Ramsey

Dayton

Rogers

Corcoran

WTP

Phase C
36" Watermain

Highway Crossing

Creek Crossing

Watermain

DIAMETER

- 4
- 6
- 8
- 10
- 12
- 16
- 24
- 36

- PRV
- Booster Station
- WTP Treatment Plant
- Pressure Boundary

Path: S:\KOM\MCES\150732\5-final-dsgn\51-drawings\90-GIS\Maps\20191210\Phase_Maps\Updates\Phase_C.mxd

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PHASE C

Northwest Metro Area Regional Water Supply Study

Figure 4

HGL 1030

Ramsey

WTP

HGL 1060

HGL 1110

Dayton

Phase D1
36" Watermain

Rogers

HGL 1080

Phase D1
36" Watermain

HGL 1130

Corcoran

HGL 1160

Watermain
DIAMETER
- 4
- 6
- 8
- 10
- 12
- 16
- 24
- 36

- Booster Station
- PRV
- WTP Treatment Plant
- Pressure Boundary

Path: S:\KOM\MCES\150732\5-final-dsgn\51-drawings\90-GIS\Maps\20191210\Phase_Maps\Updates\Phase_D1.mxd

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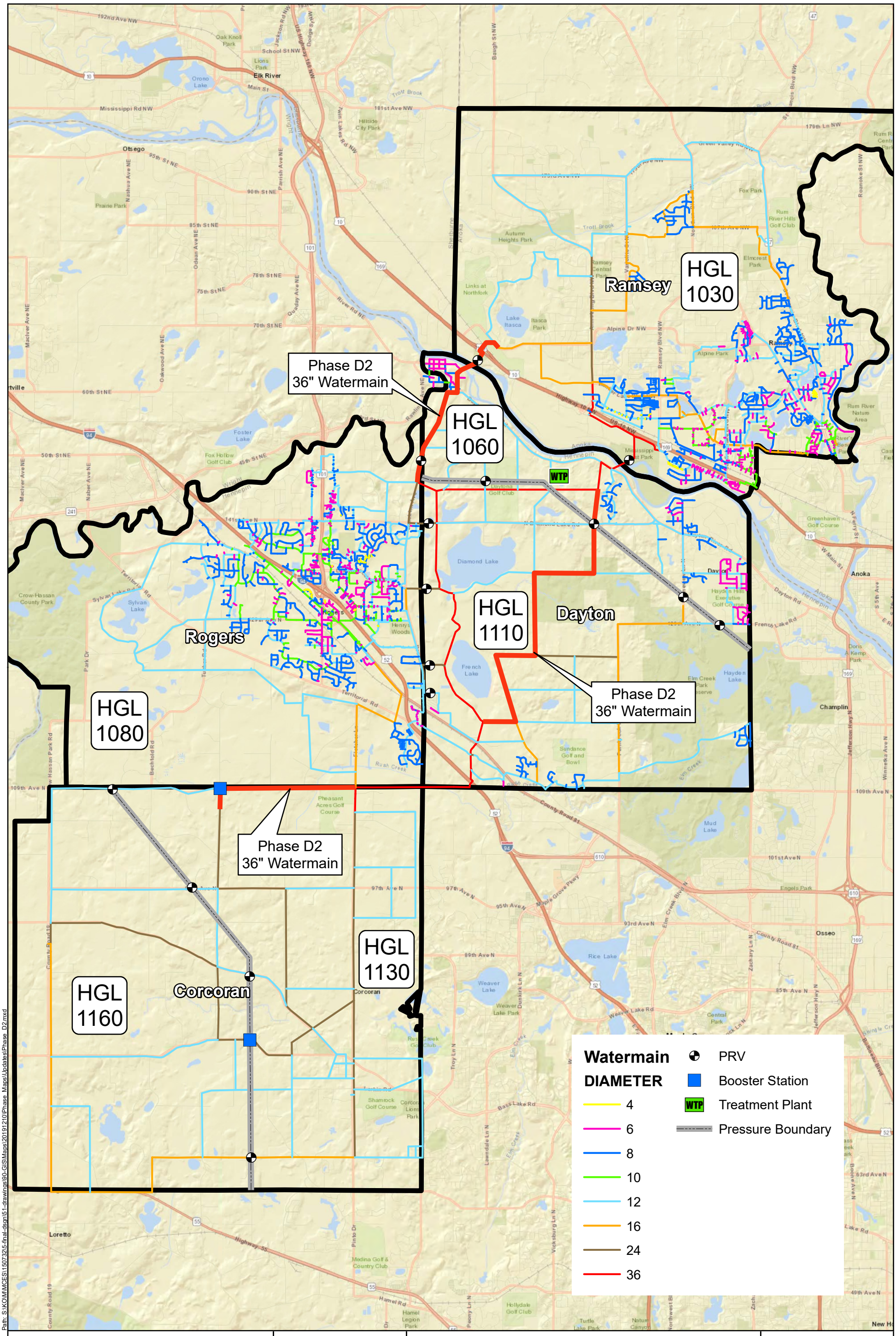
PHASE D1

Northwest Metro Area Regional
Water Supply Study

Figure
5



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Print Date: 3/12/2020

PHASE D2

Northwest Metro Area Regional Water Supply Study

Figure 6

Appendix D: Surface Water Treatment

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MEMORANDUM

TO: Chris Larson, PE

FROM: Simon McCormack

DATE: March 12, 2020

RE: Surface Water Treatment
SEH No. 150732 14.00

The Surface Water Treatment Rule was established in 1989 to protect public health from the pathogens Giardia lamblia and viruses. Following the original rule, additional rules have been established to further protect public health by addressing the pathogen Cryptosporidium, addressing risk trade-offs with disinfection and disinfection byproducts, and enhancing water system processes.

The rules apply to all water systems using surface water and together they act to limit the levels of pathogens (viruses, Giardia lamblia, and Cryptosporidium) and turbidity in the water, as well as ensure adequate disinfection of the water throughout the treatment process. Adequate disinfection throughout the treatment process is determined by conducting disinfection profiling where a system's microbial inactivation is calculated over 12 consecutive months.

The three pathogens targeted by the surface water treatment rules are regulated by required removal efficiencies called log removal. Surface water treatment processes must remove 99.99% (4-log) of viruses, 99.9% (3-log) of Giardia lamblia, and 99% (2-log) of Cryptosporidium. Further Cryptosporidium removal may be required if high concentrations are found through source water monitoring. Source water monitoring, which can be waived if the treatment processes achieve 5.5-log removal, requires 24 months of Cryptosporidium monitoring where the average Cryptosporidium concentration determines the bin classification and the additional removal requirements (see Table 4-1). Additional Cryptosporidium removal can be achieved through additional disinfection (e.g. UV), improved treatment processes, and other measures.

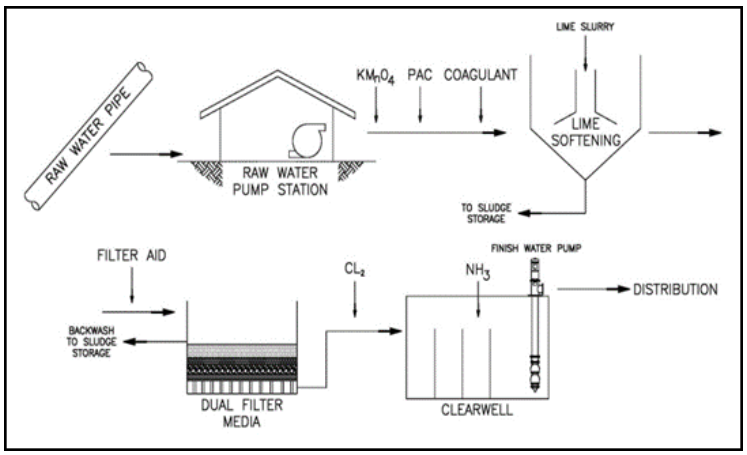
Along with those three pathogens, turbidity, a measure of the cloudiness of the water, is regulated as it serves as an indicator of the overall water quality and filter effectiveness, and because high turbidity levels are often associated with high pathogen levels. Turbidity must be reported each month from each individual filter's effluent (IFE), as well as the combined filter effluent (CFE). The CFE turbidity must be monitored and recorded every four hours and at least 95% of the turbidity measurements must be less than or equal to 0.3 NTU. MDH must be contacted if any measurement exceeds 1 NTU. The IFE turbidity must be monitored and recorded every 15 minutes and measurements exceeding 0.5 NTU must be investigated.

Table 1. Surface Water Treatment Rule Bin Classification

Bin Classification	Crypto Concentration (oocysts/L)	Additional Treatment Requirements for Systems with Conventional Treatment
1	< 0.075	No Additional Treatment
2	From 0.075 - < 1.0	1 log of Additional Treatment (90%)
3	From 1.0 - < 3.0	2 log of Additional Treatment (99%)
4	≥ 3.0	2.5 log of Additional Treatment (99.7%)

Treatment Processes

The preliminary treatment process proposed for a Northwest Metro surface WTP assumes that the surface water supply will be classified as Bin 1. If additional treatment is required, a future UV or chlorine dioxide addition process can be implemented to assist in meeting additional treatment requirements.



Process Train

As depicted in the process diagram, a potential process train to treat raw surface water from the Mississippi River includes raw water pumping, chemical addition, lime softening, filtration, chlorine contact, and finished water pumping. This process is very similar to other major surface water treatment plants in Minnesota including SPRWS, the City of Minneapolis, and the City of St. Cloud. The chemical addition includes potassium permanganate (KMnO4) for oxidation, powdered activated carbon (PAC) for taste and odor, and coagulant to help with floc production. SPRWS uses granular activated carbon (GAC) in their filters rather than PAC.

Coagulation/Flocculation and Lime Softening

In coagulation, a chemical such as alum is added to the water to encourage larger particles to form in the flocculation process. The flocculation and settling occur in the clarifier.

Hardness in water is primarily caused by calcium and magnesium ions (Ca^{2+} and Mg^{2+}). Hardness causes scaling on water fixtures, dishes, and appliances. Lime ($Ca(OH)_2$) is added to the raw water to raise the pH. When the pH is raised sufficiently, calcium and magnesium precipitates (solids) form and they are settled out of the water in clarifiers.

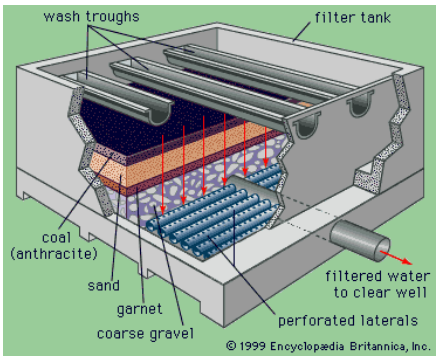
Lime from a silo or other storage method is fed into slakers which add water to the lime and the slurry is then fed into the raw water. The raw water and lime enter one of the clarifiers at the WTP where the softening process occurs and the sludge is removed from the water.

Recarbonation

The water from the clarifiers enters a recarbonation basin where carbon dioxide is bubbled into the water to lower the pH. This process stabilizes the water and prevents additional precipitation. The pH of the water in this process is lowered from approximately 11 to 9.

Conventional Filtration (Conv)

Conventional filtration is considered for its benefits in reduction of suspended particulates. Typical conventional filters used in water treatment are rapid, deep bed, dual media, gravity filters that utilize layers of both sand and anthracite for media. Typical depths are 12” sand and 12”-24” anthracite. The particulates removed in conventional filtration include microbial contaminants, turbidity, trihalomethane (THM) precursors, as well as those precipitates formed in pretreatment processes.



Chlorine Contact

After filtration, chlorine is added and the water enters a chlorine contact basin. The chlorine contact basin is provided to allow time for the chlorine to inactivate Giardia and viruses. The amount of time and chlorine concentrations are dictated by the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

In addition to chlorine, fluoride is added to the water for dental health, and corrosion inhibitor is added to the water for corrosion control. After the chlorine contact basin, the treated water is pumped into the drinking water distribution system.

Appendix E: Water Treatment Plant Layouts

A MAIN LEVEL PLAN

0 8 16 32

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STATE OF MINNESOTA.

DATE 10-08-2019 LICENSE NO.

NW METRO REGIONAL WATER SUPPLY STUDY

MARK	DATE	DESCRIPTION
	10/19/2015	RECORD PLAN

REVISIONS

FILE NO.	MCES150732
CITY PROJECT NO.	2012-108
ISSUE DATE	10-08-2019
DESIGNED BY	XXX
DRAWN BY	XXX

Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
25 MGD SURFACE WATER TREATMENT PLANT

SHEET
P1

1/22/2020 3:33:49 PM

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A MAIN LEVEL PLAN

0 8 16 32

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	10/19/2015	RECORD PLAN

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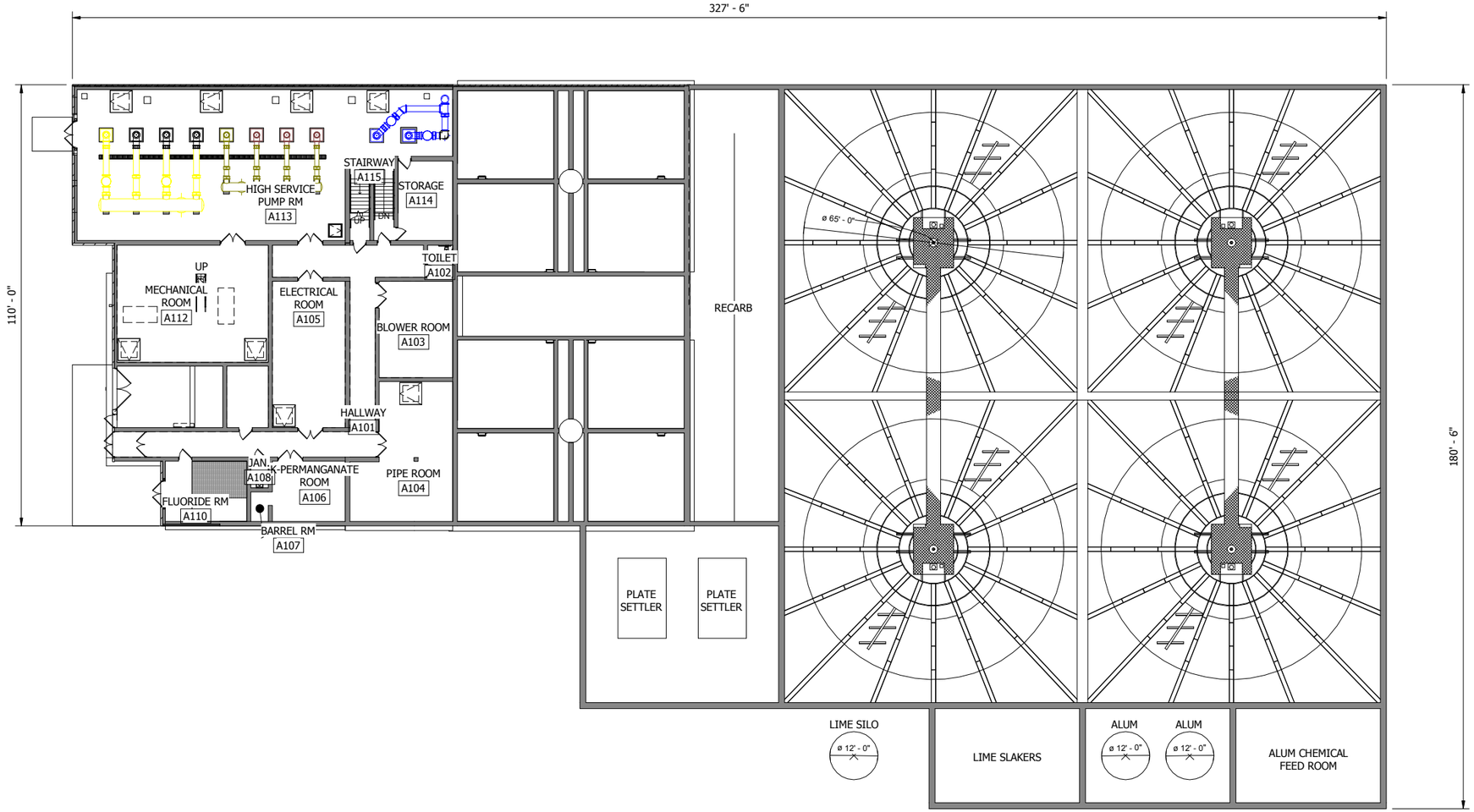
CITY PROJECT NO.	2012-108
ISSUE DATE	10-08-2019
DESIGNED BY	XXX
DRAWN BY	XXX

SHEET TITLE
25 MGD GROUNDWATER LIME SOFTENING WTP

SHEET
P2



A MAIN LEVEL PLAN

0 8 16 32

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STATE OF MINNESOTA.

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NW METRO REGIONAL WATER SUPPLY STUDY

MARK	DATE	DESCRIPTION
	10/19/2015	RECORD PLAN

REVISIONS

FILE NO. MCES150732
CITY PROJECT NO. 2012-108
ISSUE DATE 10-08-2019
DESIGNED BY XXX
DRAWN BY XXX

SHEET TITLE
12 MGD CONJUNCTIVE USE WTP

SHEET
P3

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Saint Paul, MN 55101-1805

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TTY 651.291.0904
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MEMORANDUM

TO: Ali Elhassan, PE, PhD, MCES
Emily Steinweg, MCES

FROM: Christopher Larson, SEH

DATE: September 17, 2020

RE: Potential Next Steps Study Examples
NW Metro Regional Water Supply System Study

A preliminary draft of the *Northwest Metro Area Regional Water Supply System Study* (Northwest Metro Study) was issued in March 2020. The report evaluated various water supply options for the Cities of Ramsey, Rogers, Dayton, and Corcoran; primarily looking at combining the Cities into a single water system and providing them with treated surface water or lime softened groundwater. The costs of connecting all four cities to a central water treatment plant is significant. The purpose of this memo is a preliminary evaluation of options that would reduce the initial capital costs. A way to reduce costs would be to reduce the trunk watermain necessary by not connecting all four cities and picking cities that are in close proximity to each other. The following sections identify two potential reduced scale options.

Option 1 – Connect Ramsey, Rogers, and Dayton – Phase 1
For Option 1, it is assumed that the water treatment plant that is going to be constructed in Ramsey is converted to a surface water treatment plant. The 2040 maximum day demands for the three cities is estimated to be 18.5 MGD.

Phase 1 of Option 1 would include a 20 MGD surface WTP in Ramsey, a river crossing, and approximately 4.5 miles of 36" trunk watermain. This scenario is depicted on Figure 1 (attached). The concept level costs for Option 1 are included on the following table.

Item	Quantity	Units	Unit Cost	Total Cost
20 MGD Surface WTP	1	Lump Sum	$60,000,000	$60,000,000
River Intake	1	Lump Sum	$2,000,000	$2,000,000
36" Raw Watermain	22,000	Feet	$500	$11,000,000
River Crossing	2,000	Feet	$4,000	$8,000,000
Easements/ Land Acquisitions	10	Acres	$100,000	$1,000,000
Environmental	6	Miles	$50,000	$300,000
			Subtotal	**$82,300,000**
			Contingency (30%)	$24,700,000
			Eng/Admin/Legal (20%)	$16,500,000
			Total	**$123,500,000**

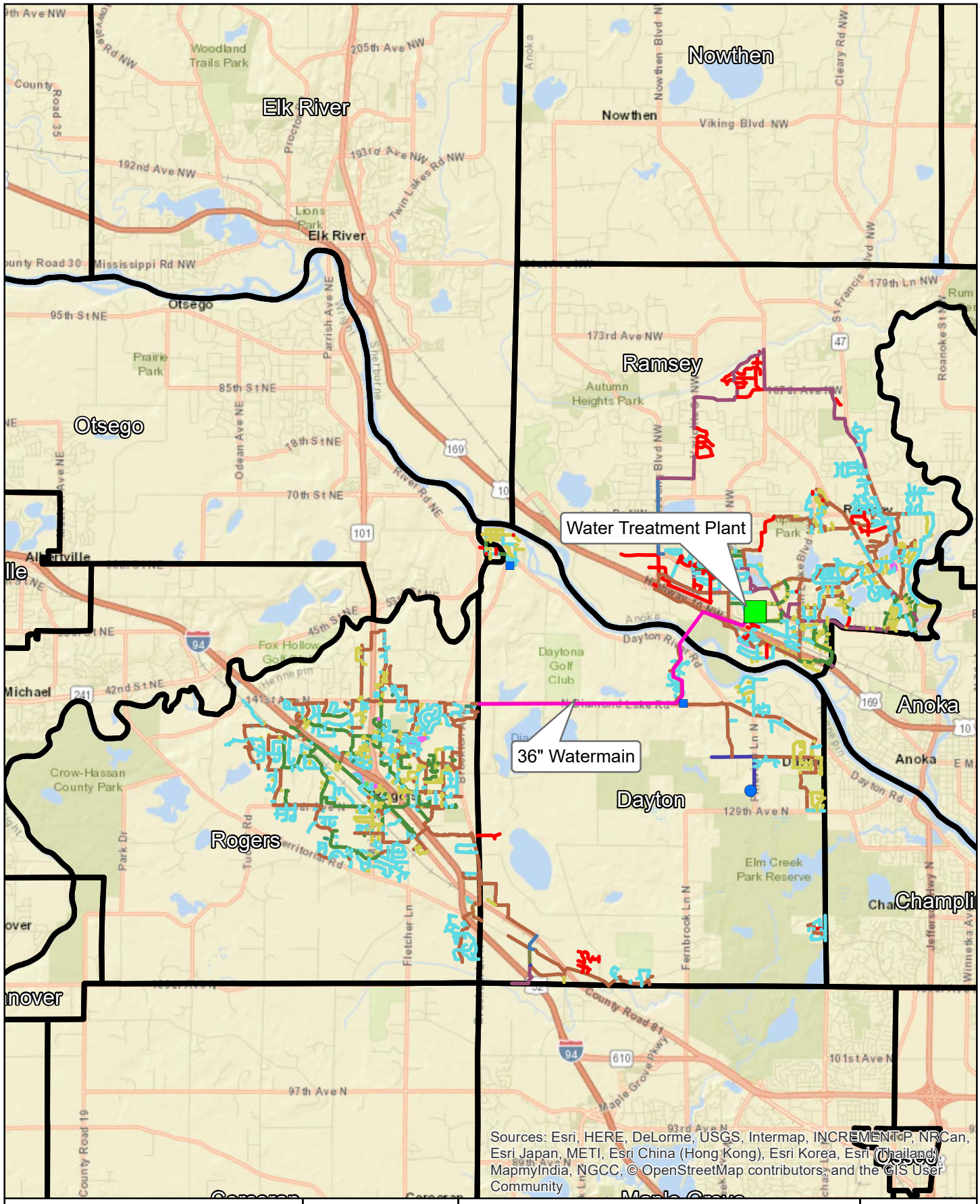
A risk of this scenario is that there is only one river crossing, however, Rogers has 7 wells and Dayton will have 4 wells soon which could be used in the event of an emergency. For comparison purposes, Approach 1 in the Draft NW Metro report which was a 25 MGD surface WTP connecting the four Cities was **$224 million**.

Option 2 – Connect Dayton and Rogers – Phase 1
Option 2 assumes that a surface water treatment plant is constructed in Dayton and serves the Cities of Dayton and Rogers. The 2040 maximum day demands for the two cities is estimated to be 8 MGD.

Phase 1 of Option 2 would include a 10 MGD surface WTP in Dayton and approximately 2.7 miles of 24" trunk watermain. This scenario is depicted on Figure 2 (attached). The concept level costs for Option 1 are included on the following table.

Item	Quantity	Units	Unit Cost	Total Cost
10 MGD Surface WTP	1	Lump Sum	$42,000,000	$42,000,000
River Intake	1	Lump Sum	$2,000,000	$2,000,000
24" Raw Watermain	14,000	Feet	$400	$5,600,000
Easements/ Land Acquisitions	10	Acres	$100,000	$1,000,000
Environmental	4	Miles	$50,000	$300,000
			Subtotal	**$50,900,000**
			Contingency (30%)	$15,300,000
			Eng/Admin/Legal (20%)	$10,200,000
			Total	**$76,400,000**

Future Phases
The intent with a smaller scale initial NW Metro water supply project is that it could expanded to add additional communities in the future. Interim watermain connections could also be made prior to making 2040 or ultimate demand connections. An example of an interim connection would be to connect Corcoran to the Rogers distribution system as discussed in the draft Northwest Metro Study.



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

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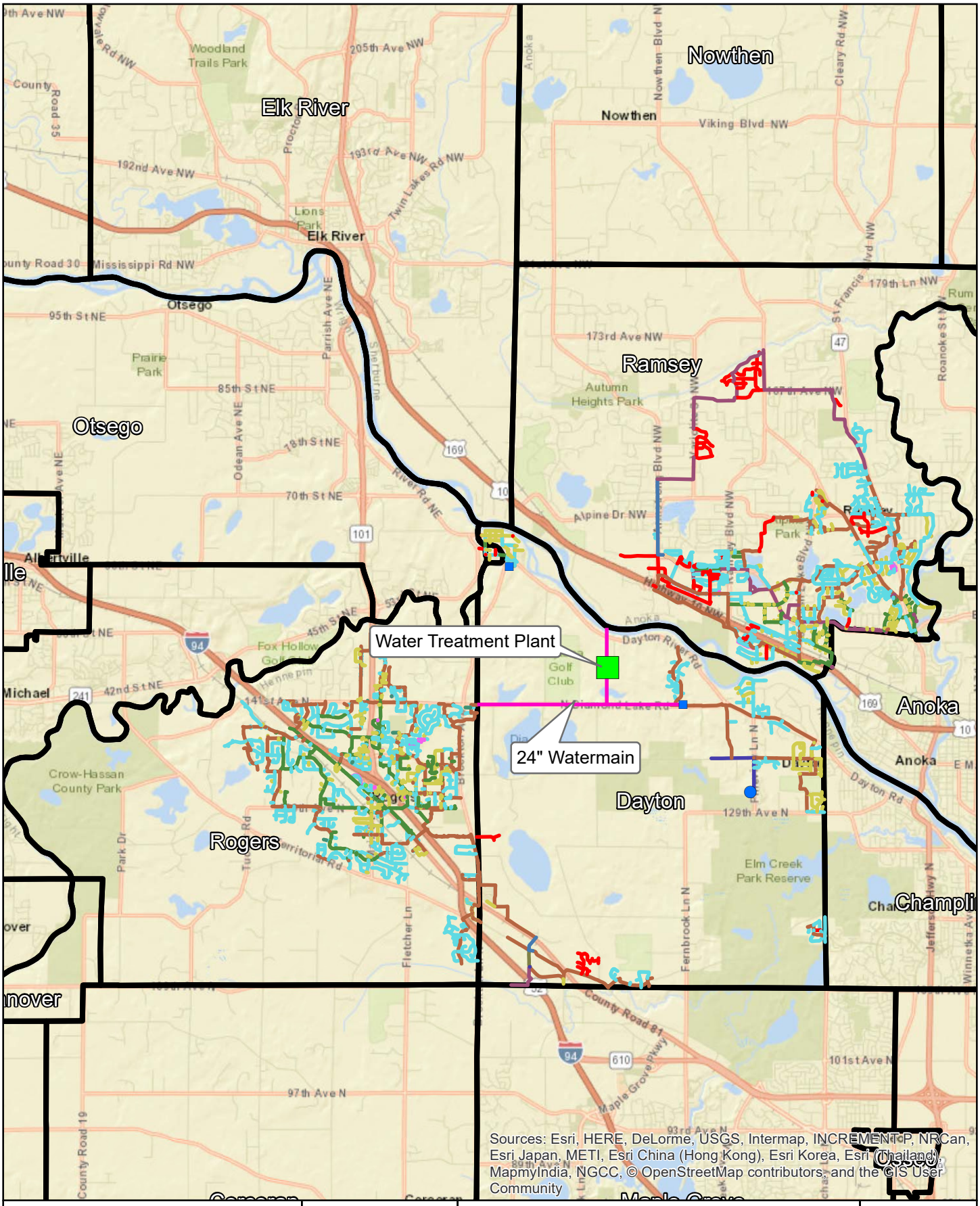
NEXT STEPS - OPTION 1

Connect Rogers, Ramsey, and Dayton

Figure 1



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NEXT STEPS - OPTION 2

Connect Rogers and Dayton

Figure 2

Public Works Committee **6. 3.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Receive Staff Updates on Improvement Projects, Studies and Items of Interest

Purpose/Background:

The purpose of this case is to update the Public Works Committee on current and proposed City, County and MnDOT improvement projects and studies, and on other items of interest to the Committee.

City Improvement Projects

- **Wetland 114P Outlet Control Improvements (#19-07)**
  - Work requested by Minnesota DNR
  - Construction proposed for 2022
- **Riverdale Drive Reconstruction – Feldspar St. to Sunfish Lake Blvd. (#21-00)**
  - Construction substantially complete
  - Final payment 2022
- **2022 PMP project updates**
- **Tiger Street Reconstruction (#21-02)**
  - Construction substantially complete
  - Final payment 2022
- **Business Park 95 Street Reconstructions (#21-03)**
  - Construction substantially complete
  - Final payment 2022
- **2021 Neighborhood Pavement Overlay Improvements (#21-04)**
  - Construction substantially complete
  - Final payment 2021/22
- **2021 MSA Pavement Overlay Improvements (#21-05)**
  - Construction substantially complete
  - Final payment 2021/22
- **2021 Crack Seal Improvements (#21-06)**
  - Construction complete
  - Final payment 2021
- **2021 WTP Trunk Watermain Improvements (#21-08)**
  - Plans complete (SEH, Inc.)
  - Construction originally proposed for summer/fall 2021
  - SEH recommends fall 2021 bids, spring 2022 construction
  - ***CC to consider authorizing Ads for Bids October 26, 2021***
- **2021 Water Treatment Plant (#21-09)**
  - Design 2021/22
  - Construction proposed 2022/23
- **2021 Additional Pavement Overlay Improvements (#21-12)**
  - Construction substantially complete

Anoka County Improvement Projects

- **Roundabout at Armstrong Boulevard/CSAH 83 and Alpine Drive**
  - Anoka County received $1.35M in HSIP funds (est. project cost = $1.5M)

- Anoka County and City of Ramsey share is $150,000 each (per $1.5M est.)
- Construction proposed for 2023, pending City & County approvals
- Anoka County presented project at July 27 City Council work session
- Anoka County is preparing preliminary plans

- **CSAH 116 Interim Improvements**
  - Adding right turn lane on Sunwood Dr west of Bunker Lk Blvd
  - Forest Lake Contracting awarded contract
  - Construction in progress
- **CSAH 116 & TH 47 Intersection Improvements**
  - Construction completion anticipated fall 2021

MnDOT Improvement Projects

- **US 10 / 169 & Ferry Street / TH 47 Interchange**
  - Construction proposed 2022 – 2023
- **Ferry Street / Trunk Highway 47 Grade Separation @ BNSF Rail Crossing**
  - Preliminary design on hold
  - MnDOT exploring realignment of Highway 47 to remove S-curve
  - $45M in bonds authorized October 2020
  - Tentatively proposed for construction in 2024 or later **–** ***Update attached***
- **Rum River Bridge Replacement**
  - Construction proposed 2022 – 2023
  - Proposing three lanes between Highway 47 and 7th Street

Studies & Items of Interest

- **5805 148th Lane NW**
  - On regular agenda
- **Anoka Solution Highway 10 Improvements**
  - Construction proposed 2022 – 2023
- **Ramsey Gateway Highway 10 Improvements**
  - Preliminary design in progress
  - Fully funded
- **Reduced Speed Limits on Local Streets**
  - No new requests received since last discussed
  - Staff continues to monitor actions in other cities

Timeframe:

Staff estimates up to 10 minutes will be needed for updates and discussion.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

N/A

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

No file(s) attached.

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	10/14/2021 04:08 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 04:12 PM
Form Started By: Bruce Westby		Started On: 10/05/2021 12:11 PM
Final Approval Date: 10/14/2021		

Public Works Committee **6. 4.**

Meeting Date: 10/19/2021

By: Bruce Westby, Engineering/Public Works

Title:

Review Future Topics Calendar

Purpose/Background:

Attached is a calendar of future topics for review and discussion by the Public Works Committee. The calendar includes topics drawn from Committee requests received during meetings and/or unresolved topics previously discussed by the Committee. Calendar dates are subject to change based on the availability of information and required attendees, staff workload, and competing interests and objectives.

Timeframe:

Staff estimates less than 5 minutes will be necessary to review the future topics calendar and address questions.

Observations/Alternatives:

N/A

Funding Source:

N/A

Recommendation:

Staff recommends reviewing the attached calendar and to either approve the calendar by consensus or to direct Staff to revise the calendar as follows; _____.

Action:

No formal action required. For Committee review and discussion purposes only.

Attachments

PWC Calendar Oct2021

Form Review

Inbox	Reviewed By	Date
Grant Riemer	MaryJo Warner	10/14/2021 04:24 PM
Kurt Ulrich	Kurt Ulrich	10/14/2021 04:27 PM
Form Started By: Bruce Westby		Started On: 10/05/2021 12:12 PM
Final Approval Date: 10/14/2021		

Public Works Committee Future Topics Calendar *

Date	Topics for Discussion – Committee Action
January 2022	Sunfish Lake Sedimentation Basin Improvements *(Westby)*
January 2022	Available Funding Assistance for Wet Basement Repairs *(Westby)*
Future/TBD	Sunwood Drive Roundabout Landscaping *(Riemer)*
Date	**Topics for Discussion – Regulatory**
Future/TBD	Sunfish Lake Boulevard Speed Study Results *(Westby)*
Future/TBD	Bunker Lake Boulevard Speed Study Results *(Westby)*
Future/TBD	County Ditch Maintenance / Buffer Law *(Westby)*
Date	**Topics for Discussion – Policy**
Future/TBD	Landscaped Median Maintenance Policy *(Riemer)*
November 2021	Draft Trail Maintenance Policy *(Westby)*
November 2021	Draft Stormwater Pond Maintenance Policy *(Westby)*
Date	**Topics for Discussion – Planning and Budget**
November 2021	Municipal State Aid System (MSAS) Revisions (Westby)
February 2022	Review 1996 and 2007 (unadopted) TH 47 Corridor Studies *(Westby)*
Future/TBD	Asset Management Program *(Westby)*
~~*October 2021*~~	~~*Yellow Flashing Arrows/Traffic Signals (NEW)*~~
Date	**Topics for Discussion – Staff Updates**
Ongoing	Water Conservation Opportunities / Incentives *(Westby)*
~~October 2021~~	~~NW Metro Area Regional Surface Water Supply Study *(Westby)*~~
November 2021	TH 47 Safety Study *(Westby)*
~~*Ongoing*~~	~~*NW Metro Mississippi River Crossing Feasibility Analysis (Westby)*~~

* Dates subject to change based on availability of information, required attendees, staff workload, and competing interests and objectives.