Engineer's Report

March 10, 2021

Normandale Lake Water Quality Improvement Project:

NMCWD hosted a community meeting on February 18, 2021 regarding the Normandale Lake Water Quality Improvement Project. The virtual meeting included a presentation by District and Barr staff on project background, goals, and monitoring results and time for questions and discussion.

Preparation for the 2021 monitoring season is underway, including consideration of additional monitoring for 2021 to quantify filamentous algae mass in Normandale Lake over time, measure dissolved oxygen across the lake, and to collect some sort of photographic documentation of lake changes during the year. Barr and District staff are also researching options to measure/quantify smells at Normandale Lake. The objectives of the potential monitoring activities are to better understand and quantify current conditions and to evaluate benefits of existing and future potential management actions. Barr and District staff are evaluating the scope and cost to conduct these additional monitoring efforts.

Preparation for a 2021 spring herbicide treatment of the remaining curly-leaf pondweed is also underway. Based on 2020 aquatic plant surveys, we anticipate that the treatment will be a spot treatment, versus a whole lake treatment. However, a spring 2021 plant delineation survey will be conducted prior to the treatment to document the extent of curly-leaf pondweed in Normandale Lake and the upstream ponds and confirm the treatment approach.

Plans for carp monitoring in 2021 are under consideration by District staff.

Discovery Point Restoration and Building Addition Rain Garden and Landscape:

Project construction scheduling and planning is underway to begin the last phase of Discovery Point Restoration. Minnesota Native Landscapes will be removing buckthorn and some select trees in the northern portion of the parcel. Coordination regarding construction submittals and site access including public safety has taken place. Buckthorn removal is scheduled for March.

Rain garden construction and restoration of the area disturbed during construction of the building addition will take place in the spring of 2021.

Bush Lake Shoreline Vegetation Management:

No new activities.

Lake Level Management Plans for Arrowhead and Indianhead Lakes:

A draft report was provided to the District and Edina staff for review on February 9, 2021. No comments on the draft report have been received to date. We will follow-up with the City of Edina in the upcoming week to solicit comments.

Edina Stream Stabilization Project:

There were no new construction/maintenance activities associated with the project. Pay Request #9 from Sunram for release of the remaining retainage for Phase 1 of the project in the amount of $2,900.01 was approved at the February 17, 2021 regular board meeting, with payment contingent upon receipt of the required project close out documentation. Sunram has provided the required documentation and the payment has been made.

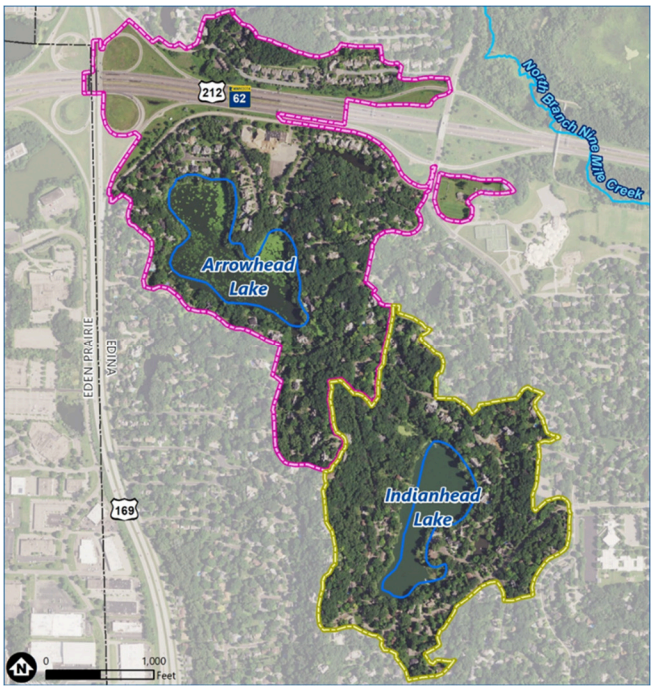
Landbridge Ecological is preparing a proposal for vegetative management services for the spring and summer seasons as a long term contract is being created by the City of Edina. Staff will review and make recommendations to the District Administrator once the proposal is received.

Wetland Restoration and Protection Opportunity Identification:

The NMCWD Board provided additional feedback on the revised project report, including a request to include general information regarding the value of wetlands. That information will be incorporated into a revised version of the report in the upcoming week.

Arrowhead Lake and Indianhead Lake Water Quality Study:

An update of the Use Attainability Analysis (UAA) of Arrowhead Lake and Indianhead Lake in Edina is underway, with completion anticipated in 2021. A UAA was originally developed for these lakes in 2006. The goals of this study are to comprehensively evaluate the current water quality and ecological status of these lakes and identify management needs to maintain or improve lake water quality. These are landlocked lakes and hence internal lake processes (e.g. internal loading) can be expected to have a significant effect of lake water quality. Initial meetings with the City of Edina and lake residents will be scheduled for the spring. We anticipate that the kick-off meeting with interested residents will be held in conjunction with a meeting regarding the Lake Level Management Plans for Arrowhead and Indianhead Lakes.



Watershed map of Arrowhead Lake and Indianhead Lake in southwest Edina. Both lakes are land-locked.

Lake Cornelia and Lake Edina Water Quality Improvements: *Rosland Park Stormwater Filtration BMP*

Design work continues on the Rosland Park Stormwater Filtration BMP, with a goal of 90% design completion by late-April. Work in the last month included preparing 30% design level construction drawings for existing conditions, erosion control, and traffic control, and continued work on the design of the vault, piping system, lift station, and filter backwashing/maintenance plan.

Barr provided these drawings to City of Edina staff from the parks and recreation, public works, and engineering departments for review and comment on February 19. Barr is currently working on refining the drawings to a 60% design level for use in project permitting, which is expected to begin in late March.

Lake Cornelia and Lake Edina Water Quality Improvements: *Rosland Park Stormwater Filtration BMP (continued):*

The stormwater filtration vault will include several chambers, in which multiple filtration media can be used/tested to optimize phosphorus removal. Barr staff have been considering several filter media options and are recommending that a series of column test experiments be conducted for the media under consideration in the upcoming months. The column testing would help to assess the performance of each media (e.g., TP removal), the filtration rates, and the performance as a function of flow rate through the media (some react quickly and some react slowly). This information would be used to select media for use in the filtration vault based on performance, cost and suitability of use. We intend to also reach out to Andy Erickson at the University of Minnesota St. Anthony Falls Laboratory (SAFL) to further brainstorm and discuss potential filtration media.

Given the experimental nature of the stormwater filtration vault, monitoring the performance of the filtration system will be important. Accordingly, the Barr team has been discussing the locations and types of monitoring that will be desired and how to incorporate access to these locations/water streams into the design for future sampling purposes.

Rendering of proposed stormwater filtration vault in Rosland Park to treat water from Swimming Pool Pond before it flows to Lake Cornelia.

Atlas 14 Flood Risk and Resiliency:

Barr staff continued work related to model QAQC and validation, which is near completion. The next step includes modeling a rainfall event larger than the Atlas 14 100-year event to reflect anticipated increases in extreme precipitation events resulting from climate change. When establishing 1% annual chance (aka 100-year year) flood elevations, the Atlas 14 50th percentile rainfall depth is typically used, which is about 7.5 inches for a 100-year, 24-hour rainfall event in the Nine Mile Creek watershed. For simulation of a larger rainfall event, there are several options as it relates to data sources and associated rainfall depths, including the following:

- Atlas 14 upper 90th percentile confidence limit for 100-year, 24-hour rainfall event (10.2 inches)
- Atlas 14 50th percentile for 500-year, 24-hour rainfall event (10.5 inches)
- Mid-21st century estimate under moderately optimistic greenhouse gas emission scenarios (10.2 inches, Simpson et. al, 2014[1])

Atlas 14 Flood Risk and Resiliency (continued):

Barr staff have begun modeling the larger rainfall event using the Atlas 14 500-year rainfall event (10.5 inches). We intend to include discussion about the options listed above at the first meeting with the District's Technical Advisory Committee (TAC).

In preparation for model calibration, Barr staff have begun evaluating 2019 and 2020 flow and rainfall data from the Watershed Outlet Monitoring Program (WOMP) stations on the creek to identify large rainfall events for model calibration (see next steps, outlined below). We also are communicating with the operational meteorologist at Hennepin County Emergency Management Services to obtain rainfall data from additional sites within or near the watershed through their Hennepin West Mesonet data program (see https://www.hennepinwestmesonet.org/ for more information).

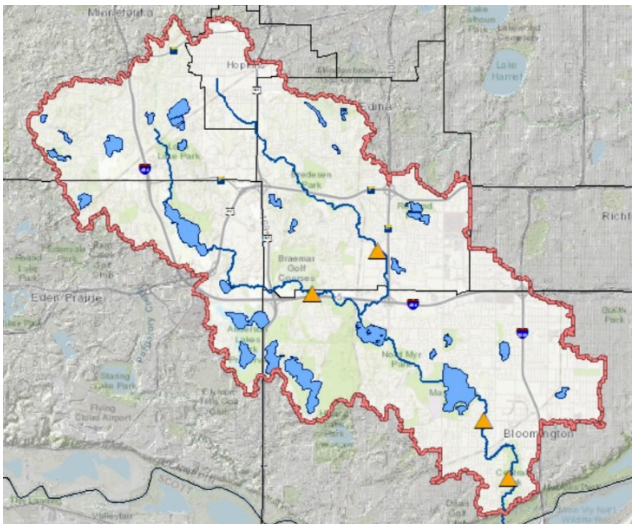
Barr is coordinating with District staff to schedule the first Technical Advisory Committee (TAC) meeting, likely in early-April. Discussion with the TAC will include summarizing the project scope and schedule, and discussing the rainfall event to model to reflect climate change, plans for sharing of results, and initial plans and steps related to task 6: *development of a framework for evaluating potential flood mitigation projects*.

Within the month of March, Barr plans to complete the following tasks:

- Stormwater volume capture of the 500-year, 24-hour rainfall event (10.5 inches)
- Initial rainfall and flow data evaluation and selection of candidate rainfall events for model calibration.
- Preparation for an early-April TAC meeting

1. Simpson, M. et. al, 2014. Long-term climate information and forecasts supporting stakeholder-driven adaptation decisions for urban water resources: Response to climate change and population growth. Final project report: Sectoral Applications Research Program FY2011, Climate Program Office, National Oceanic and Atmospheric Administration

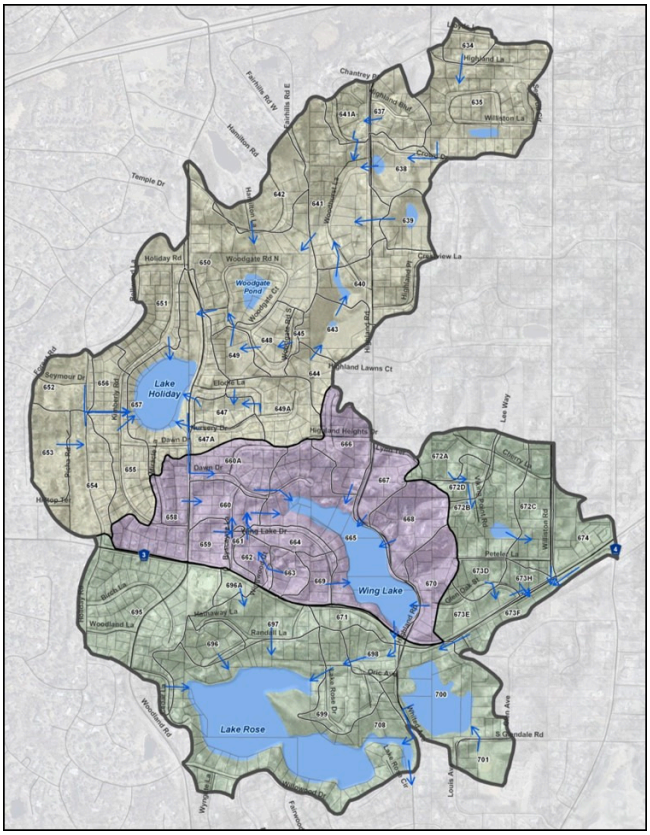
Image from NOAA NEXRAD rainfall event processing. NEXRAD data will be used to develop spatially variable rainfall inputs for calibration events.



Continuous flow monitoring locations along Nine Mile Creek are shown as orange triangles. Flow and rainfall data from these stations will be used to calibrate the District's XP-SWMM model.

Holiday-Wing-Rose Lake Water Quality Study

An update of the Use Attainability Analysis (UAA) of the Holiday-Wing-Rose chain of lakes in Minnetonka is underway with completion anticipated in 2021. The original UAA was completed for these lakes in 2010. The goals of this study are to comprehensively evaluate the current water quality and ecological status of these lakes and identify management needs to maintain or improve lake water quality. These are shallow lakes and it can be expected that aquatic plants and shoreline issues will be of interest to lake residents. This suggests that city (City of Minnetonka) and public engagement will be an important component of these studies. Initial meetings with the City and lake residents will be scheduled for the spring.



Watershed map of Holiday-Wing-Rose chain of lakes in Minnetonka. Discharge from Rose Lake flows south to Birch Island Lake in Eden Prairie.

Photo of Lake Holiday.

Photo of Wing Lake

Photo of Rose Lake

Wetland Conservation Act (WCA) and NMCWD Wetland Rule Administration:

Work administering the WCA and NMCWD wetland rule in the past month included:

- Cherokee Trail/Old Shakopee Road Culvert Improvements (Eden Prairie) – review and discuss WCA no-loss and utility exemption applicability, prepare and submit Notice of Application, and provide additional information for NMCWD permit review.
- West 70th Street (Eden Prairie) – preparing and submitting WCA Notice of Decision for wetland boundary/type and WCA no-loss approval
- Topview Park (Eden Prairie) – preparing and submitting Notice of Decision for no-wetland determination approval
- Hennepin County Home School Wetland Bank – participation in February 25, 2021 TEP meeting
- WCA annual reporting and other miscellaneous program administration