RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

January 2023
Board Packet

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Agenda

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Regular Board Meeting Agenda

Wednesday, January 4, 2023
6:30 PM

This month's meeting will be held at the District office (2665 Noel Drive, Little Canada, MN) but also via the video conferencing platform Zoom. Board members, staff, consultants, and general public will be able to join in person OR via video and/or phone. In order to continue to be sensitive to the COVID-19 pandemic, we may need to limit the number of public in the board room. The public will be able to listen to meeting but not participate with the exception of the visitor comments portion of the agenda. Instructions for joining in on the Zoom meeting can be found after the agenda.

1. Call to Order – 6:30 PM
2. **Approval of Agenda *(pg. 3)***
3. **Consent Agenda: To all be approved with one motion unless removed from consent agenda for discussion.**
    - A. Approval of Regular Meeting Minutes December 7, 2022 *(pg. 7)*
    - B. Treasurer's Report and Bill List *(pg. 17)*
    - C. Permit Program
        - i. 23-01 Phalen Village – Maryland/Prosperity, St. Paul *(pg. 26)*
4. Visitor Comments (limited to 4 minutes each)
5. Permit Program
    - A. Applications – See Consent Agenda
    - B. Enforcement Action Report *(pg. 31)*
    - C. 2022 Permit Program Summary *(pg. 33)*
6. Stewardship Grant Program
    - A. Applications – None
    - B. Budget Status Update *(pg. 35)*
7. Action Items - NONE
8. Attorney Report
9. Board Issues, Policies and Operation (for discussion at meeting)
    - A. Board Action Log: Additions, deletions
    - B. Adopt-A-Drain Incentives
10. New Reports and/or Presentations
    - A. Flood Risk Reduction Feasibility Studies
        - i. Phalen Village *(pg. 37)*
        - ii. Ames Lake *(pg. 52)*
        - iii. County Ditch 17 *(pg. 59)*
    - B. Lake Emily Targeted Retrofit Projects *(pg. 91)*
    - C. Double Driveway Pond and Fish Creek Improvements Scope Summary *(pg. 103)*
11. Administrator's Report *(pg. 109)*
    - A. Meetings Attended
    - B. Upcoming Meetings and Dates
    - C. Ongoing Project Updates

(651) 792-7950
fax (651) 792-7951
office@rwmwd.org
rwmwd.org
2665 Noel Drive
Little Canada, MN 55117

12. Project and Program Status Reports *(pg. 111)*

Project Feasibility Studies

A. Interim Emergency Response Planning
B. Kohlman Creek Flood Risk Feasibility Study
C. Kohlman Creek/Wakefield Lake Diversion Feasibility Study
D. County Ditch 17 Improvements Feasibility Study
E. Phalen Village Feasibility Study
F. Ames Lake Area Flood Risk Reduction Planning Study
G. Owasso Basin/North Star Estates Improvements
H. Double Driveway Pond Optimization Study
I. Carver Ponds Improvement Study
J. South Metro Mississippi River TSS TMDL

Research Projects

K. Kohlman Permeable Weir Test System
L. Shallow Lake Aeration Study

Capital Improvements

M. Target Store Stormwater Retrofit Projects
N. Targeted Retrofit Projects
O. Stewardship Grant Program Support
P. Lake Emily Subwatershed Regional BMP
Q. Pioneer Park Stormwater Reuse

CIP Project Repair and Maintenance

R. Beltline and Battle Creek Inspection
S. 2023 CIP Maintenance and Repair Project

Program Updates

T. Natural Resources Program
U. Public Involvement and Education Program
V. Communications Program and Website
W. Citizen Advisory Committee Program

13. Manager Comments and Next Month's Meeting
    A. Board Action Log *(pg. 130)*

14. Adjourn

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

NOTICE OF BOARD MEETING
Wednesday, January 4, 2023
6:30 PM
Hybrid Meeting: In-Person and Web Conference

This month's meeting will be held at the District office (2665 Noel Drive, Little Canada, MN) AND via the video conferencing platform Zoom. Board members, staff, consultants, and general public will be able to join in person or via Zoom. In order to continue to be sensitive to the COVID-19 pandemic, we may need to limit the number of public in the board room area. The public will be able to listen to meeting but not participate with the exception of the visitor comments portion of the agenda. Visitor comment may be given in person or via Zoom. Instructions for joining in on the Zoom meeting can be found below.

To access the meeting via webcast, please use this link: https://us02web.zoom.us/j/88345574150?pwd=MmFGT1pHRFZFR29UZmZrMThsUXVHQT09

The meeting room will open at 6:20 pm with the meeting starting at 6:30 pm. To connect to audio you may choose to use your computer audio options or you may use your mobile device to call. The phone access number is **(312) 626-6799**. The Meeting ID is **883 4557 4150**. The meeting password is **536592**. If you have any questions, please contact Tina Carstens at tina.carstens@rwmwd.org.

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Consent Agenda

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Ramsey-Washington Metro Watershed District
Minutes of Regular Board Meeting
December 7, 2022

The Regular Meeting of December 7, 2022 was held at the District Office Board Room, 2665 Noel Drive, Little Canada, Minnesota, and via Zoom web conferencing, at 6:30 p.m. A video recording of the meeting can be found at https://youtu.be/HSMKIm_0lpM. Video time stamps included after each agenda item in minutes.

PRESENT:
Larry Swope, President
Dianne Ward, Vice President
Dr. Pam Skinner, Secretary
Val Eisele, Treasurer (virtual)
Matt Kramer, Manager

ABSENT:

ALSO PRESENT:
Tina Carstens, District Administrator
Tracey Galowitz, Attorney for District
Nicole Soderholm, Permit Inspector
Matt Doneux, Natural Resources Technician
Joe Tillotson, Natural Resources Intern
Paige Ahlborg, Project Manager
Michael McKinney, Barr Engineering
Erin Anderson Wenz, Barr Engineering
Dave Vlasin, Project Coordinator
Patrick Brama, Development Manager - Enclave Companies

1. CALL TO ORDER
The meeting was called to order by President Swope at 6:30 p.m.

2. APPROVAL OF AGENDA (00:20)
Motion: Manager Ward moved, Manager Skinner seconded, to approve the agenda as presented.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

3. CONSENT AGENDA (00:50)
A. Approval of Minutes from November 2, 2022
B. Treasurer's Report and Bill List
C. Permit Program
   i. 22-37 – RWMWD 2023 CIP Maintenance and Repair
D. 2023 BMP Service Agreement – Washington Conservation District
E. 2023 BMP Service Agreement – Ramsey County

Manager Ward requested to remove Item C.i. to be considered with Item 7A.

Motion: Manager Kramer moved, Manager Skinner seconded, to approve the consent agenda as amended.

Further discussion: President Swope referenced a payment to the Fish and Water Conservation Fund in the check list and asked for details. Paige Ahlborg provided details on that payment.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

4. VISITOR COMMENTS (3:36)

No comments.

5. PERMIT PROGRAM (4:20)

A. Applications

Permit #22-36: Enclave Apartments – Maplewood

Nicole Soderholm stated that the applicant is proposing to demolish the existing building on the site to construct apartments which would have both above and below ground storm water treatment. She stated that the application would include a variance for temporary wetland impacts. She stated that the deteriorating retaining wall would be removed, replaced with a larger retaining wall and the buffer would actually be restored.

President Swope commented that this seems to be a good development and he likes the work that will be done with the buffer and wetlands.

Manager Eisele commented that he likes the direction and asked for more details on the large range of potential impervious reduction as that is listed as eight to 36 percent. Nicole Soderholm explained that is not a range, noting that the existing condition is eight percent, and the new condition would be 36 percent which would result in a net increase of pervious area on the site.

Motion: Manager Ward moved, Manager Skinner seconded, to approve Permit #22-36.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

B. Monthly Enforcement Report

During November, 10 notices were sent to address: install/maintain perimeter control (3), implement temporary soil stabilization (2), install/maintain inlet protection (1), install/maintain construction entrance (1), install/maintain energy dissipation (1), clean out temporary sediment basin (1), and sweep streets (1).

6. STEWARDSHIP GRANT PROGRAM (9:16)

A. Applications - None

B. Budget Status Update

No comments.

C. 2022 Program Overview Presentation and 2023 Program Approval

Paige Ahlborg provided an overview of the 2022 stewardship grant program activity, project locations, and project allocation. She provided details on the 2022 BMP inspections and maintenance program. She highlighted the 2022 targeted retrofit projects. She stated that staff has begun planning for 2023 projects and identified the proposed 2023 priority subwatersheds. She noted that the Board will receive a presentation later on tonight's agenda related to the street sweeping study and potential assistance. She reviewed the proposed 2023 stewardship grant coverage and requested approval from the Board.

President Swope asked if BMP inspections are only done when there is a contract in place for maintenance. Paige Ahlborg replied that there are maintenance agreements in place for BMP projects and inspections occur within the length of that agreement. She stated that they are also inspecting the projects that have a maintenance grant to ensure proper maintenance is being completed by the contractor.

President Swope stated that perhaps some of the Master Water Stewards could review some of the older rain gardens and BMPs to review whether they are still working. Paige Ahlborg stated that idea has been discussed and noted that she could follow up to determine if that could be pursued.

Motion: Manager Ward moved, Manager Skinner seconded, to approve the 2023 Stewardship Grant Program with requested changes.

Further discussion: Tina Carstens asked and received confirmation that the motion would include all the requested action items with the exception of street sweeping which will be discussed separately on the agenda.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

Manager Ward asked how the residents amounts compare to other districts. Paige Ahlborg replied that some districts do not have maximums and instead use a calculation. She stated that the District is comparable to other local watersheds with the amount that is offered to residents.

Manager Eisele asked how residents would find out about the program, other than the website. Paige Ahlborg stated that the communications staff does work to market the program through its different communication streams and also through the member cities. She noted that when inspections or plantings are done, they have been using signage to increase interest from those that may pass by as well. Tina Carstens confirmed that there are available funds in the communications budget to market the different programs, including this program.

7. ACTION ITEMS (29:35)

A. 2023 CIP Maintenance and Repair Project Bid Review and Approval

Erin Anderson Wenz replied that bids were opened the previous day with eight bids received. The lowest responsible bidder was Miller Excavating Incorporated with a bid of $517,633.33. She stated that while the District has not worked with that contractor, Barr Engineering does have experience with the contractor through other clients and has received positive feedback and references.

Motion: Manager Skinner moved, Manager Kramer seconded, to accept the bids and award the 2023 CIP Maintenance and Repair Project to Miller Excavating, Inc., and direct staff to prepare and mail the notice of award, prepare the draft agreements, and review the required submittals.

Further discussion: President Swope asked for details on the scoring of the projects included in the scope. Dave Vlasin provided an example where only a portion of the project would require maintenance.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

Manager Ward noted that there is an item identified as needing maintenance and Ramsey County is going to complete that maintenance. She asked who would ensure that is completed. Erin Anderson Wenz replied that is the infrastructure of Ramsey County. Tina Carstens stated that the site was identified for maintenance and because it is Ramsey County property, Ramsey County has stated that they would complete the work. Dave Vlasin noted that Ramsey County is very responsive and noted that he would follow up to ensure it is completed.

Manager Ward also requested that a water level gauge be installed in Grass Lake to be monitored. Tina Carstens confirmed that they could follow up with Ramsey County to install a gauge in the spring.

C. Permit Program (Continued)

i. 22-37 – RWMWD 2023 CIP Maintenance and Repair

Motion: Manager Kramer moved, Manager Skinner seconded, to approve Permit 22-37.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

B. 2022 Targeted Retrofit Projects – Change Order No. 5

Erin Anderson Wenz noted that this change order pertains to an error that Barr made on the bid form that was not found until the project was underway and provided additional details.

Motion: Manager Skinner moved, Manager Kramer seconded, to approve Change Order No. 5.

Further discussion: President Swope asked the price of the change order and whether they are sure this would not happen again. Erin Anderson Wenz replied that the project is essentially complete with only plantings remaining.

She acknowledged that there were some bumps in this project and as a show of good faith, Barr Engineering will be deducting $20,000 from their costs because of the issues that occurred.

Manager Skinner noted that this is the first time in her tenure on the Board that she can recall an issue like this.

Manager Ward commented that she supports the change order and was surprised to see that Barr Engineering did not offer to contribute more in terms of reducing their cost. Erin Anderson Wenz commented that typically Barr Engineering does not pay for a change in construction costs if that represents the true cost of the project. She recognized that Barr Engineering should have known about the Saint Paul permitting requirements, therefore it seemed reasonable to deduct the cost for creating the change orders and any inefficiencies in the design preparation. She stated that the District has then paid for the acceptable design and the work necessary for the field requirements.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

C. 2023 Budget and Levy Final Approval – Resolution 22-02

Tina Carstens stated that her memorandum did highlight changes that were made to the budget since the last review and welcomed any questions from the Board.

Manager Ward stated that she compared the budget status report to this information, and it appeared that there were some areas that could have been decreased to provide a zero percent change in the budget and noted some of those areas she felt could have been decreased. Tina Carstens stated that she would have to look at each of those general fund line items to review. She noted that the capital improvement funds have been accurately reviewed to determine carryover which cannot accurately be seen from the budget status report. She noted that she reviewed the five-year period to identify trends and ensure that the line item is not unusually high or low for one year. She stated that she followed the direction from the Board at the previous review to aim for five percent. She stated that the budget and levy have to be approved and certified tonight in order to provide it to the county by the end of the year.

President Swope stated that he does not mind five percent. He stated that in reviewing other entities there is an average between four and eight percent. He stated that he would prefer to keep funds available to ensure the District is able to complete a project and has contingency funds.

Manager Ward stated that she would prefer to see zero but understands the direction was for five percent. She recognized that action would be needed.

Manager Skinner commented that could see both sides and does not feel strongly either way. She stated that she can support the budget and levy as proposed as the District continues to do good things with its money.

Manager Ward noted that staff has been working to refine the budget and credited staff with their hard work.

Motion: Manager Skinner moved, Manager Kramer seconded, to approve the proposed FY 2023 General Fund and CIP budgets and Adopt Resolution 22-02.

Further discussion: Manager Eisele stated that he does understand the point of Manager Ward but also understood that it seems the District is going to be more ambitious in the upcoming year and would want to ensure the funds are available. He noted that he feels that this marginal increase will be well used.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

8. ATTORNEY REPORT (56:29)

Tracey Galowitz reviewed the work legal staff has done for the District in the past month. She noted that she had a great conversation with Erin Anderson Wenz about the previously discussed project. She felt that it was great for Barr to come forward and ensure no added fees resulted to the District as a result. She felt that Barr handled that issue very well and thanked Erin Anderson Wenz for reaching out to her.

Manager Ward asked if there is a legislative update related to the ability to hold hybrid meetings. Tracey Galowitz replied that she did not have an update at this time. Tina Carstens noted that there was a resolution that was presented at the MAWD annual meeting which failed to move forward. That resolution would have allowed managers to attend online for an unlimited amount of meetings. She stated that there is still a resolution of support from MAWD that was adopted the previous year that would allow hybrid attendance for up to three meetings per year.

9. BOARD ISSUES, POLICIES, AND OPERATION (FOR DISCUSSION AT MEETING) (1:04:00)

A. Board Action Log: Additions, deletions

Manager Ward noted that Ramsey County has a different definition of equity and underserved areas and would like to review the differences to determine if any changes should be made. She stated that perhaps that is added to the list for 2023. Paige Ahlborg noted that staff also noted that and confirmed that she would be reviewing that.

10. NEW REPORTS AND/OR PRESENTATIONS (1:05:35)

A. Street Sweeping Prioritization Study

Michael McKinney, Barr Engineering, provided background including the impetus for the study. He provided an overview of the street sweeping prioritization study including the project outline, street sweeping survey, and a summary of the existing operations. He reviewed the street sweeping evaluation including the baseline sweeping recommendation for one spring sweeping, one summer sweeping and two to three fall sweepings. He stated that they then developed street sweeping prioritization strategies and displayed a map which ranks the different prioritization areas. He stated that funding was provided from the District to the City of Woodbury to complete enhanced street sweeping in 2022 while the study was being completed. He stated that Woodbury sent their data from the enhanced street sweeping and reviewed that data with the Board noting that this was a very cost-effective use of funds for phosphorus removal. He explained how this could be incorporated into the stewardship grant program and reviewed key elements that they would like Board input on. He also explained how the baseline recommendation could be used.

Manager Eisele noted that five of the nine cities sweep under the baseline recommendation and asked if staff has reached out to determine if the cities could even reach that baseline. Michael McKinney stated that he does have different approaches to reach out to the member cities in the next steps. He noted that one of the questions will be whether the city believes it could reach the baseline with the equipment it has available. He stated that Woodbury contracted for the service and that would be an option for cities as well.

Manager Skinner commented that about 25 years ago they were doing recommendations in Oakdale and at that time there was a difference in the type of sweeper and asked if that was considered. Michael McKinney confirmed that was a focus in the beginning of the study, noting that they did ask the cities the types of sweepers they were using. He provided more information on the different types of sweepers and noted that the most effective method would be a tandem approach, using one type of sweeper followed by the other but recognized that is not always feasible. He stated that because there is not a huge difference between the two types of sweepers that was not taken into further account for this study. He confirmed that information on the study will be provided to the cities that mentions that tandem sweeping is the most efficient method.

Manager Ward asked if the information to the cities would include the impaired water bodies within the city boundaries to assist in showing the potential benefit to the city. Michael McKinney replied that they are still working to develop the draft that would be shared with the cities and were contemplating inclusion of prioritization areas within the city. He noted that it could be helpful to show the prioritization by sweeping zones within the communities, as most communities have street sweeping zones that assist in their planning. He recognized that cities are not always able to complete all the sweeping attempts in all zones, but the information could be helpful as cities could focus more on ensuring that the sweeping is completed in those higher priority zones.

Manager Ward commented on the importance of sharing educational information with the cities, as some cities would need to increase their street sweeping budget in order to meet that baseline recommendation. She asked if this study would cover the needs of the District or whether a second phase of the study would be recommended. Michael McKinney commented that this study did a good job of accomplishing the goals to identify the high priority street sweeping areas and identifying the baseline recommendation. He stated that if the stewardship grant program is enacted and all cities are brought up to the baseline recommendation, perhaps further analysis could be needed to determine if there would be benefit in increasing that.

Michael McKinney reviewed suggestions on how street sweeping could potentially be incorporated into the stewardship grant program through either targeted or application-based approaches. He noted that because funding was not specifically identified for street sweeping through that program in 2023 perhaps the District begin with a targeted implementation strategy which could segue into an application-based strategy.

Manager Eisele stated that he likes the idea of doing a staged approach and asked if there would be an initial step that could help offer grants to get cities closer to the baseline. Michael McKinney confirmed that would be the recommended approach and noted that he does have a ranking strategy to rank the cities that have the highest prioritization areas and where the most benefit could be gained.

Manager Skinner asked if there has been thought about equity. Michael McKinney confirmed that equity has been part of the discussion in prioritization. He noted that identifying the high priority areas in the District do provide equity without other considerations, such as the number of sweeps a city is completing each year. He noted that there is a real consideration for cities that perhaps are only completing two sweeps per year and the benefit that would be gained through getting that city up to the baseline recommendation whereas another city that is already exceeding the baseline recommendation may not have the same amount of return on additional sweeping.

President Swope asked how much money would be needed for this type of program and asked why it would be combined into the stewardship grant program instead of creating a separate program. He did not believe that funds had been limited within that program before, using the example of raingardens and that there is not a cap on the number of raingardens that could be created through that fund. Tina Carstens stated that they have earmarked funds within that program in the past, using the example of targeted retrofit projects and noted that eventually grew into its own program. Paige Ahlborg noted that public art is another example and also has a cap of $50,000 a year. She noted that they were not yet to the point in the study to budget for this purpose in 2023. She

stated that there was approximately $125,000 in carryover from 2022 and perhaps that is set aside for this purpose and then they could plan to budget for it in the future.

Michael McKinney provided a few of the different strategies that could be used to develop a targeted approach. He also provided different things to consider when determining the funds that could be contributed towards enhanced sweeping efforts. He provided an example scenario of what it could cost for the city of Little Canada to reach the baseline recommendation and confirmed in that scenario the street sweeping was calculated for the entire city and not just the priority areas. He noted that if that were reduced to the priority areas, the cost would be reduced.

Tina Carstens noted a discussion that occurred after the presentation at the MAWD conference regarding "putting a bounty on phosphorus" which would essentially pay the city for the amount of phosphorus they remove through their street sweeping activities. Michael McKinney commented that is an interesting approach but noted that city may not have a good estimate of the current removal rates and therefore would have a hard time making those estimates. He noted that cities may need support to get that process started and determine what could be gained through reaching the baseline. He stated that he does like an incentivized approach, but his only concern would be with the planning perspective of the city to ensure that the math would work to make that investment. He stated that could be an interesting study, in how that amount could be set. He stated that a city could have difficulty in determining how that would work without completing an enhanced street sweeping for one year.

Manager Ward commented that this would be a macro strategy such as a targeted retrofit compared to a micro strategy such as a rain garden. She asked if there has been consideration of providing a stipend for people that adopt drains, as that is a small action that also helps to keep the material out of the storm drains at a much lesser cost. Michael McKinney confirmed that implementation of an adopt-a-drain program is mentioned in the study report as well. He stated that information can help a city target areas where people have not adopted drains. He stated that in his experience the adopt-a-drain program is typically done as a good Samaritan program but that is an interesting concept to incentivize that. Paige Ahlborg stated that staff has access to the adopt-a-drain program within the district. Tina Carstens commented that not everyone reports their removal rates, and it could be interesting to consider monetizing that.

Manager Kramer commented that he found this to be a very useful report and perhaps it could be shared with other entities. Tina Carstens confirmed that they would be sharing the information. Erin Anderson Wenz commented that this is a hot topic in the water community.

President Swope asked what the desired action of the board is at this time. He asked whether the intent would be to earmark funds within the stewardship grant program. He noted that if that were done, it could take funds away from other eligible projects and he believed that it should be budgeted separately. Tina Carstens recommended that the carryover from the 2022 stewardship grant program of $128,000 be used for a targeted approach to offer this to the cities. She noted that they could then use that data to evaluate the program to determine if funding would be appropriate for 2024.

President Swope stated that he would prefer to keep the $128,000 separate from the stewardship grant program and use the funds to determine how it could best be used and if there is interest from the cities. Tina Carstens recognized that it is a recurring action, but it would be made clear that these funds are available on a one-time basis for 2023. She stated that most of the cities will not be able to add enhanced sweeping to their program and would have to contract out for the service.

Michael McKinney commented that in terms of tracking progress and determining if the program works, it might be helpful to require the cities to complete weights per truck for each sweeping.

Tina Carstens stated that if the Board is supportive of moving forward with a targeted approach, using the $128,000 from the stewardship grant program, staff would come back to the Board with that approach, the cities that would be targeted and the offers that would be proposed.

President Swope commented that he would encourage staff to work with the CAC to perhaps enhance the adopt-a-drain program as well. He noted that enhanced drain clearing could help to reduce the scope of street sweeping as well.

Manager Skinner noted that there would also be a benefit in education of the public.

Manager Ward noted that perhaps staff could do a press release on the study as that could help to increase interest by the cities.

Manager Eisele commented that when staff brings that proposal back, perhaps a communications strategy could also be included.

President Swope confirmed the consensus of the Board to direct staff to determine how to best use the $128,000 in a targeted approach for enhanced street sweeping and perhaps enhanced adopt-a-drain program as well. He commented that he does see that there would be benefit but the program could be hard to control.

Manager Eisele stated that he would like the opportunity to talk more in detail when this comes back as well.

President Swope stated that as this evolves the District will receive more input from the cities that can help guide this forward. He noted that this is a great idea but recognized that it is in the infant stage right now.

11. ADMINISTRATOR'S REPORT (2:32:57)

A. Meetings Attended

No comments.

B. Upcoming Meetings and Dates

Tina Carstens noted the upcoming holiday gathering for the Board and staff.

C. MAWD Annual Meeting

Tina Carstens provided an overview of the different activities at the recent MAWD annual meeting.

D. Wetland Workshop Date Planning

Tina Carstens noted that this has been postponed and confirmed a date of January 18th.

E. 2023 Meeting Schedule

Tina Carstens noted a potential conflict with the July meeting, scheduled for July 5th.

Motion: Manager Skinner moved, Manager Ward seconded, to change the date of the July meeting from July 5, 2023 to June 28, 2023.

A roll call vote was performed:

Manager Skinner	aye
Manager Kramer	aye
Manager Ward	aye
President Swope	aye

Motion carried unanimously.

12. PROJECT AND PROGRAM STATUS REPORTS (2:41:08)

A. Interim Emergency Response Planning
B. Kohlman Creek Flood Risk Feasibility Study
C. Kohlman Creek/Wakefield Lake Diversion Feasibility Study
D. County Ditch 17 Improvements Feasibility Study
E. Phalen Village Feasibility Study
F. Ames Lake Area Flood Risk Reduction Planning Study
G. Owasso Basin/North Star Estates Improvements
H. Double Driveway Pond Optimization Study
I. Carver Ponds Improvement Study
J. South Metro Mississippi River TSS TMDL
K. Kohlman Permeable Weir Test System
L. Shallow Lake Aeration Study
M. Target Store Stormwater Retrofit Projects
N. Targeted Retrofit Projects
O. Stewardship Grant Program – Street Sweeping
P. Lake Emily Subwatershed Regional BMP
Q. Beltline Five Year Inspection
R. District Inspection Standardization
S. 2023 CIP Maintenance and Repair Project
T. Natural Resources Program
U. Public Involvement and Education Program
V. Communications Program and Website

President Swope asked for an update on the West Vadnais boundary change. Tina Carstens
Stated that there is a meeting scheduled and noted that they should be able to move forward with that soon.

President Swope asked if there was an update on the land use policy. Tina Carstens stated that there is not update on that.

Manager Ward referenced the inspection grading report and asked if there would be a way to see more detail on how the sites were graded. Tina Carstens stated that she can obtain the scoring sheets for specific sites if requested.

Manager Ward stated that this year has gone by fast, and the Board should begin to think about the evaluation for Tina Carstens. Manager Skinner asked if that could be part of the January meeting. Manager Ward stated that could also occur in February, perhaps occurring the hour before the regular meeting. It was confirmed that the evaluation should be held the hour prior to the February Board meeting.

Manager Skinner complimented Bill Bartodziej on getting the $77,000 grant. She was impressed with the amount of shoreline restoration that has been able to be completed.

13. MANAGER COMMENTS AND NEXT MONTH'S MEETING (2:47:30)

A. Board Action Log

No comments.

14. ADJOURN

Motion: Manager Skinner moved, Manager Kramer seconded, to adjourn the meeting at 9:17 p.m. Motion carried unanimously.

RWMWD BUDGET STATUS REPORT
Administrative & Program Budget
Fiscal Year 2022
12/31/2022

Budget Category	Budget Item	Account Number	Original Budget	Budget Transfers	Current Month Expenses	Year-to-Date Expenses	Current Budget Balance	Percent of Budget
Manager	Per diems	4355	$8,500.00	-	2,125.00	3,534.10	$4,965.90	41.58%
	Manager expenses	4360	4,000.00	-	-	-	4,000.00	0.00%
Committees	Committee/Bd Mtg. Exp.	4365	3,500.00	-	300.00	4,363.47	(863.47)	124.67%
	Sub-Total: Managers/Committees:		**$16,000.00**	**$0.00**	**$2,425.00**	**$7,897.57**	**$8,102.43**	**49.36%**
Employees	Staff salary/taxes/benefits	4010	1,660,000.00	-	133,534.71	1,631,437.30	28,562.70	98.28%
	Employee expenses	4020	15,000.00	-	337.15	7,008.88	7,991.12	46.73%
	District training & education	4350	75,000.00	-	4,147.49	32,495.10	42,504.90	43.33%
	Sub-Total: Employees:		**$1,750,000.00**	**$0.00**	**$138,019.35**	**$1,670,941.28**	**$79,058.72**	**95.48%**
Administration/ Office	GIS system maint. & equip.	4170	10,000.00	-	-	3,134.02	6,865.98	31.34%
	Data Base/GIS Maintenance	4171	40,000.00	-	-	98.94	39,901.06	0.25%
	Equipment maintenance	4305	3,000.00	-	-	152.69	2,847.31	5.09%
	Telephone	4310	4,000.00	-	59.34	712.08	3,287.92	17.80%
	Office supplies	4320	7,000.00	-	519.30	6,713.59	286.41	95.91%
	IT/Internet/Web Site/Software Lic.	4325	75,000.00	-	6,520.64	77,264.44	(2,264.44)	103.02%
	Postage	4330	3,000.00	-	-	1,106.17	1,893.83	36.87%
	Printing/copying	4335	5,000.00	-	294.00	4,548.40	451.60	90.97%
	Dues & publications	4338	11,000.00	-	-	11,188.94	(188.94)	101.72%
	Janitorial/Trash Service	4341	15,000.00	-	900.57	10,172.11	4,827.89	67.81%
	Utilities/Bldg.Contracts	4342	30,000.00	-	333.90	9,463.95	20,536.05	31.55%
	Bldg/Site Maintenance	4343	150,000.00	-	1,089.76	100,677.26	49,322.74	67.12%
	Miscellaneous	4390	5,000.00	-	-	-	5,000.00	0.00%
	Insurance	4480	55,000.00	-	(2,167.04)	50,988.96	4,011.04	92.71%
	Office equipment	4703	150,000.00	-	-	15,556.41	134,443.59	10.37%
	Vehicle lease, maintenance	4810-40	20,000.00	-	552.61	9,204.28	10,795.72	46.02%
	Sub-Total: Administration/Office:		**$583,000.00**	**$0.00**	**$8,103.08**	**$300,982.24**	**$282,017.76**	**51.63%**
Consultants/ Outside Services	Auditor/Accounting	4110	70,000.00	-	1,670.34	54,789.17	15,210.83	78.27%
	Engineering-administration	4121	125,000.00	-	7,738.00	79,929.00	45,071.00	63.94%
	Engineering-permit I&E	4122	10,000.00	-	-	4,269.50	5,730.50	42.70%
	Engineering-eng. review	4123	60,000.00	-	-	62,150.50	(2,150.50)	103.58%
	Engineering-permit review	4124	55,000.00	-	4,696.00	52,152.00	2,848.00	94.82%
	Project Feasibility Studies	4129	410,000.00	-	21,852.25	322,035.38	87,964.62	78.55%
	Attorney-permits	4130	10,000.00	-	-	-	10,000.00	0.00%
	Attorney-general	4131	40,000.00	-	3,285.00	21,904.70	18,095.30	54.76%
	Outside Consulting Services	4160	20,000.00	-	-	-	20,000.00	0.00%
	Sub-Total: Consultants/Outside Services:		**$800,000.00**	**$0.00**	**$39,241.59**	**$597,230.25**	**$202,769.75**	**74.65%**
Programs	Educational programming	4370	75,000.00	-	3,008.12	44,731.26	30,268.74	59.64%
	Communications & Marketing	4371	50,000.00	-	1,137.45	31,822.23	18,177.77	63.64%
	Events	4372	46,000.00	-	-	51,469.59	(5,469.59)	111.89%
	Water QM-Engineering	4520-30	180,000.00	-	1,975.52	218,036.69	(38,036.69)	121.13%
	Project operations	4650	200,000.00	-	581.35	138,849.88	61,150.12	69.42%
	SLMP/TMDL Studies	4661	125,000.00	-	680.00	42,667.50	82,332.50	34.13%
	Natural Resources/Keller Creek	4670-72	120,000.00	-	727.91	105,676.52	14,323.48	88.06%
	Outside Prog.Support/Weed Mgmt.	44683	57,000.00	-	-	20,738.66	36,261.34	36.38%
	Research Projects	4695	225,000.00	-	56,638.00	150,096.69	74,903.31	66.71%
	Health and Safety Program	4697	3,000.00	-	-	3,663.18	(663.18)	122.11%
	Sub-Total: Programs:		**$1,081,000.00**	**$0.00**	**$64,748.35**	**$807,752.20**	**$273,247.80**	**74.72%**
GENERAL FUND TOTAL			**$4,230,000.00**	**$0.00**	**$252,537.37**	**$3,384,803.54**	**$845,196.46**	80.02%
CIP's	CIP Project Repair & Maintenance	516	1,500,000.00	-	50,592.77	1,178,681.08	321,318.92	78.58%
	Targeted Retrofit Projects	518	1,500,000.00	-	31,666.13	826,584.01	673,415.99	55.11%
	Flood Risk Reduction Fund	520	5,200,000.00	-	505.91	27,654.04	5,172,345.96	0.53%
	Debt Services-96-97 Beltline/MM/Battle Creek	526	394,710.00	-	-	393,040.40	1,669.60	99.58%
	Stewardship Grant Program Fund	529	1,000,000.00	-	138,595.08	603,078.90	396,921.10	60.31%
	Wetland Restoration Projects	540	500,000.00	-	-	-	500,000.00	0.00%
CIP BUDGET TOTAL			**$10,094,710.00**	**-**	**$221,359.89**	**$3,029,038.43**	**$7,065,671.57**	30.01%
TOTAL BUDGET			**$14,324,710.00**	**$0.00**	**$473,897.26**	**$6,413,841.97**	**$7,910,868.03**	**44.77%**

Current Fund Balances:

Fund:	Beginning Fund Balance @ 12/31/21	Fund Transfers	Year to date Revenue	Current Month Expenses	Year to Date Expense	Fund Balance @ 12/31/22
101 - General Fund	$2,382,780.20	-	3,315,612.65	252,537.37	3,384,803.54	2,313,589.31
516 - CIP Project Repair & Maintenance	162,659.00	-	2,054,150.39	50,592.77	1,178,681.08	1,038,128.31
518 - Targeted Retrofit Projects	948,555.00	-	31,185.00	31,666.13	826,584.01	153,155.99
520 - Flood Damage Reduction Fund	3,415,744.00	-	1,710,907.36	505.91	27,654.04	5,098,997.32
526 - Debt Services-96-97 Beltline/MM/Beltline-Battle Creek Tunnel Repair	944,949.00	-	-	-	393,040.40	551,908.60
529 - Stewardship Grant Program Fund	854,750.00	-	345,953.70	138,595.08	603,078.90	597,624.80
536 - Stormwater Impact Fund	309,837.00	-	49,113.00	-	-	358,950.00
540 - Wetland Restoration Projects	498,036.00	-	-	-	-	498,036.00
580 - Contingency Fund	1,465,487.00	-	-	-	-	1,465,487.00
Total District Fund Balance	**$10,982,797.20**	**$0.00**	**$ 7,506,922.10**	**$ 473,897.26**	**$6,413,841.97**	**$12,075,877.33**

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Dec 1, 2022 to Dec 31, 2022

Check #	Date	Payee ID	Invoice #	Payee	Description	Amount
EFT	12/01/22	met008	Dec 2022	MetLife-Group Benefits	Employee Benefits	$1,813.91
EFT	12/28/22	hea002	Jan 2023	HealthPartners	Employee Benefits	15,434.95
73418V	12/02/22	dic001	21-17 MTN	Carrie Dickson	Stewardship Grant Fund	(217.50)
73487	12/02/22	dic001	21-17 MTN	Carrie Dickson (Re-Issue)	Stewardship Grant Fund	448.50
73488	12/15/22	att002	287256653401X1125202	AT & T Mobility - ROC	Project Operations	166.34
73489	12/15/22	aws001	S1335957-120122	AWS Service Center	Janitorial/Trash Service	300.57
73490	12/15/22	gru001	01-21996	Gruber's Power Equipment	Natural Resources Project	706.70
73491	12/15/22	han008	2078	Hanna Enterprises, LLC	Janitorial/Trash Service	600.00
73492	12/15/22	inn002	SO-3971696	Innovative Office Solutions LLC	Bldg./Site Maintenance	140.97
73493	12/15/22	inn003	14488	Innovational Water Solutions, Inc.	Utilities/Bldg Contracts	221.40
73494	12/15/22	mid003	594612	Roseville Midway Ford	Vehicle Maintenance	278.47
73495	12/15/22	nsp001	51-0013406911	Xcel Energy	Construction-Flood Damage	125.01
73496	12/15/22	pre003	319129458	Premium Waters, Inc.	Utilities/Bldg Contracts	31.00
73497	12/15/22	res003	IN27508	Resource Environmental Solutions, LLC	Construction-Maint. & Repair	3,417.12
73498	12/15/22	sai001	3773	Saint Paul Media	Communications & Marketing	50.00
73499	12/15/22	san003	120522	Sandstrom Land Management	Construction-Maint. & Repair	3,932.50
73500	12/15/22	shi001	B16190443	SHI International Corp.	IT/Website/Software	66.99
73501	12/15/22	stu001	2019661	Studio Lola	Communications & Marketing	832.50
73502	12/15/22	usb002	Dec 2022	U.S. Bank	December Credit Card Expense	5,783.06
73503	12/15/22	usb005	488523382	US Bank Equipment Finance	Printing Expense	294.00
73504	12/27/22	ahl001	Dec 2022	Paige Ahlborg	Employee Reimbursement	238.99
73505	12/27/22	ame005	39706	American Bronze Casting, Inc.	Stewardship Grant Fund	6,500.00
73506	12/27/22	and004	20-13 MTN	Paul Anderson	Stewardship Grant Fund	375.00
73507	12/27/22	bar001	11/19/22-12/16/22	Barr Engineering	November/December Engineering	99,532.72
73508	12/27/22	bre003	1st Qtr-2023	Bremer Bank	Benefits-1st Quarter 2023	9,650.00
73509	12/27/22	cit006	Dec 2022	City of Woodbury	Stewardship Grant Fund	100,000.00
73510	12/27/22	cit011	231451	City of Roseville	IT/Website/Software	6,264.21
73511	12/27/22	com004	Dec 2022	Comcast	Utilities/Bldg Contracts	81.50
73512	12/27/22	con006	20-05 MTN	Concordia Arms	Stewardship Grant Fund	1,000.00
73513	12/27/22	dav003	150323	Davey Resource Group, Inc.	Construction-Maint. & Repair	3,640.00
73514	12/27/22	don001	Dec 2022	Matthew Doneux	Employee Reimbursement	133.22
73515	12/27/22	don003	21-04 MTN	Jake Donahue	Stewardship Grant Fund	300.00
73516	12/27/22	fit002	Dec 2022	Mary Fitzgerald	Employee Reimbursement	138.71
73517	12/27/22	fla001	Dec 2022	Lyndsey R. Flaten	Employee Reimbursement	487.51
73518	12/27/22	fox002	21-09 MTN	Cameron Fox	Stewardship Grant Fund	390.00
73519	12/27/22	gal001	Dec 2022	Galowitz Olson, PLLC	December Legal Fees	3,285.00
73520	12/27/22	gra009	19-07 MTN	Granite Trails Apartments	Stewardship Grant Fund	1,000.00
73521	12/27/22	ham005	21-03 MTN	Sarah Hammes	Stewardship Grant Fund	250.00
73522	12/27/22	haz001	Dec 2022	Lauren Hazenson	Employee Reimbursement	240.00
73523	12/27/22	hbf001	22-14 MTN	HB Fuller	Stewardship Grant Fund	1,000.00
73524	12/27/22	inn002	IN4036013	Innovative Office Solutions LLC	Bldg./Site Maintenance	140.97
73525	12/27/22	int001	W22110476	Office of MN, IT Services	Telephone Expense	59.34
73526	12/27/22	jac004	21-10 MTN	Michele Jacobson	Stewardship Grant Fund	1,000.00
73527	12/27/22	jad001	2022 Awards Dinner	Anita Jader Photography	Communications & Marketing	200.00
73528V	---	---	---	VOID	VOID	-
73529	12/27/22	lea003	15-1003	L. Tracy Leavenworth	Educational Program	1,841.48
73530	12/27/22	map004	19-28	Maplewood Moose Lodge	Dev. Escrow-General	6,500.00
73531	12/27/22	mel001	Nov-Dec 2022	Michelle L. Melser	Employee Reimbursement	152.77
73532	12/27/22	min008	37309	Minnesota Native Landscapes, Inc.	Construction/Stewardship Grant	17,802.00
73533	12/27/22	ncp001	Dec 2022	NCPERS Group Life Ins.	Employee Benefits	16.00
73534	12/27/22	nsp001	809265908	Xcel Energy	Water QM/Bldg./Site Maint.Proj. Oper.	1,136.42
73535	12/27/22	pac001	2210397262	Pace Analytical Services, Inc.	Water QM Staff	452.86
73536	12/27/22	par004	18-08 MTN	Park View Terrace HOA	Stewardship Grant Fund	1,000.00
73537	12/27/22	pas002	Nov-Dec 2022	Carol Passi	Employee Reimbursement	140.48
73538	12/27/22	pra001	2235305700	Prairie Moon Nursery, Inc.	Construction-Maint. & Repair	2,406.00
73539	12/27/22	qwe001	Dec 2022	CenturyLink	Project Operations	269.41
73540	12/27/22	red002	150474881	Redpath & Company	November Accounting Services	1,598.34
73541	12/27/22	ron002	12-11 MTN	Jeff Ronning	Stewardship Grant Fund	250.00
73542	12/27/22	rot003	22-07 MTN	Rotary Club of Roseville	Stewardship Grant Fund	1,000.00
73543	12/27/22	sch010	22-03 MTN	Matthew Schmidt	Stewardship Grant Fund	153.83
73544	12/27/22	sna002	22-17 CS	Snail Lake Improvement Association	Stewardship Grant Fund	718.00
73545	12/27/22	sod001	Dec 2022	Nicole Soderholm	Employee Reimbursement	40.00
73546	12/27/22	sts001	21-06 MTN	St. Stephen Lutheran Church	Stewardship Grant Fund	125.00
73547	12/27/22	svo001	22-18 CS	Thomas Svoboda	Stewardship Grant Fund	12,562.50
73548	12/27/22	til002	Dec 2022	Joseph S. Tillotson	Employee Reimbursement	76.07
73549	12/27/22	tim002	M27846	Timesaver Off-Site Secretarial, Inc.	Committee/Board Meeting Expense	300.00

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Dec 1, 2022 to Dec 31, 2022

Check #	Date	Payee ID	Invoice #	Payee	Description	Amount
73550	12/27/22	tro002	22-12	Cathy Troendle	Educational Program	1,146.25
73551	12/27/22	uni012	Dec 2022	University of Minnesota Foundation	Research Projects	50,000.00
73552	12/27/22	van001	Jan 2023	Vanguard Cleaning Systems of Minnesota	Janitorial/Trash Service	594.00
73553	12/27/22	ves001	18-05 MTN	Peter Vesterholt	Stewardship Grant Fund	312.50
73554	12/27/22	vla001	Oct 2022	Dave Vlasin	Employee Reimbursement	304.52
73555	12/27/22	vos002	BMP 2022	Keith Voss	Stewardship Grant Fund	725.00
73556	12/27/22	voy001	8692634232252	US Bank Voyager Fleet Sys.	Vehicle Fuel-General	248.65
73557	12/27/22	was002	5860	Washington Conservation District	Stewardship Grant Fund	1,142.00
73558	12/27/22	wat003	22-051511	Water Storage Tanks, Inc.	Project Operations-Maint. & Repair	1,738.80
73559	12/27/22	wes005	22-09 MTN	Westwood Village III	Stewardship Grant Fund	475.00
73560	12/27/22	ahl001	Roth IRA	Paige Ahlborg	Refund/Roth IRA	265.00
73561	12/27/22	koo001	22-10 CS	Michael Koopmeiners	Stewardship Grant Fund	430.75
Total						**$376,257.29**
EFT	12/09/22	myp001	12/09/22	December 9th Payroll	4110-101-000	$68.10
EFT	12/23/22	myp001	12/23/22	December 23rd Payroll	4110-101-000	86.90
Dir.Dep.	12/09/22	---	Payroll Expense-Net	December 9th Payroll	4010-101-000	29,213.61
EFT	12/09/22	int002	Internal Rev.Serv.	December 9th Federal Withholding	2001-101-000	10,715.30
EFT	12/09/22	mnd001	MN Revenue	December 9th State Withholding	2003-101-000	1,907.10
EFT	12/09/22	per001	PERA	December 9th PERA	2011-101-000	6,518.21
EFT	12/09/22	emp002	Empower Retirement	Employee Def. Comp. Contributions	2016-101-000	3,170.00
EFT	12/09/22	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	400.00
Dir.Dep.	12/23/22	---	Payroll Expense-Net	December 23rd Payroll	4010-101-000	29,461.29
EFT	12/23/22	int002	Internal Rev.Serv.	December 23rd Federal Withholding	2001-101-000	11,080.79
EFT	12/23/22	mnd001	MN Revenue	December 23rd State Withholding	2003-101-000	1,955.08
EFT	12/23/22	per001	PERA	December 23rd PERA	2011-101-000	6,480.41
EFT	12/23/22	emp002	Empower Retirement	Employee Def. Comp. Contributions	2016-101-000	2,803.00
EFT	12/23/22	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	592.00
					Payroll/Benefits:	**$104,451.79**
Total					**Accounts Payable/Payroll/Benefits:**	**$480,709.08**

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From December 1, 2022 - December 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	
12/01/22	EFT	met008	MetLife-Group Benefits	4040-101-000	Employee Benefits-General	$1,813.91	
12/28/22	EFT	hea002	HealthPartners	4040-101-000	Employee Benefits-General	15,434.95	
12/02/22	73418V	dic001	Carrie Dickson	4682-529-000	Stewardship Grant Fund	(217.50)	
12/02/22	73487	dic001	Carrie Dickson (re-issue)	4682-529-000	Stewardship Grant Fund	448.50	
12/15/22	73488	att002	AT & T Mobility - ROC	4650-101-000	Project Operations-General	166.34	
12/15/22	73489	aws001	AWS Service Center	4341-101-000	Janitorial/Trash Service	300.57	
12/15/22	73490	gru001	Gruber's Power Equipment	4670-101-000	Natural Resources Project-General	706.70	
12/15/22	73491	han008	Hanna Enterprises, Inc.	4341-101-000	Janitorial/Trash Service	600.00	
12/15/22	73492	inn002	Innovative Office Solutions LLC	4343-101-000	Bldg./Site Maintenance	140.97	
12/15/22	73493	inn003	Innovational Water Solutions, Inc.	4342-101-000	Utilities/Bldg. Contracts	221.40	
12/15/22	73494	mid003	Roseville Midway Ford	4820-101-000	Vehicle Maintenance-General	278.47	
12/15/22	73495	nsp001	Xcel Energy	4630-520-000	Construction-Flood Damage	125.01	
12/15/22	73496	pre003	Premium Waters, Inc.	4342-101-000	Utilities/Bldg. Contracts	31.00	
12/15/22	73497	res003	Resource Environmental Solutions, LLC	4630-516-000	Construction Imp.-Maint. & Repair	3,417.12	
12/15/22	73498	sai001	Saint Paul Media	4371-101-000	Communications & Marketing	50.00	
12/15/22	73499	san003	Sandstrom Land Management	4630-516-000	Construction Imp.-Maint. & Repair	3,932.50	
12/15/22	73500	shi001	SHI International Corp.	4325-101-000	IT/Website/Software	66.99	
12/15/22	73501	stu001	Studio Lola	4371-101-000	Communications & Marketing	832.50	
12/15/22	73502	usb002	U.S. Bank			5,783.06	
				4325-101-000	IT/Website/Software		96.29
				4320-101-000	Office Supplies		43.32
				4530-101-000	Water QM Staff-General		9.34
				4320-101-000	Office Supplies		17.12
				4320-101-000	Office Supplies		268.21
				4343-101-000	Bldg./Site Maintenance		113.08
				4325-101-000	IT/Website/Software		93.15
				4320-101-000	Office Supplies		10.90
				4350-101-000	Training & Education-General		200.00
				4350-101-000	Training & Education-General		200.00
				4350-101-000	Training & Education-General		200.00
				4350-101-000	Training & Education-General		325.00
				4350-101-000	Training & Education-General		200.00
				4350-101-000	Training & Education-General		200.00
				4350-101-000	Training & Education-General		300.00
				4320-101-000	Office Supplies		80.81
				4320-101-000	Office Supplies		97.00
				4371-101-000	Communications & Marketing		20.95
				4530-101-000	Water QM Staff-General		40.99
				4350-101-000	Training & Education-General		400.00
				4350-101-000	Training & Education-General		100.00
				4343-101-000	Bldg./Site Maintenance		17.96
				4040-101-000	Employee Benefits-General		79.85
				4343-101-000	Bldg./Site Maintenance		20.04
				4530-101-000	Water QM Staff-General		139.28
				4350-101-000	Training & Education-General		628.34

Ramsey Washington Metro Watershed Dist.

Cash Disbursements Journal

For the Period From December 1, 2022 - December 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	
				4350-101-000	Training & Education-General		1,172.01
				4350-101-000	Training & Education-General		71.28
				4371-101-000	Communications & Marketing		34.00
				4650-101-000	Project Operations-General		55.10
				4040-101-000	Employee Benefits-General		467.25
				4040-101-000	Employee Benefits-General		79.85
				4320-101-000	Office Supplies		1.94
12/15/22	73503	usb005	US Bank Equipment Finance	4335-101-000	Printing-General	294.00	
12/27/22	73504	ahl001	Paige Ahlborg			238.99	
				4020-101-000	Employee Expenses-General		80.72
				4040-101-000	Employee Benefits-General		80.00
				4830-101-000	Vehicle Fuel-General		25.49
				4350-101-000	Training & Education-General		52.78
12/27/22	73505	ame005	American Bronze Casting, Inc.	4682-529-000	Stewardship Grant Fund	6,500.00	
12/27/22	73506	and004	Paul Anderson	4682-529-000	Stewardship Grant Fund	375.00	
12/27/22	73507	bar001	Barr Engineering			99,532.72	
				4121-101-000	Engineering Admin-General Fund		7,738.00
				4129-101-000	Project Feasability-General		13,358.00
				4129-101-000	Project Feasability-General		3,464.00
				4129-101-000	Project Feasability-General		247.00
				4129-101-000	Project Feasability-General		60.00
				4129-101-000	Project Feasability-General		4,189.75
				4129-101-000	Project Feasability-General		533.50
				4520-101-000	Engineering-WQM		207.00
				4520-101-000	Engineering-WQM		345.63
				4520-101-000	Engineering-WQM		576.25
				4124-101-000	Engineering-Permit Review		4,696.00
				4661-101-000	SLMP/TMDL Studies		680.00
				4695-101-000	Research Projects-General		4,347.50
				4695-101-000	Research Projects-General		2,290.50
				4650-101-000	Project Operations-General		90.50
				4128-518-000	Engineering-Targeted Retrofit		13,145.00
				4128-518-000	Engineering-Targeted Retrofit		10,137.00
				4128-518-000	Engineering-Targeted Retrofit		5,287.13
				4682-529-000	Engineering-Stewardship Grant Program		5,517.00
				4128-518-000	Engineering-Targeted Retrofit		3,097.00
				4128-516-000	Engineering-Maint. & Repair		2,508.50
				4128-516-000	Engineering-Maint. & Repair		1,512.00
				4128-516-000	Engineering-Maint. & Repair		115.00
				4128-516-000	Engineering-Maint. & Repair		15,390.46
				4128-516-000	Engineering-Maint. & Repair		
12/27/22	73508	bre003	Bremer Bank	4040-101-000	Employee Benefits-General	9,650.00	
12/27/22	73509	cit006	City of Woodbury	4682-529-000	Stewardship Grant Fund	100,000.00	
12/27/22	73510	cit011	City of Roseville	4325-101-000	IT/Website/Software	6,264.21	
12/27/22	73511	com004	Comcast	4342-101-000	Utilities/Bldg. Contracts	81.50	
12/27/22	73512	con006	Concordia Arms	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73513	dav003	Davey Resource Group, Inc.	4630-516-000	Construction Imp.-Maint & Repair	3,640.00	
12/27/22	73514	don001	Matthew Doneux			133.22	
				4040-101-000	Employee Benefits-General		90.00
				4350-101-000	Training & Education-General		43.22

Ramsey Washington Metro Watershed Dist.

Cash Disbursements Journal

For the Period From December 1, 2022 - December 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	
12/27/22	73515	don003	Jake Donahue	4682-529-000	Stewardship Grant Fund	300.00	
12/27/22	73516	fit002	Mary Fitzgerald			138.71	
				4020-101-000	Employee Expenses-General		44.25
				4040-101-000	Employee Benefits-General		94.46
12/27/22	73517	fla001	Lyndsey R. Flaten			487.51	
				4020-101-000	Employee Expenses-General		42.12
				4040-101-000	Employee Benefits-General		340.00
				4530-101-000	Water QM Staff-General		105.39
12/27/22	73518	fox002	Cameron Fox	4682-529-000	Stewardship Grant Fund	390.00	
12/27/22	73519	gal001	Galowitz Olson, PLLC	4131-101-000	Attorney General-General	3,285.00	
12/27/22	73520	gra009	Granite Trails Apartments	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73521	ham005	Sarah Hammes	4682-529-000	Stewardship Grant Fund	250.00	
12/27/22	73522	haz001	Lauaren Hazenson	4040-101-000	Employee Benefits-General	240.00	
12/27/22	73523	hbf001	HB Fuller	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73524	inn002	Innovative Office Solutions LLC	4343-101-000	Bldg./Site Maintenance	140.97	
12/27/22	73525	int001	Office of MN, IT Services	4310-101-000	Telephone-General	59.34	
12/27/22	73526	jac004	Michele Jacobson	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73527	jad001	Anita Jader Photography	4371-101-000	Communications & Marketing	200.00	
12/27/22	73528	---	VOID	---	VOID	-	
12/27/22	73529	lea003	L. Tracy Leavenworth	4370-101-000	Educational Program-General	1,841.48	
12/27/22	73530	map004	Maplewood Moose Lodge	2024-101-000	Dev. Escrow-General Fund	6,500.00	
12/27/22	73531	mel001	Michelle Melser			152.77	
				4040-101-000	Employee Benefits-General		91.52
				4020-101-000	Employee Expenses-General		61.25
12/27/22	73532	min008	Minnesota Native Landscapes, Inc.			17,802.00	
				4630-516-000	Construction Imp.-Maint. & Repair		15,882.00
				4682-529-000	Stewardship Grant Fund		1,920.00
12/27/22	73533	ncp001	NCPERS Group Life Insurance	4040-101-000	Employee Benefits-General	16.00	
12/27/22	73534	nsp001	Xcel Energy			1,136.42	
				4343-101-000	Bldg./Site Maintenance		656.74
				4530-101-000	Water QM Staff-General		98.78
				4650-520-000	Project Operations-General		380.90
12/27/22	73535	pac001	Pace Analytical Services, Inc.	4530-101-000	Water QM Staff-General	452.86	
12/27/22	73536	par004	Park View Terrace HOA	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73537	pas002	Carol Passi			140.48	
				4020-101-000	Employee Expenses-General		83.07
				4040-101-000	Employee Benefits-General		37.02
				4370-101-000	Educational Program-General		20.39
12/27/22	73538	pra001	Prairie Moon Nursery, Inc.	4630-516-000	Construction Imp.-Maint. & Repair	2,406.00	
12/27/22	73539	qwe001	CenturyLink	4650-101-000	Project Operations-General	269.41	
12/27/22	73540	red002	Redpath & Company, Ltd.	4110-101-000	Auditor/Accounting	1,598.34	
12/27/22	73541	ron002	Jeff Ronning	4682-529-000	Stewardship Grant Fund	250.00	
12/27/22	73542	rot003	Rotary Club of Roseville	4682-529-000	Stewardship Grant Fund	1,000.00	
12/27/22	73543	sch010	Matthew Schmidt	4682-519-000	Stewardship Grant Fund	153.83	
12/27/22	73544	sna002	Snail Lake Improvement Associatin	4682-529-000	Stewardship Grant Fund	718.00	
12/27/22	73545	sod001	Nicole Soderholm	4040-101-000	Employee Benefits-General	40.00	
12/27/22	73546	sts001	St. Stephen Lutheran Church	4682-529-000	Stewardship Grant Fund	125.00	
12/27/22	73547	svo001	Thomas Svoboda	4682-529-000	Stewardship Grant Fund	12,562.50	

Ramsey Washington Metro Watershed Dist.

Cash Disbursements Journal

For the Period From December 1, 2022 - December 31, 2022

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	
12/27/22	73548	til001	Joseph Tillotson			76.07	
				4670-101-000	Natural Resources Project-General		21.21
				4350-101-000	Training & Education-General		54.86
12/27/22	73549	tim002	Timesaver Off-Site Secretarial, Inc.	4365-101-000	Committee/Board Meeting Expense	300.00	
12/27/22	73550	tro002	Cathy Troendle	4370-101-000	Educational Program-General	1,146.25	
12/27/22	73551	uni012	University of Minnesota Foundation	4695-101-000	Research Projects-General	50,000.00	
12/27/22	73552	van001	Vanguard Cleaning Systems of Minnesota	4341-101-000	Janitorial/Trash Service	594.00	
12/27/22	73553	ves001	Peter Vesterholt	4682-529-000	Stewardship Grant Fund	312.50	
12/27/22	73554	vla001	Dave Vlasin			304.52	
				4020-101-000	Employee Expenses-General		25.74
				4040-101-000	Employee Benefits-General		228.39
				4630-516-000	Construction Imp.-Maint. & Repair		50.39
12/27/22	73555	vos002	Keith Voss	4682-529-000	Stewardship Grant Fund	725.00	
12/27/22	73556	voy001	US Bank Voyager Fleet Sys.	4830-101-000	Vehicle Fuel-General	248.65	
12/27/22	73557	was002	Washington Conservation District	4682-529-000	Stewardship Grant Fund	1,142.00	
12/27/22	73558	wat003	Water Storage Tanks, Inc.	4650-516-000	Project Operations-Maint. & Repair	1,738.80	
12/27/22	73559	wes005	Westwood Village III	4682-529-000	Stewardship Grant Fund	475.00	
12/27/22	73560	ahl001	Paige Ahlborg	2018-000-000	Roth IRA-Withholding	265.00	
12/27/22	73561	koo001	Michael Koopmeiners	4682-529-000	Stewardship Grant Fund	430.75	
			Accounts Payable Total:			**$376,257.29**	
EFT	12/09/22	myp001	Payroll Fees	4110-101-000	December 9th Payroll	$68.10	
EFT	12/23/22	myp001	Payroll Fees	4110-101-000	December 23rd Payroll	86.90	
Dir.Dep.	12/09/22	---	Payroll Expense-Net	4010-101-000	December 9th Payroll	29,213.61	
EFT	12/09/22	int002	Internal Rev.Serv.	2001-101-000	December 9th Federal Withholding	10,715.30	
EFT	12/09/22	mnd001	MN Revenue	2003-101-000	December 9th State Withholding	1,907.10	
EFT	12/09/22	per001	PERA	2011-101-000	December 9th PERA	6,518.21	
EFT	12/09/22	emp002	Empower Retirement	2016-101-000	Employee Def. Comp. Contributions	3,170.00	
EFT	12/09/22	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	400.00	
Dir.Dep.	12/23/22	---	Payroll Expense-Net	4010-101-000	December 23rd Payroll	29,461.29	
EFT	12/23/22	int002	Internal Rev.Serv.	2001-101-000	December 23rd Federal Withholding	11,080.79	
EFT	12/23/22	mnd001	MN Revenue	2003-101-000	December 23rd State Withholding	1,955.08	
EFT	12/23/22	per001	PERA	2011-101-000	December 23rd PERA	6,480.41	
EFT	12/23/22	emp002	Empower Retirement	2016-101-000	Employee Def. Comp. Contributions	2,803.00	
EFT	12/23/22	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	592.00	
			Payroll/Benefits			**$104,451.79**	
			TOTAL:			**$480,709.08**	

BARR

Summary of Professional Engineering Services During the Period
November 19, 2022 through December 16, 2022

	Total Engineering Budget (2022)	Total Fees to Date (2022)	Budget Balance (2022)	Fees During Period	District Accounting Code	Plan Implementation Task Number
Engineering Administration						
General Engineering Administration	$80,000.00	$79,929.00	$71.00	$7,738.00	**4121-101**	DW-13
RWMWD Health and Safety/ERTK Program	$2,000.00	$540.00	$1,460.00	$0.00	**4697-101**	DW-13
Educational Program/Educational Forum Assistance	$20,000.00	$2,847.50	$17,152.50	$0.00	**4129-101**	DW-11
Topical Workshop, Education, and Planning	$25,000.00	$0.00	$25,000.00	$0.00	**4129-101**	DW-13
Engineering Review						
Engineering Review	$60,000.00	$62,150.50	-$2,150.50	$0.00	**4123-101**	DW-13
Project Feasibility Studies						
Interim emergency response plan funds for top priority District flooding areas	$30,000.00	$36,961.00	-$6,961.00	$13,356.00	**4129-101**	DW-19
Groundwater/Surface Water Next Steps	$50,000.00	$0.00	$50,000.00	$0.00	**4129-101**	DW-10, DW-16
Hillcrest Golf Course	$20,000.00	$72.00	$19,928.00	$0.00	**4129-101**	DW-6
Kohlman Creek flood damage reduction feasibility study	$75,000.00	$6,503.50	$68,496.50	$0.00	**4129-101**	DW-9, KC-2, BELT-3
Kohlman Creek- Wakefield Lake Diversion Planning and Design	$111,600.00	$71,022.63	$86,010.00	$3,464.00	**4129-101**	DW-9, KC-2, BELT-3
Improvements to County Ditch 17	$20,000.00	$34,535.50	-$14,535.50	$0.00	**4129-101**	DW-9, BELT-3
Improvements to Phalen Village	$20,000.00	$23,259.00	-$3,259.00	$247.00	**4129-101**	DW-9, BELT-3
Ames Lake Technical Assistance and Project Planning with St. Paul	$25,000.00	$18,482.00	$6,518.00	$60.00	**4129-101**	DW-9, BELT-3
694/494/94 WQ treatment feasibility study	$30,000.00	$0.00	$30,000.00	$0.00	**4129-101**	BCL-3
Double Driveway Optimization Study	$25,000.00	$12,465.25	$13,534.75	$4,189.75	**4129-101**	FC-2
Carver Pond Improvements Study (Fish Creek Subwatershed)	$25,000.00	$19,603.53	$5,396.47	$0.00	**4129-101**	FC-2
Evaluate compliance with South Metro Mississippi River TSS TMDL	$30,000.00	$2,496.00	$27,504.00	$0.00	**4129-101**	MR-2
Owasso Basin area/North Star Estates improvements (with City of Little Canada)	$59,000.00	$89,063.47	-$39,063.47	$533.50	**4129-101**	GC-3
Wetland Restoration Workshop, Education, and Planning	$5,000.00	$2,969.00	$2,031.00	$0.00	**4129-101**	DW-8
Contingency*	$45,000.00	$0.00	$45,000.00	$0.00	**4129-101**	
GIS Maintenance						
GIS Maintenance	$5,000.00	$1,047.00	$3,953.00	$0.00	**4170-101**	DW-13
Monitoring Water Quality/Project Monitoring						
Lake Water Quality Monitoring (Misc QA/QC)	$10,000.00	$34.50	$9,965.50	$0.00	**4520-101**	DW-2
Annual WQ Report Assistance	$10,000.00	$13,513.00	-$3,513.00	$207.00	**4520-101**	DW-2
Special Project BMP Monitoring	$25,000.00	$10,723.43	$14,276.57	$345.63	**4520-101**	DW-12
Grass Lake Berm Wetland Monitoring	$10,000.00	$9,589.33	$410.67	$576.25	**4520-101**	DW-5
Permit Processing, Inspection and Enforcement						
Permit Application Inspection and Enforcement	$10,000.00	$4,269.50	$5,730.50	$0.00	**4122-101**	DW-7
Permit Application Review	$55,000.00	$52,152.00	$2,848.00	$4,696.00	**4124-101**	DW-7
Lake Studies/TMDL Reports						
2022 Grant Applications	$40,000.00	$2,005.50	$37,994.50	$0.00	**4661-101**	DW-13
WMP Updates - Including Implementation Plan Updates if needed	$20,000.00	$7,365.00	$12,635.00	$660.00	**4661-101**	DW-13
Prioritization of water quality projects from subwatershed feasibility studies	$5,000.00	$957.00	$4,043.00	$0.00	**4661-101**	DW-13
Cost/Benefit Analysis of Treatment Options for Bennett and Wakefield in 2020 Internal Load Analysis	$35,000.00	$30,270.00	$4,730.00	$0.00	**4661-101**	WL-3, BeL-3
Phalen Chain of Lakes Changes in Water Quality	$2,500.00	$2,070.00	$430.00	$0.00	**4661-101**	DW-2, DW-12
Contingency for Lake Studies	$22,500.00	$0.00	$22,500.00	$0.00	**4661-101**	
Research Projects						
New Technology Mini Case Studies (average 6 per year)	$12,000.00	$4,174.50	$7,825.50	$0.00	**4695-101**	DW-12
Kohlman Permeable Weir Test System - Implement Monitoring Plan	$50,000.00	$24,434.13	$25,565.87	$4,347.50	**4695-101**	DW-12
Shallow Lake Aeration Study	$90,000.00	$71,488.06	$18,511.94	$2,290.50	**4695-101**	DW-12
Project Operations						
2022 Tanners Alum Facility Monitoring	$15,000.00	$19,887.27	-$4,887.27	$90.50	**4650-101**	TaL-3
Capital Improvements						
North St. Paul Target	$160,000.00	$158,012.30	$1,987.70	$0.00	**4128-518**	DW-6
East St Paul and North St. Paul Target Retrofit Projects	$5,000.00	$4,607.00	$393.00	$0.00	**4128-518**	DW-6
Woodbury Target Stormwater Retrofit	$46,900.00	$15,321.00	$31,579.00	$13,145.00	**4128-518**	DW-6
Ryan Drive-Keller Parkway Conveyance	$194,000.00	$226,570.20	-$32,570.20	$0.00	**4128-520**	DW-9, GC-3
2022 Targeted Retrofit Projects	$191,000.00	$184,090.54	$6,909.46	$10,137.00	**4128-518**	DW-6
Pioneer Park Stormwater Reuse	$151,200.00	$6,471.13	$144,728.87	$5,287.13	**4128-518**	DW-6
Stewardship Grant Program: Gen'l BMP Design Assistance and Review (cases where Dist is approached by landowner, or landowner is not commercial, school, church).	$75,000.00	$65,103.31	$9,896.69	$5,517.00	**4682-529**	DW-6
Kohlman Creek Storage and Detention	$200,000.00	$0.00	$200,000.00	$0.00	**4128-520**	KC-2
Wetland Restoration	$100,000.00	$0.00	$100,000.00	$0.00	**4128-529**	DW-8
South Owasso Boulevard East WQ Pond	$150,000.00	$0.00	$150,000.00	$0.00	**4128-520**	GC-3
West Industrial Park Berm and associated improvements	$150,000.00	$0.00	$150,000.00	$0.00	**4128-520**	GC-3
Lake Emily Subwatershed Regional BMP	$160,000.00	$63,883.26	$96,116.74	$3,097.00	**4128-518**	LE-3
CIP Project Repair & Maintenance						
Routine CIP Inspection and Unplanned Maintenance Identification	$125,000.00	$125,964.71	-$964.71	$2,508.50	**4128-516**	DW-5
Beltline 5-year Inspection	$70,000.00	$70,825.95	-$825.95	$1,512.00	**4128-516**	BELT-2
District Inspection Standardization	$34,200.00	$35,926.26	-$1,726.26	$115.00	**4128-516**	DW-5
2022 CIP Maintenance and Repairs	$150,000.00	$94,789.92	$55,210.08	$0.00	**4128-516**	DW-5
2023 CIP Maintenance and Repairs (planning, bidding, and project setup)	$166,800.00	$29,999.46	$137,800.54	$15,390.46	**4128-516**	DW-5
				$99,532.72		

Barr declares under the penalties of Law that this Account, Claim, or Demand is just and that no part has been paid.

Bradley J. Lindaman, Vice President

Galowitz Olson, PLLC
10390 39th Street North
Lake Elmo, Minnesota 55042
Office: (651) 777-6960
Fax: (651) 777-8937

December 20, 2022
File No: 9M

Ramsey-Washington Metro Watershed District
C/O Tina Carstens
2665 Noel Drive
Little Canada MN 55117

	Balance
General Account	$3,285.00

Permit Application Coversheet

Date January 04, 2023

Project Name Phalen Village- Maryland/Prosperity Project Number 23-01

Applicant Name Ryan Schwickert, MWF Properties

Type of Development Residential

Property Description

This project is located on the southeast corner of Maryland Avenue & Prosperity Avenue, north of Ames Lake in the City of St. Paul. The applicant is proposing to construct an apartment building with associated parking, landscaping, and utilities. The total site area is 1.2 acres. An underground infiltration system is proposed to meet stormwater treatment requirements. Pretreatment will include sumped inlets and isolator row.

Watershed District Policies or Standards Involved:

- ☐ *Wetlands*
- ☑ *Erosion and Sediment Control*
- ☑ *Stormwater Management*
- ☐ *Floodplain*

Water Quantity Considerations

The proposed stormwater management plan is sufficient to handle the runoff from the site.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during the course of construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

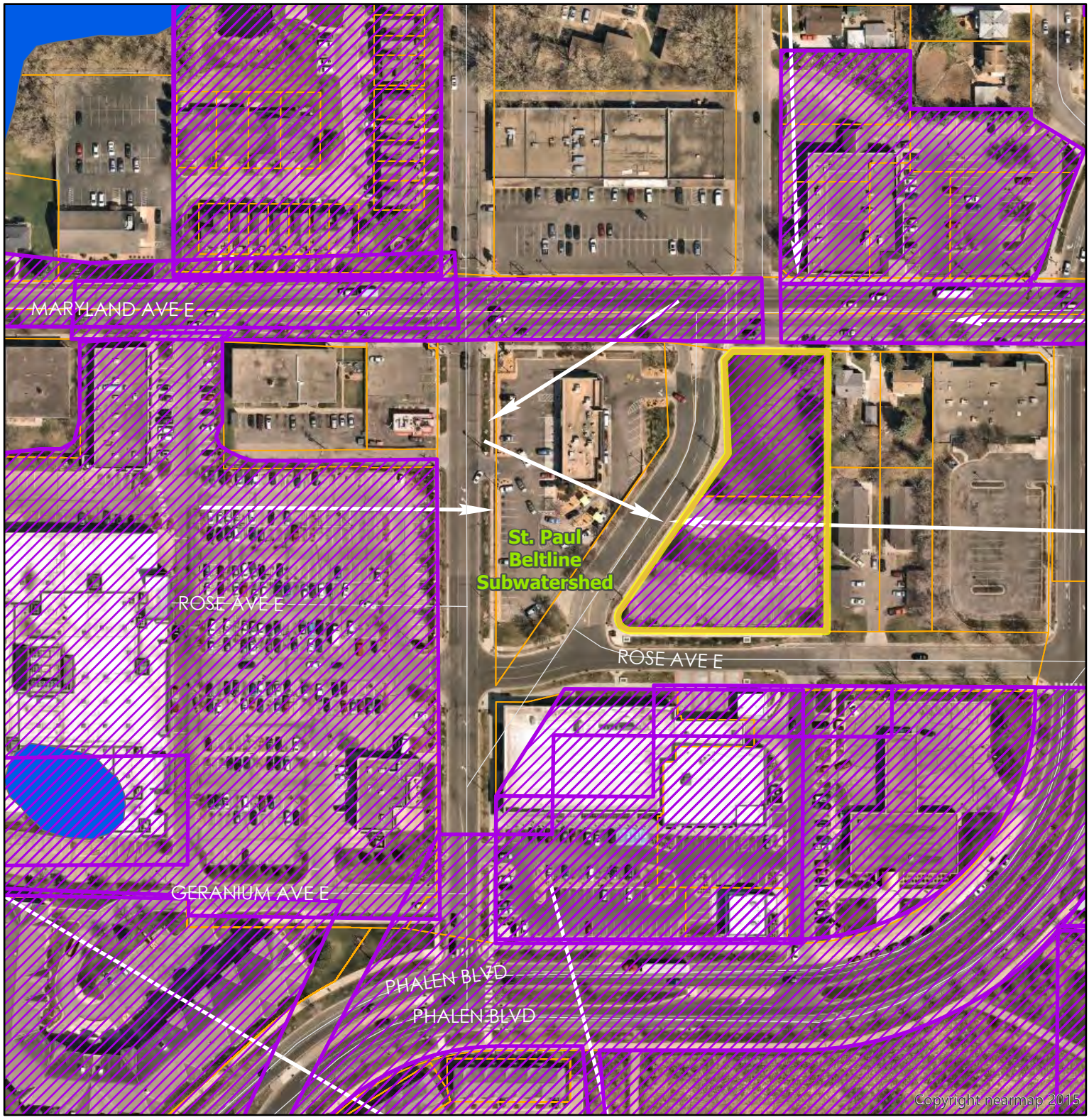
Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- ☑ Project Location Map
- ☑ Project Grading Plan

#23-01 Phalen Village - Maryland/Prosperity



- Flow Arrows
- Roads
- Permits
- Cities
- Subwatersheds
- ParcelsRamsey
- RWMWD Boundary

Wetlands

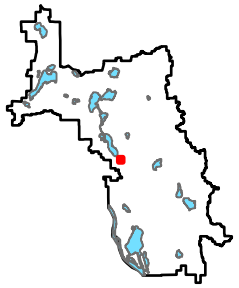
- Manage A
- Manage B
- Manage C
- Lake
- Sediment Pond
- Not Assessed

Highlighted Areas
Represent Active Permit

Miles
0 0.01 0.03

Kilometers
0 0.03 0.06

N



23-01

Special Provisions

1. The applicant shall submit the executed stormwater maintenance agreement.

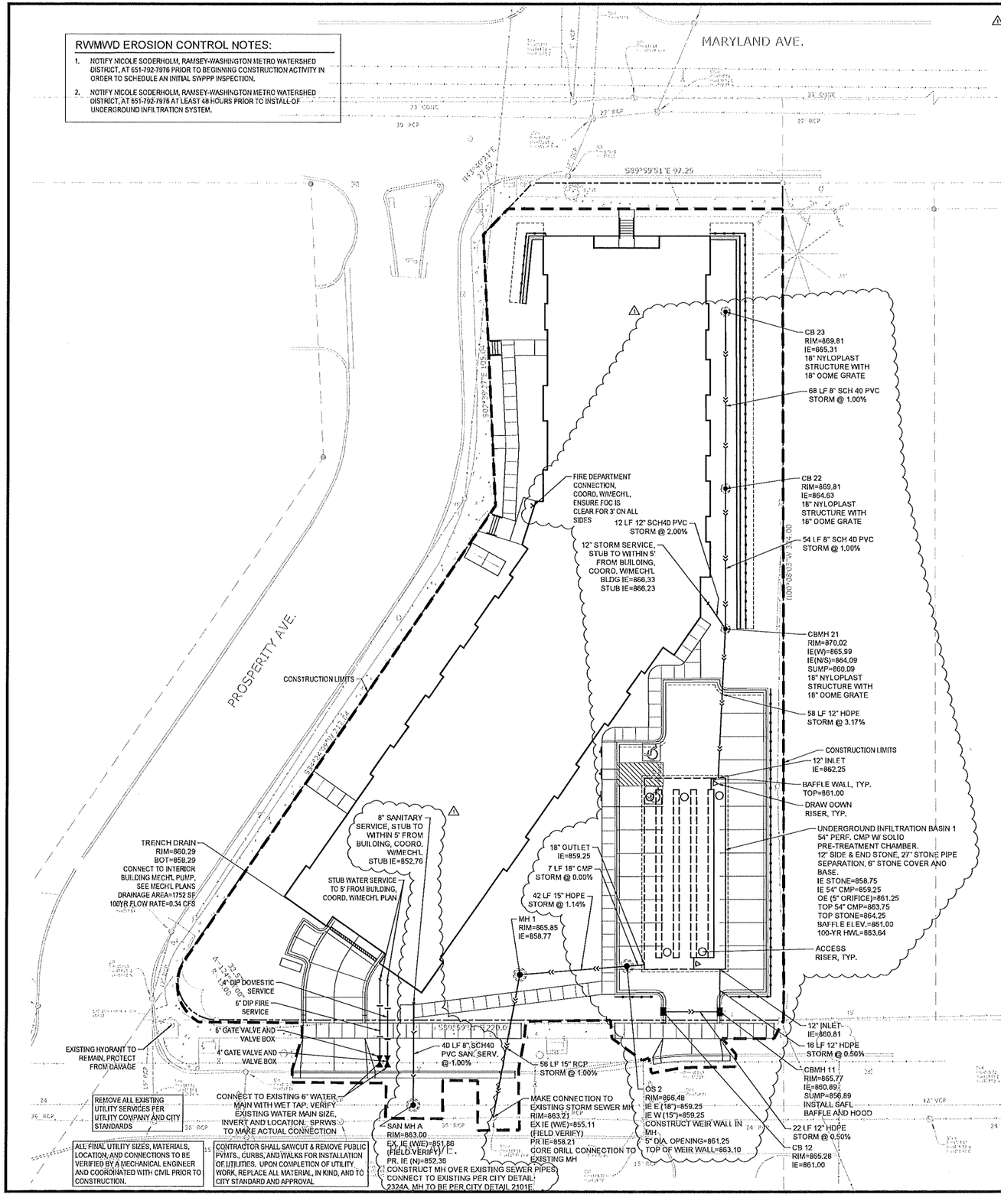
2. The applicant shall submit a site-specific BMP Operations & Maintenance Plan.

3. The applicant shall submit contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).

4. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Construction Permit coverage for the project.

RWMWD EROSION CONTROL NOTES:

1. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7976 PRIOR TO BEGINNING CONSTRUCTION ACTIVITY IN ORDER TO SCHEDULE AN INITAL SWPPP INSPECTION.
2. NOTIFY NICOLE SODERHOLM, RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, AT 651-792-7976 AT LEAST 48 HOURS PRIOR TO INSTALL OF UNDERGROUND INFILTRATION SYSTEM.



GENERAL UTILITY NOTES:

1. SEE SITE PLAN FOR HORIZONTAL DIMENSIONS AND LAYOUT.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF DISCREPANCIES OR VARIATIONS FROM THE PLANS.
3. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. UTILITY INSTALLATION SHALL CONFORM TO THE CURRENT EDITION OF "STANDARD SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION" AND "SANITARY SEWER AND STORM SEWER INSTALLATION" AS PREPARED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), AND SHALL CONFORM WITH THE REQUIREMENTS OF THE CITY AND THE PROJECT SPECIFICATIONS.
5. CASTINGS SHALL BE SALVAGED FROM STRUCTURE REMOVALS AND RE-USED OR PLACED AT THE DIRECTION OF THE OWNER.
6. PIPE MATERIAL FOR 8" DUCTILE IRON PIPE MUST BE CLASS 52, PIPE MATERIAL FOR 6" AND 4" DUCTILE IRON PIPE MUST BE CLASS 53, THE EXTERIOR OF DUCTILE IRON PIPE SHALL BE COATED WITH A LAYER OF ARC-SPRAYED ZINC PER ISO 8179, THE INTERIOR CEMENT MORTAR LINING SHALL BE APPLIED WITHOUT ASPHALT SEAL COAT. PIPE MUST BE WRAPPED IN V-SIO POLYWRAP ENCASEMENT.
7. ALL STORM SEWER PIPE SHALL BE HDPE ASTM F714 & F2306 WITH ASTM D3212 SPEC FITTINGS UNLESS OTHERWISE NOTED.
8. PIPE LENGTHS SHOWN ARE FROM CENTER TO CENTER OF STRUCTURE OR TO END OF FLARED END SECTION.
9. UTILITIES ON THE PLAN ARE SHOWN TO WITHIN 5' OF THE BUILDING FOOTPRINT. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THE FINAL CONNECTION TO BUILDING LINES. COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS.
10. CATCH BASINS AND MANHOLES IN PAVED AREAS SHALL BE SUMPED 0.04 FEET. ALL CATCH BASINS IN GUTTERS SHALL BE SUMPED 0.15 FEET PER DETAILS. RIM ELEVATIONS SHOWN ON THIS PLAN DO NOT REFLECT SUMPED ELEVATIONS.
11. ALL FIRE HYDRANTS SHALL BE LOCATED 5 FEET BEHIND BACK OF CURB UNLESS OTHERWISE NOTED.
12. HYDRANT TYPE, VALVE, AND CONNECTION SHALL BE IN ACCORDANCE WITH CITY REQUIREMENTS. HYDRANT EXTENSIONS ARE INCIDENTAL.
13. SERVICE CONNECTIONS SHALL BE INSTALLED WITH 8 FEET OF COVER AS PER THE ESTABLISHED GRADE FROM THE MAIN TO THE PROPERTY LINE. MAINTAIN 3 FEET VERTICAL SEPARATION BETWEEN WATER AND SEWER PIPES OR 18-INCH SEPARATION INCLUDING 4-INCH HIGH DENSITY INSULATION PER SPRWS STANDARD PLATE D-10 FOR TYPICAL WATER MAIN OFFSETS.
14. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND COORDINATED WITH THE CITY PRIOR TO CONSTRUCTION.
15. CONNECTIONS TO EXISTING STRUCTURES SHALL BE CORE-DRILLED.
16. COORDINATE LOCATIONS AND SIZES OF SERVICE CONNECTIONS WITH THE MECHANICAL DRAWINGS.
17. COORDINATE INSTALLATION AND SCHEDULING OF THE INSTALLATION OF UTILITIES WITH ADJACENT CONTRACTORS AND CITY STAFF.
18. ALL STREET REPAIRS AND PATCHING SHALL BE PERFORMED PER THE REQUIREMENTS OF THE CITY. ALL PAVEMENT CONNECTIONS SHALL BE SAWCUT. ALL TRAFFIC CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE ESTABLISHED PER THE REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CITY. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SIGNAGE, BARRICADES, FLASHERS, AND FLAGGERS AS NEEDED. ALL PUBLIC STREETS SHALL BE OPEN TO TRAFFIC AT ALL TIMES. NO ROAD CLOSURES SHALL BE PERMITTED WITHOUT APPROVAL BY THE CITY.
19. ALL STRUCTURES, PUBLIC AND PRIVATE, SHALL BE ADJUSTED TO PROPOSED GRADES WHERE REQUIRED. THE REQUIREMENTS OF ALL OWNERS MUST BE COMPLIED WITH. STRUCTURES BEING RESET TO PAVED AREAS MUST MEET OWNERS REQUIREMENTS FOR TRAFFIC LOADING.
20. CONTRACTOR SHALL COORDINATE ALL WORK WITH PRIVATE UTILITY COMPANIES.
21. CONTRACTOR SHALL COORDINATE CONNECTION OF IRRIGATION SERVICE TO UTILITIES. COORDINATE THE INSTALLATION OF IRRIGATION SLEEVES NECESSARY AS TO NOT IMPACT INSTALLATION OF UTILITIES.
22. CONTRACTOR SHALL MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO ENGINEER UPON COMPLETION OF WORK.
23. ALL JOINTS AND CONNECTIONS IN STORM SEWER SYSTEM SHALL BE GASTIGHT OR WATERTIGHT. APPROVED RESILIENT RUBBER JOINTS MUST BE USED TO MAKE WATERTIGHT CONNECTIONS TO MANHOLES, CATCHBASINS, OR OTHER STRUCTURES.
24. ALL PORTIONS OF THE STORM SEWER SYSTEM LOCATED WITHIN 10 FEET OF THE BUILDING OR WATER SERVICE LINE MUST BE TESTED IN ACCORDANCE WITH MN RULES, CHAPTER 4714, SECTION 1109.0.
25. FOR ALL SITES LOCATED IN CLAY SOIL AREAS, DRAIN TILE MUST BE INSTALLED AT ALL LOW POINT CATCH BASINS 25' IN EACH DIRECTION. SEE PLAN AND DETAIL. INSTALL LOW POINT DRAIN TILE PER PLANS AND GEOTECHNICAL REPORT RECOMMENDATIONS AND REQUIREMENTS.

CITY OF ST. PAUL UTILITY NOTES:

1. SEWER CONNECTION PERMIT: LICENSE HOUSE DRAIN CONTRACTOR TO OBTAIN (SEWER CONNECTION PERMIT) TO CONSTRUCT NEW SANITARY AND STORM CONNECTION IN STREET FROM MAIN TO THE PROPERTY. CALL ST PAUL PW PERMIT DESK (651-266-6234) FOR INFORMATION ON OBTAINING THIS PERMIT.
2. WATER SERVICES TO BE INSTALLED ACCORDING TO SPRWS "STANDARDS FOR THE INSTALLATION OF WATER MAINS.
3. THE FOLLOWING WORK IN THE R-O-W SHALL BE PERFORMED BY SPRWS ON AN ACTUAL COST BASIS. AN ESTIMATE WILL BE PROVIDED FOR THIS WORK AND PAYMENT IN THE AMOUNT OF THE ESTIMATE MUST BE RECEIVED BEFORE THE WORK CAN BE SCHEDULED. ALL OTHER WORK, INCLUDING EXCAVATION, RESTORATION, CUT-OFFS, AND PIPE WORK TO BE PERFORMED BY THE CONTRACTOR:
   - TAP, VALVE, AND BOX FOR ANY SERVICE TAPPED FROM 12" MAINS OR LARGER.
   - INSPECTION OF CONTRACTOR INSTALLED MAINS AND SERVICES.
   - CONSTRUCTION OF TEMPORARY SERVICES IF NECESSARY.
4. A FOUR-SIDED TRENCH BOX IS REQUIRED ON ALL EXCAVATIONS DEEPER THAN 5 FEET WHERE UNDERGROUND WORK OR INSPECTION IS TO BE PERFORMED BY SPRWS. FOR ALL WET TAP TO BE PERFORMED BY SPRWS, A MINIMUM TRENCH BOX SIZE OF 8 FEET HIGH X 8 FEET WIDE X 10 FEET LONG IS REQUIRED. LADDERS ARE REQUIRED AND MUST EXTEND 3 FEET ABOVE THE SURFACE OF THE TRENCH. SIDEWALKS, PAVEMENTS, DUCTS AND APPURTENANT STRUCTURES SHALL NOT BE UNDERMINED UNLESS A SUPPORT SYSTEM OR ANOTHER METHOD OF PROTECTION IS PROVIDED. TRENCHES IN EXCESS OF 20 FEET IN DEPTH MUST BE SIGNED OFF BY A REGISTERED PROFESSIONAL ENGINEER. EXCAVATED MATERIAL MUST BE KEPT A MINIMUM OF 2 FEET FROM THE EDGE OF THE TRENCH.
5. SERVICE CONNECTIONS SHALL BE INSTALLED WITH 8 FEET OF COVER AS PER THE ESTABLISHED GRADE FROM THE MAIN TO THE PROPERTY LINE, OR APPLICABLE, TO THE UTILITY EASEMENT LINE. WHEN SOLID ROCK CONDITIONS ARE ENCOUNTERED, WATER SERVICES MAY BE INSTALLED WITH 6.5' OF COVER. AT THIS DEPTH, THE NEED FOR INSULATION WILL BE DETERMINED BY SPRWS INSPECTORS.
6. PIPE MATERIAL FOR 8' DUCTILE IRON PIPE MUST BE CLASS 52, PIPE MATERIAL FOR 6" AND 4" DUCTILE IRON PIPE MUST BE CLASS 53. THE EXTERIOR OF DUCTILE IRON PIPE SHALL BE COATED WITH A LAYER OF ARC-SPRAYED ZINC PER ISO 8179. THE INTERIOR CEMENT MORTAR LINING SHALL BE APPLIED WITHOUT ASPHALT SEAL COAT. PIPE MUST BE WRAPPED IN V-8IO POLYWRAP ENCASEMENT AND SHALL BE INSTALLED UTILIZING MODIFIED METHOD A AS RECOMMENDED BY DIPRA. ENCASEMENT SHALL BE TAPED AT EACH JOINT AND AROUND THE MIDDLE OF THE PIPE.
7. ALL 2" AND SMALLER WATER SERVICES MUST BE TYPE K COPPER.
8. PIPE MUST BE WRAPPED IN V-8IO POLYWRAP ENCASEMENT.
9. MAINTAIN 3 FEET VERTICAL SEPARATION BETWEEN WATER AND SEWER PIPES OR 18 INCH SEPARATION WITH 4 INCH HIGH DENSITY INSULATION PER SPRWS STANDARD PLATE D-10 FOR TYPICAL WATER MAIN OFFSETS.
10. REFER TO SPRWS "STANDARDS FOR THE INSTALLATION OF WATER MAINS" STANDARD PLATE D-11 FOR RESTRAINED PIPE REQUIREMENT.
11. ALL PIPE WORK INSIDE OF PROPERTY TO BE PERFORMED BY A PLUMBER LICENSED BY THE STATE OF MINNESOTA AND CERTIFIED BY THE CITY OF SAINT PAUL. SPRWS REQUIRES SEPARATE OUTSIDE AND INSIDE PLUMBING PERMITS FOR EACH NEW WATER SERVICE.
12. ALL UNUSED EXISTING WATER SERVICES TO BE CUT OFF BY CONTRACTOR AT THE MAIN. EXCAVATION AND RESTORATION BY OWNER'S CONTRACTOR. CUT OFFS MUST BE PERFORMED PRIOR TO THE SCHEDULED TIME OF NEW INSTALLATION NEW WATER SERVICES WILL NOT BE TURNED ON UNTIL REQUIRED CUTOFFS HAVE BEEN PERFORMED.
13. THE CONTRACTOR PROVIDING EXCAVATION IS RESPONSIBLE FOR OBTAINING ALL EXCAVATION AND OBSTRUCTION PERMITS REQUIRED BY ANY GOVERNING AUTHORITY.
14. CONTRACTOR MUST MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO SPRWS ENGINEERING DEPARTMENT UPON COMPLETION OF WORK VIA EMAIL AT: WATER-PLUMBINGPERMITAPP@CI.STPAUL.MN.US.
15. CATHODIC PROTECTION IN THE FORM OF (2) 32 LB (BARE WT) MAGNESIUM ANODES IS REQUIRED IN CONJUNCTION WITH NEW SERVICE INSTALLATIONS IN THE R-O-W. REFER TO STANDARD PLATE D-15.
16. RATIO OF FIRE SUPPRESSION TO DOMESTIC TAKEOFF MUST BE NO LESS THAN 4:1.
17. CONTRACTOR TO MAINTAIN ACCESS TO THE FIRE DEPARTMENT CONNECTION FOR FIRE DEPARTMENT PERSONNEL AT ALL TIMES DURING THE CONSTRUCTION PERIOD
18. PLUMBING PERMIT APPLICATIONS TO BE MADE WITH SPRWS AT 1900 RICE STREET, ST. PAUL, MN.
19. BEFORE SCHEDULING INSTALLATION OF A NEW WATER SERVICE, SPRWS MUST RECEIVE A WATER SERVICE CONTRACT SIGNED BY THE OWNER, PAYMENTS IN THE A MOUNT SHOWN ON THE CONTRACT, AND APPLICATIONS FOR ALL OUTSIDE PLUMBING PERMITS.
20. PROVIDE COMPLETED PROJECT DATA SHEETS TO DETERMINE METER SIZING.
21. FURNISH ONE SET OF INTERIOR FIRE SUPPRESSION MECHANICAL PLANS FOR REVIEW AND APPROVAL BY SPRWS PLUMBING INSPECTION UNIT.
22. ALL WATER SERVICE VALVE BOXES WITHIN CONSTRUCTION AREA MUST BE EXPOSED AND BROUGHT TO GRADE UPON COMPLETION OF CONSTRUCTION.
23. LASER EQUIPMENT IS REQUIRED FOR SEWER PIPES WITH THE SLOPES LESS OR EQUAL THAN 2%
24. SEWER REMOVAL /ABANDONMENT PERMIT PLUMBING CONTRACTOR TO OBTAIN "REMOVAL PERMITS FROM PUBLIC WORKS TO CUT OFF EXISTING SEWER CONNECTIONS SERVICES TO THE PROPERTY. CALL ST PAUL PW PERMIT DESK (651-266-6234) FOR INFORMATION ON OBTAINING THIS PERMIT.
25. ALL PORTIONS OF THE STORM SEWER SYSTEM LOCATED WITHIN 10 FEET OF THE BUILDING OR WATER SERVICE LINE MUST BE TESTED IN ACCORDANCE WITH MN RULES, CHAPTER 4714, SECTION 1109.0.
26. SANITARY AND/OR STORM SEWER SERVICE PASSING WITHIN 10 FEET OF THE BUILDING ARE GOVERNED BY THE MN PLUMBING CODE. SPECIFICATION FOR PIPE MATERIAL SELECTION AND NOTES FOR REQUIRED AIR TEST OF THE PIPING, COMPLIANT WITH MN STATE PLUMBING CODE 4717 SECTION 1109.1, MUST BE SHOWN ON THE PLAN. THIS SYSTEM MUST BE APPROVED BY THE CITY OF ST. PAUL PLUMBING INSPECTIONS DEPARTMENTS DESIGNEE. PLEASE CONTACT STEVE FERNLUND, SENIOR PLUMBING INSPECTOR (651-266-9052) WITH ANY QUESTIONS.
27. ALL PRIMARY ROOF DRAINS SHALL BE PIPED INTERNALLY CONNECTED TO THE STORM SEWER (UNDERGROUND) DETENTION SYSTEM). MPC 4714.1101.1.
28. CONTRACTOR SHALL SUBMIT MH SHOP DRAWING FOR REVIEW TO CITY OF ST. PAUL PUBLIC WORKS INSPECTOR. SHOP DRAWING NEEDS TO BE SUBMITTED/APPROVED PRIO TO ISSUING THE CONNECTION PERMITS.

UTILITY LEGEND:

- MANHOLE
- CATCH BASIN
- GATE VALVE AND VALVE BOX
- PROPOSED FIRE HYDRANT
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- WATERMAIN UTILITY EASEMENT
- FES AND RIP RAP

Know what's below. Call before you dig.

N

1" = 20'-0"
10'-0" 0 20'-0"

CivilSite GROUP
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5000 Glenwood Avenue
Golden Valley, MN 55422
civilsitegroup.com 612-615-0060

MWF properties

MILLER HANSON PARTNERS

PHALEN VILLAGE

1180 & 1186 PROSPERITY AVENUE, ST. PAUL, MN 55106

PROJECT

MWF PROPERTIES
7845 LYNDALE AVENUE SOUTH MINNEAPOLIS, MN 55423

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.

David J. Knaeble
DATE 11/23/22 LICENSE NO. 48776

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
05/13/22	CITY SUBMITTAL
09/15/22	50% CONSTRUCTION DOCUMENTS
10/4/22	50% BID SET
11/23/22	CITY RESUBMITTAL

DRAWN BY: AM, MD, JL REVIEWED BY: DK
PROJECT NUMBER: 22174

REVISION SUMMARY

DATE	DESCRIPTION

UTILITY PLAN

C4.0

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Permit Program

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

MEMORANDUM

Date: January 4, 2023

To: Board of Managers and Staff

From: Nicole Soderholm, Permit Coordinator
Mary Fitzgerald, District Inspector

Subject: December Enforcement Action Report

During December 2022:

Number of Violations: **0**

Activities and Coordination Meetings: Minnesota Association of Watershed Districts (MAWD) annual conference in Alexandria MN, initial erosion control walk-throughs, active permit site monitoring and inspections, Metro Regulators meeting at Capitol Region Watershed District (CRWD) office, permitting assistance to private developers and public entities, miscellaneous resident inquiries, WCA administration, new permit review with Barr Engineering, RWMWD 2023 CIP pre-construction meeting, draft rule change collaboration with CRWD, permit pre-submittal meetings

Project Updates:

With temperatures lingering below freezing for much of the month of December, many active construction sites have been quiet – with work focused on the interior of buildings. Permit staff continue to drive by and monitor all sites to check for any signs of activity and inspect when necessary. A few winter site condition examples are pictured below: (Top left: #22-03 Gervais Woods 2nd Addition, Little Canada; Bottom Left: #22-32 Oakdale Elementary Demolition; Top right: Tartan High School Phase 2, Oakdale; Bottom right: #20-13 Menard's Remodel, Maplewood).



Single Lot Residential Permits Approved by Staff:

None

Permits Closed:

19-28 Maplewood Moose Lodge (Maplewood- WITHDRAWN)

Permit Program Summary 2020-2022

	2020	2021	2022
Open Permits	129	122	119
Board-Approved Applications	40	33	37
ESC Inspections	492	523	413
Violations	84	119	83
Verbal Warnings	4	2	11
Surety Deductions	$4,650	$3,335	$2,635
Non-Compliant Inspection Reports	30	38	56
% Inspections Found Non-Compliant	6	7	14
Permits Closed	29	40	42
Active Sites	64	44	47
% Active Sites Received Violations	53	52	55
WCA Applications	22	23	28
Variances Approved*	11	3	5

*newly reported 2022

4 most common ESC violations observed in 2022

- Install/Maintain Perimeter Control (26 violations)
- Install/Maintain Inlet Protection (15 violations)
- Stabilize Exposed Soils (11 violations)
- Removed Discharged Sediment (8 violations)

Trends/Observations

- Permit applications slightly up from last year
- Similar number of active sites and permit closures
- 2 residential permit applications (down from 5 last year), 0 associated violations
- Increased trend of non-compliance despite dry year
- Increased non-compliance on publicly owned sites

Permit Program Updates in 2022:

District staff have been collaborating with Capitol Region Watershed District (CRWD) on proposed rule changes, which are expected to come before the board for review in 2023.

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Stewardship Grant Program

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Stewardship Grant Program Budget Status Update

January 4, 2023

Homeowner	Coverage	Number of Projects: 0	Funds Allocated
Habitat Restoration and rain garden w/o hard surface drainage	50% Cost Share $15,000 Max	0	$0
Rain garden w/hard surface drainage, pervious pavement, green roof	75% Cost Share $15,000 Max	0	$0
Master Water Steward Project	100% Cost Share $15,000 Max	0	$0
Shoreland Restoration	100% Cost Share $15,000 Max	0	$0

Commercial, School, Government, Church, Associations, etc.	Coverage	Number of Projects: 0	Funds Allocated
Habitat Restoration	50% Cost Share $15,000 Max	0	$0
Shoreland Restoration (below 100-year flood elevation w/actively eroding banks)	100% Cost Share $100,000 Max	0	$0
Priority Area Projects	100% Cost Share $100,000 Max	0	$0
Non-Priority Area Projects	75% Cost Share $50,000 Max	0	$0
Public Art	50% Cost Share $15,000 Max	0	$0
Aquatic Veg Harvest/LVMP Development	50% Cost Share $15,000 Max	0	$0
Enhanced Street Sweeping	Amount Allocated for 2023 but not distributed	0	$128,000

Maintenance	50% Cost Share $7,500 Max for 5 Years	63	$43,500
Consultant Fees			$0
Total Allocated			**$171,500**

2023 Stewardship Grant Program Budget	
Budget	$1,128,000
Total Funds Allocated	$171,500
Total Available Funds	**$956,500**

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New Reports/ Presentations

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resourceful. naturally.
engineering and environmental consultants

BARR

Technical Memorandum

To: Ramsey-Washington Metro Watershed District (RWMWD) Board of Managers
From: Jay Hawley and Brandon Barnes – Barr Engineering Co.
Subject: Phalen Village Flood-Reduction Feasibility Study
Date: November 21, 2022
Project: 23/62-1200.22 - 004
c: Tina Carstens, RWMWD Administrator
Steve Love, City of Maplewood Public Works Director

This technical memorandum summarizes the results of the Phalen Village Flood-Reduction Feasibility Study that Barr Engineering Co. (Barr) conducted for the Ramsey-Washington Metro Watershed District (District). The feasibility study included localized updates to the District's XPSWMM model and the evaluation of five potential flood-reduction projects.

1.0 Background

In 2018, the District completed an evaluation to identify potentially flood-prone habitable structures based on updated rainfall depths published in Atlas 14. Barr detailed this work in a technical memorandum dated September 4, 2018, titled "Identification and Prioritization of Potentially Flood-Prone Structures." The District then completed the Beltline Resiliency Study in 2020, which evaluated potential system modifications that could be implemented in the Beltline watershed to reduce flood risk to habitable structures. Detailed background information on this study can be found in the Barr report titled *System-Wide Evaluation of Flood-Risk Mitigation Options: Beltline Resiliency Study* (November 2020). Since then, the District has conducted feasibility studies that further evaluate the concept-level modifications proposed in the Beltline Resiliency Study through a series of phases.

This feasibility study focuses on three potentially flood-prone habitable structures on the north end of Lake Phalen, as shown with purple house symbols in Figure 1 and listed in Table 1. The flooding potential for these structures is due to high water in the adjacent wetlands, identified as the "West Wetland" and "East Wetland," based on the 2018 Atlas 14 100-year, 96-hour inundation extents (blue shaded areas). The West Wetland outlets to Phalen Creek and the East Wetland outlets to Lake Phalen, as shown by the existing storm sewer pipes (yellow lines). There are no known reports of flooding for the two structures by the West Wetland; however, according to the City of Maplewood, there have been flooding reports near the East Wetland.

Figure 1 Potentially Flood-Prone Habitable Structures

2.0 Existing Conditions XPSWMM Model Updates

Barr reviewed the 2018 existing conditions XPSWMM model in this area and updated it based on current GIS data and as-built storm sewer plans from the District and the City of Maplewood. These revisions updated the outlets from the two wetlands and subdivided their respective subwatershed areas to account for additional stormwater storage locations in their direct watersheds.

Based on these updates, the West Wetland's contributing area increased from approximately 275 to approximately 310 acres, but the Atlas 14 100-year, 96-hour peak water surface elevation decreased from 863.2 feet to 861.9 feet as a result of accounting for additional stormwater storage locations within the model. This updated 100-year, 96-hour peak water surface elevation is now approximately 0.3 feet below the lowest low-entry elevations of the structures adjacent to the West Wetland, as listed in Table 1. As a result of this revised peak water surface elevation, these structures are no longer catagorized as potentially impacted, and no modifications to the stormwater system are require to remove them from the 100-year floodplain.

The East Wetland's contributing area also increased slightly from 20 to 21 acres, but the Atlas 14 100-year, 96-hour peak water surface elevation increased from 863.0 feet to 863.5 feet, as shown in Table 1. The increase in the 100-year peak water surface elevation is primarily due to accounting for additional resolution in the storm sewer network in the model. The updated 100-year, 96-hour peak water surface

elevation impacts the property listed in Table 1 and could potentially impact habitable structures to the west and east. It is important to note that the low-entry elevations of these habitable structures have not been surveyed; these impacts are based on LiDAR elevations. Barr evaluated several options for lowering the water level in this wetland, which are discussed in section 3.

Based on the updated model results, the highest water level in the East Wetland occurs approximately 49 hours after the start of the storm event. It is caused primarily by runoff from the wetland's direct drainage area. A secondary water level peak at an elevation of 861.7 feet occurs approximately 96 hours after the start of the storm event and is caused by backflow from Lake Phalen. This secondary peak is not high enough to impact any habitable structures, but it does inundate large portions of the nearby residents' yards and may impact some of their auxillary buildings. The secondary peak would need to be reduced to approximately 860.5 to keep most of the yard areas dry. The duration of this secondary peak is also much longer than the primary peak, maintaining water levels above 861.5 feet for a couple of days.

Table 1 Potentially Flood-Prone Habitable Structures

Location	Address	Lowest Adjacent Grade/Low-Entry Elevation	2018 100-Year Water Surface Elevation	Updated 100-Year Water Surface Elevation
West Wetland	1880 East Shore Dr, Maplewood 55109 (West Building)	862.33 (Survey)	863.2	861.9
West Wetland	1880 East Shore Dr, Maplewood 55109 (East Building)	862.24 (Survey)	863.2	861.9
East Wetland	1858 East Shore Dr, Maplewood 55109	862.3 (LiDAR)	863.0	863.5

3.0 East Wetland Potential Flood-Reduction Options

The following section discusses the five flood-reduction designs that Barr developed to decrease the Atlas 14 100-year, 96-hour peak water surface elevations in the East Wetland to 862.3 feet or lower.

3.1 Option1: Upsize All the Existing Outlet Structures and Pipes

The first flood-reduction design replaces the wetland's existing outlet system with larger pipes and structures to increase the outflow rates from the wetland and decrease the peak water elevations. The main design elements are shown in Figure 2 and listed below:

- Replace the existing 21-inch stool grate outlet with a 60-inch-diameter outlet structure with a trash rack
- Replace the existing 12-inch high-density polyethylene (HDPE) pipe with a 30-inch equivalent reinforced-concrete (RCP) arch pipe between the outlet and the lake

- Add backflow prevention on the 30-inch-equivalent RCP arch pipe just upstream of the lake and on the 12-inch RCP pipe between the wetland outlet and the East Shore Drive storm sewers

This option reduces the wetland's 100-year, 96-hour peak water surface elevation to 862.2 feet, below the the target elevation of 862.3 feet. The backflow prevention on the East Shore Drive storm sewer connection prevents street runoff from backflowing into the wetland system and slowing its outflow during the storm's peak. The backflow prevention on the pipe to Lake Phalen prevents the lake from backflowing into the wetland, lowers the secondary wetland peak by 1.1 feet (to 860.6 feet), and greatly reduces the yard area inundated by this second peak. The water surface elevations discussed above are also summarized in Table 2.

Potential drawbacks to this option include the following:

- It will disturb a large area of private property and be close to two residences.
- It will temporarily disturb wetland areas.
- The new outlet pipe will likely have some standing water in it since its inverts are below the Lake Phalen outlet elevation (857.5).

Figure 2 Option 1 Design Features

3.2 Option 2: Add Overflow Structure, Upsize the Downstream Portion of the Outlet System

The second flood-reduction design adds a high-water overflow structure along the existing outlet system approximately 185 feet south of the wetland's outlet structure. The storm sewer downstream of this new structure would be replaced with larger pipes and structures to increase the outflow rates from the wetland during periods of high water and decrease the peak water elevations. The main design elements are shown in Figure 3 and listed below:

- Add a 60-inch-diameter overflow structure and trash rack along the outlet pipe approximately 185 feet south of the outlet with a rim elevation of 860.0 feet, 0.5 feet above the wetland outlet's rim elevation of 859.5 feet.
- Grade along the existing pipe between the wetland and the new overflow structure to allow flows to reach the structure when water levels exceed 860.0 feet
- Replace the 12-inch HDPE pipe with a 30-inch-equivalent RCP arch pipe between the new overflow structure and the lake
- Add backflow prevention on the 30-inch-equivalent RCP arch pipe just upstream of the lake and on the 12-inch RCP pipe between the wetland outlet and the East Shore Drive storm sewers

Similar to Option1, Option 2 also reduces the 100-year, 96-hour peak water surface elevation in the wetland to 862.2, below the target elevation of 862.3 feet. The backflow prevention on the East Shore Drive storm sewer connection prevents street runoff from backflowing into the wetland system and reduces the peak outflow. The backflow prevention on the pipe to Lake Phalen prevents the lake from backflowing into the wetland, lowers the secondary peak in the wetland by 1.1 feet (to 860.6 feet), and greatly reduces the yard areas inundated by this second peak. The water surface elevations discussed above are also summarized in Table 2.

Potential drawbacks to this option include the following:

- It will disturb a large area of private property and be close to two residences.
- It may disturb wetland areas depending on how much grading is needed.
- The downstream sections of the new outlet pipe will have some standing water most of the time since its inverts will be below the Lake Phalen outlet elevation (857.5); however, there will likely be less standing water than in the Option 1 pipe.

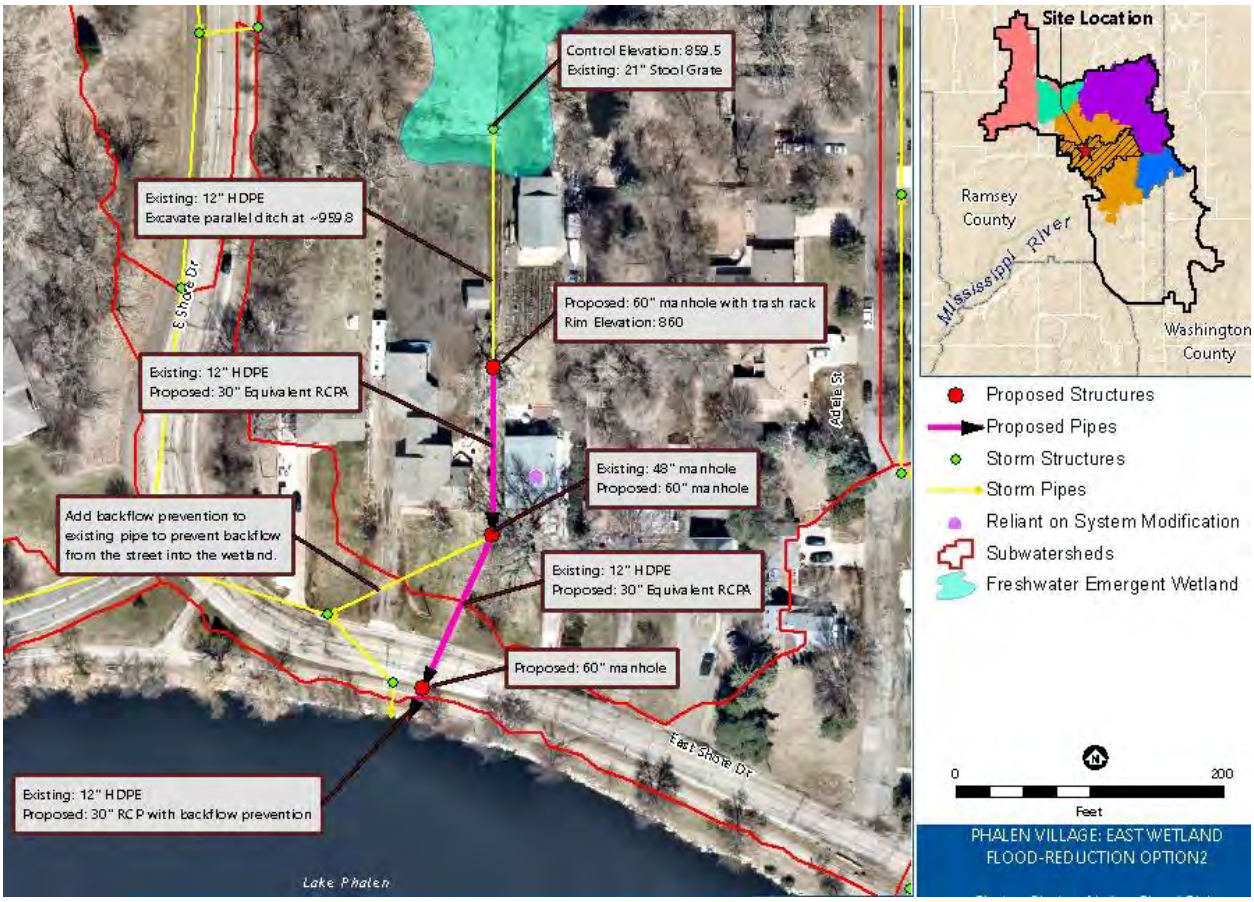

Figure 3 Option 2 Design Features

3.3 Option 3: Divert the Storm Sewer at the Intersection of Adele Street and Gordon Avenue

The third flood-reduction design diverts the storm sewer at the intersection of Adele Street and Gordon Avenue away from the East Wetland and route it directly to Lake Phalen. The main design elements are shown in Figure 4 and listed below:

- Replace the existing manhole at the intersection of Adele Street and Gordon Avenue to lower the new outlet pipe below the manhole's invert
- Install a new 21-inch RCP pipe from the replaced manhole to the lake. Includes a new manhole structure in East Shore Drive where the pipe slope changes
- Bulkhead or remove the existing 27-inch RCP going north to prevent flow from entering the East Wetland
- Add backflow prevention on the existing 12-inch HDPE pipe just upstream of the existing wetland outlet to the lake and the existing 12-inch RCP pipe between the wetland outlet and the East Shore Drive storm sewers

Option 3 reduces the 100-year, 96-hour peak water surface elevation in the wetland to 862.6, failing to meet the target elevation of 862.3 feet. Like Options 1 and 2, the backflow prevention on the East Shore Drive storm sewer connection prevents street runoff from backflowing into the wetland system and reduces its outflow. However, the backflow prevention on the outlet pipe to Lake Phalen has less impact in Option 3, only lowering the secondary peak in the wetland by 0.5 feet to 861.2 feet. The water surface elevations discussed above are also summarized in Table 2.

Potential drawbacks to this option include the following:

- It does not lower the wetland's 100-year, 96-hour peak water surface elevation to the target elevation.
- It is less effective at decreasing the area of yard flooding during the secondary peak.
- It may cause wetland impacts by changing the amount of water flowing into the East Wetland.

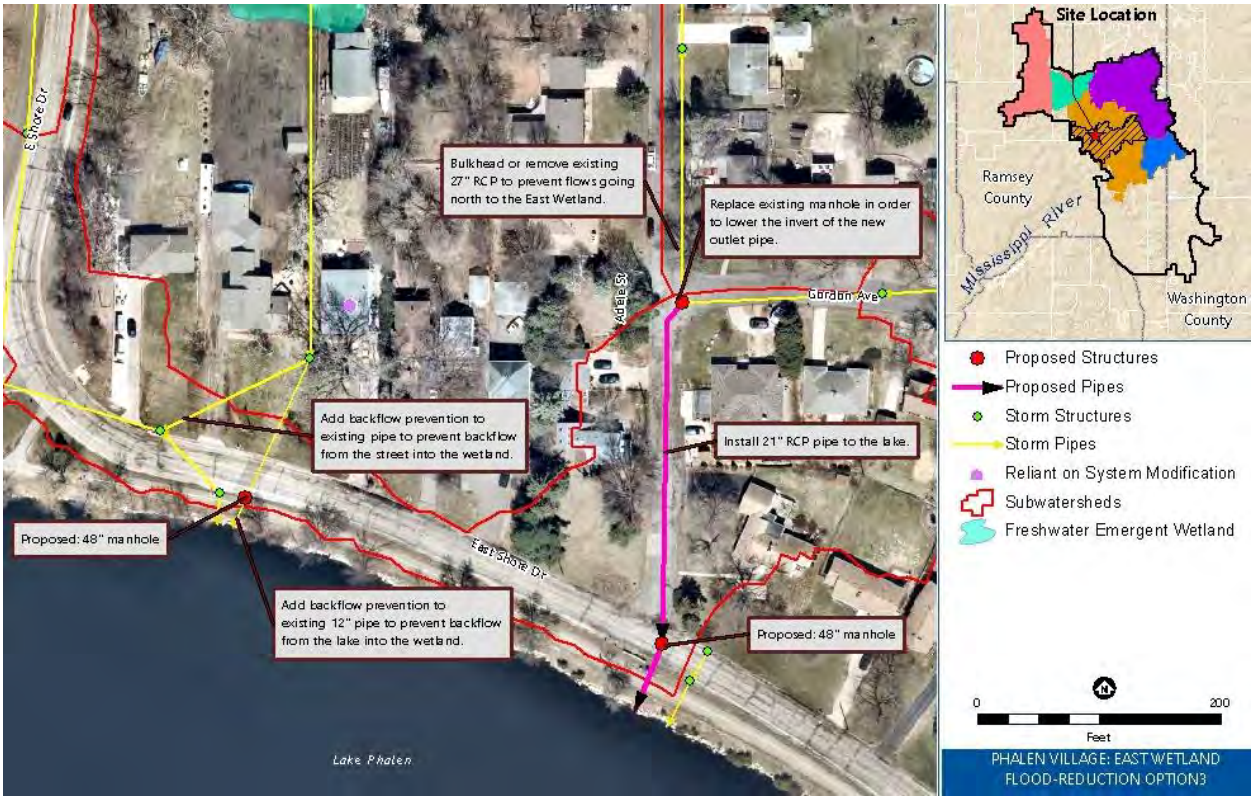

Figure 4 Option 3 Design Features

3.4 Option 4a: Add a New Outlet to East Shore Drive, Upsize Existing Pipes in the Street with a New Inlet to the Lake

The fourth flood-reduction design adds a new outlet pipe from the west side of the East Wetland connecting to the storm sewer system on East Shore Drive. The East Shore Drive storm sewer would be upsized to accommodate the additional flow, and a new inlet to Lake Phalen would be added to prevent

the increased flow volumes from impacting the West Wetland. The main design elements are shown in Figure 5 and listed below:

- Install a new 42-inch RCP pipe with a flared-end section (FES), trash guard, and backflow prevention; the control elevation at the inlet to this pipe will match the wetland's existing control elevation of 859.5
- If necessary, grade the surface between the existing and proposed outlets to an elevation of 859.5
- Add a new manhole along the existing 15-inch RCP storm sewer pipe in East Shore Drive and connect the existing 15-inch RCP from the north and the new 42-inch RCP from the east; replace the downstream pipes with 42-inch RCP
- Bulkhead the existing 15-inch RCP that goes west along East Shore Drive to prevent the increased flow volumes from increasing water levels in the West Wetland
- Install a new 42-inch RCP from the manhole at the East Shore Drive intersection to Lake Phalen
- Add backflow prevention on the existing 12-inch HDPE pipe just upstream of the existing wetland outlet to the lake and the existing 12-inch RCP pipe between the wetland outlet and the East Shore Drive storm sewers

Similar to options 1 and 2, Option 4a also reduces the 100-year, 96-hour peak water surface elevation in the wetland to 862.2, exceeding the target elevation of 862.3 feet. The backflow prevention on the East Shore Drive storm sewer connection and the new and existing outlet pipes to Lake Phalen also produced results similar to Options 1 and 2, preventing street runoff and high lake-water elevations from backflowing into the wetland system. These backflow preventers lowered the secondary peak in the wetland by 1.1 feet to 860.6 feet and significantly reduced the yard areas inundated by this second peak. The water surface elevations discussed above are also summarized in Table 2.

Potential drawbacks to this option include the following:

- It may disturb wetland areas depending on how much grading is needed.

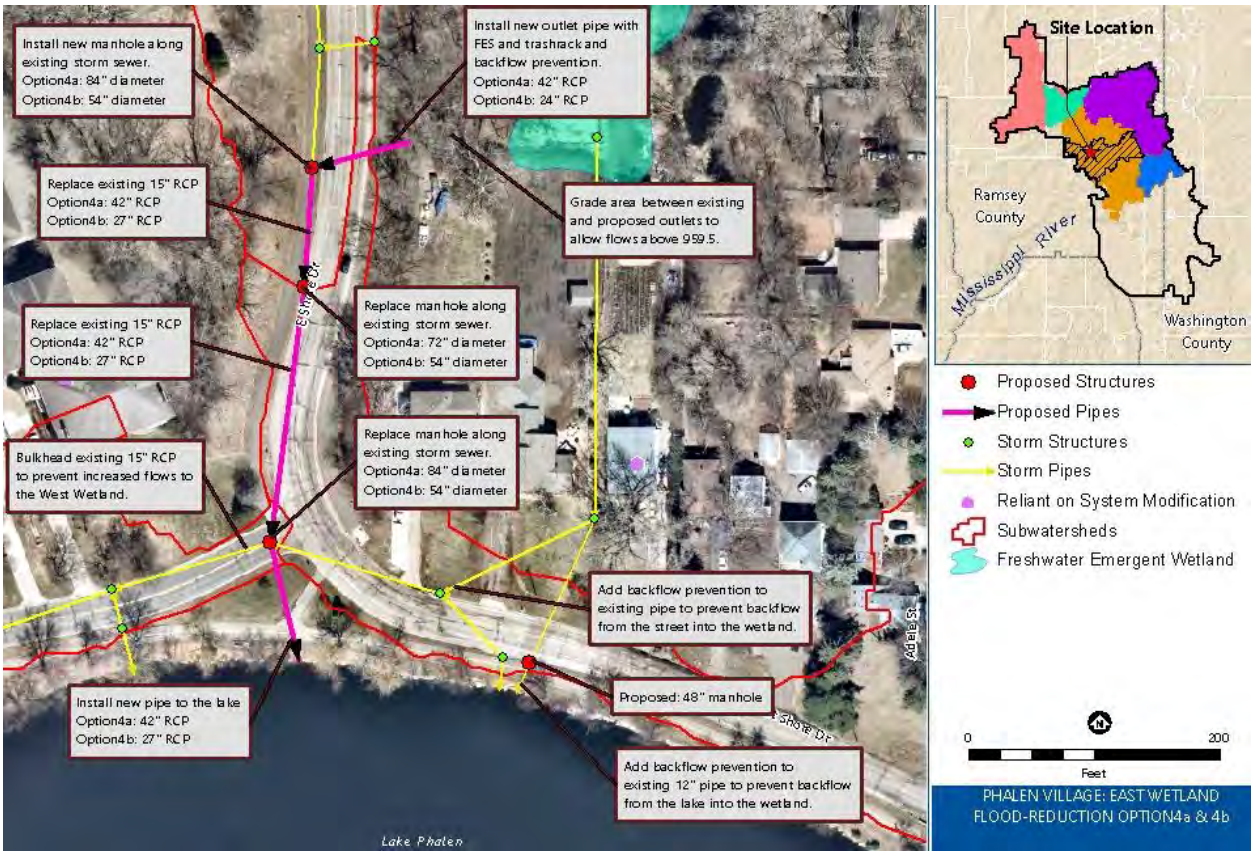

Figure 5 Option 4a Design Features

3.5 Option 5: Combination of Option3 and Option4b

The fifth flood-reduction option combines Option 3 and Option 4b. Option 4b is the same as Option 4a except that the new pipes are smaller in diameter: 24 inches for the first section of the new outlet pipe and 27 inches for the pipes under East Shore Drive down to Lake Phalen. The manhole structures in the street are also reduced to 54 inches in diameter. The main design elements are shown in Figure 4 and Figure 5 and described in Sections 3.4 and 3.5 (other than the size reductions).

Option 5 also effectively reduced the 100-year, 96-hour peak water surface elevation in the wetland to 862.2, exceeding the target elevation of 862.3 feet. The backflow prevention on the East Shore Drive storm sewer connection and the new and existing outlet pipes to Lake Phalen produced results similar to Options 1, 2, and 4a, preventing street runoff and backflowing of high lake waters into the wetland system. Backflow prevention was the most effective in this option, lowering the secondary peak in the wetland by 1.2 feet to 860.5 feet. The water surface elevations discussed above are also summarized in Table 2.

Potential drawbacks to this option include the following:

- It may disturb wetland areas depending on how much grading is needed.

Table 2 Summary of 100-Year, 96-Hour Peak Water Surface Elevations in the East Wetland for the Five Proposed Flood-Reduction Options

Proposed Flood-Reduction Option	Existing and Target 100-Year, 96-Hour Peak Water Surface Elevations (feet, NAVD88)	Proposed 100-Year, 96-Hour Primary Peak Water Surface Elevation (feet, NAVD88)	Proposed 100-Year, 96-Hour Secondary Peak Water Surface Elevation (feet, NAVD88)
Option 1: Replace Entire Outlet System	Existing Primary: 863.5 Target Primary: 862.3 Existing Secondary: 861.7 Target Secondary: 860.5	862.2	860.6
Option 2: Partially Replace Outlet System		862.2	860.6
Option 3: Divert Storm Sewer at the Intersection of Adele Street and Gordon Avenue[1]		862.6	861.2
Option 4a: New Outlet into East Shore Drive Storm Sewer[2]		862.2	860.6
Option 5: Combination of Option 3 and Option 4b[3]		862.2	860.5

[1] Option 3 does not lower the 100-year water surface elevation enough by itself; it needs to be combined with Option 4b.

[2] Option 4a can lower the 100-year water surface elevation to the target elevation by itself if 42-inch-diameter pipes can be used.

[3] Option 5 will lower the 100-year water surface elevation to the target elevation if the Option 4a pipes are reduced to a 24-inch outlet pipe and 27-inch pipes are used in the street (Option 4b).

4.0 Planning-Level Opinions of Probable Cost of Projects

Following further definition of the scope of the flood-reduction modifications and completion of detailed design, the final cost may be lower or higher than the planning-level opinions of cost included in Table 3. These costs are intended to provide a planning-level estimate for the potential system modifications described in previous sections.

These opinions of cost, project reserves, contingency, documentation, and discussion are intended to provide background information for planning-level options assessment, analysis purposes, and budget planning. The cost of time escalation is not included in the opinions of probable cost. All costs are presented in 2022 US dollars.

Unit costs are based on recent bid prices, published construction cost-index resources, and similar projects. Costs associated with base planning engineering and design (PED), construction management (CM), and permitting are not included in the overall estimate for construction costs.

The opinions of cost also do not include other tasks following construction of each option, such as operations and maintenance or monitoring.

Contingency used in these opinions of probable cost is intended to help identify an estimated construction cost amount for items included in the current Project scope that have not yet been accurately quantified at the current level of design. Stated another way, contingency is the resultant of the pluses and minuses that cannot be estimated at the level of project definition that exists. The contingency also includes the cost of ancillary items not currently itemized in the quantity summaries but commonly identified in more detailed design and required for completeness of the work. A 30% contingency is applied to the estimated construction cost to account for the costs of these items.

Industry resources for cost estimating (*AACE International Recommended Practice No. 18R-97, and ASTM E2516-11 Standard Classification for Cost Estimate Classification System*) provide guidance on cost uncertainty, depending on the level of project design developed. The opinion of probable cost for the options evaluated generally corresponds to a Class 4 estimate characterized by completion of limited engineering. As the level of design detail increases, the level of uncertainty is reduced. Figure 6 provides a graphic representation of how uncertainty (or accuracy) of cost estimates can be expected to improve as more detailed design is developed.

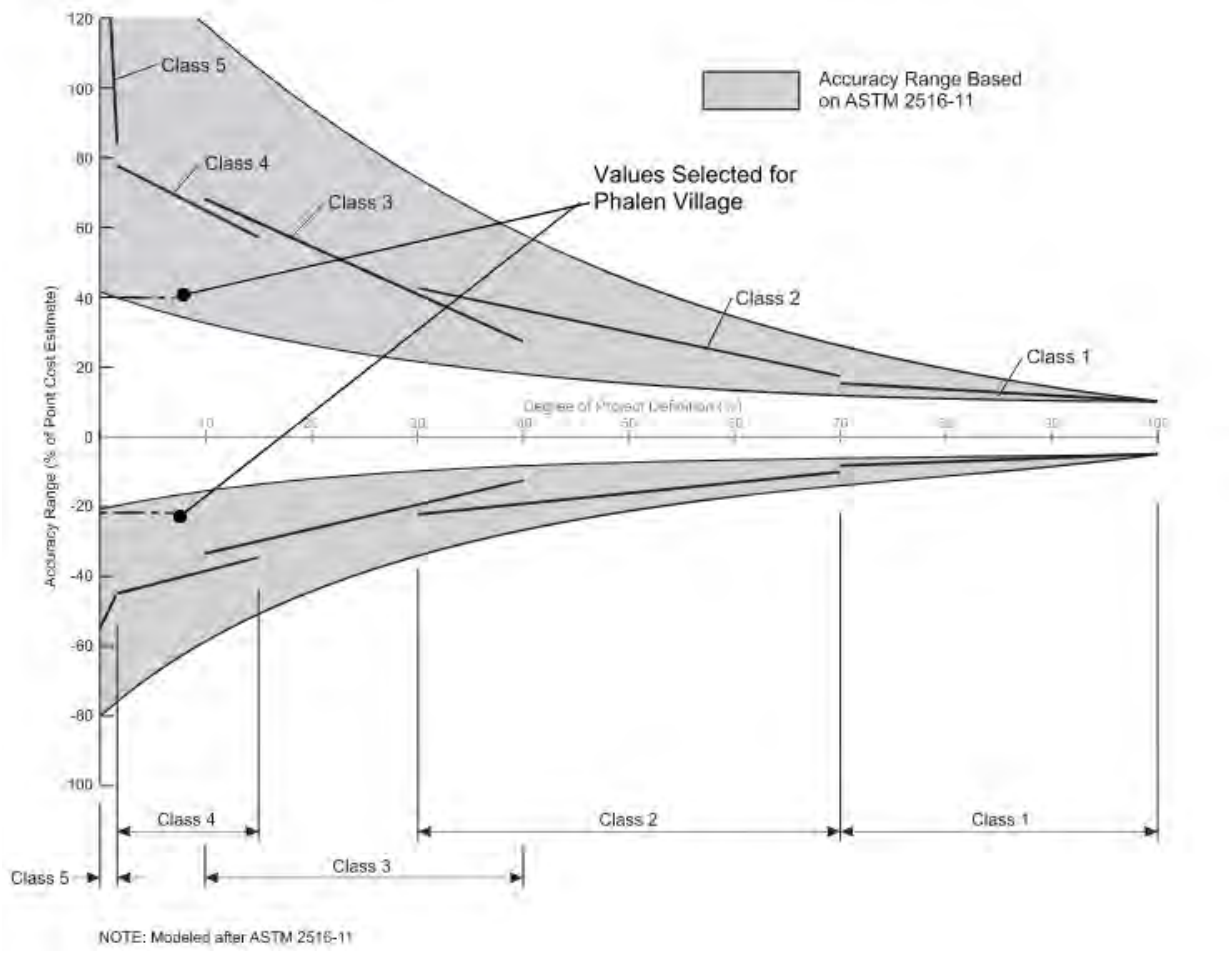

Figure 6 Relationship between Cost Accuracy and Degree of Project Definition

At this early stage of planning, the range of uncertainty of total project cost is high. Due to the early stage of the project, it is standard practice to place a broad accuracy range around the point cost estimate.

The accuracy range is based on professional judgment considering the level of design completed, the complexity of the project, and the uncertainties in the project scope; the accuracy range does not include costs for future scope changes that are not part of the project as currently defined or risk contingency. The estimated accuracy range for this point estimate is -20% to +40%.

The opinion of probable construction cost is made based on Barr's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. It is acknowledged that additional investigations and additional site-specific information that becomes available in the next stage of design may result in changes to the proposed configuration, cost, and functioning of project features. This opinion is based on project-related information available to Barr at this time and includes a planning-level feasibility design of the project. In addition, because we have no control over the eventual cost of labor, materials, equipment, or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost presented.

Table 3 Summary of Planning-Level Opinions of Probable Costs for Flood-Reduction Options

Proposed Flood-Reduction Option	Planning-Level Opinion of Cost for Total Project[1,2]	Planning-Level Opinion of Cost for RWMWD Portion of Project[1,2,3]
Option 1: Replace Entire Outlet System	$320,000 *($260,000–$450,000)*	$50,000 *($40,000–$70,000)*
Option 2: Partially Replace Outlet System	$275,000 *($220,000–$390,000)*	$48,000 *($39,000–$68,00)*
Option 3: Divert Storm Sewer at Intersection of Adele and Gordon Streets	$375,000 *($300,000–$530,000)*	$40,000 *($32,000–$56,000)*
Option 4a: New Outlet (42 Inch) into East Shore Drive Storm Sewer	$747,000 *($600,000–$1,050,000)*	$125,000 *($100,000–$175,000)*
Option 5: Combination of Option3 and Option 4b (24" outlet)	$980,000 *($790,000–$1,380,000)*	$118,000 *($95,000–$166,000)*

[1] Costs include a 30-percent construction contingency. Costs are represented as a feasibility-level class 4 cost estimate, as defined by the Association for the Advancement of Cost Estimating with a +40%/-20% uncertainty.
[2] These costs assume that no wetland mitigation will be required as part of these projects and that contaminated soils will not be encountered.
[3] The RWMWD portion of project costs includes the furnishing and installation of storm sewer between East Shore Drive and Lake Phalen, backflow prevention devices, modeling and permit guidance. These costs do not include other aspects of the project such as removals, erosion and sediment control, and restoration.

5.0 Regulatory Approval

The following permits may be required for one or more of the proposed flood-reduction projects:

- **Excavating and grading permit (City of Maplewood):** An excavating and grading permit application and an erosion control plan must be submitted with the final grading plans to the City of Maplewood any time a significant amount of soil is displaced or a drainage pattern is altered.
- **Right-of-way permit (City of Maplewood):** Any work in the public rights of way requires a city right-of-way permit.

- **RWMWD permit:** A permt is required if any RWMWD rules are triggered. Rule C Stormwater Management is triggered if the proposed land disturbance exceeds 1 acre. Rule D Flood Control is triggered for any land-disturbing activity greater than 1 acre that increases impervious area or any land-disturbing activity of any size that involves alteration or fill of land below the 100-year flood elevation of a water body. Rule E Wetland Management applies for land disturbance that exceeds 1 acre and is located adjacent to a wetland. Finally Rule F Erosion and Sediment Control applies for proposed land disturbance that exceeds 1 acre or is greater than 1,000 squre feed and within the 100-year floodplain or adjance to a public water wetland, public water or wetland.
- **National Pollutant Discharge Elimination System (NPDES) permit (Minnesota Pollution Control Agency (MPCA):** An NPDES permit is required if the disturbed area is greater than 1 acre or if the MPCA determines that the area poses a risk to water resources.
- **Public water work permit (Minnesota Department of Natural Resources [MnDNR]):** A public water work permit may be required since all the proposed drainage modification scenarios include work along the edge of Lake Phalen, which is an MnDNR public water.
- **Clean Water Act permit (US Army Corp of Engineers [USACE]):** A Clean Water Act permit may be required since all the proposed drainage modification scenarios include work along the edge of Lake Phalen, which is an MnDNR public water.

6.0 Summary

This memo includes the results of the XPSWMM model updates in the Phalen Village area and the conceptual designs for five flood-reduction projects to reduce the 100-year, 96-hour peak water surface elevations in the East Wetland. The main findings of this study are summarized below:

- The model updates lowered the 100-year, 96-hour peak water surface elevation in the West Wetland to 861.9, so the habitable structures adjacent to this wetland are no longer impacted.
- Option 2 is less expensive than Option 1 and produces similar results. It also has fewer potential drawbacks than Option 1.
- Option 2, with a partial outlet replacement, is the most cost-effective option for lowering the peak water surface elevation to the target elevation, regardless of whether the street reconstruction costs are included. But it does require disturbing large areas of private property and working very close to structures.
- Option 3 is the only option that failed to lower the 100-year, 96-hour peak water surface elevations enough to meet the target elevation of 862.3 (see Table 3). As a result, this option is not recommended for construction as a stand-alone project.
- Options 4a and 5 are much more expensive than Option 2 but reduce impacts to private property. Option 4a is more cost-effective than Option 5 if the street costs are included, but Option 5 is more cost-effective if only the storm sewer costs are considered. Option 5 is also the most effective at lowering the secondary water peak and reducing the area of yard inundation.

Barr recommends that RWMWD Mannagers direct staff to coordinate with City of Maplewood staff to complete final design of flood-reduction modifications included in Option 5, such that modifications could be constructed at the same time as the City's 2025 planned street improvement project (SIP).

References

Association for the Advancement of Cost Estimating. Rev. 2016. AACE International Recommended Practice NO. 18R-97, March 1, 2016. (AACE, 2016)

ASTM E2516-11, Standard Classification for Cost Estimate Classification System, ASTM International, West Conshohocken, PA, 2011, www.astm.org. (ASTM, 2011)

Barr Engineering Co., 2018. *Identification and Prioritization of Potentially Flood-Prone Structures*. Report. (Barr, 2018)

Barr Engineering Co., 2020. *System-Wide Evaluation of Flood-Risk Mitigation Options. Beltline Resiliency Study*. Report. (Barr, 2020)

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Memorandum

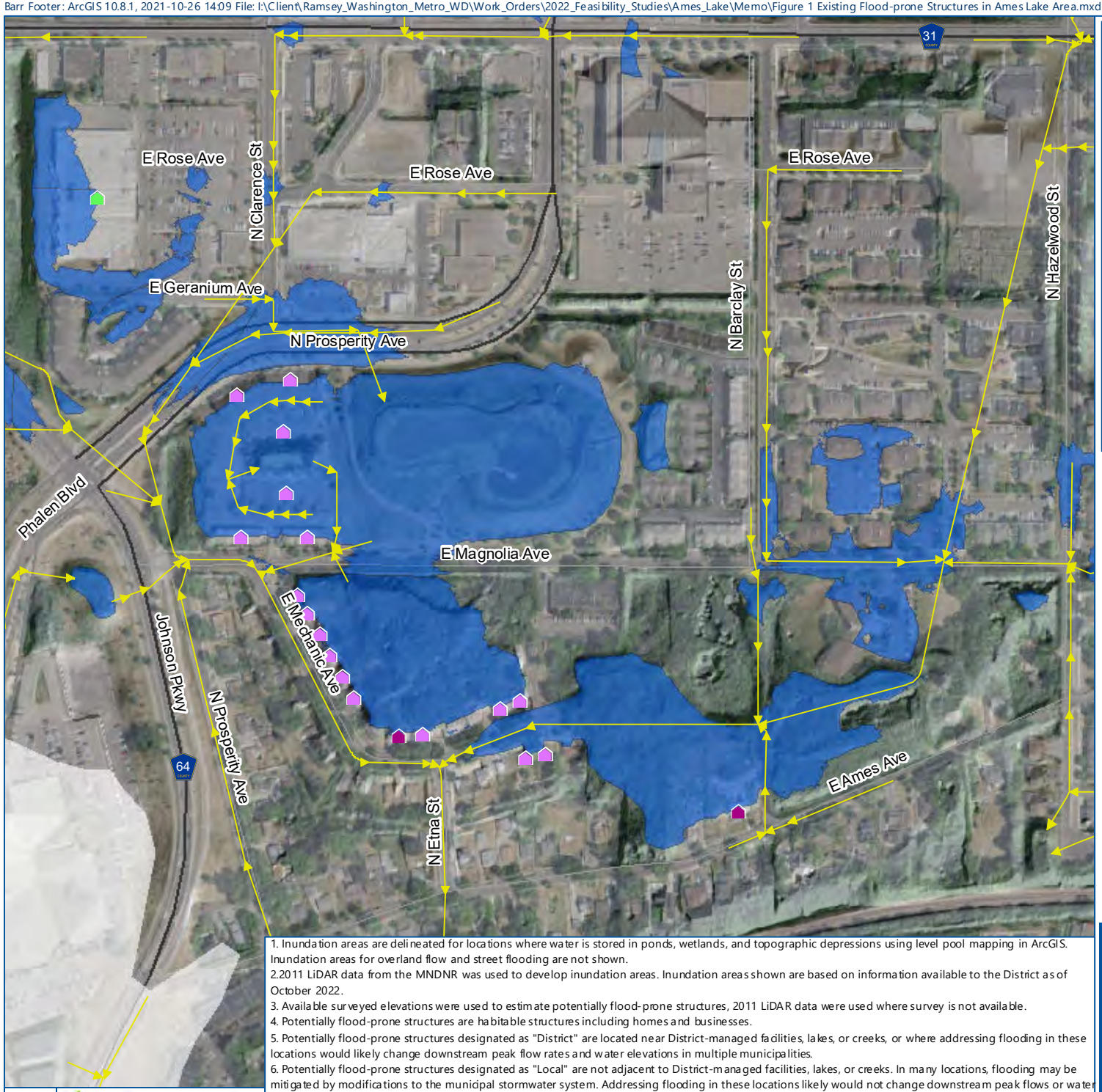
To: Ramsey-Washington Metro Watershed District (RWMWD) Board of Managers
From: Lulu Fang & Brandon Barnes
Subject: Ames Lake Prefeasibility Study
Date: November 21, 2022
Project: 23/62-1200.22- 003
c: Tina Carstens, RWMWD Administrator

The purpose of this study was to identify locations for flood-risk reduction BMPs to remove habitable structures near Ames Lake from the 100-year floodplain. This project included coordination with stakeholders and planning-level modeling to identify potential cost-effective strategies for managing flood risk within this portion of the watershed. The following discussion summarizes locations (parcels) considered for system modifications to reduce flood risk, stakeholder coordination, planning-level model results, and recommendations.

Atlas 14 modeling updates in 2015 revealed that the Ames Lake area downstream of Lake Phalen and northeast of Johnson Parkway and Magnolia Avenue is prone to flooding during the 100-year rainfall event. A desktop study revealed that 44 homes and businesses may be located within the flood zone and that an additional 13 homes and businesses are very near it. The Beltline Resiliency Study identified that one option for mitigating flood risk is a combination of regional stormwater ponds and storm sewer system modifications.

In 2020, RWMWD started the Ames Lake Flood Risk Reduction study, which included gathering survey information for flood-prone structures presented in the Beltline Resiliency Study. Barr surveyed low entrances for habitable structures near Ames Lake. Survey results confirmed that 43 habitable structures are located within the 100-year floodplain, as shown in Figure 1.

In 2022 Barr completed a desktop review of open areas, including parks, vacant parcels, streets, etc., to identify potential locations for system modifications to reduce flood risk.



Potential Flood-prone Structures:

- Within the 100-year Floodplain (Surveyed Confirmed)
- Within the 100-year Floodplain (Survey not available)
- No Longer Considered to be in the 100-year Floodplain (Surveyed Confirmed)

Design Elements:

- Existing Storm Sewer Pipe

100-Year Floodplain:

- Existing

0 600

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas. Inundation areas shown are based on information available to the District as of October 2022.
3. Available surveyed elevations were used to estimate potentially flood-prone structures, 2011 LiDAR data were used where survey is not available.
4. Potentially flood-prone structures are habitable structures including homes and businesses.
5. Potentially flood-prone structures designated as "District" are located near District-managed facilities, lakes, or creeks, or where addressing flooding in these locations would likely change downstream peak flow rates and water elevations in multiple municipalities.
6. Potentially flood-prone structures designated as "Local" are not adjacent to District-managed facilities, lakes, or creeks. In many locations, flooding may be mitigated by modifications to the municipal stormwater system. Addressing flooding in these locations likely would not change downstream peak flows or water levels in downstream municipalities. In these locations, the municipality will likely lead the evaluation of system modifications to mitigate flood-risk, and the District may choose to be involved in a supporting role.

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Existing Flood-prone Structures in Ames Lake Area

Phalen Chain of Lakes Flood Risk Reduction Study- Ames Lake Area
Ramsey-Washington Metro Watershed District

FIGURE 1

1 Stakeholder Coordination

In March 2022, Barr and RWMWD staff met with City of Saint Paul staff to discuss potential locations for a flood-risk reduction BMP. Staff presented locations to the City's Water Resources Working Group (WRWG), which consists of representatives from different departments to request feedback on proposed locations shown in Figure 2. The WRWG provided feedback regarding potential constraints such as programming needs in City parks, utility conflicts, and street improvements. Barr Staff also contacted the Saint Paul Housing and Redevelopment Authority (HRA) to request input on plans for vacant parcels and information on whether open areas could be used for flood-risk reduction BMPs.

Potential locations for flood-risk reduction BMPs were classified based on the comments provided by the City and HRA. Locations were classified as:

- Likely Not Feasible—These areas have conflicts that would prevent a future system modification. Conflicts could include future programming needs for parks, utility conflicts, or shallow groundwater.
- Feasible with Conditions—These areas have potential conflicts that might prevent future system modifications, but additional evaluation is required. Examples of these conflicts could include future programming needs in City parks or the potential development of currently vacant parcels.
- Likely Feasible—These are areas where no conflicts were identified, and the property owners are interested in further evaluation of a flood-risk BMP in the area.
- Opportunity for Local Project—These are areas for smaller-scale BMPs.

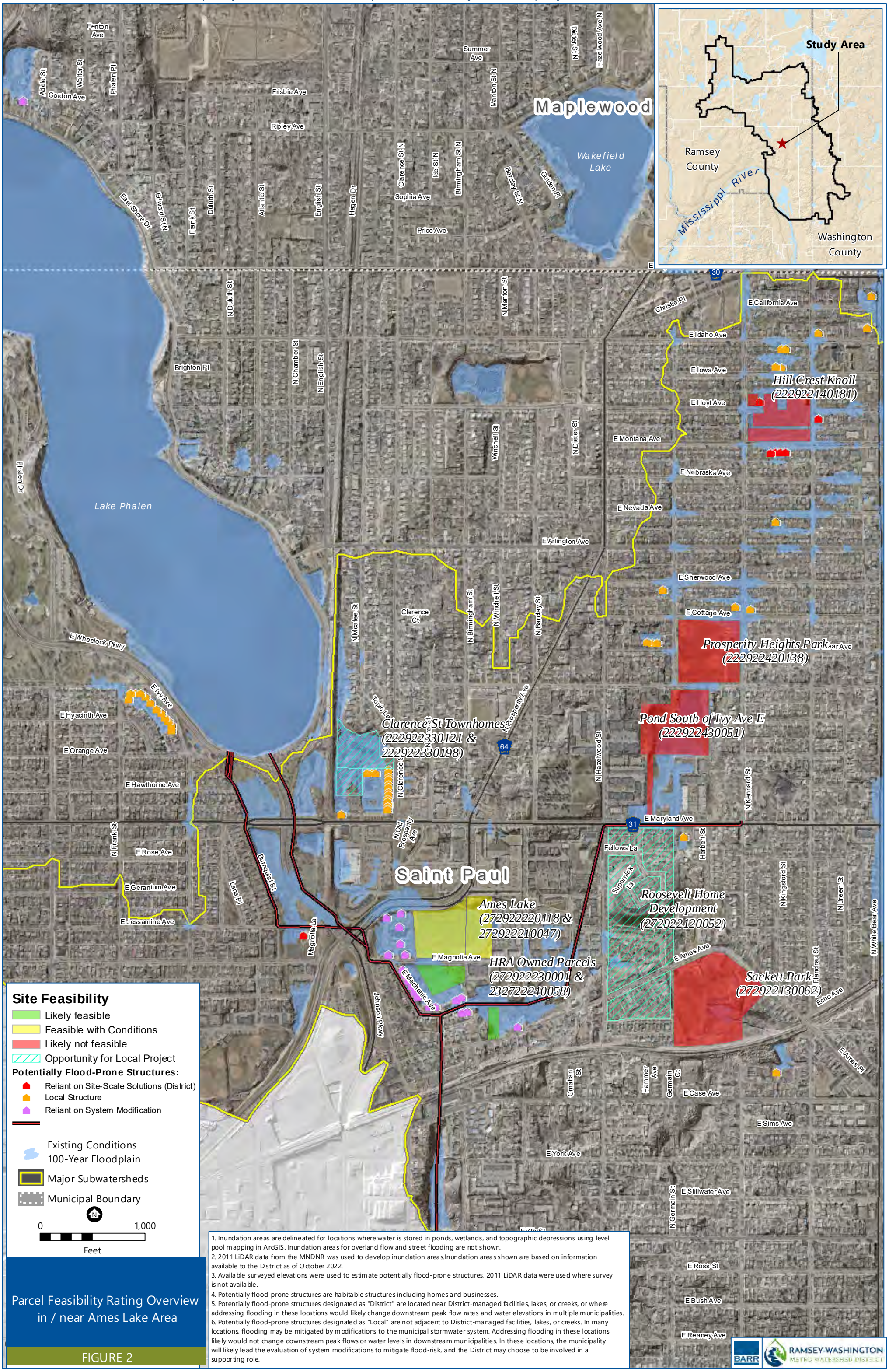
Feedback provided by the City and HRA is summarized in Table 1. The locations considered are shown in Figure 2.

Table 1 Summary of Stakeholder Feedback

Parcel ID	Description	Property Owner	Feedback	Classification
272922130062	Sackett Park/ Boys & Girls Club	City Of Saint Paul Parks And Recreation	Saint Paul has a BMP designed for this site.[1] The size of the BMP was defined based on future programming needs for the Boys and Girls Club.	Likely Not Feasible
272922120052	Roosevelt Home Development	Saint Paul Public Housing Agency	There are opportunities to improve local drainage, but insufficient area for a regional-scale BMP that would lower flood risk near Ames Lake.	Opportunity for Local Project
272922230001 & 232722240058	HRA Owned Parcels	Housing and Redevelopment Authority (HRA)	Flood-risk reduction BMPs in these locations would require upland impacts. HRA indicated they would support a flood-risk BMP in this location.	Likely Feasible

Parcel ID	Description	Property Owner	Feedback	Classification
272922220118 & 272922210047	Ames Lake	Housing and Redevelopment Authority (HRA)	There may be limited opportunity for site-scale modifications west of the park.	Feasible with Conditions
222922140181	Hill Crest Knoll Park	City Of Saint Paul	Flood-risk BMP in this location results in a minimal reduction in the 100-year peak water surface elevation in Ames Lake.	Likely Not Feasible
222922430051	Pond South of Ivy Ave E. (In Prosperity Heights Park)	City Of Saint Paul	Site-specific utility constraints limit opportunities to modify the existing pond.	Likely Not Feasible
222922420138	Prosperity Heights Park	City Of Saint Paul	Future programming needs may limit opportunities for flood-risk reduction.	Likely Not Feasible
222922330121 & 222922330198	Clarence Street Townhomes	City Of Saint Paul	There is insufficient area to provide a BMP that affects regional water levels near Ames Lake.	Opportunity for Local Project

1 Previous study (*Flandrau-Case Pond Improvements: Alternatives Review*) was completed in 2017. The plan (Flandrau-Case stormwater pond improvements) was delivered in 2019.


Study Area
Ramsey County
Washington County
Mississippi River
Maplewood
Wakefield Lake
Lake Phalen
Saint Paul
Fenton Ave
Adele St
Walter St
Phalen Pl
Gordon Ave
Frisbie Ave
Ripley Ave
Summer Ave
Manton St N
Dieter St N
Hazelwood Ave N
Clarence St N
Ide St N
Birmingham St N
Barclay St N
Gulden Pl
Sophia Ave
Price Ave
East Shore Dr
Edward St N
Frank St
Duluth St
Atlantic St
English St
Hagen Dr
N Duluth St
N Manton St
Brighton Pl
N Chamber St
N English St
Christie Pl
E California Ave
E Idaho Ave
E Iowa Ave
E Hoyt Ave
E Montana Ave
E Nebraska Ave
E Nevada Ave
E Arlington Ave
Winchell St
N Dieter St
Phalen Dr
E Wheelock Pkwy
E Sherwood Ave
E Cottage Ave
N Mcafee St
Clarence Ct
N Birmingham St
N Winchell St
N Barclay St
Prospery Heights Park
(222922420138)
E Ivy Ave
E Hyacinth Ave
E Orange Ave
E Hawthorne Ave
Topic La
Clarence St Townhomes
(222922330121 &
222922330198)
N Clarence St
N Prosperity Ave
Pond South of Ivy Ave E
(222922430051)
N Hazelwood St
N Kennard St
E Maryland Ave
N Frank St
E Rose Ave
E Geranium Ave
E Jessamine Ave
Burnquist St
Lane Pl
N Old Prosperity Ave
Fellows La
Herbert St
Supornick La
Roosevelt Home
Development
(272922120052)
N Kingsford St
N Breen St
N White Bear Ave
Ames Lake
(272922220118 &
272922210047)
Magnolia La
E Magnolia Ave
HRA Owned Parcels
(272922230001 &
232722240058)
E Mechanic Ave
Johnson Pkwy
E Ames Ave
Sackett Park
(272922130062)
Flandrau St
Echo Ave
E Ames Pl
Omaban St
Hammer Ave
Germain Ct
E Case Ave
E Sims Ave
E York Ave
N Germain St
E Stillwater Ave
E Ross St
E Bush Ave
E Reaney Ave
Site Feasibility
Likely feasible
Feasible with Conditions
Likely not feasible
Opportunity for Local Project
Potentially Flood-Prone Structures:
Reliant on Site-Scale Solutions (District)
Local Structure
Reliant on System Modification
Existing Conditions
100-Year Floodplain
Major Subwatersheds
Municipal Boundary
0
1,000
Feet
1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas.Inundation areas shown are based on information available to the District as of October 2022.
3. Available surveyed elevations were used to estimate potentially flood-prone structures, 2011 LiDAR data were used where survey is not available.
4. Potentially flood-prone structures are habitable structures including homes and businesses.
5. Potentially flood-prone structures designated as "District" are located near District-managed facilities, lakes, or creeks, or where addressing flooding in these locations would likely change downstream peak flow rates and water elevations in multiple municipalities.
6. Potentially flood-prone structures designated as "Local" are not adjacent to District-managed facilities, lakes, or creeks. In many locations, flooding may be mitigated by modifications to the municipal stormwater system. Addressing flooding in these locations likely would not change downstream peak flows or water levels in downstream municipalities. In these locations, the municipality will likely lead the evaluation of system modifications to mitigate flood-risk, and the District may choose to be involved in a supporting role.
Parcel Feasibility Rating Overview
in / near Ames Lake Area
FIGURE 2
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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

2 Pre-Feasibility Evaluation

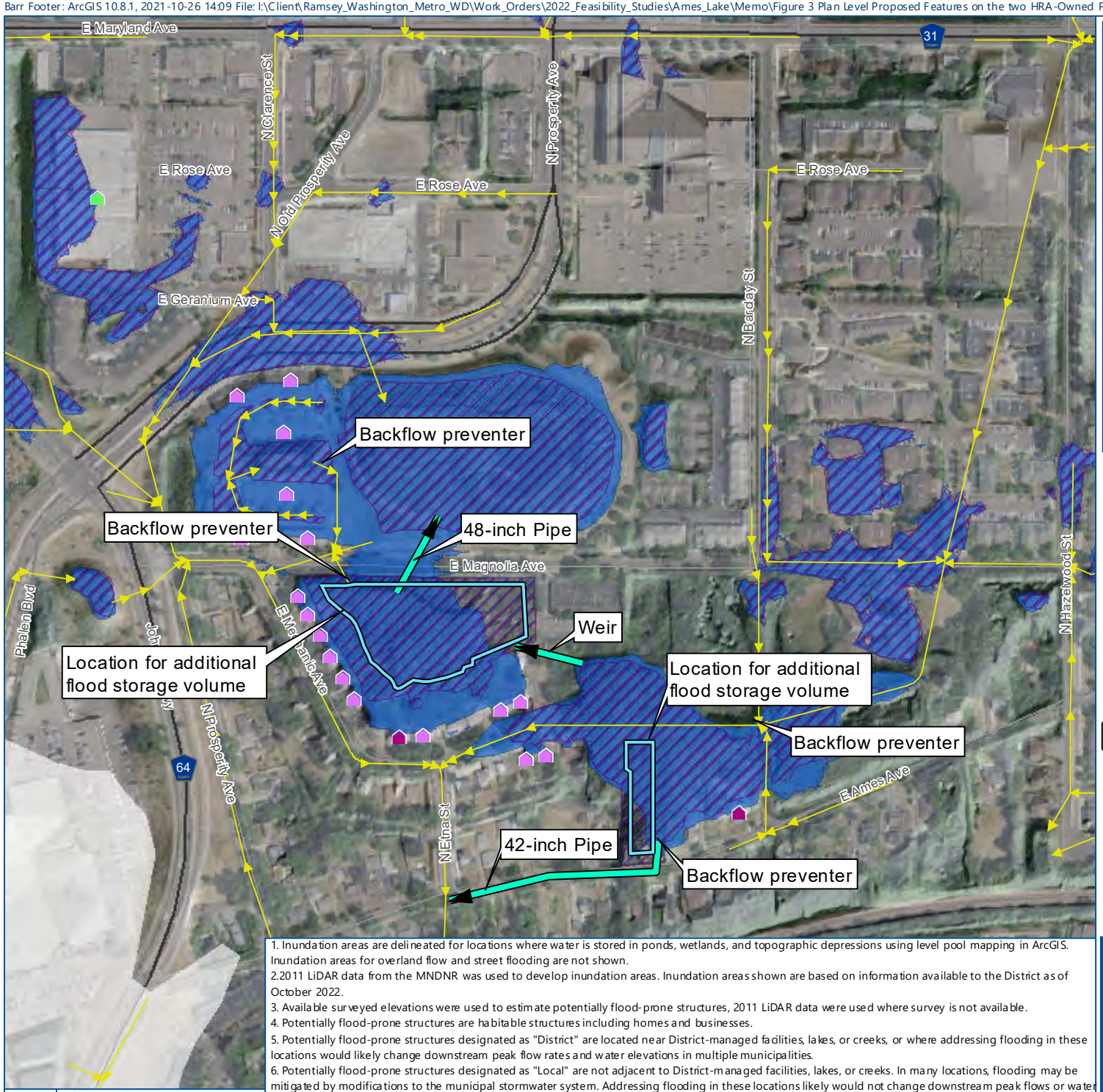
Figure 1 shows locations discussed with stakeholders. Parcels were categorized based on each location's potential for a flood-risk BMP. The evaluation identified two parcels as the most feasible sites. A preliminary evaluation indicated that site grading could provide approximately 25 acre-feet of storage volume. Additional coordination with the property owner and an evaluation of system modifications will be required to optimize a storage configuration that both mitigates flood risk and integrates with the adjacent park system. The additional storage volume, combined with storm sewer modifications near the two parcels, could keep the 100-year, 96-hour inundation away from the low entry of the 44 homes.

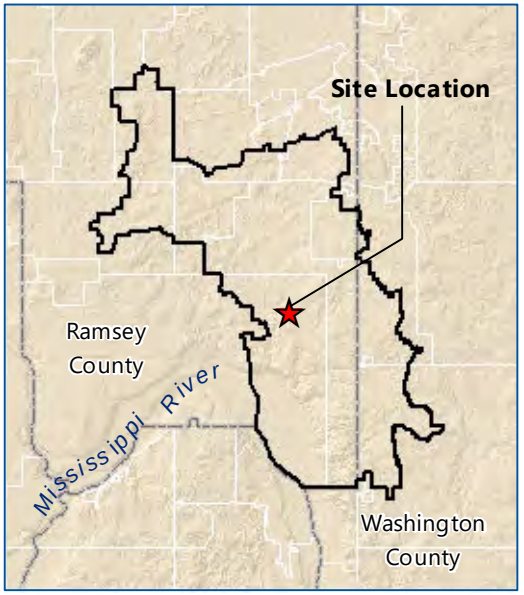
Potential system modifications are shown in Figure 3 and include the following:

- Grading the two parcels to provide additional storage volume
- Storm sewer modifications

3 Recommendations

Based on feedback provided by project stakeholders, two feasible locations for flood-risk reduction BMPs were identified. Barr recommends that RWMWD complete a detailed feasibility study to evaluate system modifications on these two parcels that could lower flood levels in Ames Lake.





Potential Flood-prone Structures:

- Removed from the 100-year Floodplain (Surveyed Confirmed)
- Removed from the 100-year Floodplain (Survey not available)
- No Longer Considered to be in the 100-year Floodplain (Surveyed Confirmed)

Design Elements:

- Existing Storm Sewer Pipe
- Proposed Pipe
- Location of storage BMP

100-Year Floodplain:

- Proposed
- Existing

0 600

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
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4. Potentially flood-prone structures are habitable structures including homes and businesses.
5. Potentially flood-prone structures designated as "District" are located near District-managed facilities, lakes, or creeks, or where addressing flooding in these locations would likely change downstream peak flow rates and water elevations in multiple municipalities.
6. Potentially flood-prone structures designated as "Local" are not adjacent to District-managed facilities, lakes, or creeks. In many locations, flooding may be mitigated by modifications to the municipal stormwater system. Addressing flooding in these locations likely would not change downstream peak flows or water levels in downstream municipalities. In these locations, the municipality will likely lead the evaluation of system modifications to mitigate flood-risk, and the District may choose to be involved in a supporting role.

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Planning-Level System Modifications

Phalen Chain of Lakes Flood Risk Reduction Study- Ames Lake Area
Ramsey-Washington Metro Watershed District

FIGURE 3

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Memorandum

To: Ramsey-Washington Metro Watershed District (RWMWD) Board of Managers
From: Gabby Campagnola, Lulu Fang, and Brandon Barnes
Subject: County Ditch 17 Feasibility Study
Date: December 28, 2022
Project: 23/62-1200.22- 003
c: Tina Carstens, RWMWD Administrator
Steve Love, City of Maplewood Public Works Director

This study was completed to evaluate flood-risk mitigation alternatives on County Ditch 17 south of Frost Avenue in Maplewood, Minnesota. The site was identified in 2020 following the completion of the Beltline Resiliency Study, which evaluated potential system modifications to reduce flood risk to habitable structures. This site presents several design and maintenance challenges, including, but not limited to, a storm sewer system located in residential backyards, flood-prone areas upstream and downstream of the site, and recently reconstructed roadways.

Several flood-risk mitigation alternatives were evaluated, including combinations of storm sewer modifications, construction of retention (best management practices) BMPs, and site-specific modifications for individual parcels. Each alternative was evaluated, considering flood-risk-reduction benefits, regulatory approvals, affected property owners, and construction costs. Based on the evaluation results, potential site impacts, and construction costs, site-specific modifications or emergency response plans are the most feasible flood-risk mitigation strategy for this site. The recommended approach minimizes offsite flood-level impacts, avoids disturbance in residential backyards and recently reconstructed roadways, and has the lowest construction cost.

The engineer's opinion of probable cost for the construction of site-specific modifications is estimated at $49,000 with an estimated accuracy range of $40,000 to $69,000 based on the feasibility level of design. As additional site-specific information becomes available in the next stage of design (e.g., soil borings and feedback from individual property owners), the proposed configuration, cost, performance, and maintenance considerations could change. The City of Maplewood has typically led the implementation of site-specific modifications and emergency response plans and coordinated with individual property owners. If property owners are interested in pursuing site-specific modifications, the District will need to collaborate closely with the City to ensure the successful implementation of the project.

This memorandum summarizes the background, data sources reviewed, and flood-risk mitigation alternatives. Each alternative description includes system modifications, affected property owners, regulatory approvals, and the engineer's opinion of probable cost.

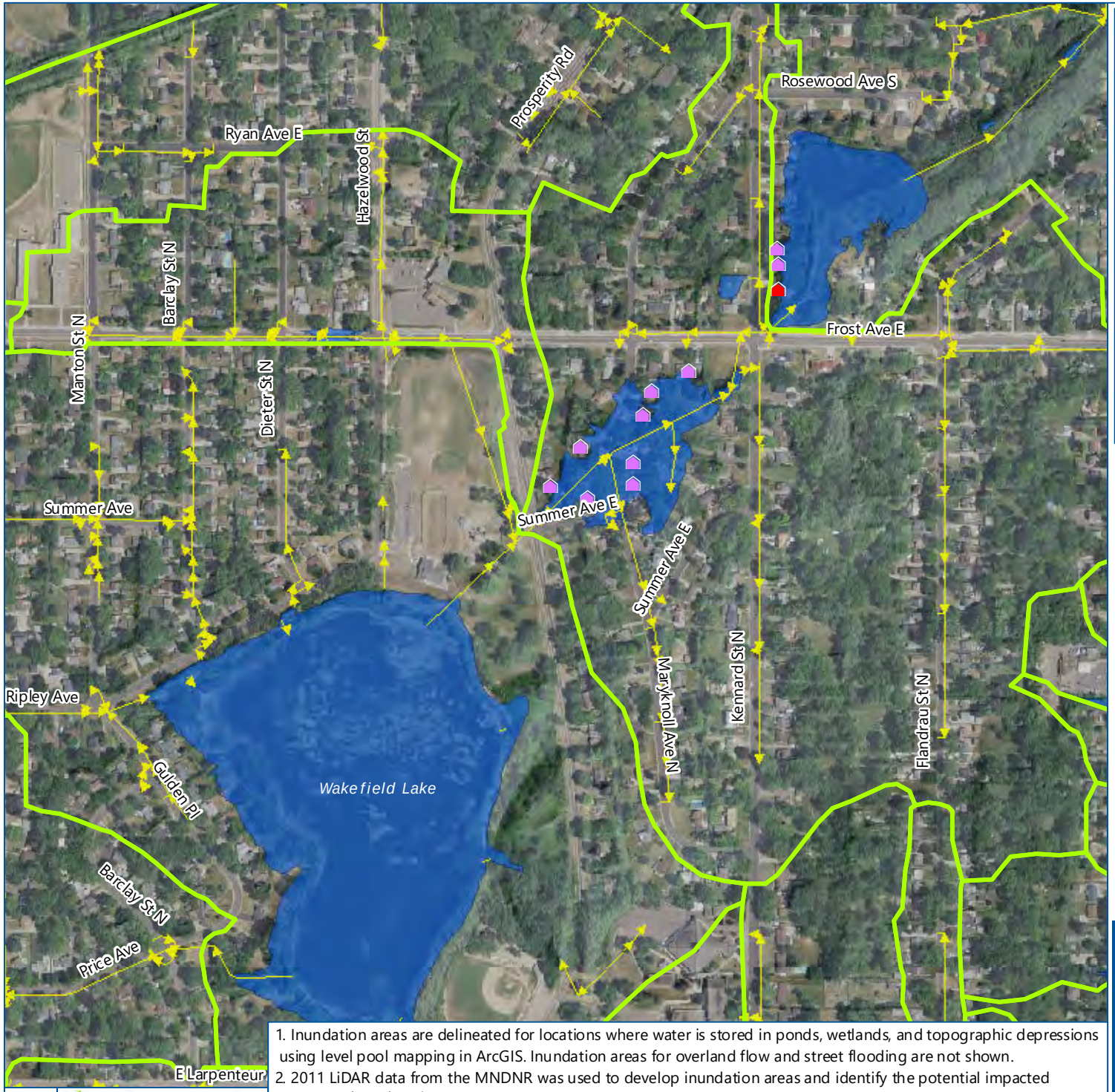
The purpose of this technical memorandum is to document the feasibility study and resulting recommendations for flood-risk mitigation alternatives on County Ditch 17 south of Frost Avenue.

1 Background

In 2018, the Ramsey-Washington Metro Watershed District (RWMWD, District) evaluated potentially flood-prone habitable structures based on updated rainfall depths published in Atlas 14. As a result, numerous structures were identified in flood-risk areas upstream of the District's Beltline storm sewer. Barr detailed this work in a technical memorandum dated September 4, 2018, titled "Identification and Prioritization of Potentially Flood-Prone Structures."

In 2020, the District completed the Beltline Resiliency Study, which evaluated potential system modifications that could be implemented in the Beltline watershed to reduce flood risk to habitable structures. Much of that study focused on optimizing the use of the Beltline to lower flood levels upstream. That study assumed that (1) the size and/or peak capacity of the Beltline would not be increased and (2) flood-prone homes upstream of the Beltline would not be purchased and removed from the flood plain. Detailed background information on the Beltline Resiliency Study is in the Barr report titled *System-Wide Evaluation of Flood-Risk Mitigation Options: Beltline Resiliency Study* (November 2020). Since then, the District has conducted studies that evaluate the feasibility of flood-risk-reduction projects for locations throughout the watershed. On County Ditch 17, the Beltline Resiliency Study identified 11 flood-prone structures and included concept-level storm sewer modifications to mitigate flooding in the area. Figure 1 shows the homes within the floodplain and existing drainage patterns in this portion of the watershed.

The purpose of this study is to evaluate alternatives for reducing the flood risk for the 11 habitable structures shown in Figure 1. It is important to note that there is also a flood-risk-reduction feasibility study upstream that examines using area within Goodrich Golf Course to store flood water. A preliminary evaluation of golf course modifications indicates the potential for further reductions in flood elevations along County Ditch 17. However, the feasibility study for the golf course modifications will not be complete until the summer of 2023. Therefore, this memorandum will focus only on comparing existing conditions to the proposed alternatives—without the additional benefits that may be realized if feasible modifications to the Goodrich Golf Course are identified and constructed.



Original Existing Atlas 14 Inundation

Existing Storm Sewer Pipe

Reliant on Site-Scale Solutions (District)

Reliant on System Modification

Pre-Feasibility Study Subwatersheds

0 1,000

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Pre-Feasibility Study Existing Condition

Improvement to County Ditch 17

Ramsey-Washington
Metro Watershed District

FIGURE 1

2 Data Sources

Multiple data sources were used to determine the feasibility of flood-risk mitigation along County Ditch 17. The list below identifies data sources and how they were used in this study.

- 2011 LiDAR—LiDAR was used to estimate the low adjacent ground elevation for each habitable structure. LiDAR was used because property owners did not authorize Barr personnel to enter their properties to collect site-specific survey data. As a result, the low home elevations are estimates and should be verified before implementing flood-risk-reduction modifications.

- Gopher State One Call (GSOC)—A non-excavation utility request was submitted on April 8, 2022 for the project area. Utility information obtained from the GSOC request is shown in Figure 2.

- Maplewood Street capital improvement project (CIP) plan—The City of Maplewood provided the Maplewood Street CIP plan on May 10, 2022. Over the next years, the City of Maplewood is planning to conduct street repairs in the project vicinity.

- RWMWD XPSWMM model.

- As-builts for the project area—The City of Maplewood provided as-built files on June 6, 2022 and June 26, 2022. As-builts were used to update the storm sewer information in the RWMWD stormwater model.

- Comcast Utility Points
- Maplewood Storm Sanitary Points
- Zayo Utility Points
- Arvig Utility Lines
- Comcast Utility Lines
- Maplewood Utility Lines
- St. Paul Water Utility Data
- Xcel Utility Data
- Zayo Utility Data

N

0 1,000

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Existing Utilities

Improvement to County Ditch 17

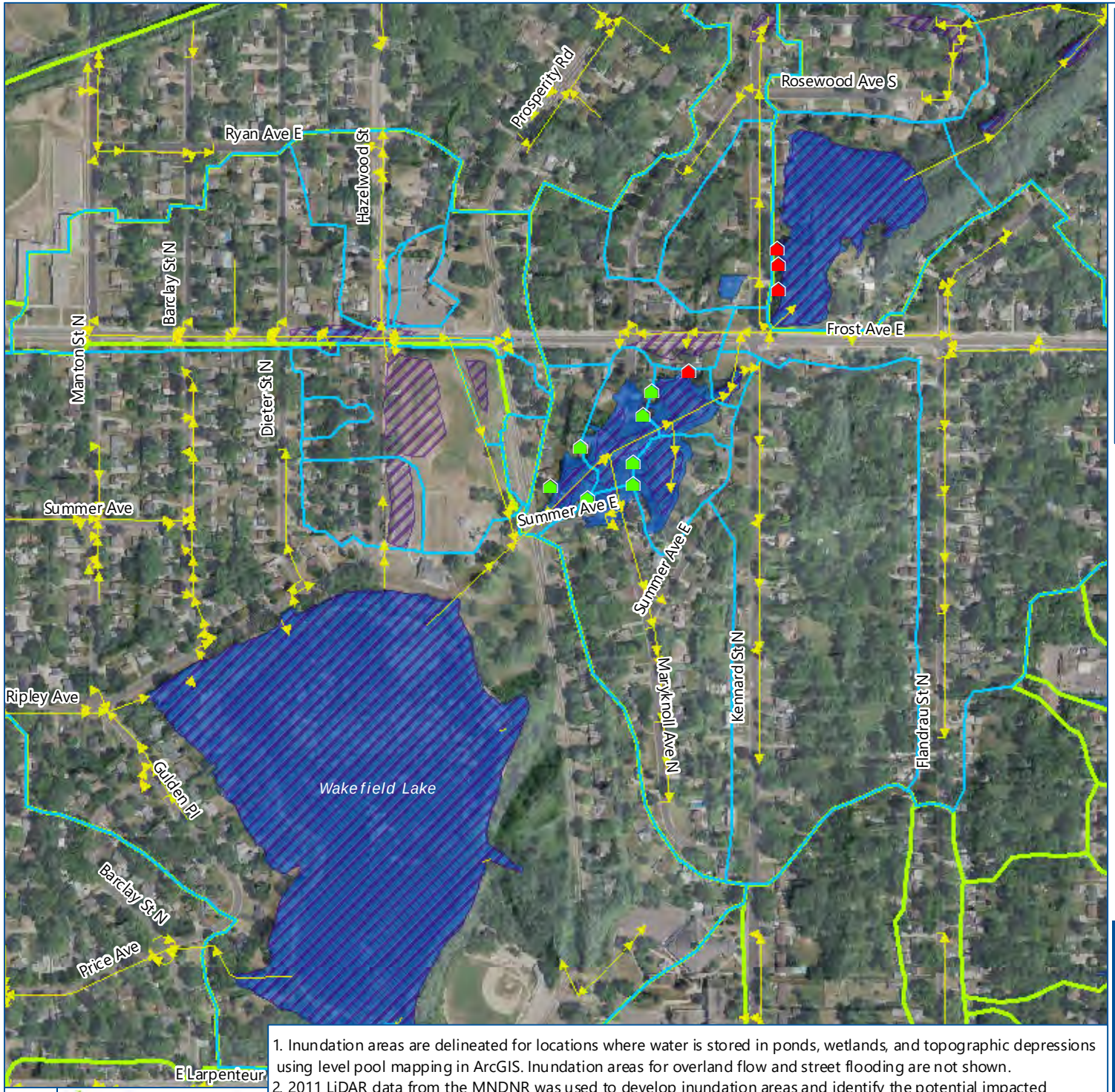
Ramsey-Washington
Metro Watershed District

FIGURE 2

3 Hydrologic and Hydraulic Analysis

The RWMWD stormwater model was updated with as-built information provided by the City of Maplewood. Model updates included revisions to the storm sewer network to match the as-built plans and to incorporate additional detail of the stormwater system along County Ditch 17. The stormwater model was also updated to add more detail to the subwatersheds to characterize the topography more accurately. Figure 3 shows the initial and revised subwatershed divides.

Refinement of the stormwater model indicated that seven of the 11 homes previously identified as flood-prone were no longer within the 100-year floodplain. Therefore, flood-risk-mitigation alternatives were focused on removing the remaining four homes from the 100-year floodplain.



Existing Condition Flood-prone Structures:

- No Longer Flood-prone
- Still Flood-Prone
- 2022 Updated Subwatershed Divides
- Pre-Feasibility Study Subwatersheds

100-Year Floodplain:

- 2022 Updated Atlas 14 Inundation
- Pre-Feasibility Study Atlas 14 Inundation
- Existing Storm Sewer Pipe

N

0 1,000

Feet

2022 Updated Subwatershed Divides

Improvement to County Ditch 17

Ramsey-Washington Metro Watershed District

FIGURE 3

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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4 Alternative Evaluation

Four alternatives were considered:

- Alternative 1: New storm sewer and pond north of Frost Avenue
- Alternative 2: New storm sewer and pond west of White Bear Avenue
- Alternative 3: Outlet structure modification and pond west of White Bear Avenue
- Alternative 4: Site-specific solutions and outlet structure modification

Each alternative will be discussed in terms of system modifications, benefits, and affected property owners. The goal for each alternative is to remove the four flood-prone habitable structures from the floodplain.

4.1 Alternative 1: New Storm Sewer and Pond North of Frost Avenue

Alternative 1 includes new storm sewer on Frost Avenue and Prosperity Road and modifications to the Pond northeast of Frost and Kennard. The proposed alternative is shown in Figure 4.

4.1.1 System modifications

Alternative 1 has two new storm sewer pipe segments. The first pipe segment is 1,350 feet of 1.75-foot-diameter pipe along Frost Avenue and Prosperity Road. The second segment is 250 feet of 3.5-foot-diameter pipe which will provide a high-flow bypass for the pond northeast of Frost Avenue and Kennard Street. The purpose of these pipes is to divert water from the pond and County Ditch 17, lowering the water levels. This alternative also includes modifications to the pond northeast of the intersection of Frost Avenue and Kennard Street, as shown in Figure 4, to prevent increases to the peak 100-year water surface elevation in Wakefield Lake.

The weir could be lowered by half a foot to provide more live storage, as shown in Figure 5. Lowering the normal water level by 0.5 feet will not be enough to remove all four homes from the floodplain. Therefore, with this alternative, an additional 2 acre-feet of storage would be graded below an elevation of 902 feet in the pond. A combination of the proposed storm sewer improvements and pond alterations will remove the remaining four homes from the 100-year floodplain.

Alternative 1 Impacted Structures:

- No Longer Flood-prone
- Reliant on System Modification
- Reliant on Site-Scale Solutions
- 2022 Updated Subwatershed Divides
- Existing Storm Sewer Pipe
- Approximate Grading Extents
- Proposed Storm Sewer Modification

100-Year Floodplain:

- Proposed Atlas 14 Inundation
- 2022 Current Atlas 14 Inundation

N

0 600

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

Alternative 1: New Storm Sewer and Pond North of Frost Avenue

Improvement to County Ditch 17

Ramsey-Washington Metro Watershed District

FIGURE 4

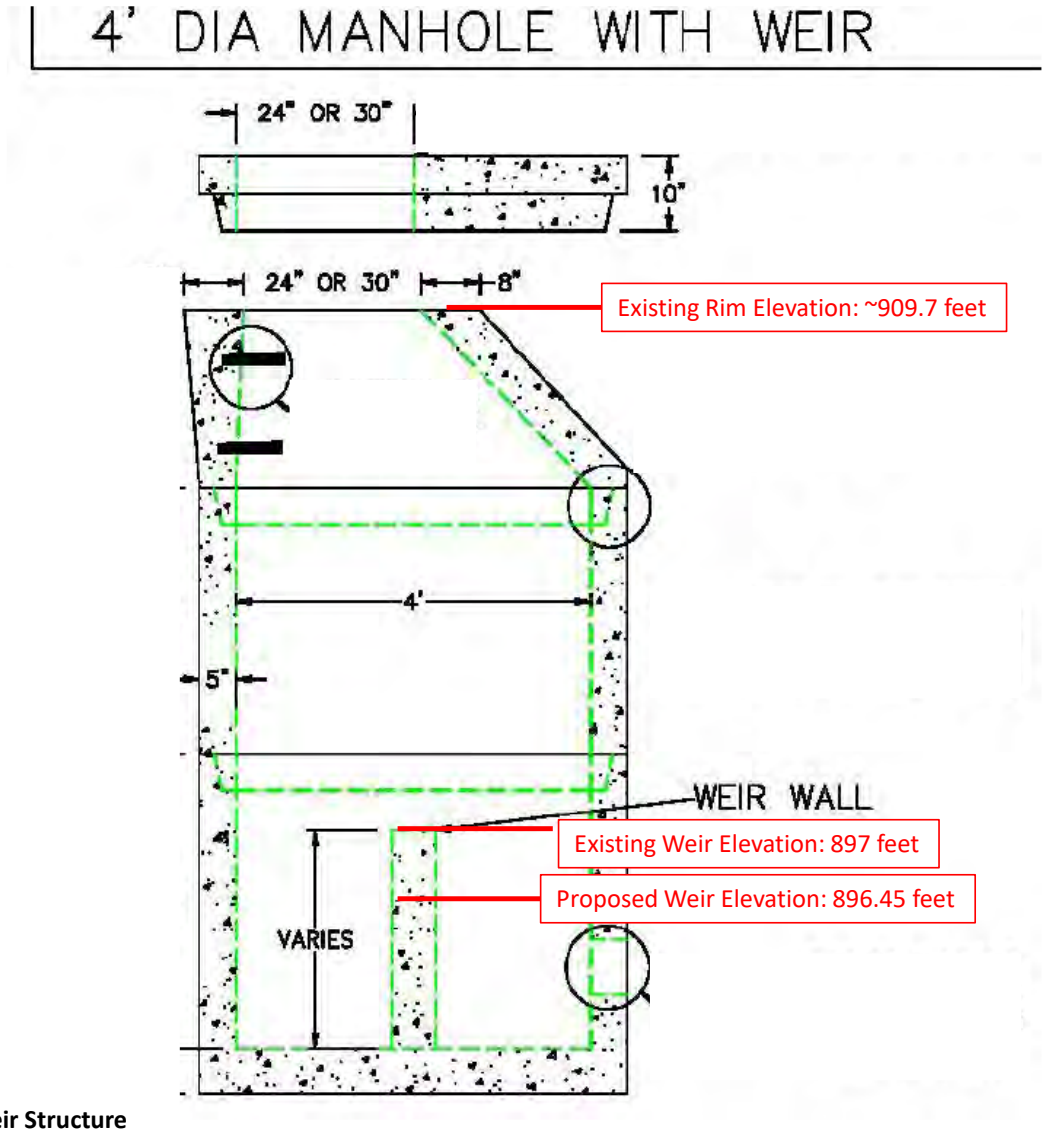


Figure 5 **Modifications to Existing Weir Structure**

4.1.2 Affected Property Owners

The proposed alternative will directly and indirectly impact multiple property owners. The pond northeast of the intersection of Frost Avenue and Kennard Street is on a private parcel. Significant grading and dredging will be required to provide the additional 2 acre-feet of storage. Two additional property owners will be directly impacted because ditch clearing will occur on their property. The proposed alternative will impact sections of Frost Avenue and Prosperity Road due to new storm sewer installation and indirectly affect adjacent property owners.

4.1.3 Regulatory Approval

Permits will be needed from multiple entities to construct the storm sewer improvements and pond alterations. For RWMWD, Rule C—Stormwater Management, Rule D—Flood Control, Rule E- Wetland Management, and Rule F—Erosion Control will apply due to work occurring below the 100-year floodplain and the extent of disturbed land.

For the City of Maplewood, up to three permits could be required depending on the final design. The first is a grading permit due to the amount of soil displaced and the alteration to the drainage pattern in the project area. The second is a right-of-way permit, required for projects that occur in the right-of-way and could cause degradation. The third that may be required is a storm sewer connection permit.

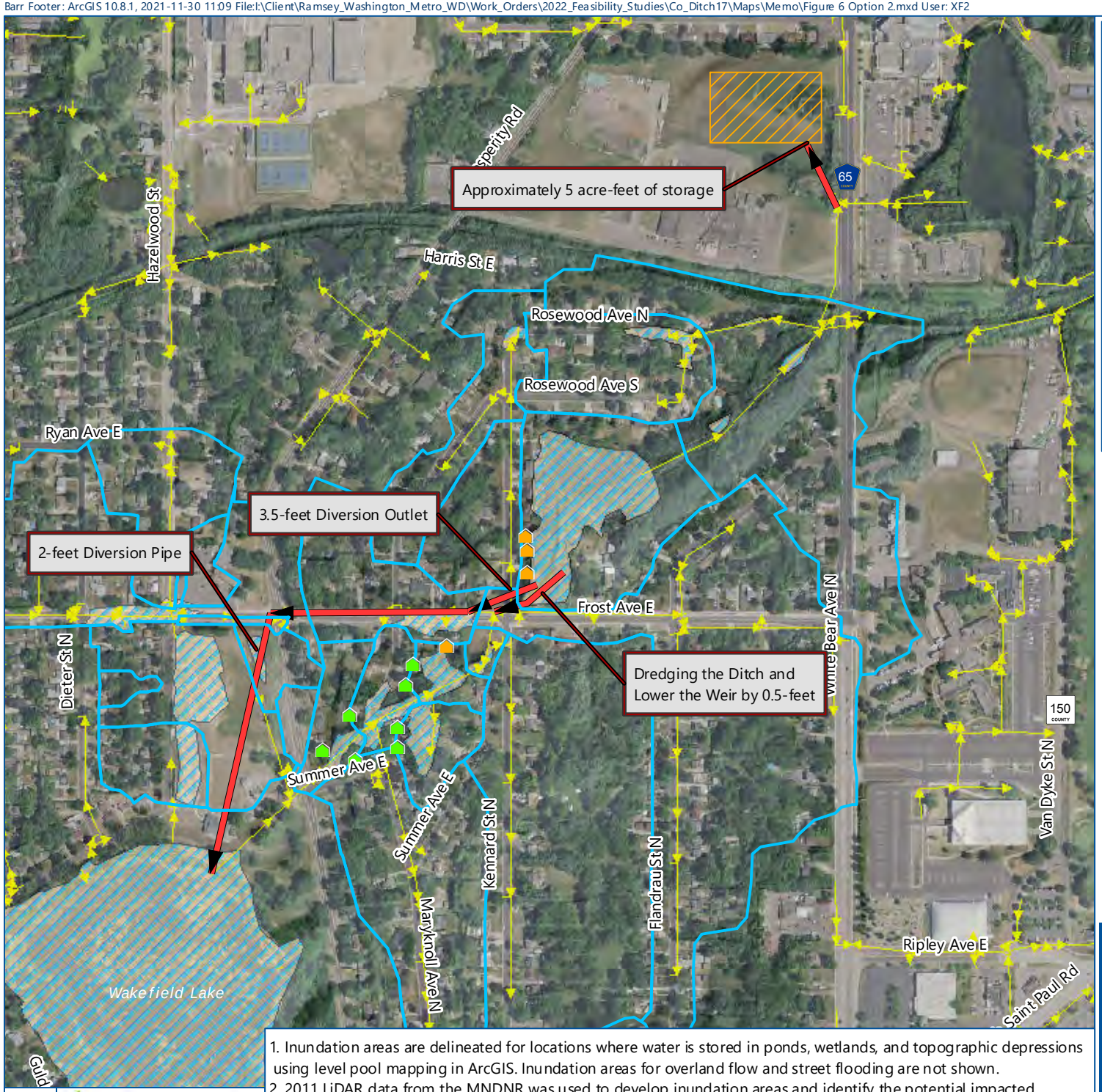
Only one permit will be required from Ramsey County. Ramsey County requires permits if excavation or obstruction occurs due to construction. The proposed project will include excavation and may include temporary obstruction during construction.

Finally, the Minnesota Pollution Control Agency will require a permit because the project will disturb more than 1 acre of soil.

This alternative will also require additional approval that is not related to permitting requirements. Frost Avenue was reconstructed with funds from multiple entities. In order to proceed with this alternative, approval will be required from the County and State.

4.2 Alternative 2: New Storm Sewer and Pond West of White Bear Avenue

Alternative 2 includes the installation of new storm sewer on Frost Avenue and Prosperity Road, outlet modifications to the pond northeast of Frost Avenue and Kennard Street, and an upstream storage basin west of White Bear Avenue. Alternative 2 is shown in Figure 6.



Alternative 2 Flood-prone Structures:

- No Longer Flood-prone
- Reliant on Site-Scale Solutions
- 2022 Updated Subwatershed Divides
- Existing Storm Sewer Pipe
- Proposed Storm Sewer Modification
- Additional Storage

100-Year Floodplain:

- Proposed Atlas 14 Inundation
- 2022 Current Atlas 14 Inundation

0 1,000
Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

Alternative 2: New Storm Sewer and Pond West of White Bear Avenue

Improvement to County Ditch 17

Ramsey-Washington Metro Watershed District

FIGURE 6

4.2.1 System modifications

Alternative 2 contains most of the same features as Alternative 1, with two minor differences. First, the proposed storm sewer pipe along Frost Avenue and Prosperity Road must be increased to 2 feet in diameter. Second, the pond modifications only include the high-flow bypass pipe, lowered weir, and ditch cleanout. Five acre-feet of storage will be required on the parcel west of White Bear Avenue.

4.2.2 Affected Property Owners

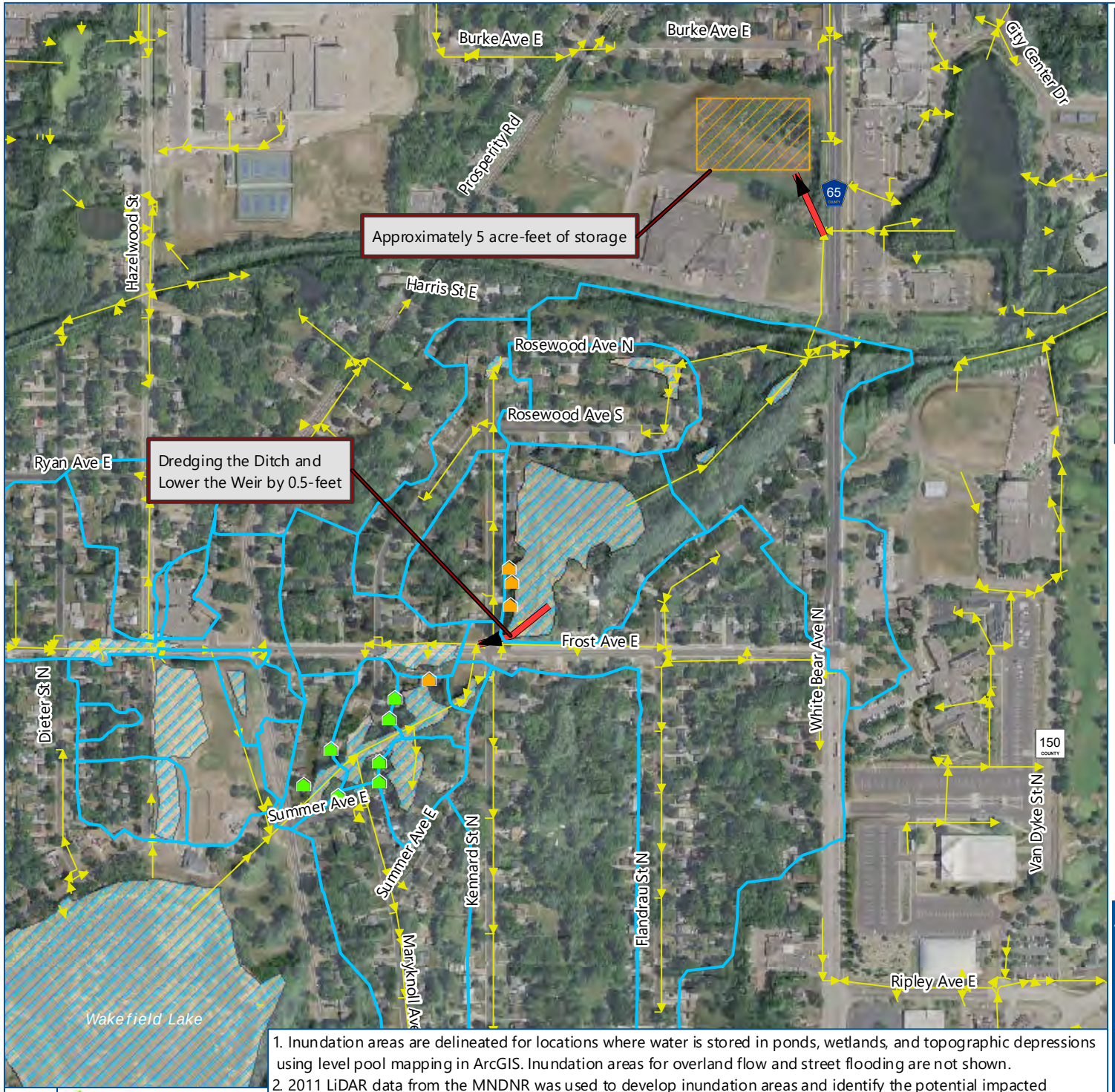
Alternative 2 will directly impact two property owners to complete the ditch cleanout for the northeast pond. In addition the property owner that owns the parcel west of White Bear Avenue will be directly impacted. This proposed alternative will indirectly impact the same property owners described in Section 4.1.2.

4.2.3 Regulatory Approval

The regulatory approval required for this Alternative is the same as Alternative 1, detailed in Section 4.1.3. The sole difference in regulatory approval is that this alternative will not have wetland impacts.

4.3 Alternative 3: Outlet Structure Modification and Pond West of White Bear Avenue

An obstacle to the feasibility of Alternatives 1 and 2 is that Frost Avenue was reconstructed in the past two years with funds from multiple stakeholders, including RWMWD, the City of Maplewood, Ramsey County, and the state of Minnesota. Therefore, this alternative includes system modifications that do not disturb Frost Avenue, as shown in Figure 7.



Alternative 3 Flood-prone Structures:

- No Longer Flood-prone
- Reliant on Site-Scale Solutions
- 2022 Updated Subwatershed Divides
- Existing Storm Sewer Pipe
- Proposed Storm Sewer Modification
- Additional Storage

100-Year Floodplain:

- Proposed Atlas 14 Inundation
- 2022 Current Atlas 14 Inundation

0 1,000
Feet

Alternative 3: Outlet Structure Modification and Pond West of White Bear Avenue

Improvement to County Ditch 17

Ramsey-Washington
Metro Watershed District

FIGURE 7

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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4.3.1 System modifications

System modifications include lowering the weir north of Frost Avenue and cleaning County Ditch 17 north of Frost Avenue, as shown in Figure 7. Alternative 3 also includes the 5-acre-feet basin west of White Bear Avenue. Because this alternative does not include storm sewer modifications along Frost Avenue, it does not remove all the homes from the floodplain. Alternative 3 will remove one home from the floodplain and reduce the flood risk for the remaining three homes.

4.3.2 Affected Property Owners

Three property owners in total will be impacted. Two property owners with the ditch on their property will be impacted. In addition the property owner that owns the parcel west of White Bear Avenue will be impacted.

4.3.3 Regulatory Approval

The regulatory approvals, besides wetland impacts, described in Section 4.1.3 apply.

4.4 Alternative 4: Site-Specific Solutions and Outlet Structure Modification

Site-specific modifications and emergency response plans (ERPs) may be feasible options in locations where the depth of flooding is small or water levels increase gradually following a rainfall event. Site-specific modifications include localized grading or structural modifications on individual parcels. ERPs provide information and guidance to property owners about protecting low-lying habitable structures from flooding. Typically, ERPs are used for locations where a feasible alternative is not identified or when a project cannot be implemented in the near future due to logistical or budgetary constraints. A primary feature of every ERP is a detailed sheet for each low-lying site that identifies measures to temporarily protect a property during a 100-year flood event. Therefore, the ERP can be used to remove the homes from the 100-year floodplain. Figure 8 shows the homes needing a site-scale solution or ERP for Alternative 4.

Alternative 4 Flood-prone Structures:

- No Longer Flood-prone
- Reliant on Site-Scale Solutions
- 2022 Updated Subwatershed Divides
- Existing Storm Sewer Pipe
- Proposed Storm Sewer Modification

100-Year Floodplain:

- Proposed Atlas 14 Inundation
- 2022 Proposed Atlas 14 Inundation

0 600

Feet

1. Inundation areas are delineated for locations where water is stored in ponds, wetlands, and topographic depressions using level pool mapping in ArcGIS. Inundation areas for overland flow and street flooding are not shown.
2. 2011 LiDAR data from the MNDNR was used to develop inundation areas and identify the potential impacted structures' low elevation.
3. Existing Storm Sewer Network was provided by City of Maplewood in 2022.

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Alternative 4 Location of Site-Scale Solution or Emergency Response Plan

Improvement to County Ditch 17

Ramsey-Washington Metro Watershed District

FIGURE 8

4.4.1 System modifications

Alternative 4 includes coordination with property owners regarding the selection of either a site-specific modification or ERP.

Typically, site-specific modifications include grading or drainage improvements on individual parcels to reduce the risk of flooding. Modifications are usually permanent and do not require operation prior to or during a flood event. Whereas ERPs include placement of sand bags or temporary berms prior to a flood event, which are then removed after water levels recede. Alternative 4 site-specific modifications include two berms, one spanning the backyards of homes north of Frost Avenue. This berm is approximately 3-feet tall and 330-foot long. The second berm is for the home south of Frost Street, and requires an approximatly 2-foot tall and 100-foot long berm. Schematic figures for site-specific modifications are included in Attachment 1.

Alternatively, property owners may select an ERP rather than a site-specific modifications. For the three homes on north of Frost Avenue, 7,400 sand bags will need to be placed along all three backyards. The ERP for the home south of Frost Avenue requires approxiamtly 75 sandbags placed along the backyard basement door. Schematic figures for sandbag placement are included in Attachment 2.

This alternative also includes lowering the outlet weir and clearing the ditch for the pond northeast of Frost Avenue and Kennard Street. Modifying the pond's outlet without storage could still lower the floodplain of the northeast pond from 903.8 feet to 903.7 feet. In addition, the floodplain elevation near the home on Frost Avenue would decrease from 901.46 feet in existing conditions to 901.45 in the proposed condition.

4.4.2 Affected Property Owners

This alternative will impact the property owners that require site-specific modifications or an ERP to remove their homes from the floodplain. Two of the property owners will also be affected by the ditch cleaning.

4.4.3 Regulatory Approval

This alternative will require the least regulatory approval due to smaller work sites. The RWMWD permit requirements may still apply depending on the final configuration of modifications and disturbed area.

Site-specific modifications may also require a grading permit from the City of Maplewood.

5 Planning-Level Opinions of Probable Cost of Projects

Following further definition of the scope of the flood-reduction modifications and completion of detailed design, the final cost may be lower or higher than the planning-level opinions of cost included in Table 1. These costs are intended to provide a planning-level estimate for the potential system modifications described in previous sections.

These opinions of cost, project reserves, contingency, documentation, and discussion are intended to provide background information for planning-level alternatives assessment, analysis purposes, and budget planning. The cost of time escalation is not included in the opinions of probable cost. All costs are presented in 2022 US dollars.

Unit costs are based on recent bid prices, published construction cost-index resources, and similar projects. Costs associated with base planning engineering and design (PED), construction management (CM), and permitting are not included in the overall estimate for construction costs.

The opinions of cost also do not include other tasks following construction of each alternative, such as operations and maintenance or monitoring.

Contingency used in these opinions of probable cost is intended to help identify an estimated construction cost amount for items included in the current Project scope that have not yet been accurately quantified at the current level of design. Stated another way, contingency is the resultant of the pluses and minuses that cannot be estimated at the level of project definition that exists. The contingency also includes the cost of ancillary items not currently itemized in the quantity summaries but commonly identified in more detailed design and required for completeness of the work. A 30% contingency is applied to the estimated construction cost to account for the costs of these items.

Industry resources for cost estimating (*AACE International Recommended Practice No. 18R-97, and ASTM E2516-11 Standard Classification for Cost Estimate Classification System*) provide guidance on cost uncertainty, depending on the level of project design developed. The opinion of probable cost for the alternatives evaluated generally corresponds to a Class 4 estimate characterized by completion of limited engineering. As the level of design detail increases, the level of uncertainty is reduced. Figure 9 provides a graphic representation of how uncertainty (or accuracy) of cost estimates can be expected to improve as more detailed design is developed.

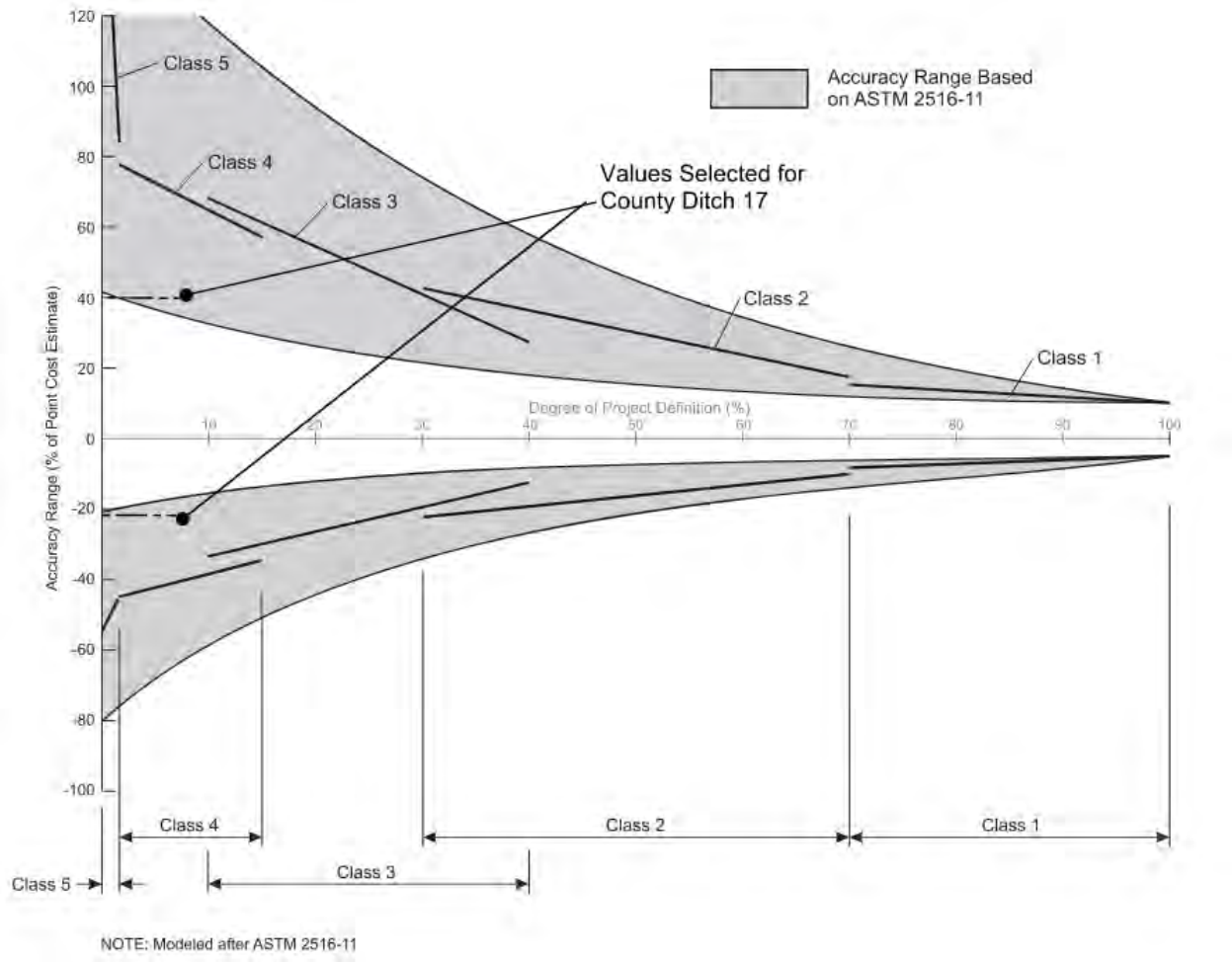


Figure 9 Relationship between Cost Accuracy and Degree of Project Definition

At this early stage of planning, the range of uncertainty of total project cost is high. Due to the early stage of the project, it is standard practice to place a broad accuracy range around the point cost estimate.

The accuracy range is based on professional judgment considering the level of design completed, the complexity of the project, and the uncertainties in the project scope; the accuracy range does not include costs for future scope changes that are not part of the project as currently defined or risk contingency. The estimated accuracy range for this point estimate is -20% to +40%.

The opinion of probable construction cost is made based on Barr's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. It is acknowledged that additional investigations and additional site-specific information that becomes available in the next stage of design may result in changes to the proposed configuration, cost, and functioning of project features. This opinion is based on project-related information available to Barr at this time and includes a planning-level feasibility design of the project. In addition, because we have no

control over the eventual cost of labor, materials, equipment, or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost presented.

Table 1 Summary of Planning-Level Opinions of Probable Costs for Flood-Reduction Alternatives

Proposed Flood-Reduction Alternative	Planning-Level Opinion of Cost without Street Reconstruction Costs[1,2]	Planning-Level Opinion of Cost with Street Reconstruction Costs[1,2]
Alternative 1: New Storm Sewer and Pond North of Frost Avenue [3]	$1,635,000 *($1.308,000–$2,289,000)*	$1,733,000 *($1.390,000–$2,430,000)*
Alternative 2: New Storm Sewer and Pond West of White Bear Avenue [3]	$2,933,000 *($2,346,000–$4,106,00)*	$3,031,000 *($2,430,000–$4,250,000)*
Alternative 3: Outlet Structure Modification and Pond West of White Bear Avenue [3]	$1,915,000 *($1,540,000–$2,690,000)*	NA
Alternative 4: Site-Specific Solutions and Outlet Structure Modification	$49,000 *($40,000–$69,000)*	*NA*

[1] Costs include a 30-percent construction contingency. Costs are represented as a feasibility-level class 4 cost estimate, as defined by the Association for the Advancement of Cost Estimating with a +40%/-20% uncertainty.
[2] These costs assume that no wetland mitigation will be required as part of these projects and that contaminated soils will not be encountered.
[3] Attachment 3 includes detailed information on cost estimates. High costs associated with Alternative 1 – 3 are primarily due to land acquisition costs required to construct system modifications.

6 Recommendation

Based on the evaluation results, affected property owners, regulatory requirements, and probable cost, Alternative 4—Site-Specific Modifications or ERPs, is recommended as the most feasible approach to flood-risk mitigation along County Ditch 17. The evaluation was based on information collected while reviewing available data and preliminary updates to the District's stormwater model.

The City of Maplewood supports Alternative 4. This alternative has the fewest impacts to adjacent property owners and avoids impacts to Frost Avenue, which was recently reconstructed. The funds for Frost Avenue reconstruction came from multiple partners, including RWMWD and the state, and impacts to Frost Avenue may require funds to be reimbursed.

The engineer's opinion of probable cost for the construction of Alternative 4 is $49,000, with an estimated accuracy range of $40,000 to $69,000 based on the current level of design.

RWMWD should provide the City of Maplewood with information needed to begin coordination with individual property owners to determine whether they are interested in proceeding with either site specific modifications or preparing an ERP, and support the City in outreach to property owners. The City

typically leads property owner outreach; however, the District should continue coordinating with the City. The District could lead the implementation of modifications to the storm sewer system included in Altrnative 4.

7 References

Association for the Advancement of Cost Estimating. Rev. 2016. AACE International Recommended Practice NO. 18R-97, March 1, 2016. (AACE, 2016)

ASTM E2516-11, Standard Classification for Cost Estimate Classification System, ASTM International, West Conshohocken, PA, 2011, www.astm.org. (ASTM, 2011)

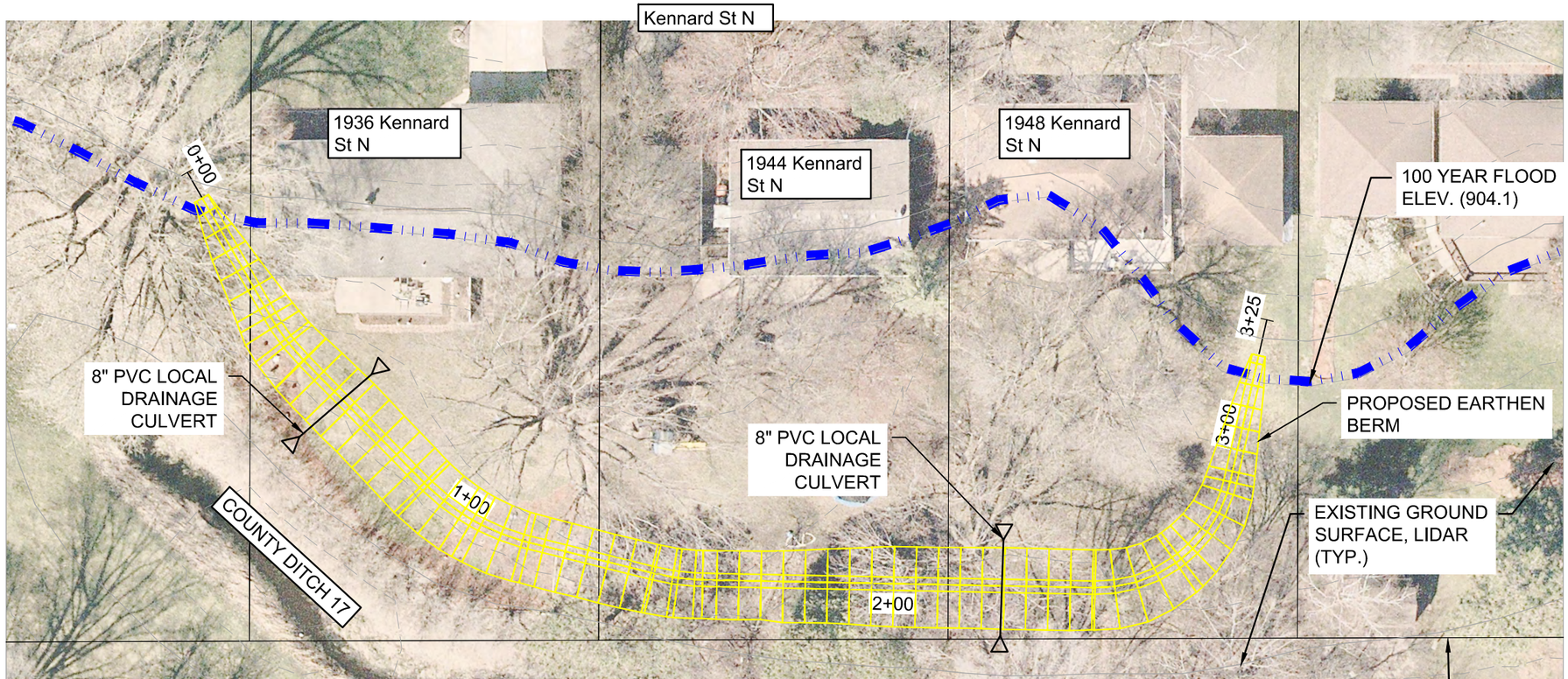
Barr Engineering Co., 2018. *Identification and Prioritization of Potentially Flood-Prone Structures*. Report. (Barr, 2018)

Barr Engineering Co., 2020. *System-Wide Evaluation of Flood-Risk Mitigation Options. Beltline Resiliency Study*. Report. (Barr, 2020)

- Attachment 1 Site-Specific Modifications Schematic Figures
- Attachment 2 ERP Schematic Figures
- Attachment 3 Engineer's Opinion of Probable Cost

Attachment 1

Site-Specific Modifications Schematic Figures



NOTES:

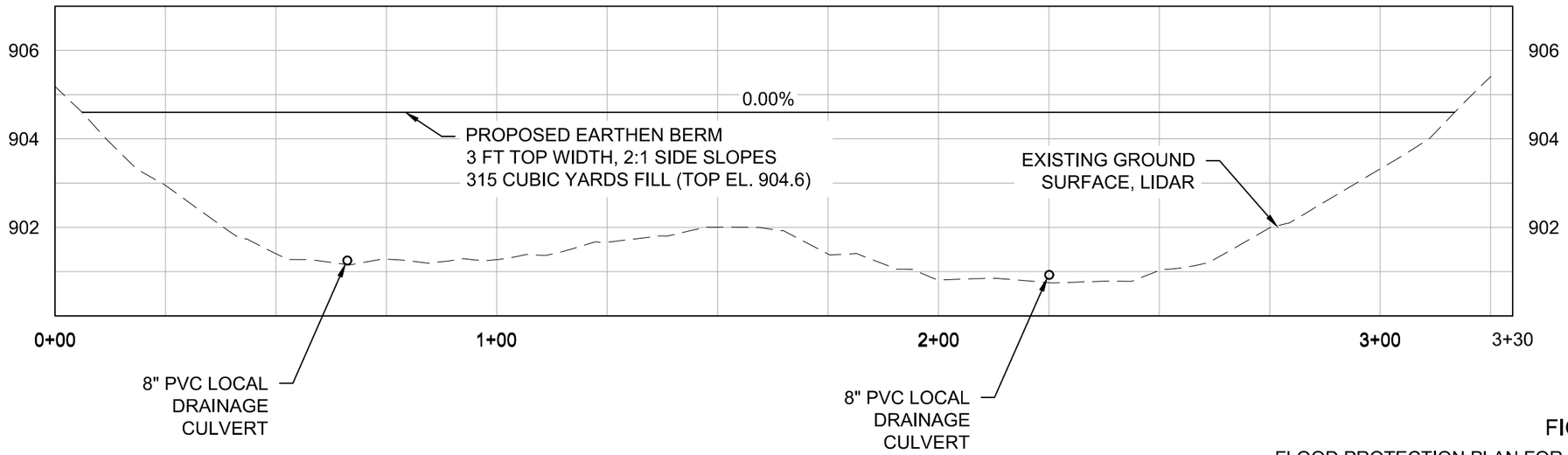
1. 1944 AND 1948 KENNARD ST HAVE LOW ENTRY ELEVATIONS OF 904.1 AND 903.9, RESPECTIVELY. THIS GROUP OF PROPERTIES REQUIRES 315 CUBIC YARDS OF MATERIAL TO PROTECT TO THE 100-YEAR FLOOD ELEVATION (904.1) PLUS 6" OF FREEBOARD.
2. CONTOURS AND LOW ADJACENT GRADE ARE DERIVED FROM LiDAR.
3. RAMSEY WASHINGTON METRO WATERSHED DISTRICT SHALL NOT BE HELD RESPONSIBLE FOR THE DATA PROVIDED ON THIS DRAWING OR FOR ANY USE OTHER THAN ITS INTENDED PURPOSE.
4. AERIAL IMAGE IS NEARMAP 2022
5. DRAWING IS IN RAMSEY COUNTY COORDINATES NAD 83, NAVD88, US FOOT

PLAN & PROFILE: 1936, 1944, & 1948 KENNARD ST N

N

0 30 60

SCALE IN FEET (PROFILE 1H:10V)

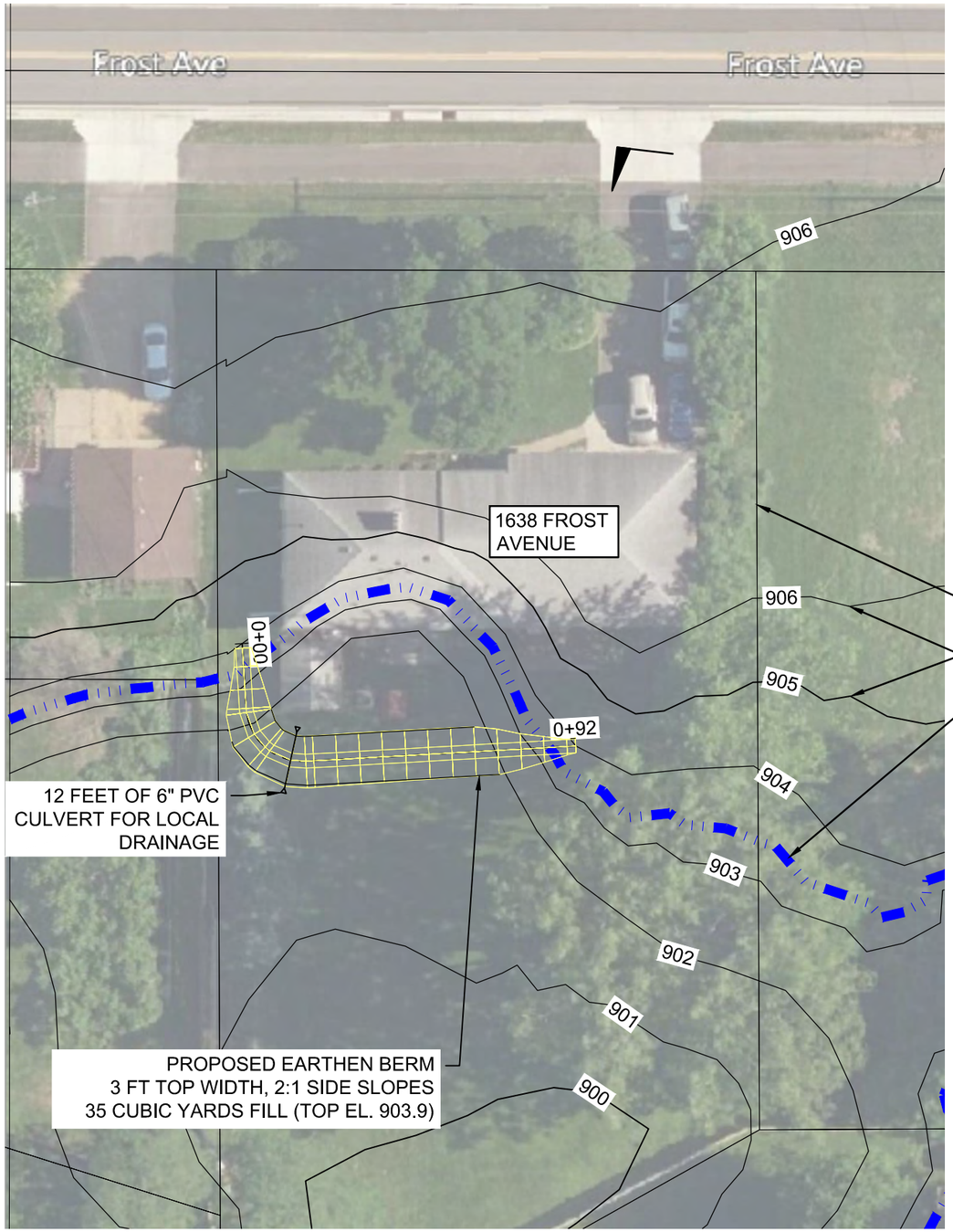


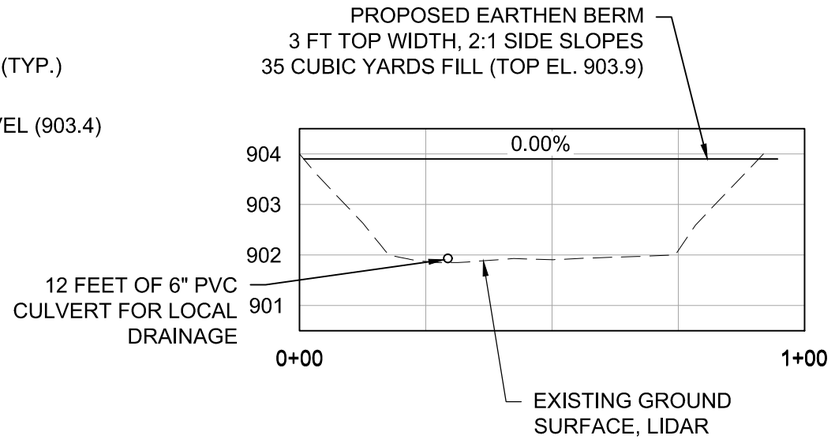
DRAFT

FIGURE

FLOOD PROTECTION PLAN FOR 1936, 1944, & 1948 KENNARD ST N

St. Paul, Minnesota
Prepared by RWMWD





1638 FROST AVENUE

N

0 30 60

SCALE IN FEET

DRAFT

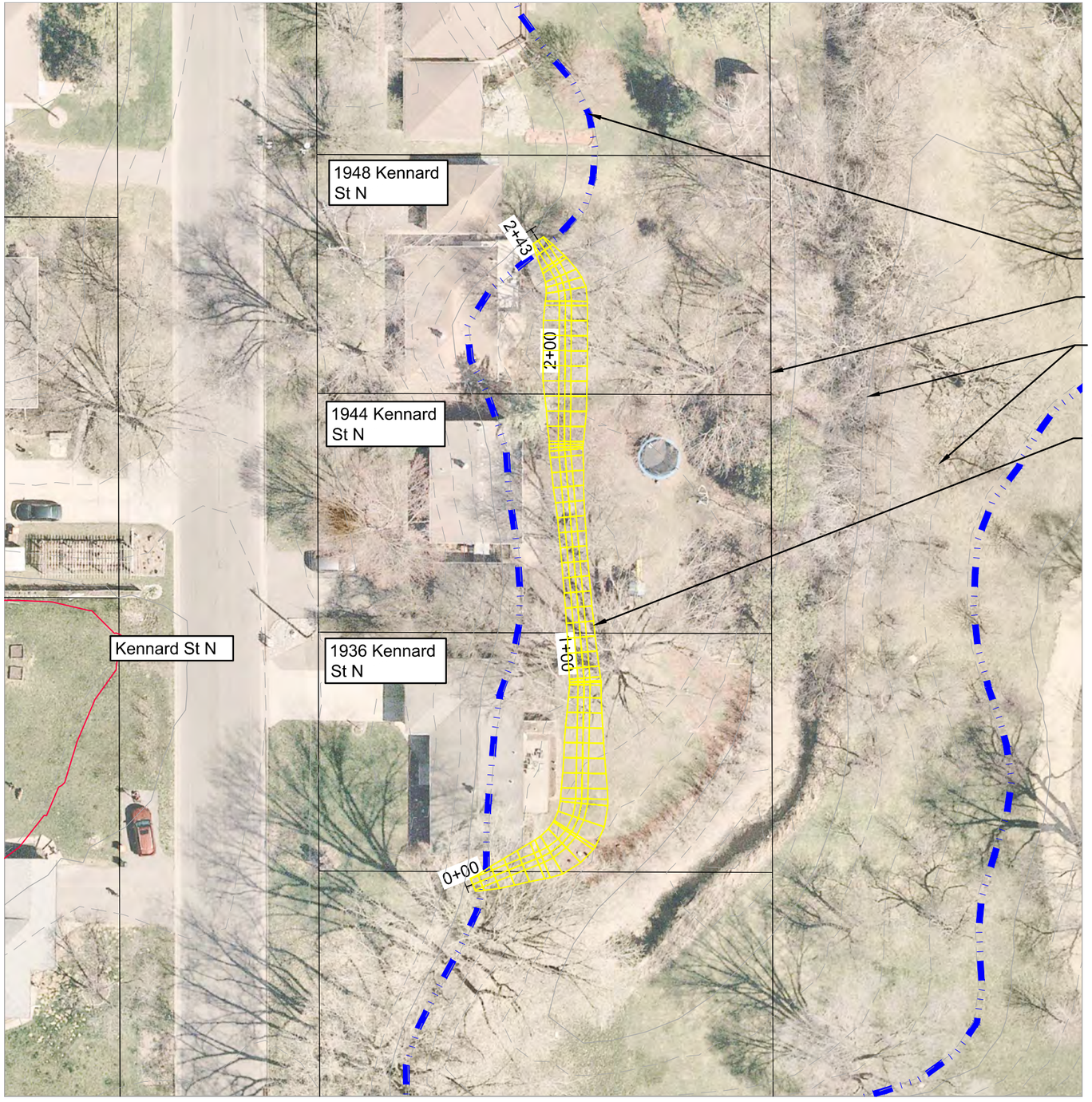
FIGURE XX:

FLOOD PROTECTION PLAN FOR 1638 FROST AVENUE

Maplewood, Minnesota
Prepared by RWMWD

Attachment 2

ERP Schematic Figures



NOTE:

1. 1944 AND 1948 KENNARD ST HAVE LOW ENTRY ELEVATIONS OF 904.1 AND 903.9, RESPECTIVELY. THIS GROUP OF PROPERTIES REQUIRES 7,400 SANDBAGS (BASED ON 0.5 CUBIC FEET PER SANDBAG) TO PROTECT TO THE 100-YEAR FLOOD ELEVATION (904.1) PLUS 6" OF FREEBOARD.
2. CONTOURS AND LOW ADJACENT GRADE ARE DERIVED FROM LiDAR.
3. RAMSEY WASHINGTON METRO WATERSHED DISTRICT SHALL NOT BE HELD RESPONSIBLE FOR THE DATA PROVIDED ON THIS DRAWING OR FOR ANY USE OTHER THAN ITS INTENDED PURPOSE.
4. AERIAL IMAGE IS NEARMAP 2022
5. DRAWING IS IN RAMSEY COUNTY COORDINATES NAD 83, NAVD88, US FOOT

DRAFT

1936, 1944, & 1948 Kennard St

N

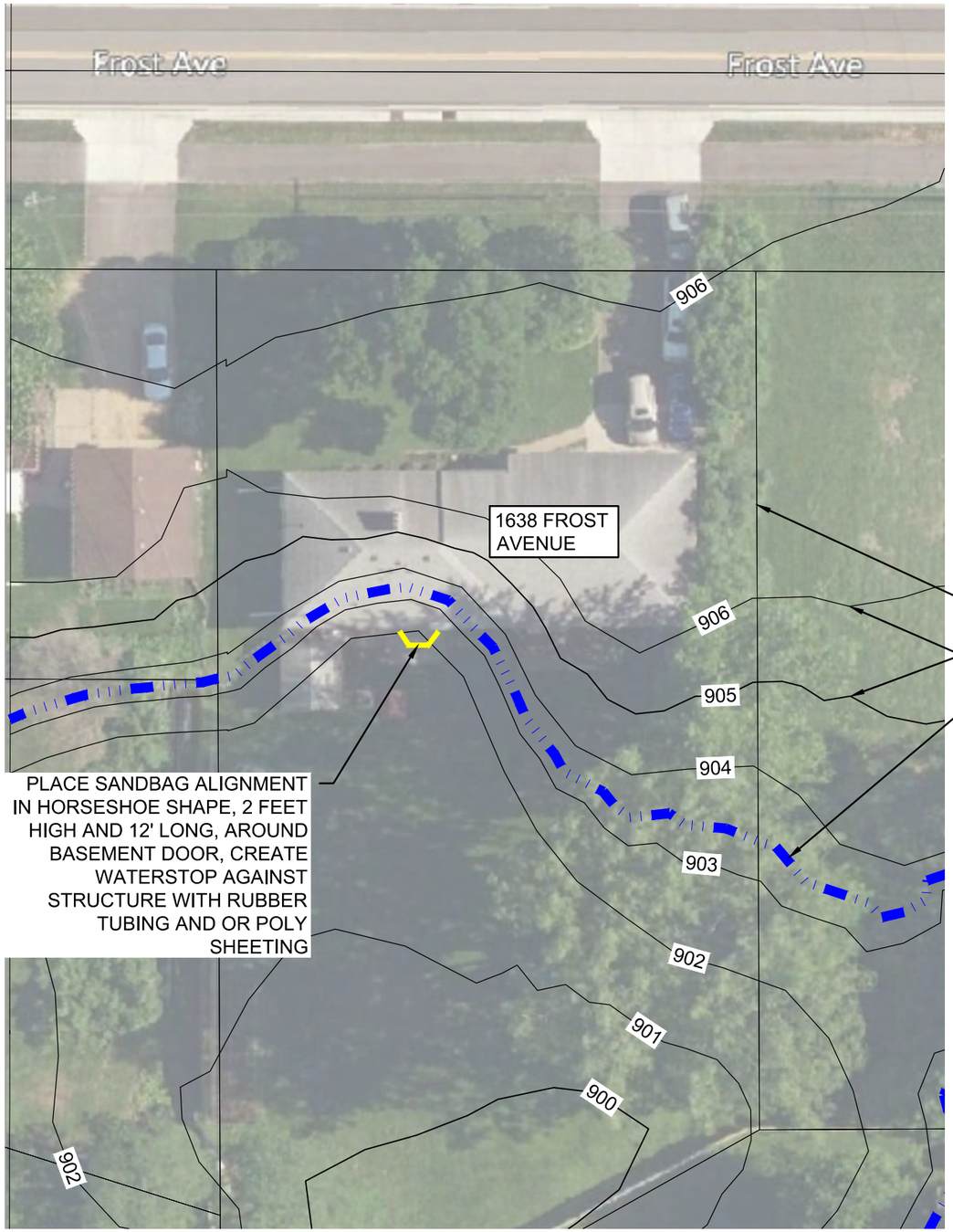
0 40 80

SCALE IN FEET

FIGURE 01:

FLOOD WARNING EMERGENCY RESPONSE PLAN FOR 1936, 1944, & 1948 Kennard St

Maplewood, Minnesota
Prepared by RWMWD



1638 FROST AVENUE

N

0 30 60

SCALE IN FEET

DRAFT

NOTE:

1. THIS SITE REQUIRES 75 SANDBAGS TO PROTECT TO THE 100-YEAR FLOOD ELEVATION (904.1), PLUS FREEBOARD. THIS NUMBER IS BASED 0.5 CUBIC FEET OF SAND PER SANDBAG.

2. RAMSEY WASHINGTON METRO WATERSHED DISTRICT SHALL NOT BE HELD RESPONSIBLE FOR THE DATA PROVIDED ON THIS DRAWING OR FOR ANY USE OTHER THAN ITS INTENDED PURPOSE.

3. AERIAL IMAGE IS BING MAPS 2021

4. DRAWING IS IN RAMSEY COUNTY COORDINATES NAD 83, NAVD88, US FOOT

FIGURE XX:

FLOOD WARNING EMERGENCY RESPONSE PLAN FOR 1638 FROST AVENUE

Maplewood, Minnesota
Prepared by RWMWD

Attachment 3

Engineer's opinion of Probable Cost

Table: Engineer's Opinion of Probable Project Cost

BARR	PREPARED BY: BARR ENGINEERING COMPANY		SHEET:	1	OF	1
			CREATED BY:	FPD	DATE:	9/20/2022
ENGINEER'S OPINION OF PROBABLE PROJECT COST			CHECKED BY:	BJB	DATE:	10/21/2022
PROJECT:	Improvements to County Ditch 17		APPROVED BY:		DATE:	
LOCATION:	Frost Ave. & Prosperity Blvd., Maplewood, MN 55109	ISSUED:			DATE:	
PROJECT #:	23621200.22.003	ISSUED:			DATE:	
OPINION OF COST - SUMMARY		ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

Alternative 1: New Storm Sewer and Pond North of Frost Avenue

Expand existing Frost Ave. / Kennard St. pond storage, Lower Weir, & Install New Stormwater Diversion Pipe to Wakefield Lake

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	New Storage Facility Land Acquisition (Edgeview, Lot NO. 2)	L.S.	1	290,000	$290,000.00	1,2,3,4,5
B	Project Mobilization/Demobilization	%	10%	$101,000.00	$101,000.00	1,2,3,4,5
C	Traffic Control	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5
D	SWPP	L.S.	1	$2,500.00	$2,500.00	1,2,3,4,5,6
E	Dust Control	%	0.15%	$1,500.00	$1,500.00	1,2,3,4,5,6
F	Dust Control @ Prosperity Rd.	%	0.10%	$1,000.00	$1,000.00	1,2,3,4,5,6
G	Construction Site Dewatering, Control of Water	L.S.	1	$64,900.00	$64,900.00	1,2,3,4,5,6
H	Salvage Existing Top Soil	C.Y.	300	$5.00	$1,500.00	1,2,3,4,5,6
I	Clearing, Grubbing & Tree Removal	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5,6
J	Remove and Dispose of 48" HDPE Storm Sewer Pipe	L.F.	310	$20.00	$6,200.00	1,2,3,4,5,6
K	Sawcut Bituminous Pavement	L.F.	825	$7.00	$5,775.00	1,2,3,4,5,6
L	Sawcut Bituminous Pavement @ Prosperity Rd.	L.F.	710	$7.00	$4,970.00	1,2,3,4,5,6
M	Remove & Dispose of Unclassified Excavation Material (Type 3) @ Existing Pond Retention Facility	C.Y.	3,500	$20.00	$70,000.00	1,2,3,4,5,6
N	Remove and Dispose of Bituminous Pavement	S.Y.	2,213	$4.50	$9,960.00	1,2,3,4,5,6
O	Remove and Dispose of Bituminous Pavement @ Prosperity Rd.	S.Y.	1,390	$4.50	$6,255.00	1,2,3,4,5,6
P	Remove and Dispose of Concrete Curb and Gutter	L.F.	880	$4.00	$3,520.00	1,2,3,4,5,6
Q	Remove and Dispose of Concrete Sidewalk / Apron	S.Y.	13	$5.00	$65.00	1,2,3,4,5,6
R	Remove and Dispose of Asphalt @ Prosperity Rd. Approaches	S.Y.	18	$4.50	$80.00	1,2,3,4,5,6
S	54" RCP Class II (1' to 10' Deep)	L.F.	310	$210.00	$65,100.00	1,2,3,4,5,6
T	60" RCP Class III (2' to 10' Deep) from Weir to Exist MH	L.F.	120	$220.00	$26,400.00	1,2,3,4,5,6
U	42" RCP Class III (1' to 10' Deep) from Diversion Inlet to MH 1	L.F.	315	$200.00	$63,000.00	1,2,3,4,5,6
V	21" RCP Class III (2' to 10' Deep)	L.F.	2,000	$160.00	$320,000.00	1,2,3,4,5,6
W	30"-54" FES with Bullnose Trashguard	Each	4	$4,100.00	$16,400.00	1,2,3,4,5,6
X	96" Precast Concrete Manhole (< 42" dia pipe connection)	Each	6	$7,200.00	$43,200.00	1,2,3,4,5,6
Y	96" Manhole Casting Assembly	Each	6	$1,000.00	$6,000.00	1,2,3,4,5,6
Z	Connect to Existing Manhole	Each	2	$2,500.00	$5,000.00	1,2,3,4,5,6
AA	Utility Main Crossing	Each	10	$1,000.00	$10,000.00	1,2,3,4,5,6
AB	Utility Service Crossing	Each	18	$700.00	$12,600.00	1,2,3,4,5,6
AC	Overhead Utility pole support	L.S.	1	$20,000.00	$20,000.00	1,2,3,4,5
AD	Saw Cut Weir w/in Manhole (-1.5 ft)	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5
AE	Bituminous Base (8-inch)	Ton	475	$95.00	$45,125.00	1,2,3,4,5,6
AF	Bituminous Wearing Coarse (4-inch)	Ton	253	$98.00	$24,794.00	1,2,3,4,5,6
AG	Concrete Curb & Gutter	L.F.	880	$44.00	$38,720.00	1,2,3,4,5,6
AH	Bituminous Base (8-inch) @ Prosperity Rd.	Ton	560	$95.00	$53,200.00	1,2,3,4,5,6
AI	Bituminous Wearing Coarse (4-inch) @ Prosperity Rd.	Ton	300	$98.00	$29,400.00	1,2,3,4,5,6
AJ	Bituminous Pathway Wearing Course (4 inch)	Ton	225	$98.00	$22,050.00	1,2,3,4,5,6
AK	Replace Bituminous Access	Each	2	$1,450.00	$2,900.00	1,2,3,4,5,6
AL	Replace Concrete Driveway Apron / Sidewalk	Each	3	$1,500.00	$4,500.00	1,2,3,4,5,6
AM	Site Grading - Replace Existing Topsoil (6 inch depth)	C.Y.	300	$5.00	$1,500.00	1,2,3,4,5,6
AN	Furnish and Install Turf Grass Seed	S.Y.	1,790	$4.65	$8,300.00	1,2,3,4,5,6
AO	Tree Replacement	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5,6
	LAND ACQUISITION SUBTOTAL				**$290,000.00**	**1,2,3,4,5,8**
	CONSTRUCTION SUBTOTAL				$1,110,000.00	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (30%)				$333,000.00	1,5,6,7,8
	ESTIMATED CONSTRUCTION COST				$1,443,000.00	1,2,3,4,5,6,7,8
	PROSPERITY RD. CIP CREDIT				$98,000.00	8,9
	ESTIMATED TOTAL PROJECT COST				$1,733,000.00	1,2,3,4,5,6,7,8
	ESTIMATED ACCURACY RANGE	**-20%**			**$1,390,000.00**	5,7,8
		40%			**$2,430,000.00**	5,7,8

Notes

[1] Limited Design Work Completed (5-10%).

[2] Quantities Based on Design Work Completed.

[3] Unit Prices Based on Information Available at This Time.

[4] No Soil Boring and Field Investigation Information Available.

[5] This feasibility-level (Class 5, 5-10% design completion per ASTM E 2516-11) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -25% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[6] Estimate assumes that projects will not be located on contaminated soil.

[7] Estimate costs are for construction of each alternative. The estimated costs do not include design, permitting, maintenance, monitoring or additional tasks following constuction.

[8] Estimate costs are reported to nearest thousand dollars.

[9] Prosperity Rd. CIP Credit reflects scope items that would be covered under a separate contract if construction is coincident with a 2025 street improvement project on Prosperity Rd. This project is indicated in City of Maplewood's 2022 5-year Draft Capital Improvement Plan. Scope items included in the CIP credit are highlighted green.

Table: Engineer's Opinion of Probable Project Cost

BARR	PREPARED BY: BARR ENGINEERING COMPANY	SHEET:	1	OF	1
		CREATED BY:	FPD	DATE:	9/20/2022
ENGINEER'S OPINION OF PROBABLE PROJECT COST		CHECKED BY:	BJB	DATE:	10/21/2022
PROJECT: Improvements to County Ditch 17		APPROVED BY:		DATE:	
LOCATION: Frost Ave. & Prosperity Blvd., Maplewood, MN 55109	ISSUED:			DATE:	
PROJECT #: 23621200.22.003	ISSUED:			DATE:	
OPINION OF COST - SUMMARY	ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

Alternative 2: New Storm Sewer and Pond West of White Bear Avenue

Construct new stormwater storage on acquired parcel west of White Bear Ave, Lower Weir, & Install New Stormwater Diversion Pipe to Wakefield Lake

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	New Storage Facility Land Acquisition (Lots 2-6)	L.S.	1	1,500,000	$1,500,000.00	1,2,3,4,5
B	Project Mobilization/Demobilization	%	10%	$107,000.00	$107,000.00	1,2,3,4,5
C	Traffic Control	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5
D	SWPP	L.S.	1	$2,500.00	$2,500.00	1,2,3,4,5,6
E	Dust Control	%	0.15%	$1,600.00	$1,600.00	1,2,3,4,5,6
F	Dust Control @ Prosperity Rd.	%	0.10%	$1,100.00	$1,100.00	1,2,3,4,5,6
F	Construction Site Dewatering, Control of Water	L.S.	1	$69,900.00	$69,900.00	1,2,3,4,5,6
G	Salvage Existing Top Soil	C.Y.	300	$5.00	$1,500.00	1,2,3,4,5,6
H	Dispose of Excess Topsoil	C.Y.	810	$7.00	$5,670.00	1,2,3,4,5,6
I	Clearing, Grubbing & Tree Removal	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5,6
J	Remove and Dispose of 48" CMP Storm Sewer Pipe	L.F.	310	$20.00	$6,200.00	1,2,3,4,5,6
K	Sawcut Bituminous Pavement	L.F.	825	$7.00	$5,775.00	1,2,3,4,5,6
L	Sawcut Bituminous Pavement @ Prosperity Rd.	L.F.	710	$7.00	$4,970.00	1,2,3,4,5,6
M	Remove & Dispose of Excavated Material (Type 1) @ New Pond Detention Facility	C.Y.	7,500	$12.00	$90,000.00	1,2,3,4,5,6
N	Remove and Dispose of Bituminous Pavement	S.Y.	2,213	$4.50	$9,960.00	1,2,3,4,5,6
O	Remove and Dispose of Bituminous Pavement @ Prosperity Rd.	S.Y.	1,390	$4.50	$6,255.00	1,2,3,4,5,6
P	Remove and Dispose of Concrete Curb and Gutter	L.F.	880	$4.00	$3,520.00	1,2,3,4,5,6
Q	Remove and Dispose of Concrete Sidewalk / Apron	S.Y.	13	$5.00	$65.00	1,2,3,4,5,6
R	Remove and Dispose of Asphalt @ Prosperity Rd. Approaches	S.Y.	18	$4.50	$80.00	1,2,3,4,5,6
S	54" RCP Class II (1' to 10' Deep)	L.F.	460	$210.00	$96,600.00	1,2,3,4,5,6
T	60" RCP Class III (2' to 10' Deep) from Weir to Exist MH	L.F.	120	$220.00	$26,400.00	1,2,3,4,5,6
U	42" RCP Class III (1' to 10' Deep) from Diversion Inlet to MH 1	L.F.	315	$200.00	$63,000.00	1,2,3,4,5,6
V	24" RCP Class III (2' to 10' Deep)	L.F.	2,000	$160.00	$320,000.00	1,2,3,4,5,6
W	30"-54" FES with Bullnose Trashguard	Each	4	$4,100.00	$16,400.00	1,2,3,4,5,6
X	96" Precast Concrete Manhole (< 42" dia pipe connection)	Each	6	$7,000.00	$42,000.00	1,2,3,4,5,6
Y	96" Manhole Casting Assembly	Each	6	$1,000.00	$6,000.00	1,2,3,4,5,6
Z	Connect to Existing Manhole	Each	2	$2,500.00	$5,000.00	1,2,3,4,5,6
AA	Utility Main Crossing	Each	10	$1,000.00	$10,000.00	1,2,3,4,5,6
AB	Utility Service Crossing	Each	18	$700.00	$12,600.00	1,2,3,4,5,6
AC	Overhead Utility pole support	L.S.	1	$20,000.00	$20,000.00	1,2,3,4,5
AD	Saw Cut Weir w/in Manhole (-1.5 ft)	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5
AE	Bituminous Base (8-inch)	Ton	475	$95.00	$45,125.00	1,2,3,4,5,6
AF	Bituminous Wearing Coarse (4-inch)	Ton	253	$98.00	$24,794.00	1,2,3,4,5,6
AG	Concrete Curb & Gutter	L.F.	880	$44.00	$38,720.00	1,2,3,4,5,6
AH	Bituminous Base (8-inch) @ Prosperity Rd.	Ton	560	$95.00	$53,200.00	1,2,3,4,5,6
AI	Bituminous Wearing Coarse (4-inch) @ Prosperity Rd.	Ton	300	$98.00	$29,400.00	1,2,3,4,5,6
AJ	Bituminous Pathway Wearing Course (4 inch)	Ton	225	$98.00	$22,050.00	1,2,3,4,5,6
AK	Replace Bituminous Access	Each	2	$1,450.00	$2,900.00	1,2,3,4,5,6
AL	Replace Concrete Driveway Apron / Sidewalk	Each	3	$1,500.00	$4,500.00	1,2,3,4,5,6
AM	Site Grading - Replace Existing Topsoil (6 inch depth)	C.Y.	300	$5.00	$1,500.00	1,2,3,4,5,6
AN	Furnish and Install Turf Grass Seed	S.Y.	1,790	$4.65	$8,300.00	1,2,3,4,5,6
AO	Tree Replacement	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5,6
	LAND ACQUISITION SUBTOTAL				**$1,500,000.00**	**1,2,3,4,5,8**
	CONSTRUCTION SUBTOTAL				$1,178,000.00	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (30%)				$353,000.00	1,5,6,7,8
	ESTIMATED CONSTRUCTION COST				$1,531,000.00	1,2,3,4,5,6,7,8
	PROSPERITY RD. CIP CREDIT				$98,000.00	8,9
	ESTIMATED TOTAL PROJECT COST				$3,031,000.00	1,2,3,4,5,6,7,8
	ESTIMATED ACCURACY RANGE	**-20%**			**$2,430,000.00**	5,7,8
		40%			**$4,250,000.00**	5,7,8

Notes

[1] Limited Design Work Completed (5-10%).

[2] Quantities Based on Design Work Completed.

[3] Unit Prices Based on Information Available at This Time.

[4] No Soil Boring and Field Investigation Information Available.

[5] This feasibility-level (Class 5, 5-10% design completion per ASTM E 2516-11) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -25% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[6] Estimate assumes that projects will not be located on contaminated soil.

[7] Estimate costs are for construction of each alternative. The estimated costs do not include design, permitting, maintenance, monitoring or additional tasks following constuction.

[8] Estimate costs are reported to nearest thousand dollars.

[9] Prosperity Rd. CIP Credit reflects scope items that would be covered under a separate contract if construction is coincident with a 2025 street improvement project on Prosperity Rd. This project is indicated in City of Maplewood's 2022 5-year Draft Capital Improvement Plan. Scope items included in the CIP credit are highlighted green.

Table: Engineer's Opinion of Probable Project Cost

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**	SHEET:	1	OF	1
		CREATED BY:	FPD	DATE:	9/20/2022
ENGINEER'S OPINION OF PROBABLE PROJECT COST		CHECKED BY:	BJB	DATE:	10/21/2022
PROJECT: Improvements to County Ditch 17		APPROVED BY:		DATE:	
LOCATION: Frost Ave. & Prosperity Blvd., St. Paul, MN 55109	ISSUED:			DATE:	
PROJECT #: 23621200.22.003	ISSUED:			DATE:	
OPINION OF COST - SUMMARY	ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

Alternative 3: Outlet Structure Modification and Pond West of White Bear Avenue

Construct new stormwater storage on acquired parcel west of White Bear Ave & Lower Weir

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	New Storage Facility Land Acquisition (Lots 2-6)	L.S.	1	1,500,000	$1,500,000.00	1,2,3,4,5
B	Project Mobilization/Demobilization	%	10%	$29,000.00	$29,000.00	1,2,3,4,5
C	Traffic Control	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5
D	SWPP	L.S.	1	$2,500.00	$2,500.00	1,2,3,4,5,6
E	Dust Control	%	0.15%	$400.00	$400.00	1,2,3,4,5,6
F	Construction Site Dewatering, Control of Water	L.S.	1	$23,800.00	$23,800.00	1,2,3,4,5,6
H	Dispose of Excess Topsoil	C.Y.	810	$7.00	$5,670.00	1,2,3,4,5,6
I	Clearing, Grubbing & Tree Removal	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5,6
J	Remove and Dispose of 48" CMP Storm Sewer Pipe	L.F.	310	$20.00	$6,200.00	1,2,3,4,5,6
K	Sawcut Bituminous Pavement	L.F.	50	$7.00	$350.00	1,2,3,4,5,6
M	Remove & Dispose of Excavated Material (Type 1) @ New Pond Detention Facility	C.Y.	7,500	$12.00	$90,000.00	1,2,3,4,5,6
N	Remove and Dispose of Bituminous Pavement	S.Y.	35	$4.50	$160.00	1,2,3,4,5,6
P	Remove and Dispose of Concrete Curb and Gutter	L.F.	25	$4.00	$100.00	1,2,3,4,5,6
Q	Remove and Dispose of Concrete Sidewalk	S.Y.	15	$5.00	$75.00	1,2,3,4,5,6
S	54" RCP Class II (1' to 10' Deep)	L.F.	460	$210.00	$96,600.00	1,2,3,4,5,6
T	60" RCP Class III (2' to 10' Deep) from Weir to Exist MH	L.F.	120	$220.00	$26,400.00	1,2,3,4,5,6
X	96" Precast Concrete Manhole (< 42" dia pipe connection)	Each	1	$7,000.00	$7,000.00	1,2,3,4,5,6
Y	96" Manhole Casting Assembly	Each	1	$1,000.00	$1,000.00	1,2,3,4,5,6
Z	Connect to Existing Manhole	Each	1	$2,500.00	$2,500.00	1,2,3,4,5,6
AA	Utility Main Crossing	Each	3	$1,000.00	$3,000.00	1,2,3,4,5,6
AC	Overhead Utility pole support	L.S.	1	$7,000.00	$7,000.00	1,2,3,4,5
AD	Saw Cut Weir w/in Manhole (-1.5 ft)	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5
AE	Bituminous Base (8-inch)	Ton	15	$95.00	$1,425.00	1,2,3,4,5,6
AF	Bituminous Wearing Coarse (4-inch)	Ton	10	$98.00	$980.00	1,2,3,4,5,6
AG	Concrete Curb & Gutter	L.F.	25	$44.00	$1,100.00	1,2,3,4,5,6
AL	Replace Concrete Sidewalk	S.Y.	15	$40.00	$600.00	1,2,3,4,5,6
AO	Tree Replacement	L.S.	1	$1,500.00	$1,500.00	1,2,3,4,5,6
	LAND ACQUISITION SUBTOTAL				**$1,500,000.00**	**1,2,3,4,5,8**
	CONSTRUCTION SUBTOTAL				$319,000.00	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (30%)				$96,000.00	1,5,6,7,8
	ESTIMATED CONSTRUCTION COST				$415,000.00	1,2,3,4,5,6,7,8
	ESTIMATED TOTAL PROJECT COST				$1,915,000.00	1,2,3,4,5,6,7,8
	ESTIMATED ACCURACY RANGE	**-20%**			**$1,540,000.00**	5,7,8
		40%			**$2,690,000.00**	5,7,8

Notes

[1] Limited Design Work Completed (5-10%).

[2] Quantities Based on Design Work Completed.

[3] Unit Prices Based on Information Available at This Time.

[4] No Soil Boring and Field Investigation Information Available.

[5] This feasibility-level (Class 5, 5-10% design completion per ASTM E 2516-11) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -25% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[6] Estimate assumes that projects will not be located on contaminated soil.

[7] Estimate costs are for construction of each alternative. The estimated costs do not include design, permitting, maintenance, monitoring or additional tasks following constuction.

[8] Estimate costs are reported to nearest thousand dollars.

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**		SHEET:	1	OF	1
			CREATED BY:	GTC	DATE:	10/7/2022
ENGINEER'S OPINION OF PROBABLE PROJECT COST			CHECKED BY:	BJB	DATE:	10/21/2022
PROJECT:	Improvements to County Ditch 17		APPROVED BY:		DATE:	
LOCATION:	Frost Ave. & Prosperity Blvd., St. Paul, MN 55109	ISSUED:			DATE:	
PROJECT #:	23621200.22.003	ISSUED:			DATE:	
OPINION OF COST - SUMMARY		ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

Alternative 4: Site-Specific Solutions and Outlet Structure Modification

Construct berm in the backyards of 1936, 1944, and 1948 Kennard Street and 1638 Frost Avenue

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
B	Project Mobilization/Demobilization	%	10%	$3,000.00	$3,000.00	1,2,3,4,5
C	Silt Fence	L.F.	495	$7.00	$3,465.00	1,2,3,4,5
D	Clearing, Grubbing & Tree Removal	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5,6
E	Strip, Salvage, and Replace Topsoil	C.Y.	135	$5.00	$675.00	1,2,3,4,5,6
F	PV Daintile Culvert	L.F.	56	$2	$112.00	1,2,3,4,5
H	Common Borrow Fill Material	C.Y.	350	$30.00	$10,500.00	1,2,3,4,5
I	Site Restoration (Seeding and Erosion Control Blanket)	S.Y.	850	$10.00	$8,500.00	1,2,3,4,5,6
J	Tree Replacement	L.S.	1,500	$1,500.00	$1,500.00	1,2,3,4,5,6
K	Saw Cut Weir w/in Manhole (-1.5 ft)	L.S.	1	$5,000.00	$5,000.00	1,2,3,4,5,6
	CONSTRUCTION SUBTOTAL				$38,000.00	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (30%)				$11,000.00	1,5,6,7,8
	ESTIMATED CONSTRUCTION COST				$49,000.00	1,2,3,4,5,6,7,8
	ESTIMATED TOTAL PROJECT COST				$49,000.00	1,2,3,4,5,6,7,8
	ESTIMATED ACCURACY RANGE	**-20%**			**$40,000.00**	5,7,8
		40%			**$69,000.00**	5,7,8

Notes

[1] Limited Design Work Completed (5-10%).

[2] Quantities Based on Design Work Completed.

[3] Unit Prices Based on Information Available at This Time.

[4] No Soil Boring and Field Investigation Information Available.

[5] This feasibility-level (Class 5, 5-10% design completion per ASTM E 2516-11) cost estimate is based on feasibility-level designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -25% to +50%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[6] Estimate assumes that projects will not be located on contaminated soil.

[7] Estimate costs are for construction of each alternative. The estimated costs do not include design, permitting, maintenance, monitoring or additional tasks following constuction.

[8] Estimate costs are reported to nearest thousand dollars.

resourceful. naturally.
engineering and environmental consultants

BARR

Technical Memorandum

To: RWMWD Board of Managers
From: Tyler Olsen, Gabby Campagnola, Leslie DellAngelo, and Erin Anderson Wenz
Subject: 30% Design Summary for Lake Emily Stormwater Retrofit Projects
Date: November 30, 2022
Project: 23/62-1446
c: Paige Ahlborg (RWMWD), Tina Carstens (RWMWD), Tom Wesolowski (City of Shoreview), Mark Maloney (City of Shoreview)

1 Introduction

This memorandum summarizes the 30%-level designs of the stormwater Best Management Practices (BMP) identified in the Lake Emily Subwatershed Feasibility Study (Barr, 2016). The goal of the BMPs is to improve the water quality in Lake Emily located in the City of Shoreview (City). Barr evaluated two of the original conceptual BMP designs developed in 2016: the bioretention basin located on a City-owned parcel on Vivian Avenue (BMP 4 in the 2016 feasibility study) and the regional underground filtration BMP on Arbogast street (BMP 1 in the 2016 feasibility study). Locations of the two projects are shown in Figure 1. Barr updated the conceptual designs to a 30% design level using topographic survey information collected in the field, geotechnical investigation, hydraulic and hydrologic modeling, and water quality modeling. Additionally, Barr updated the engineer's opinion of probable cost and cost-benefit estimate (in terms of cost/lb TP removed/year) for each project. The updated BMP designs, modeling results, and cost estimates are discussed in the following sections, along with Barr's recommendation for further design. These designs were presented to (and discussed with) staff from the City of Shoreview on November 22 who had no immediate concerns with the projects, their designs and locations on City property.

Figure 1: Lake Emily Watershed Project Locations

2 Vivian Avenue Filtration Basin Design

In 2016, Barr developed a conceptual design for a bioretention basin located on a City-owned parcel along Vivian Avenue, south of Lake Judy (which is actually a wetland). The goal of the proposed basin is to divert flows from storm sewer along Vivian Avenue and treat the diverted stormwater before it enters

Lake Judy (which, in turn, drains to Lake Emily). The original conceptual design utilized infiltration for treatment of the diverted runoff.

This year, Barr conducted a survey of the site, including collection of topography and storm sewer information. Upon reviewing the survey information, and reviewing the normal water level of Lake Judy, it was apparent that the proposed site would not support an infiltration feature due to the shallow groundwater table (i.e. the Lake Judy normal water level is approximately 944 ft NAVD88, and the bottom of the proposed basin is approximately 945.7 ft NAVD88).

Because infiltration is not feasible at the site, Barr converted the proposed design to a filtration basin, assuming the use of CC17 media. CC17 is an aggregate form of calcium-carbonate based media (i.e. crushed limestone) that is used to remove phosphorus from stormwater runoff. Its nutrient removal levels are similar to those of a sand filter (without the addition of zero valent iron filings). The primary benefits of using CC17 media in a filtration BMP are that it can be inundated for longer periods of time than iron enhanced sand and it has a high hydraulic conductivity. The updated design would route flows in the storm sewer under Vivian Avenue into the CC17 filter, treat it, and then return it to the storm sewer before discharging to Lake Judy. Barr modeled the proposed design using XPSWMM and P8 and estimated that approximately 20% of the tributary area's annual flows would be diverted to the filter and treated, resulting in approximately 1.2 pounds removal of total phosphorus annually.

The 30% design plan sheets for the CC17 filter are attached to this memo. A summary of the 30% engineer's opinion of probable cost and the water quality treatment estimate for the CC17 filter is included in the table below.

Table 1 Summary of 30% Opinion of Probable Costs and Water Quality Treatment Estimate for the Vivian Avenue Filtration Basin

Engineer 's Opinion of Probable Project Construction Cost (30% Design)	Engineer's Opinion of Probable Cost Range (-15% to +20%)	BMP Average Annual TP Removal (lbs/year)	Annualized Cost per Pound of TP Removal
$281,000	$239,000-$337,000	1.2	$14,300-$18,900

The current engineer's opinion of probable cost for the project ranges from -15% to +20%. These opinions include a 30% contingency and reflect a 30% design level of accuracy. This contingency reflects the current uncertainty in bid prices due to supply chain disruptions, as well as uncertainty in the design elements. The annualized cost per pound of TP removed by the project reflects annualized total capital cost, including estimated annual maintenance with the range reflecting a 20-35-year lifespan on the project.

3 Arbogast Underground Filtration Chamber Design

In 2016, Barr developed a conceptual design for an underground filtration system under City right-of-way beneath a paved biking/walking path perpendicular to Arbogast Street. The goal of the underground filtration system is to divert low flows from the storm sewer along Arbogast Street (which conveys outflow from Lake Judy, as well as stormwater runoff from the residential drainage area to the northwest) to a

subsurface treatment system before discharging back to the storm sewer and ultimately into Lake Emily. This year's updated 30% design of the filter is similar to what was proposed in 2016, with updated elevations based on Barr's 2022 survey. In 2016, Barr proposed to use spent lime as a filtration media in the system. However, after discussions with Barr staff and review of new monitoring results of other filtration media systems, iron-enhanced sand was chosen instead.

In the updated design, stormwater would be diverted from the existing 42-inch RCP trunk storm sewer along Arbogast Street with a 0.2-foot-tall weir within a 72-inch manhole structure. The diverted flows would be conveyed in an 18-inch storm pipe below Arbogast Street to an underground concrete vault below the trail in the Emmert Street Right-of-Way. The effluent from the filter would be conveyed through an 18-inch storm pipe approximately 400 feet below the sidewalk that runs parallel to Arbogast Street and then cross the street to connect back to the Arbogast storm sewer. The iron-enhanced sand filter (IESF) media would be contained in the underground vault, with a media surface area of approximately 1,000 square feet and a media depth of 2 feet. Underlying the media there would be a 6-inch drain tile network. The underground structure would also feature a sediment forebay with a passive aeration structure to ensure settling of solids and oxygenation of the inflows. Aeration is important for IESFs because under low oxygen conditions (anoxia), IESFs have the potential to release (instead of bind) total phosphorus. The structure would also feature open catchbasin grates on either side of the trail and above the vault, to provide air exchange at the surface for ventilation of the surface of the IESF.

Under this configuration, approximately 90% of annual flows through the Arbogast storm sewer would be diverted to and treated by the filter. Barr modeled the system using P8 and estimated that approximately 7.0 pounds of total phosphorus would be removed from the influent stormwater annually. Additionally, Barr used a spreadsheet model to determine the change in dissolved oxygen in the IESF to ensure that the design would not cause frequent anoxia in the system. The model was developed by Barr to evaluate dissolved oxygen levels and aeration rates in sand filters under a range of filter configurations using the hydraulic capacity of the system, the water balance of the system, and biological consumption of oxygen. The model determined that the proposed filter would not go anoxic based on the given sizing and inflow volume.

The 30% design plan sheets for the underground filter are attached to this memo. A summary of the 30% engineer's opinion of probable cost and the water quality treatment estimate for the underground filter is included in the table below.

Table 2 Summary of 30% Opinion of Probable Costs and Water Quality Treatment Estimate for the Arbogast Underground Filtration Chamber

Engineer 's Opinion of Probable Project Construction Cost (30%)	Engineer's Opinion of Probable Cost Range (-15% to +20%)	BMP Average Annual TP Removal (lbs/year)	Annualized Cost per Pound of TP Removal
$711,000	$604,000-$853,000	7.0	$5,900-$8,000

The current engineer's opinion of probable cost for the project ranges from -15% to +20%. These opinions include a 30% contingency and reflect a 30% design level of accuracy. This contingency reflects the current uncertainty in bid prices due to supply chain disruptions, as well as uncertainty in the design elements. The annualized cost per pound of TP removed by the project reflects annualized total capital cost, including estimated annual maintenance with the range reflecting a 20-35-year lifespan on the project.

4 RWMWD Prioritization Tool

Based on the 2016 feasibility study conceptual designs, the Vivian and Arbogast sites were added to the RWMWD water quality project prioritization tool. The projects were updated in the tool based on the 30% designs outlined in this memo. The Arbogast filter project scores third in the list of actionable projects that have not been previously evaluated (i.e. property owners contacted for implementation). The Vivian filter scores seventh on the list of actionable projects. The term "actionable" pertains to the fact that although there are projects that may currently rank higher in the RWMWD water quality project prioritization tool, there are several that are on hold for a variety of reasons, such as unwilling property owners, or projects still under consideration for a variety of reasons.

The Arbogast filter has a primary project benefit of "Water Quality", and the Vivian filter has a primary project benefit of "Community". The table below summarizes the project's scores per each goal in the RWMWD's Watershed Management Plan.

Table 3 Summary of RWMWD Prioritization Tool Scores for Vivian Ave Filter and Arbogast Street Filter Retrofit Projects

Plan Goal Category	Vivian Avenue Filter Scores per Plan Goal Category	Arbogast Street Scores per Plan Goal Category
1. Water Quality	0.5	3.0
2. Ecosystem	1.0	0.0
3. Flooding	0.0	0.0
4. Groundwater	0.0	0.0
5. Community	3.0	3.0
6. Manage Organization	2.0	2.0

A description of the credits that each project received in the tool under each of RWMWD's Plan Goal categories is included below.

Vivian Avenue Filter Prioritization Tool Credits:

RWMWD Goal 1. Achieve quality surface water

- Annual cost-benefit of Vivian TP removal = $15,300/lb TP/yr (>10,300/lb TP/yr)
- Vivian TP removal = 1.2 lbs/yr

RWMWD Goal 2. Achieve healthy ecosystems

- Vivian filter would remove pollutants upstream of wetland (Lake Judy)

RWMWD Goal 3. Manage risk of flooding

- N/A

RWMWD Goal 4. Support sustainable groundwater

- N/A

RWMWD Goal 5. Inform and empower communities

- Project fosters collaboration with cities, watershed management organizations, education institutions, or other stakeholders to develop and implement shared communication and messaging strategies

RWMWD Goal 6. Manage organization effectively

- City of Shoreview would provide long-term operations and maintenance
- Willing project partners (City) are collaborating on the design process

Arbogast Street Filter Prioritization Tool Credits:

RWMWD Goal 1. Achieve quality surface water

- Annual cost-benefit of Arbogast TP removal = $6,400/lb TP/yr (<$10,300/lb TP/year)
- Arbogast TP removal = 7.0 lbs/yr

RWMWD Goal 2. Achieve healthy ecosystems

- N/A

RWMWD Goal 3. Manage risk of flooding

- N/A

RWMWD Goal 4. Support sustainable groundwater

- N/A

RWMWD Goal 5. Inform and empower communities

- Project fosters collaboration with cities, watershed management organizations, education institutions, or other stakeholders to develop and implement shared communication and messaging strategies

RWMWD Goal 6. Manage organization effectively

- City of Shoreview will provide long-term operations and maintenance
- Willing project partners (City) are collaborating on the design process

5 Recommendations

Based on this evaluation, Barr recommends advancing the Arbogast underground filtration chamber to final design and developing 100% design engineering drawings and specification, contract documents, and a 100% engineer's opinion of probable cost. The annualized cost-benefit estimate of $5,900-$8,000/lb TP is within the typical range ($400 to $14,000 per pound of TP) of cost per pound of TP removal for regional RWMWD water quality projects. Furthermore, the location of the proposed filtration BMP is desirable because stormwater enters Lake Emily less than 1,000 feet downstream.

Barr does not recommend implementing the Vivian Avenue stormwater filtration basin for a few different reasons. First, the estimated cost-benefit of $14,300-$18,900/lb TP is on the high side for regional BMPs in RWMWD (typically $400 to $14,000/lb TP removed/year for larger-scale, regional projects). In addition, the stormwater runoff from the Vivian Avenue storm sewer discharges through Lake Judy (a wetland upstream of Lake Emily) before reaching Lake Emily. Particulate phosphorus and some of the dissolved phosphorus fraction in the stormwater runoff is likely removed in Lake Judy prior to reaching Lake Emily. Perhaps most importantly, some of the flows that would have been treated in this BMP have the potential for treatment in the Arbogast underground filtration chamber since if both projects were ultimately implemented, the filters would be in series.

The site is, however, a potential candidate for a wetland restoration project sometime in the future. Barr wetland scientists identified this site as having potential for a wetland restoration in the past- the site received an overall potential wetland restoration rating of "Medium" in RWMWD's Draft Wetland Restoration Site Search memorandum (December, 2021). As such, there is a potential opportunity at this site to improve the City's parcel that will have water quality and habitat enhancement benefits above and beyond those associated with the filter project evaluated for the site this year. Barr staff do not recommend embarking on a wetland restoration project at this site in the immediate future, however; other wetland restoration sites may be deemed a higher priority across the RWMWD.

Schedule

Pending Board approval to continue the design of the Arbogast filter, 75% plans and specifications will be prepared for review by RWMWD and City staff and presented to the City Council for their approval. After approval from City Council and obtaining design feedback from RWWMD and City staff, 100% plans, specification, and an updated engineer's opinion of cost will be prepared and presented to the Board (we estimate that this would be at the April, 2023 meeting). At that time, staff would ask for approval to put the project out to bid. After bidding, if a responsible low bidder is identified, the project could be implemented as early as summer, 2023.

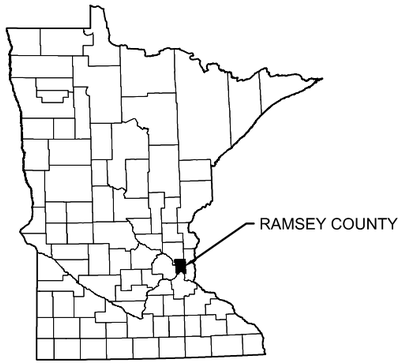
Attachments

30% Draft Planset for the Vivian/Cobb stormwater Filter and the Arbogast Underground Iron Enhanced Sand Filter

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED
TARGETED RETROFITS

SHOREVIEW, MINNESOTA



MINNESOTA COUNTY MAP

VICINITY MAP

SHEET INDEX

G-GENERAL
C-CIVIL

SHEET NO.	TITLE
G-01	TITLE SHEET AND DRAWING INDEX
~~G-02~~	~~STORMWATER POLLUTION PREVENTION PLAN (SWPPP)~~
~~G-03~~	~~STORMWATER POLLUTION PREVENTION PLAN (SWPPP)~~
~~C-01~~	~~EXISTING CONDITIONS, REMOVALS, EROSION AND SEDIMENT CONTROL PLAN~~
~~C-02~~	~~EROSION AND SEDIMENT CONTROL DETAILS~~
C-03	ARBOGAST STORMWATER FILTER - SITE PLAN
C-04	ARBOGAST UNDERGROUND FILTER - DETAIL, PROFILE, & SECTION
C-05	ARBOGAST STORMWATER FILTER - STORM PROFILES
C-06	VIVIAN AVENUE BASIN - SITE GRADING AND STORM SEWER PLAN
C-07	VIVIAN AVENUE BASIN - GRADING AND DRAINAGE SYSTEM SECTION

PROJECT CONTACTS:

NAME:
BARR ENGINEERING CO.
PHONE:
FAX:
EMAIL:

NAME:
BARR ENGINEERING CO.
PHONE:
FAX:
EMAIL:

COORDINATE SYSTEM: MINNESOTA DOT RAMSEY COUNTY, FOOT
HORIZONTAL DATUM: NAD83 (2011)
VERTICAL DATUM: NAVD88

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.
1-800-252-1166

CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

30% DESIGN
NOT FOR CONSTRUCTION

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
-	-	-	-	———	-

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.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT							
BID							
CONSTRUCTION							
DATE RELEASED							

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-832-2277
Fax: (952) 832-2601
www.barr.com

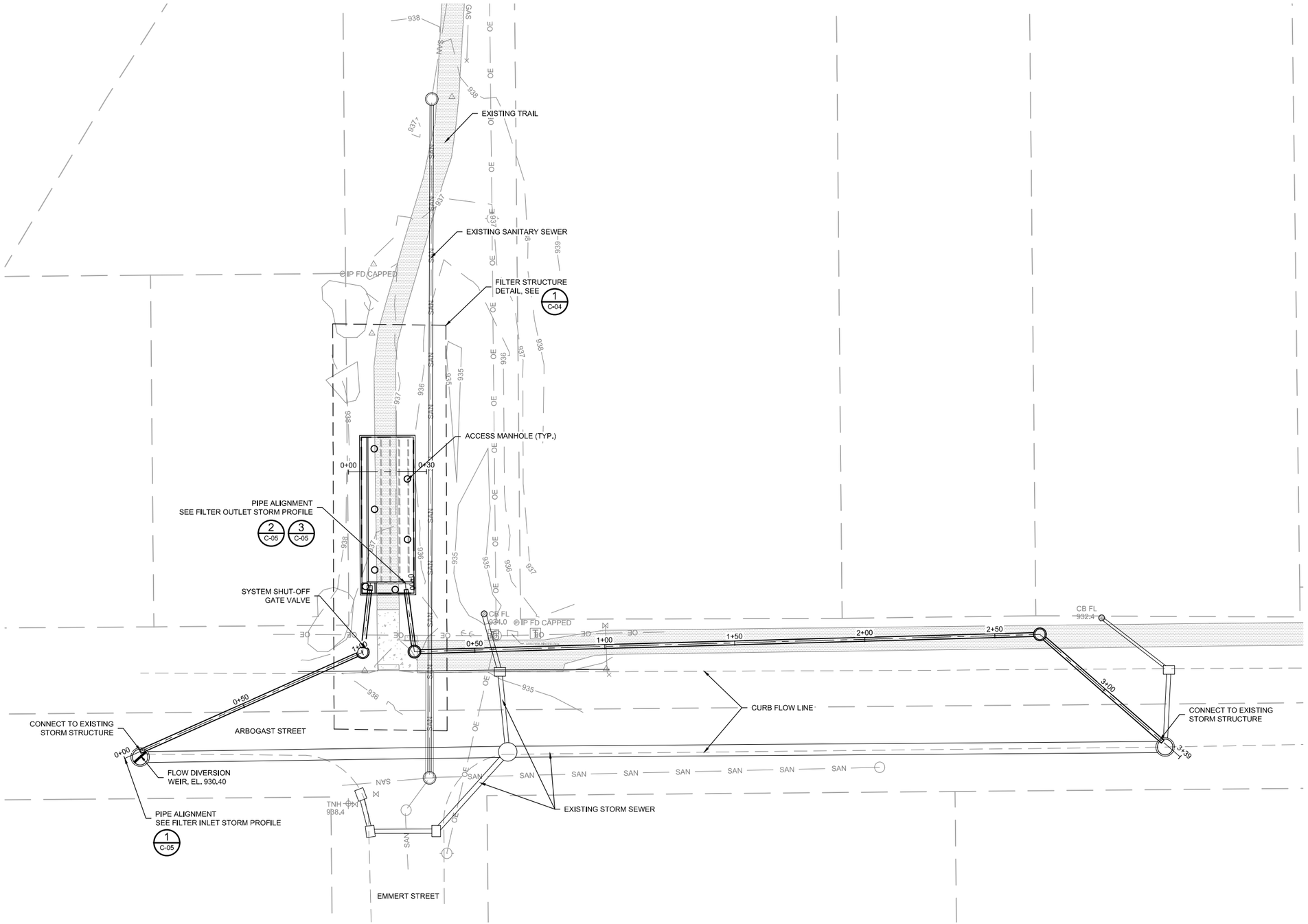
Scale	AS SHOWN
Date	11/17/2022
Drawn	GGN
Checked	.
Designed	.
Approved	.

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED TARGETED RETROFITS

TITLE SHEET AND DRAWING INDEX

BARR PROJECT No.	23/62-1446.00
CLIENT PROJECT No.	
DWG. No.	G-01
REV. No.	A



1 SITE PLAN
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SCALE IN FEET

30% DESIGN
NOT FOR CONSTRUCTION

CADD USER: GREG NELSON FILE: M:\DESIGN\23621446.00\23621446.00_ARBOGAST GRADING AND STORM DRAWING.DWG PLOT SCALE: 1:2 PLOT DATE: 11/17/2022 9:50 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
-	-	-	-	———	-

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.
PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

	A	B	C	0	1	2	3
CLIENT							
BID							
CONSTRUCTION							
RECORD							
RELEASED TO/FOR	DATE RELEASED						

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Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

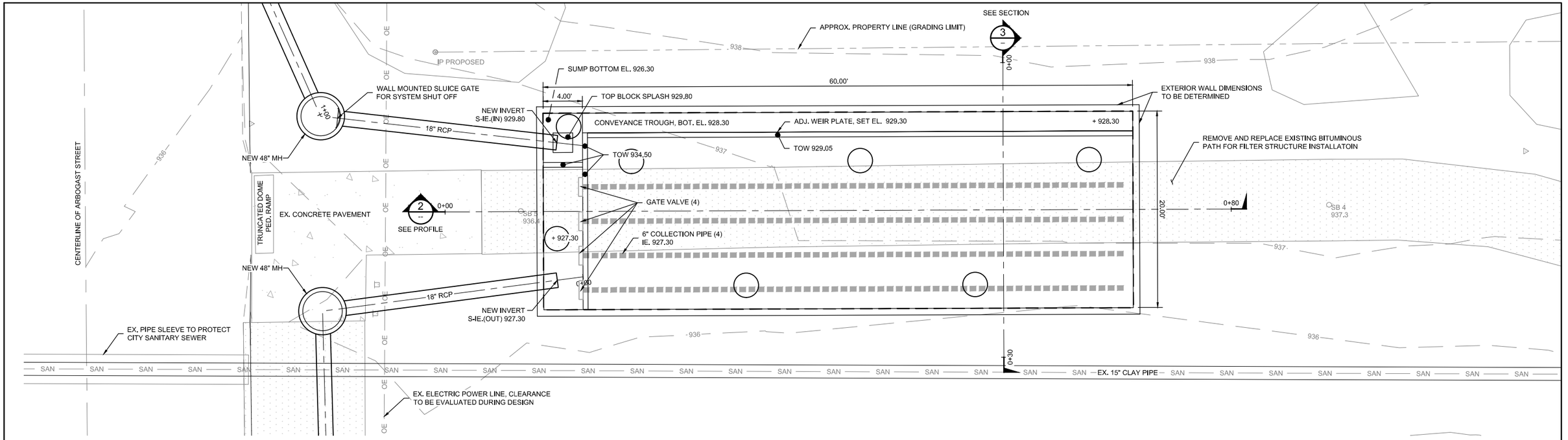
Scale	AS SHOWN
Date	11/17/2022
Drawn	GGN
Checked	---
Designed	---
Approved	---

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED TARGETED RETROFITS

ARBOGAST STORMWATER FILTER SITE PLAN

BARR PROJECT No.	23/62-1446.00
CLIENT PROJECT No.	
DWG. No.	C-03
REV. No.	A



1 – DETAIL: FILTER STRUCTURE

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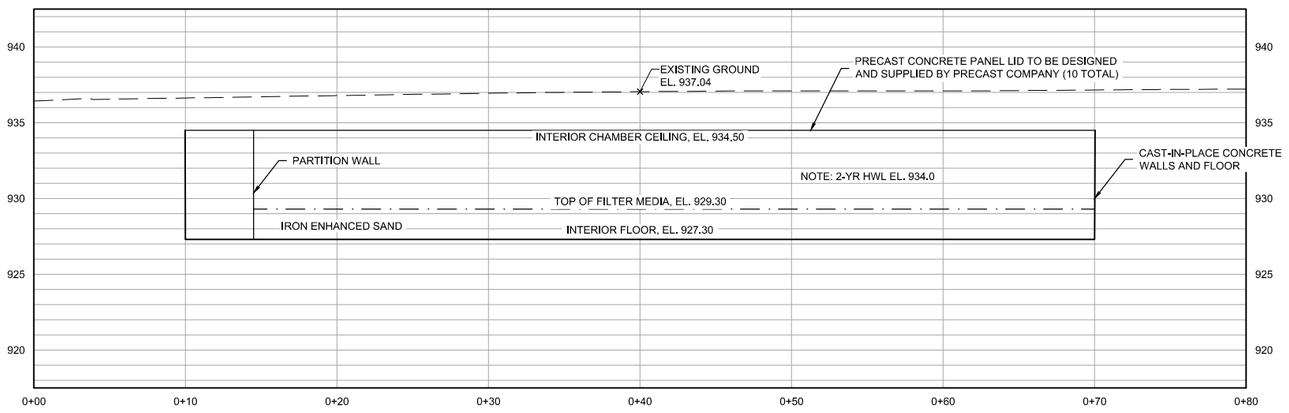
SCALE IN FEET



2 – PROFILE: FILTER STRUCTURE

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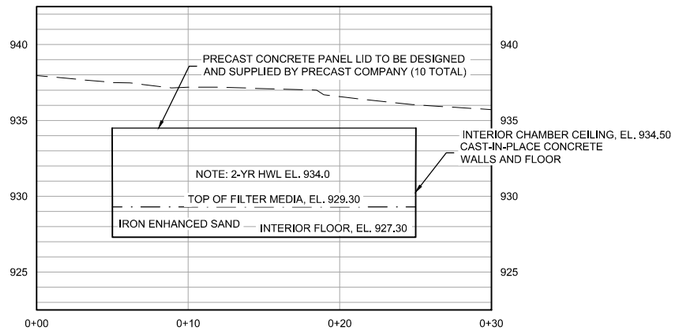
SCALE IN FEET



3 – SECTION: FILTER STRUCTURE

0 5 10

SCALE IN FEET

30% DESIGN
NOT FOR CONSTRUCTION

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
-	-	-	-	———	-

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.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

CLIENT	
BID	
CONSTRUCTION	
RECORD	
RELEASED TO/FOR	

A	B	C	0	1	2	3
DATE RELEASED						

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

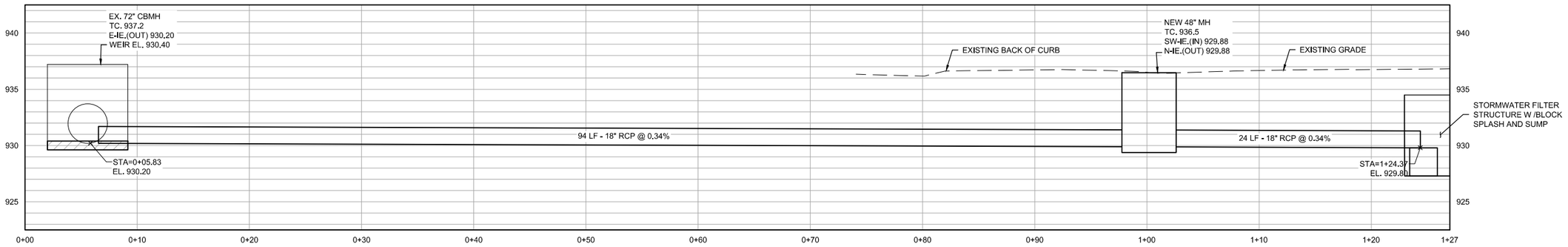
Scale	AS SHOWN
Date	11/17/2022
Drawn	GGN
Checked	---
Designed	---
Approved	---

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED TARGETED RETROFITS

ARBOGAST UNDERGROUND FILTER DETAIL, PROFILE, & SECTION

BARR PROJECT No.	23/62-1446.00
CLIENT PROJECT No.	
DWG. No.	C-04
REV. No.	A



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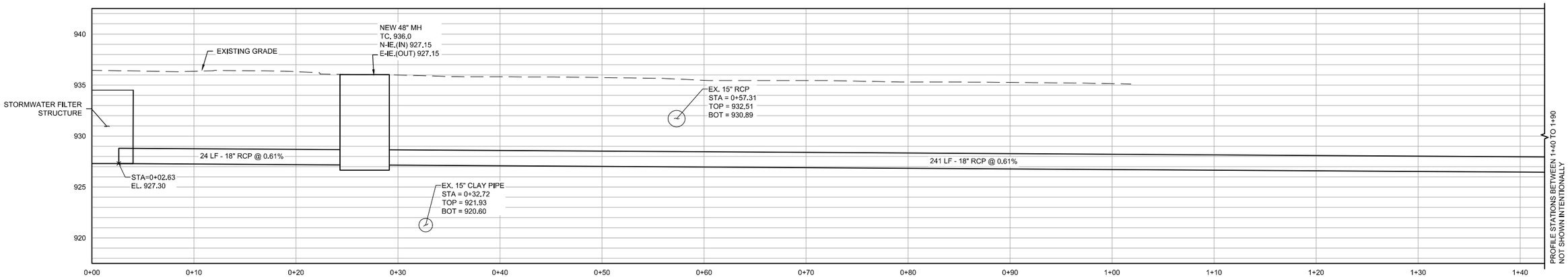

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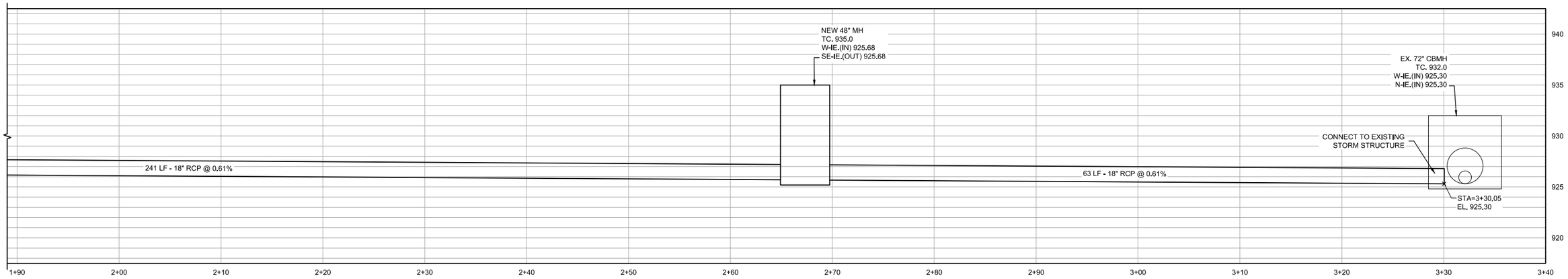

3 FILTER OUTLET STORM PROFILE
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30% DESIGN
NOT FOR CONSTRUCTION

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
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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.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

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BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	11/17/2022
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Approved	---

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED TARGETED RETROFITS

ARBOGAST STORMWATER FILTER STORM PROFILES

BARR PROJECT No. 23/62-1446.00
CLIENT PROJECT No.
DWG. No. C-05
REV. No. A

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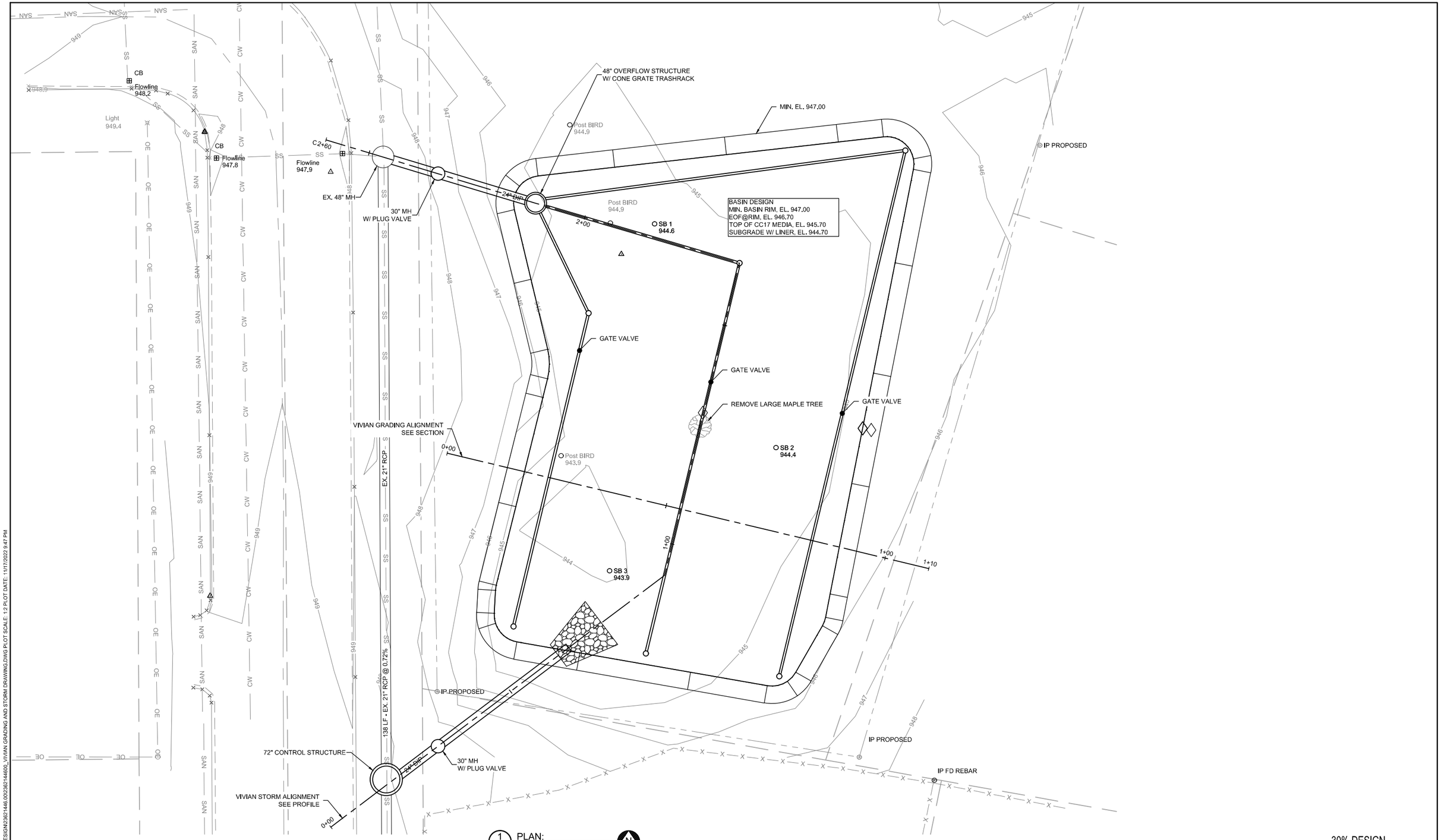

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PRINTED NAME

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4300 MARKETPOINTE DRIVE
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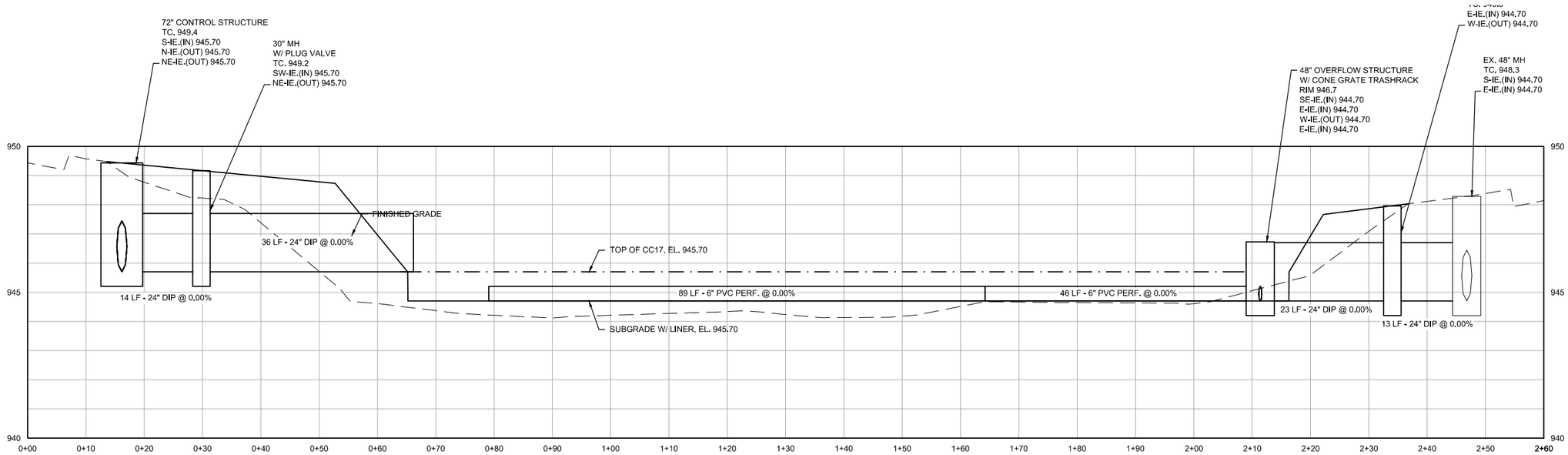
RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED TARGETED RETROFITS

VIVIAN AVENUE BASIN SITE GRADING AND STORM SEWER PLAN

BARR PROJECT No.	23/62-1446.00
CLIENT PROJECT No.	
DWG. No.	C-06
REV. No.	A



1 VIVIAN STORM ALIGNMENT PROFILE

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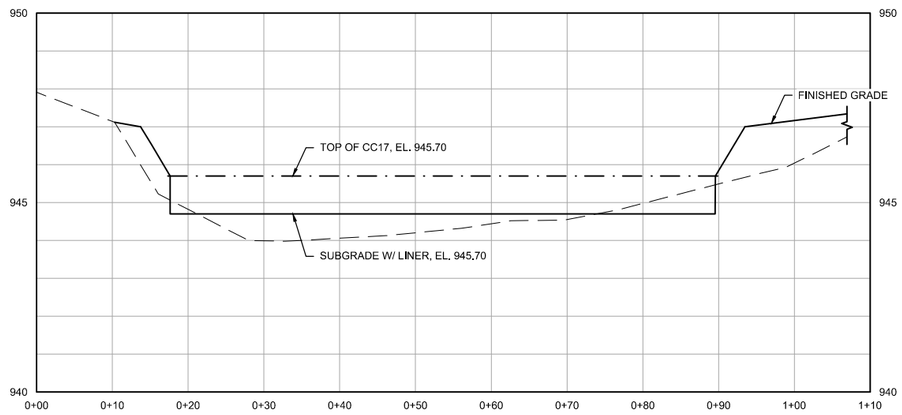

2 VIVIAN GRADING ALIGNMENT SECTION

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PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

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CONSTRUCTION								
RECORD								
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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

LAKE EMILY SUBWATERSHED
TARGETED RETROFITS

VIVIAN AVENUE BASIN
GRADING AND DRAINAGE SYSTEM SECTIONS

BARR PROJECT No.	23/62-1446.00
CLIENT PROJECT No.	
DWG. No.	C-07
REV. No.	A

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engineering and environmental consultants

Project Work Plan

Original Date: December 22, 2022
Updated: December 22, 2022
Project: Double Driveway Pond and Fish Creek Tributary Improvements Design

Project Team

District Staff: Tina Carstens (District Administrator), Dave Vlasin
Barr Staff: Tyler Olsen (Project Manager), Kallie Doeden, Andrea Wedul, Katherine Tomaska, Greg Nelson, Marcy Bean, Brad Lindaman, Jessica Olson

Barr team roles

Project management: Tyler Olsen
Pond Design: Greg Nelson
Stream Design: Andrea Wedul/Katherine Tomaska
Restoration: Marcy Bean
Engineering Review: Brad Lindaman/Jessica Olson

Scope of Work

Since 2020, Barr has been evaluating Double Driveway Pond as a potential capital improvement project for improving sediment and nutrient loading to Fish Creek. This pond receives drainage from approximately 308 acres (shown in Figure 1), most of which is comprised of Bailey Nurseries in Maplewood, MN. Historically, Double Driveway Pond has accumulated sediment at a significantly faster rate than a typical stormwater pond, triggering maintenance needs every few years including dredging and re-design of the pond. In 2014, the pond's permanent pool volume was increased and a forebay was installed at the inlet to the pond. In recent years, sediment deltas formed at the pond inlet have been removed through dredging activities. It has been noted in historic inspections that the Fish Creek tributary that flows from Bailey Nurseries to Double Driveway Pond has significant erosion issues. This tributary creek is shown in Figure 2.

In 2021, the Minnesota Department of Agriculture (MDA) required Bailey Nurseries to investigate sediments accumulated in both Double Driveway Pond and Fish Creek for accumulation of pesticides that were previously used on the nursery property. A report was prepared and submitted to the MDA for review in early 2022, and a decision on any required remediation is being awaited by Bailey Nursery. Likely, the MDA will require the Double Driveway Pond to be dredged to remove any contamination.

In conversations with the MDA team, the RWMWD indicated that the remediation actions would provide a unique opportunity to conduct improvements to Double Driveway Pond that would go "above and beyond" what is being required by MDA. This scope summary summarizes the actions Barr is proposing to facilitate the design of these "above and beyond" actions, which include:

- Evaluation of additional dredging of Double Driveway Pond (beyond dredging depth required by MDA)
- Potential restoration of Double Driveway Pond banks with native species, and removal of any invasives
- Erosion inventory and subsequent restoration design of the Fish Creek tributary that flows from the Bailey Nurseries property to Double Driveway Pond

The overall project will be completed in two major phases of work. The first phase will include the design for any "above and beyond" dredging of Double Driveway Pond, as well as restoration plans. Additionally, the first phase will also include an inventory of the tributary creek to identify heavily eroding areas and the design of the creek restoration sites. The second phase of the project will be to facilitate the bidding and construction of the creek restoration sites, as this will be conducted separately from the MDA work with a separate contractor.

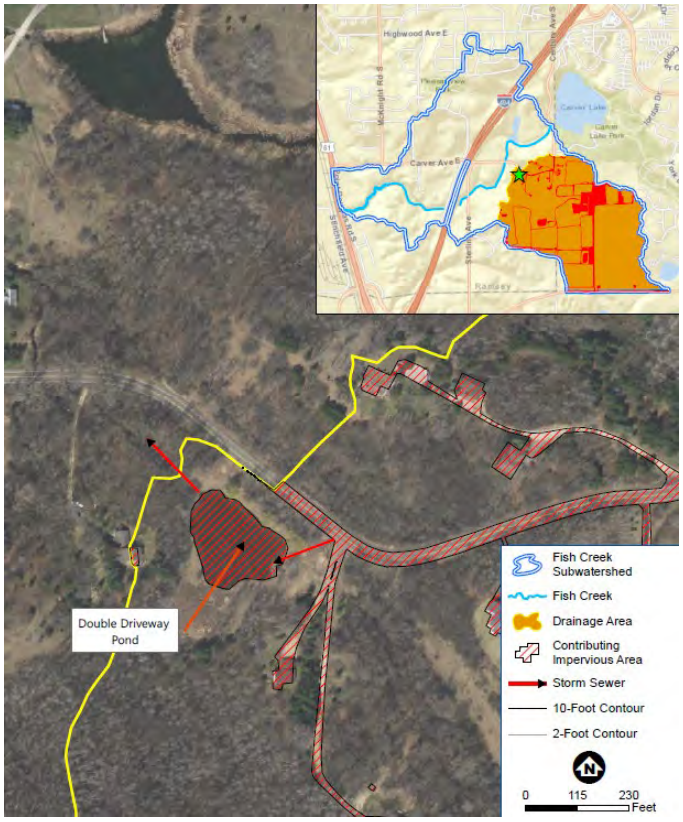

Figure 1. Double Driveway Pond location

Figure 2. Fish Creek Tributary with Heavy Erosion

Task 1: Conduct Erosion Inventory of Fish Creek Tributary from Bailey Nurseries property to Double Driveway Pond

This task will include conducting a field investigation of the tributary creek to Double Driveway Pond to determine locations of significant erosion where stabilization project may occur. Additionally, this task will involve coordination with the four property owners that the tributary creek crosses to gain access for the erosion inventory.

Barr staff will utilize the District's ArcGIS Field Map application to collect GPS point locations, erosion severity data, and photographs. Following the inventory, Barr will prepare a summary report of the findings and recommendations of locations for a stabilization project.

Task 2: Design for Pond Excavation Improvements and Restoration

This task will involve the coordination and communication with both MDA and Bailey Nursery staff in order to stay informed on any required remediation that the nursery will be required to perform on Double Driveway Pond. Once the MDA provides its required remediation action, Barr will work with the MDA/Bailey design team to coordinate any "above and beyond" dredging that the District would like to perform. Depending on how much excavation will be required, Barr may propose to excavate to the 2014 as-built depth of Double Driveway Pond. Barr will develop final plans and specifications to supplement the

MDA/Bailey construction documents. This scope assumes that the MDA/Bailey team will facilitate project permitting, bidding and construction administration/oversight.

Additionally, Barr staff will evaluate the vegetation condition around Double Driveway Pond during this process to determine if there are opportunities to improve the vegetation community. If Barr staff recommend any improvements, a landscape restoration plan will be developed in conjunction with the dredging plans.

Task 3: Fish Creek Tributary Survey

A topographic survey will be conducted to establish existing grades and elevations, as well as locations of any existing infrastructure or utilities along the tributary. The survey will be conducted using a total station and/or survey-grade GPS with horizontal and vertical accuracy of +/- 0.2 feet. The tree survey will also be conducted to determine trees to be preserved and for quantifying removal cost estimates.

Task 4: Fish Creek Tributary Restoration Design, Bidding, and Construction

This task will include the final design of the tributary creek stabilization improvements that are recommended from Task 1. Barr staff will complete one set of preliminary design plans to a 30-percent design level, including relevant plan sheets. These plans will be submitted to the RWMWD staff and property owners for review.

Following review by the district and property owners, Barr will complete one set of final design plans and technical specifications for the project. All additional contract and bidding documents will be completed, as well as the assumed permits for the project, listed below:

- U.S. Army Corps of Engineers Joint Permit Application
- Construction Stormwater Permit
- City of Maplewood Grading Permit

We assume an Environmental Assessment Worksheet (EAW) and City of Maplewood Tree Preservation Plan will not be required by the project. All final design documents will be submitted to the RWMWD board of managers as well as the property owners for final review and approval. If the RWMWD board and property owners approve the plans and specifications, the project will be put out to bid in late 2023 or early 2024. This project schedule is dependent on the Task 1 findings, as well as coordination with the property owners.

This task also includes the facilitation of project bidding and construction administration/oversight for the creek restoration design from Task 4. This effort is separated from the construction of the Double Driveway "above and beyond" improvements due to the project timeline of the MDA team (early 2023). Bidding of the creek portion of the project will likely occur late summer of 2023, and construction will occur in late fall or over the winter in 2023 into 2024. Overall, this effort will still fall under the proposed project budget in the next section.

Budget

Barr will complete the work outlined above on a time-and-expense basis for an estimated **$112,200**. The final design and construction observation costs may change during the development of the designs for both phases of the project.

We propose the following milestone schedule:

Milestone	Estimated Completion Date	Actual Date
Project Start	November 2022	
Task 1: Conduct Erosion Inventory of Fish Creek Tributary from Bailey Nurseries property to Double Driveway Pond	December 2022	
Task 2: Design for Pond Excavation Improvements and Restoration	February 2023 **dependent on MDA schedule*	
Task 3: Fish Creek Tributary Survey	March 2023	
Task 4: Fish Creek Tributary Restoration Design, Bidding, Construction	Fall 2023	

Project Budget Tracking

Project Tasks	Estimated Budget
Task 1: Conduct Erosion Inventory of Fish Creek Tributary from Bailey Nurseries property to Double Driveway Pond	$12,200
Task 2: Design and Construction for Pond Excavation Improvements and Restoration	$24,200
Task 3: Fish Creek Tributary Survey	$6,600
Task 4: Fish Creek Tributary Restoration Design, Bidding and Construction	$69,200
Total	**$112,200**

[2]Construction costs subject to change based on erosion inventory and site survey

Monthly Updates

Month	Budget Spent $ / %

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Administrator's Report

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MEMO

TO: Board of Managers and Staff

FROM: Tina Carstens, Administrator

SUBJECT: December Administrator's Report

DATE: December 29, 2022

A. Meetings Attended

Tuesday, December 6	9:00 AM	MAWD Events/Education Committee
Wednesday, December 7	6:30 PM	Board Meeting
Friday, December 16	9:00 AM	Project Inventory Discussion
Wednesday, December 21	11:00 AM	Holiday Party

B. Upcoming Meetings and Dates

Metro MAWD	January 17, 2023
Board Workshop – Wetlands	January 18, 2023
Administrator Review	February 1, 2023 (5:00 PM)
February Board Meeting	February 1, 2023
CAC Meeting	February 7, 2023
March Board Meeting	March 1, 2023 (Annual Meeting)
MAWD Legislative Days	February 15-16, 2023
April Board Meeting	April 5, 2023
CAC Meeting	April 11, 2023
Metro MAWD	April 18, 2023
May Board Meeting	May 3, 2023
WaterFest	June 3, 2023
June Board Meeting	June 7, 2023
CAC Meeting	June 13, 2023
July Board Meeting	June 28, 2023

C. Ongoing Project Updates

Land Acquisition and Use Policy – The board will see more information on this at your February meeting.

West Vadnais Lake Boundary Change – I have met with the new BWSR board conservationist and anticipate this being completed by the end of January.

Board of Managers Governance Documents – This will be completed in time for the February board meeting for review and comment and then approval at the March annual meeting.

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Project and Program Status Reports

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RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

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Memorandum

To: Board of Managers and Staff

From: Tina Carstens and Brad Lindaman

Subject: Project and Program Status Report – December 2022

Date: December 29, 2022

Note: The location, brief description, and current status of each project described below can be found on the 2022 RWMWD engineering services story map.

Project feasibility studies

A. Interim emergency response planning for district areas at risk of flooding (Barr project manager: Gareth Becker; RWMWD project manager: Tina Carstens)

The purpose of this project is to provide information and guidance to cities throughout the district about how to protect low-lying habitable structures from flooding during the 100-year storm event. These emergency response plans address areas for which there is 1) not currently a feasible project that has been identified to protect structures or 2) a project that cannot be implemented in the near future due to logistical and/or budgeting reasons. This effort is an outcome of the Beltline resiliency study. This project will extend into 2022.

Barr has created plan sheets for placing emergency flood risk mitigation measures. We will be meeting with district staff this month to go over the set of figures. Afterwards, any needed edits will be made to the designs/figures, and Barr will begin working directly with city representatives to communicate the plans to potentially impacted individuals and answer questions about implementation.

B. Kohlman Creek flood risk reduction feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk along Kohlman Creek to remove structures from the 100-year floodplain. Work includes coordination with the cities of Maplewood and North Saint Paul, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This project focused primarily on areas surrounding PCU Pond and the wetland complex west of White Bear Avenue. This feasibility study is a follow-up study of flood-prone areas identified in the Beltline resiliency study.

The Kohlman Creek flood risk reduction feasibility study focuses on concept development of the types of system improvements near PCU Pond that the city would support and that would complement North Saint Paul's other ongoing studies. The city's study is being conducted in parallel with the Kohlman Creek/Wakefield Lake diversion study (upstream of PCU Pond and the North Saint Paul Urban Ecology Center), so system modifications around PCU Pond will not be further developed until later in 2023 when the Kohlman Creek/Wakefield Lake diversion concept is better defined and resulting design flows are determined.

Barr has provided the district's stormwater model to the city of North Saint Paul for reference in the city's flood risk reduction study. After learning about the city's planned approach for flood risk mitigation in these areas and better understanding the change in peak-flow rates following the Kohlman Creek/Wakefield Lake diversion study, Barr will begin evaluating potential flood risk mitigation options for PCU Pond and the wetland complex west of White Bear Avenue. In 2023, we will continue working with the city to identify flood risk reduction opportunities that accomplish both RWMWD's and the city's goals and objectives.

C. Kohlman Creek/Wakefield Lake diversion feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk on Kohlman Creek by diverting high flows to the historic County Ditch 17. Work includes coordination with stakeholders, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr and RWMWD staff met with the county and the county's contractor to discuss site constants for flood risk reduction modifications. County staff provided updated direction regarding potential ponding locations on the golf course. Following discussions with county staff, Barr started incorporating revisions to the district's stormwater model to incorporate larger BMPs to lower peak water-surface elevations on Kohlman Creek.

In January, Barr will complete revisions to the stormwater model and meet with county staff to discuss modifications to the golf course drainage system.

Barr met with stakeholders in the fall of 2022. We will reconvene the stakeholder group to identify feasible modifications to the golf course drainage system that will achieve flood control objectives. Ongoing discussions with the county are guiding modifications to basin size and location as well as the size of the diversion pipe that conveys stormwater from Kohlman Creek to Goodrich Golf Course.

Next month, Barr expects to start reviewing the water quality monitoring data that the RWMWD collected during summer 2022. Water quality information will inform decisions about whether additional treatment is required before diverting stormwater from Kohlman Creek into Wakefield Lake. We will continue evaluating and refining alternatives throughout the winter. The feasibility study is scheduled to continue through summer 2023.

D. County Ditch 17 improvements feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk northeast of Wakefield Lake along historic County Ditch 17 to remove structures from the 100-year floodplain. Work includes coordination with the City of Maplewood, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr met with City of Maplewood staff to review the draft memorandum that documents the methodology, alternatives for system modifications for flood risk reduction, and opinions of probable construction cost to confirm that recommended system modifications will have city support. The findings will be presented to the RWMWD managers at the January board meeting.

E. Phalen Village feasibility study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this study is to complete a feasibility evaluation of modifications to reduce flood risk near Phalen Village north of Lake Phalen to remove structures from the 100-year floodplain. Work includes coordination with the City of Maplewood, evaluation of alternatives to reduce flood risk, preparation of cost estimates for each alternative, and identification of permitting requirements. This feasibility study is a follow-up study of a flood-prone area identified in the Beltline resiliency study.

This month, Barr met with City of Maplewood staff to review the draft memorandum that documents the methodology, alternatives for system modifications for flood risk reduction, and opinions of probable construction cost to confirm that recommended system modifications will have city support. The findings will be presented to the RWMWD managers at the January board meeting.

F. Ames Lake area flood risk reduction planning study (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose is to complete a planning-level evaluation of modifications to reduce flood risk near Ames Lake, supported by the City of Saint Paul. Work includes coordination discussions with Saint Paul; review of potential pipe alignments, land acquisition costs, utility conflicts, and permitting issues; and related design. If the planning study identifies projects that impact regional drainage, a feasibility study will be completed in 2023. This planning study is a follow-up study that was identified in the Beltline resiliency study.

This month, Barr finished a memorandum summarizing stakeholder coordination and possible opportunities for flood risk reduction projects near Ames Lake and provided the draft memorandum for RWMWD staff review. Following discussions with the Saint Paul Housing and Redevelopment Authority, two parcels were identified near Ames Lake as potential locations for regional flood risk reduction best management practices (BMPs). The memorandum summarizes stakeholder coordination, opportunities for flood risk reduction projects near Ames Lake, and recommendations for next steps to be completed in 2023. Barr will present the findings and recommendations to the managers during the January board meeting.

G. Owasso Basin area/North Star Estates improvements (Barr project manager: Sam Redinger; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost of flood risk reduction strategies in the Owasso Basin/North Star Estates area by reviewing potential pipe and berm alignments, land acquisition costs, utility conflicts, permitting issues, and related design as well as construction and long-term maintenance costs associated with each alternative that achieves the project objective of removing habitable structures from the floodplain in this area. Stakeholder outreach with the City of Little Canada is an important part of this effort. This study is a continuation of the Owasso Basin bypass study, which laid out several phases of implementation and areas of further study.

Barr drafted a technical memorandum to summarize the flood risk reduction alternatives evaluated in and around North Star Estates and Owasso Basin. The document is in the final stages of review, and cost estimates are being developed. Once the internal review is complete, Barr will share the technical memorandum with RWMWD staff. Barr and district staff have been invited to present the memo to the City of Little Canada at a January council meeting. After comments from the staff and the city are incorporated, the memo will be distributed to the RWMWD board in early 2023. The memo will serve as the basis for the preliminary design of improvements to the area.

H. Double Driveway Pond optimization study (Barr project manager: Tyler Olsen; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost of water quality improvements in Double Driveway Pond in the Fish Creek subwatershed. These improvements will be targeted at sediment reduction strategies that will benefit downstream Fish Creek, which is considered impaired by excess sediment. An important part of this study is tying strategies to the findings of a current Department of Agriculture study (currently under review) that is assessing the water quality of runoff from upstream areas.

This month, the scope summary for the Double Driveway Pond will be included in the board packet. The scope includes an erosion inventory of the creek, coordination with the MDA to dredge Double Driveway Pond, vegetation restoration, and targeted stream restoration. Barr completed the erosion inventory of the tributary creek (task 1). Staff walked the length of the upstream creek between Double Driveway Pond and the Bailey Nurseries' property and collected GPS coordinates and erosion classifications. The results from this inventory will be summarized in a memo and used to guide final design of the creek restoration.

Barr continues coordinating with the Bailey/MDA team on the dredging of Double Driveway Pond. The design team plans to put the design out to bid in January or February. Barr also assisted in evaluating permitting considerations for dredging the pond. Additionally, Barr is currently evaluating the benefit-cost of excavating beyond the 2014 design depth of the pond.

I. Carver Ponds improvements study (Barr project manager: Tyler Olsen; RWMWD project manager: Tina Carstens)

The purpose of this study is to characterize the water quality in the Carver Ponds in the Fish Creek subwatershed and to evaluate the benefit-cost of water quality improvements to the ponds. These improvements will be targeted at internal loading of nutrients in the pond, as well as potential external sediment and nutrient loading. The goal will be to inform design solutions to be implemented in the ponds.

There was no new activity this period.

J. Evaluation of compliance with South Metro Mississippi River total suspended solids (TSS) total maximum daily load (TMDL) (Barr project manager: Tyler Olsen; RWMWD project managers: Eric Korte, Nicole Soderholm)

The purpose of this study is to evaluate the RWMWD's compliance with the South Metro Mississippi River TSS TMDL. As a regulated municipal separate storm sewer system (MS4), the district is required to meet the waste load allocations (WLA) of 154 pounds of TSS per acre per year. The WLA is applicable to the RWMWD for the Saint Paul Beltline Interceptor and its contributing drainage area, as the district owns and operates the infrastructure.

There was no new activity this period. Barr will continue working with the RWMWD to evaluate the TSS data for 2023 TMDL reporting requirements.

Research projects

K. Kohlman permeable weir test system (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The objective of this current investigation is to design a full-scale permeable weir treatment system for installation in the Kohlman Basin.

Ongoing efforts include wetland permitting and initial steps in the development of a property-access liability agreement with Hubbard Broadcasting. The work associated with this site will be constructed in the spring of 2023 under the CIP 2023 maintenance and repairs project.

L. Shallow lake aeration study (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The purpose of this study is to evaluate the potential effectiveness of aeration in shallow lakes by studying the effect of aeration in three smaller shallow systems (Markham Pond, Bennett Lake, and Gervais Mill Pond) in detail during 2021 and 2022. This approach is being pursued as an alternative to whole-lake alum treatments.

The fieldwork portion of this project is complete for 2022. The data have been received and are being compiled into a report. Monitoring recommendations for next year will be provided in the first quarter of 2023.

Capital improvements

M. Woodbury Target store stormwater retrofit projects (Barr project manager: Katie Turpin-Nagel; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits at two Target retail stores.

The topographic-survey deliverables provided by Alliant Engineering, Inc. were reviewed for completeness at the end of November. In early December, Barr reviewed the existing site information and brainstormed stormwater retrofit options for the parcel. Throughout December, Barr developed various concept design layouts, performed minimum impact design standards (MIDS) water quality modeling, and drafted cost estimates. These deliverables will be shared with RWMWD in early January 2023.

N. Targeted retrofit projects (Barr project manager: Marcy Bean; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits on previously identified commercial, school, and faith-based properties throughout the district.

A site survey was completed for Roosevelt Homes (owned by the Saint Paul Public Housing Authority). Existing-conditions models are being updated. Preliminary concepts will be developed to present the owner with options and show how projects could be phased in over time. Barr and the RWMWD are coordinating with the City of Saint Paul to help inform improvements.

O. Stewardship grant program support (Barr project manager: Marcy Bean and Michael McKinney; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to is to a) provide BMP design and review services to cost-share applicants throughout the RWMWD on as-needed basis and b) support development of the stewardship grant program.

Barr coordinated with the RWMWD to complete a.) development of a street-sweeping prioritization strategy; b.) development of a "baseline" street-sweeping strategy; and c.) related recommendations for updates to the stewardship grant program to support enhanced street-sweeping efforts beginning in 2023. A technical memorandum was developed that summarizes methodologies and all related recommendations. The memorandum has been finalized; presentations were given at the Minnesota Association of Watershed Districts (MAWD) and the RWMWD board meetings in December.

In addition, Barr and the RWMWD met with Woodland Hills Church owners, who are interested in reducing parking spaces and retrofitting the highly impervious site to demonstrate a tiny-homes neighborhood. The potential to reduce parking spaces has been confirmed with the City of Maplewood. Barr is developing preliminary concepts for stormwater management alongside pavement removal. Preliminary stormwater calculations and spatial diagrams are being developed to help determine the potential for grant funding in 2023.

P. Lake Emily subwatershed regional BMP (Barr project manager: Leslie DellAngelo; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to complete final design, plans, and specifications for a regional stormwater BMP in the Lake Emily subwatershed with the purpose of decreasing phosphorus loads to Lake Emily, which is deemed to be at risk of impairment from excess nutrients.

Last period, Barr finalized conceptual designs for both the Arbogast Street and the Vivian Avenue/Cobb Street sites to a 30-percent design level using additional survey information collected in the field, geotechnical information obtained from site soil borings and laboratory testing, additional hydrologic and hydraulic modeling, and water quality modeling. We also finalized the 30-percent engineer's opinion of probable cost and cost-benefit for each project. The 30-percent design summary is included in a memorandum for manager consideration at the January meeting. The managers will be asked if they approve moving the Arbogast underground filter design forward to final design, plans, and specifications.

Q. Pioneer Park stormwater reuse (Barr project manager: Jennifer Koehler; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design and implement a stormwater reuse irrigation system in Pioneer Park to conserve groundwater and reduce phosphorus loading to downstream water bodies, in partnership with the City of Little Canada.

We performed a site survey, including topographic, utility, and tree surveys, to develop the design base map. Additional surveys (e.g., existing irrigation system) will be completed in spring 2023. An internal project-team kickoff meeting was held. At the request of city staff, Barr and the RWMWD will be presenting to the Little Canada park commissioners and city council meetings in January 2023. Barr also followed up on items related to wetland delineation and incidental classification per TEP review and conversations with BWSR.

CIP project repair and maintenance

R. Beltline and Battle Creek inspection (Barr project manager: Sam Redinger, RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain the existing Beltline and Battle Creek tunnel systems and

infrastructure owned and operated by the RWMWD.

In January, Barr will evaluate findings to develop the inspection report, which will be complete in February 2023.

S. 2023 CIP maintenance and repair project (Barr project manager: Gareth Becker; RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain existing systems and infrastructure owned and operated by the RWMWD and to assist and facilitate stormwater pond cleanouts to allow other public entities to meet their MS4 requirements.

As directed by the board last month, Barr finalized design, prepared bidding documents, and advertised the project for bid. A bid opening was held on December 6 at 10:30 a.m.; Miller Contracting was selected at the December 7 board meeting. A preconstruction meeting was held on December 22. Required submittals are currently being reviewed, and it is likely that construction will begin in early January.

T. Natural Resources Update – Bill Bartodziej and Matt Doneux

Journal submission to *Ecological Restoration:* An assessment of the Lake Phalen Shore Restoration – 20 years after project implementation

NR staff is collaborating over the winter with Dr. Sue Galatowitsch, U of MN - Fish, Wildlife, and Conservation Biology Department, on paper that details the assessment of the Lake Phalen shoreland restoration. This is a very unique opportunity because the Phalen restoration is the largest and one of the most established shoreland ecological restorations in the state. We have in-depth restoration and detailed long-term maintenance records available for each site which will allow for a comprehensive assessment. Critically evaluating this project after two decades since the initial project broke ground is likely to provide valuable guidance for advancing shore restoration practices and maintenance activities. In the summer of 2021, we collected plant community and landform survey data on each restoration site. We are now in the process of analyzing these data and synthesizing our findings into a paper that will be submitted to *Ecological Restoration*. To our knowledge, there is not another long-term case study like this reported in the literature. It will be a significant contribution to lakeshore restoration. Below are draft excerpts (editing still underway) from the Introduction and the Methods sections. We plan to have a final draft ready for submission in April.

Background and History

The Phalen Chain of Lakes is located in an urban watershed on the east side of St. Paul, MN (Figure 1). Lake Phalen (81 ha) is the last lake in the Chain and serves at the focal point of Phalen Regional Park. The City of St. Paul owns all of the parkland surrounding the lake and the 4.5 km of shore. Currently, the park receives approximately 1.1 million visitors on an annual basis. It is one of the most popular parks in the Twin Cities metropolitan area. Patrons use bike and walking trails that encircle the lake. Lake Phalen is home to the only public swimming beach in St. Paul. Fishing is popular from shore, by boat, and through the ice.

The Phalen shoreline experienced a long history of substantial alterations. In 1899, soon after park acquisition, a steam-driven bucket dredge was used to excavate lake bottom sediments and fill wet meadow areas along the shore. An early City report acknowledged that “dredge material is used for filling low, marshy land adjacent to the lakeshore, and these now unsightly places are being converted to lawn spaces.” St. Paul Parks staff then used a flock of sheep to graze the turf grass along the shoreline. These alterations caused shore erosion, and beginning in the 1920s, rock rirap was used to combat soil loss and stabilize the lake edge. By the late 1990s, over 50% percent of the Lake Phalen shoreline was in a degraded state. The shoreland vegetation community was dominated by invasive weed species and turf grass. Legacy shoreland practices, altered hydrological conditions from an urban watershed, and heavy foot traffic caused substantial cut banks along the shore edge and gully formation. Areas of failing riprap were common due to poor installation practices, such as the lack of geotextile placement behind the rock.

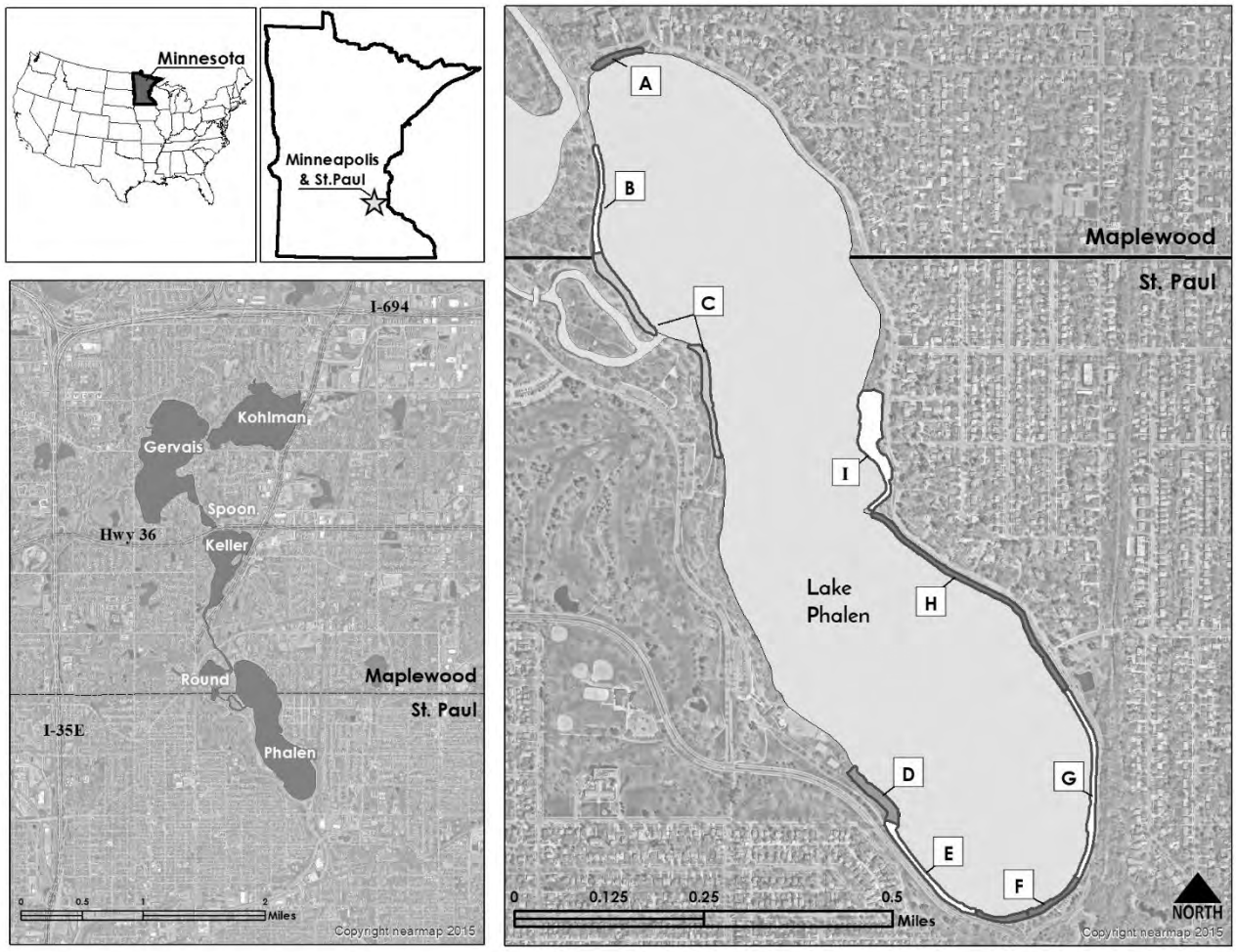

Figure 1: Intensive restoration took place on nines sites around Lake Phalen.

Project Objectives

In 2000, RWMWD, St. Paul, and the Minnesota Department of Natural Resources (MDNR) began developing a long-term ecological restoration project that addressed 2.7 km (60 percent) of the Phalen shoreline. The main project goals were to: (1) stabilize the shore through the reintroduction of native plant communities, (2) eliminate hazards (steep eroded banks) to park patrons, (3) reduce erosion, (4) create quality fish and wildlife habitat, (5) increase aesthetics, (6) incorporate informal lake access points, and (7) educate and provide opportunities for watershed residents to become involved in the project. Between 2001-08, nine shore segments ranging from 120 to 435 m were restored on an annual basis. Sites with substantial erosion that posed safety hazards were given the highest priority.

Restoration approach

Restoration centered on shoreland areas between the walking path and the water's edge, with the average width being 10 m. Three vegetation zones were addressed, the upland (area above the ordinary high water – OHW), the transitional (the seasonally inundated area below the OHW), and the aquatic (typically inundated area below the OHW). As part of the initial site preparation, turf grass in the upland, and invasive weed species in all zones were treated with glyphosate. There were no native remnant patches of vegetation to save in the restoration areas.

For each site, dimensions, physical restoration elements, and procedural notes are listed in Table X. Six sites had riprap (0.3-1.0 m dia.) where a model 320 type Cat excavator was used to reposition the rock. Our general approach was to take excess rock off the shore slopes and relocate this material 1-2 m offshore in order to create berms. This rock served as a natural wave break during normal water level conditions. We set the top elevation of the berms at approximately 50 cm above Lake Phalen's OHW (857.43'). After the excess rock was moved off the slopes, a soil layer (15-30 cm) was placed on top of the remaining rock and smoothed with the excavator bucket. Gullies and erosional cut bank areas were also filled with soil and regraded. Site A had gullies that were filled but no riprap. Site D was unique in that we removed 300 m^3 of fill material to daylight wet meadow peat soils.

Erosion control materials were used to facilitate plant establishment. On all but one site, coir logs (41 cm) were installed at the base or the toe of the shore slope. In 2001-02, a custom seed mix and pre-vegetated mats fabricated from North American Green C-350 were used in the transitional zone. In 2003, these mats were replaced with North American Green SC-150BN blanket, seed, and then we installed 25 cm x 50 cm (flat sized) pre-vegetated rectangles (heavy-duty coir material) on top of the erosion control blanket. For the upland areas, seed, SC-150BN, and 2" container plants were installed through the fabric at 0.7 m spacing. Planting and seeding generally took place in May and June of each year; comprehensive lists are in Table X. Volunteer civic groups and over 2,000 students from 17 local schools installed approximately 50% of the plant material. Wood lathe snow fencing was used on two sites to reduce wave action. Wood and metal fencing were installed 1 m lakeward of the pathway on all sites to reduce foot traffic.

Shoreline assessment

In July 2021, key physical parameters were assessed in order to determine if restoration measures were successful in stabilizing the shoreline and also to gauge disturbance from foot traffic. For each of the nine sites, we measured: 1) slope from the OHW to the pathway, 2) elevation of rock berm (if present), 3) percent of rock berm colonized by wetland and emergent plant species, 4) percent exposed soil on slope, 5) presence of cut bank formation, and 6) number of trails with bare soil down to the water's edge. We compared these data to historical field survey data and construction notes and plans for each site. Although the measures of erosion and foot traffic activity are qualitative, we believe that these comparative observations are useful in assessment with this type of case study.

Plant Community Dynamics

Plant community establishment and change over time considered four components: 1) the establishment of seeded and planted species, 2) the colonization of unplanted species, 3) effects of vegetation management on invasive species prevalence. The data for all of these components relied on timed meander surveys, adapted from Bohnen and Galatowitsch (2016). Vegetation was surveyed twice, in July and September 2021, which facilitated the identification of nearly all species encountered. The timed meander sampling technique, a plotless assessment method, was chosen because it allowed for comprehensive coverage of each restoration site and was adaptable to the linear configuration of shorelines. At each of the nine sites, we surveyed vegetation along 3 separate meander routes for the littoral, wet meadow and upland shoreland areas. We recorded all of the species, both native and introduced, encountered during the meander (i.e., those visible from the route-approximately 3.5 m from observer) and estimated aerial cover using a 6-class cover scale. Each site was fully surveyed in 90 minutes (not including time needed to resolve plant identification uncertainties).

We compared the lists of seeded and planted species for each site to 2021 occurrence data. The frequency of establishment across all sites was calculated to identify species that were most and least likely to persist over time. This comparison was also used to evaluate the relative importance of natural colonization (i.e., passive revegetation) to active revegetation (i.e., seeding and planting). We tabulated and ranked the frequency of all species observed that had not been seeded or planted.

To assess the effectiveness of vegetation management to limit the abundance of invasive species we compared occurrence data from each site to records of management effort. Management records compiled for these restorations also indicated which species were targeted for control.

Long-term Maintenance

A majority of the vegetation management, henceforth maintenance, activities were conducted by Watershed staff. St. Paul staff conducted prescribed burns with assistance from the Watershed. Initially, installation and maintenance records were kept as paper documents. Work hours were recorded daily, assigning person hours for each maintenance category. (e.g., string trimming, chemical application). A brief narrative describing details such as target weed species was recorded for each field trip. Beginning in 2006, record-keeping was transferred to a digital spreadsheet and the same task breakout and short narrative format was retained. Mobilization and travel were included in the maintenance time summaries. Crew time spent on tasks other than restoration maintenance (e.g., educational events, seed collection, and trash removal) was recorded, but not included here.

Prescribed burns

Prescribed burns were conducted almost exclusively in April and May, with the goal of reducing annual weed cover and eliminating woody plant seedlings. Our plan was to burn approximately one-third of the sites annually on a rotational basis. However, weather and staffing challenges made this schedule unattainable.

Mechanical control

String trimming was used to selectively target annual and bolting biennial weeds to prevent flowering and seed production, especially lambsquarters, and giant and common ragweed. The same method was used on select perennials to prevent or reduce seed production and reduce plant biomass in anticipation of late-season chemical control. The most commonly targeted weed species were Canada thistle, reed canary grass, and stinging nettle. Hand pulling was sometimes used to control scattered populations of mostly biennials and some annuals and perennials; including sweet clover, mullein, white campion. If the flowering window was missed with string trimming, and if time permitted, crews clipped and removed seed heads on outlier patches of reed canary grass and Canada thistle.

Chemical control

Herbicides were employed judicially to control the most invasive weed species. Backpack sprayers were used to treat weed patches and wipe on application was performed on individual outlier plants. An aquatic formulation of glyphosate was used to treat reed canary grass, hybrid cattail, and stinging nettle. A clopyralid based herbicide was applied to Canada thistle, birdsfoot trefoil, crown vetch, burdock, Canada goldenrod, and perennial sow thistle. For target woody vegetation, such as common and glossy buckthorn, Siberian elm, box elder, green ash, Virginia creeper, and wild grape, stems were cut and then treated with a concentrated formulation of glyphosate. This technique was also used on outlier patched of Canada goldenrod.

NR staff conducting a timed meander survey along a shore restoration area.

U. Public Involvement and Education Program – Sage Passi

Sowing Seeds for 2023 – A Joyful Learning Opportunity


Above: Seed Starting with ESL and Biology Science Classes at Battle Creek Middle School

We got off to a great start this winter by scheduling seed stratification activities for fourteen classes beginning on December 7 and will be extending this activity into the first week in January. This is a popular learning activity that we've had to do mostly on our own at the office in the past two years due to Covid. It was fun to be back in the ESL and science eighth grade classrooms at Battle Creek Middle School for this activity after a many years' hiatus and also with two fifth grade classes at American Indian Magnet since their science teacher Kate Swensen left the school who helped us grow plants. We also engaged four fifth grade classes at Weaver Elementary and one class of eighth grade Avid science students at Hazel Park Academy.

We combine this activity with either a slide show or what's even more fun – a puppet show that never fails to excite students. We will be back in January to finish off this first step of the process – cleaning native seeds, mixing them with vermiculite and putting them in the fridge at our office garage for two months. In January we will be leading this activity with three classes at Lionsgate Academy (we are excited to be back after a two year hiatus and they have a light rack!), two science classes at L'Etoile du Nord and for the first time with the Environmental Club at Woodbury High School supported by their science teacher, Noor Sinada. Ed Shinbach, the School Coordinator for The Ramsey County Master Gardener Program recruited eleven Ramsey County Master Gardeners to help us and we recruited Several Water Stewards as well!

Below are some photo highlights from our December sessions including our puppet show that teaches students about the value of native plants, the transition from seed to plant, native plants' life cycles, long roots, their role in infiltration of run-off and their relationship to pollinators.






RWMWD's New Water Steward-in Training

We are excited to announce that we have recruited a new Water Steward who will be participating in Freshwater's online training in 2023 and working with RWMWD to develop her education and capstone projects. Martha Boyd lives in east St. Paul near Beaver Lake and moved to St. Paul in 2021. She will join three Water Stewards in training from Capitol Region Watershed District and one other Water Steward in training who lives in Oakdale, Amy Ury a resident just across our watershed border in Valley Branch Watershed District. Sage Passi, Angie Hong and Lyndsey Schwantes from Capitol Region Watershed District together will help this cohort go through their online training process beginning in January 2023.

Here are several excerpts from Martha's application that provide some insight into her interests and experience that she brings to the table.

"Since 1989, most of my work has been related to urban/sustainable farming, and to community education around environmental and food justice, basic urban ecology, and gardening. In those positions, nearly all as part of nonprofit organizations, I developed and managed sites and programs, and helped to plan and support others' projects…

In 2013, I co-taught a studio course in sustainable urban residential zoning and policy at UI-Chicago's College of Urban Planning and Policy Administration (CUPPA). A small town on Chicago's south border served as client for the class. They sought policy guidance to encourage sustainable practices by residents. Student planners analyzed their municipal code, researched a variety of practices and considered consequences and barriers them in that town, and then presented recommendations to town staff and community members. In 2008, through the University of Chicago's Civic Knowledge Project, I created and facilitated an evening class series called "Local Infrastructures: Living Downstream" that introduced participants to concepts and technologies related to water infrastructure from the home to the treatment plant, including a spectrum of toilet and bathing alternatives, graywater systems, and more. The series hosted subject matter experts and was as fascinating and educational for me as the students!
Prior to that - as a graduate student in the Land Resources program at UW-Madison, I helped to create and teach environmental justice courses, via readings/discussion, in person and online, and field trips (2003-5). We visited sites around Madison and in Chicago. Over spring break in March 2005, we took a group to New Orleans – pre-Katrina though of course we didn't know it then."

We look forward to getting to know and working with Martha. Welcome to our community!

V. Communications and Outreach Program Report – Lauren Hazenson

Content Creation

Tabling Displays
This project is a continuation of one started earlier this year, where the goal is to modernize our event and table displays. We also aim to have these updated materials reflect our newer branding and clearly state our organization's purpose to a general and largely unfamiliar audience. This month the intern recruiting table materials were completed, and we started on a refresh of the general organization display. We are also focusing on creating a new organization brochure to distribute to city halls in the district and other places of interest.

Social Media Backlog and Maternity Leave Preparation
Several staff were trained as backups on our social media scheduling software, our MailChimp service, our website and media analytics, and the back end of our website. This is in the event that my maternity leave starts early and staff need to step in to make regular updates. Social media drafts on popular winter watershed topics were also created and loaded into the social media software so that they could be published at any time. Finally, article preparation for common spring topics started this month so that content can be regularly distributed to city newsletters during maternity leave.

Year End Newsletter
This newsletter highlights a few key RWMWD projects and accomplishments for 2022. We began this practice last year, and it was by far the most read edition, with over 52% readership. It allows the organization to update the public on work being done in their community, particularly those that do not tend to read the annual reports.

E-newsletter

Audience: 1,596
Opens: 47.3%
Link clicks: 7%

Social Media (Facebook, Twitter, Instagram)
Numbers as of 12/28:

Facebook
Reach: 1,595
Engagement (likes, shares, comments): 132
Audience: 1,327

Instagram
Reach: 548
Engagement: 39
Audience: 730

Twitter
Reach: 1,639
Engagement: 27
Audience: 998

Resident Communications/Professional Development/ Public Meetings, Misc.

- CAC meeting (12/13/2022)
- Intern job posting and job description review
- Staff Communications support
- Lake Owasso Story Map support

W. Citizen Advisory Committee – Carrie Magnuson

The Citizen Advisory Committee met on December 13th 2022 at 6:30 pm via Hybrid In-Person at HB Fuller and Zoom. In attendance were 14 CAC members, 3 staff members, and 1 BOM member. The following initiatives were discussed and further developed.

1. **2023 Meeting Schedule and Format** – The CAC would like to move to in-person (with an option for hybrid via Zoom) in 2023. HB Fuller is a meeting location option, and the group would like to get clarity on the use of the RWMWD Board Room as well. The meetings for 2023 will be on the following evenings at 6:30 pm:
    a. February 7th
    b. April 11th
    c. June 13th
    d. September 26th
    e. October 24th
    f. December 5th

2. **Leadership Election** - Per the CAC Bylaws, leadership elections for the Chair and Vice-Chair position will take place at the organizational meeting, defined to be the "first meeting following the District Board of Managers annual meeting (January or February)"**.** Roles and responsibilities for these positions were reviewed.

3. **Project, Activity & Event Updates:**
    a. Recognition Dinner review

4. **Work Plan -** Each year, the CAC uses their time and expertise to assist several projects that help advance RWMWD projects and programs. Below are the 2023 priorities.
    a. Rain Garden/BMP video series – development by and featuring CAC members.
    b. East Side Stewardship Relationship Building
    c. Salt Use Outreach/Education: [in progress]
    d. Create Invasive Species Education Pieces
    e. CAC Rain Garden Clean Up Project: [ongoing]
    f. CAC/LEAP Team Planting (annual event)
    g. Buckthorn Removal
    h. Paddle the Phalen Water Trail as a group
    i. Assist in planning and hosting WaterFest (annual)
    j. LEAP Program nominations and subcommittee (annual)
    k. Watershed Excellence Awards & Volunteer Recognition Dinner planning (annual)
    l. Education Topics: Invite RWMWD staff or applicable professionals in to share knowledge. This was done heavily in 2022, so focus on this will be less in 2023.

More details on these discussions will be available on the CAC website when meeting minutes are approved. Future meetings listed in item 1 above.

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Board Action Log

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RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

Board of Managers Action Log

Wednesday, January 4, 2023

Date Added	Item	Anticipated Action Date	Means of Action	Completed
December 2022	Review of Equity Areas Definition	Spring 2023	Stewardship Grant Program Review and Board Approval	
November 2022	Planting of Edible Plants in Restoration Areas	Winter 2022/2023	Barr new technology report	
November 2022	Alum Use Policy	Spring 2023	Proposed policy discussion.	
July 2022	PFAS (Per- and polyfluoroalyl substances) in MN and RWMWD's role.	Winter 2022/2023	Presentation – invite MPCA representative	
July 2022	Miyawaki Mini-Forest Assessment	Fall 2022	Barr new technology report	Oct 2022 PSR
July 2022	Alum use for internal load control along with information on alternative solutions.	Fall/Winter 2022	Memo/Presentation	Nov 2022

(651) 792-7950
fax (651) 792-7951
office@rwmwd.org
rwmwd.org
2665 Noel Drive
Little Canada, MN 55117