

Engineer's Report

January 13, 2020

Normandale Lake Water Quality Improvement Project:

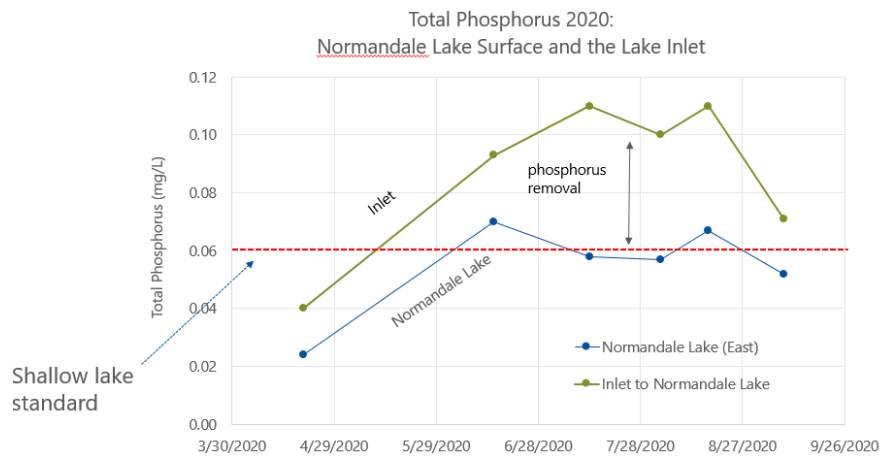
Barr staff presented the Normandale Lake 2020 monitoring results to District staff on December 15, 2020, including water quality data, phytoplankton data, plant data, and results of the fall 2020 curly-leaf pondweed turion survey. During the meeting, next steps for the project were discussed, including conducting a spring 2021 herbicide treatment and continued monitoring of the lake in 2021. Plans for a District-hosted virtual public meeting in early-2021 were also discussed to provide an update to interested residents and lake users on project implementation and monitoring results.

To fulfill the requirements of the Minnesota Department of Natural Resources (MDNR) Lake Vegetation Management Plan (LVMP) for Normandale Lake, Barr prepared and submitted an annual monitoring report. The report included a summary of the herbicide treatment completed in Normandale Lake and Nine Mile Creek on May 8, 2020 and aquatic submersed plant data collected during June 26, 2020 and August 26, 2020 from Normandale Lake. The report also presented biomass data from Normandale Lake collected on June 26, 2020 and August 26, 2020 from and a supplemental report summarizing results of turion monitoring on October 18, 2020 (provided as additional information).

Barr and District staff met with Mike Berndt, a citizen scientist and Bloomington resident, on January 6, 2021 to discuss analysis of 2020 water quality data from Normandale Lake, including water quality data collected by the District and by Mr. Berndt. The meeting included discussion regarding nitrogen and data that support the conclusion that algal growth in Normandale Lake is "nitrogen-limited" at times, meaning that nitrogen is the nutrient that's in shortest supply and thus limits the growth of algae during these times. During the meeting, the need for additional education for home owners regarding fertilizer application was discussed.

District and Barr staff plan to meet later this week to coordinate the upcoming virtual public meeting.

Comparison of data collected at the inlet of Nine Mile Creek into Normandale Lake and from the east side of Normandale Lake (typical monitoring location) indicates that a significant amount of phosphorus is removed as water travels through the lake. Removal of phosphorus occurs through several mechanisms, including sedimentation and uptake by biological communities (e.g., aquatic plants, algae).



Discovery Point Restoration and Building Addition Rain Garden and Landscape:

Quotes for the final phase of the Discovery Point site restoration and the rain garden and landscaping associated with the recent building addition were received on December 21, 2020. Minnesota Native Landscapes submitted the low quote for the project at \$105,828.00. There were three quotes submitted via the invitation. Contracting is underway with Minnesota Native Landscapes.

District staff are pursuing the necessary NMCWD and City of Eden Prairie permits. Project information will also be submitted to the Minnesota Land Trust for review prior to project work starting. Development of an agreement with the City if Eden Prairie is underway by District staff and legal counsel.

Buckthorn removals are likely to occur during the time period of frozen soils, with spring seedings and plantings to compliment the invasive removals and prevent erosion. District staff is working with the City of Eden Prairie to coordinate buckthorn removal up to the wetland trail which would include some removal on City property to create a seamless restoration area.

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.

Edina Stream Stabilization Project:

There were no new construction/maintenance activities associated with the project. For the last several months we reported that Landbridge had provided a cost estimate for extending their maintenance work for an additional six months into 2021 to line-up with the completion of the maintenance work for Phase 2 of the project. The cost estimate received on September 6th was reviewed and we requested that the cost provided be revisited. The revisited cost received was reviewed and we requested that Landbridge again revisit their cost to come more into line with the original bid cost received for the project. We have not yet received this information and therefore will not have a recommendation for consideration at the January meeting.

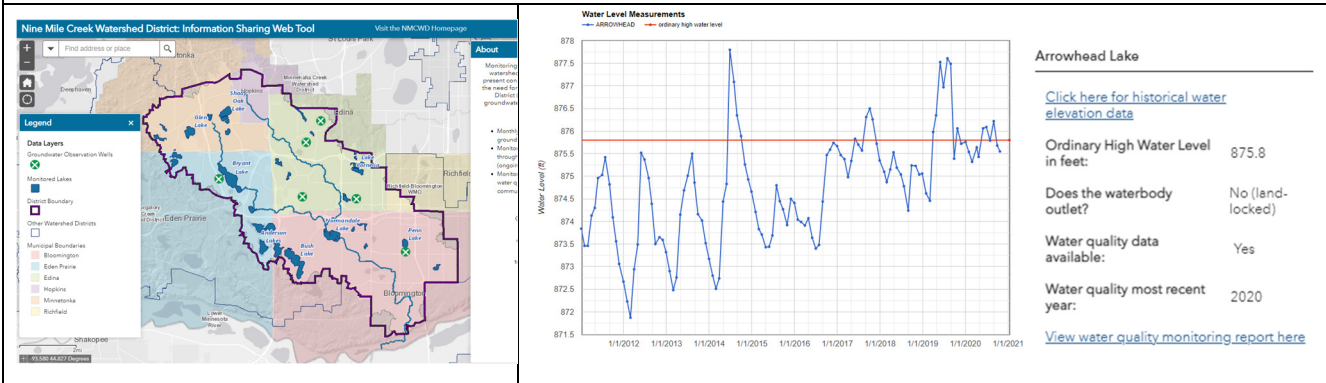
Lake Level Management Plans for Arrowhead and Indianhead Lakes:

Based on the discussions from the virtual meeting with the City of Edina and District staff on December 1, a draft report is in preparation. The report addresses the model used, how the model was matched to lake level data, and the important findings of the modelling work: that groundwater levels appear to control the winter low lake elevations and rainfall drives the spring/summer rise in lake levels. The model was then used to understand how much precipitation would cause flooding of the low dwellings, and options to protect them, such as pumping the excess runoff or lowering the lakes to water surface elevations that should protect the low homes in a 100-year return frequency precipitation event. The graph below shows approximate initial lake levels that would be needed to avoid flooding dwellings at Arrowhead Lake for 24-hour rainstorms of 1-year to 200-year return frequencies. The draft report summarizing the water balance model and flood mitigation analyses is in preparation and will be ready for review by Edina and the District in the upcoming weeks.

Development of Data-sharing Web Map Tool:

The final round of edits and updates has been completed. Visualizations of the ordinary high water levels (OHWL) for waterbodies have been added to the charting tool where available. Information and web links shared in the "pop-up" functionality of the web map has been customized to display the unique data available on a waterbody-by-waterbody basis. Updates have also been made to the disclaimer text on the web map and the charting tool.

The URL for the web map → https://maps.barr.com/NMCWD/NMCWD_InformationSharingApp/index.html



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

Design work continues on the Rosland Park Stormwater Filtration BMP. The design team met to discuss the alternative design concept and establish project design milestones, with a goal of 90% design by late-April. Work continued on evaluating options for filter backwashing and maintenance, including a site visit to view potential backwash discharge locations.



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

Wetland Restoration and Protection Opportunity Identification:

Barr staff met with District staff on December 7, 2020 to discuss project status and the planned approach for compiling the “best available” wetland data into a GIS database, including functional assessment data, to identify and characterize high quality wetlands throughout the watershed.

The National Wetlands Inventory (NWI) database was identified as the most comprehensive and up-to-date inventory of wetlands in the Nine Mile Creek watershed. NWI provides multiple wetland classifications not typically included in city wetland databases. Because the NWI only includes information on wetland type, wetland condition and functional assessments from cities were used to assess Nine Mile Creek watershed wetlands. While the objective of the project was to compile the “best available” wetland information in GIS, wetland data available from the cities was in varying formats and not all cities maintained the same data on wetland condition and function. Upon project initiation, we did not anticipate that the GIS data compilation would include merging the NWI database with city functional assessments due to the challenging and time intensive nature of this effort. However, based on feedback received from the NMCWD Board and staff throughout the project, it became apparent that merging these numerous databases would provide the District with a more comprehensive review of the wetlands throughout the watershed (i.e., start to answer the question of what we have in terms of wetland quality) and allow the data to be used to preliminarily categorize wetlands based on quality for future wetland management. In addition, including functional assessments in the merged database also provides the District with a means to sort and prioritize by various functions (e.g., vegetative diversity, stormwater sensitivity, wildlife habitat) and wetland type. Barr’s work in the past month included developing the wetland database, obtaining additional information from the cities pertaining to the functional assessments of their wetlands, adding the unique city datasets to the GIS database, and conducting QA/QC on the results (removing duplicates, correcting inconsistencies, adding wetland data).

Another objective of the project was to identify potential wetland protection or restoration opportunities throughout the watershed, with a focus on high-quality wetlands and/or wetlands with rare and high-quality biological communities. Work in the past month to address this objective included summarizing the wetland protection and restoration opportunities identified through the field assessment of 21 wetlands. Detailed summaries of each field assessed wetland were developed and maps and tables summarizing the protection and hydrologic restoration opportunities were prepared. The functional ratings of these 21 wetlands were also summarized to help target and prioritize the opportunities. For example, the functional ratings can be used to identify those wetlands that are most or least sensitive to stormwater inundation or have the highest ratings for vegetative diversity. It should be noted that not every wetland in the District could be evaluated at this level of detail and some high-quality wetlands or opportunities will not be included on the list. The purpose of this objective was to provide the District with a set of potential protection and restoration opportunities based on knowledge of the watershed and professional judgment.

Because the specific wetland protection and restoration opportunities identified were only a small set of the wetlands in the District, work was also completed to identify “high value” wetlands on a broader scale for future management efforts. The functional ratings identified in Appendix 3b of the NMCWD’s Wetlands Management rule (Rule 3.0) for defining high value wetlands were used as a guide to identify high quality wetland protection and enhancement opportunities. This was completed on a city-by-city basis based on the level of information available regarding wetland functions or values.



Photo of a silver maple floodplain forest wetland adjacent to Nine Mile Creek in the Lower Valley.

Wetland Restoration and Protection Opportunity Identification (continued):

A draft report summarizing the results of the project was prepared and submitted to District staff on January 7, 2021. Barr presented the draft findings to the Board and solicited feedback at the January 7, 2021 special meeting. A final report incorporating feedback from Managers and staff will be completed in the upcoming weeks.

Atlas 14 Flood Risk and Resiliency:

Barr staff completed work on updating the NMCWD's watershed-wide Xp-SWMM model (Phase 1 of the Atlas 14 Flood Risk and Resiliency project). A considerable amount of work was completed in December, including:

- Finalizing subwatersheds and storm sewer updates in Eden Prairie and "capturing" excess runoff by adding surface overflows and storage, as needed
- Converting Richfield model to Xp-SWMM, including condensing subwatersheds, re-computing hydrologic parameters, capturing water, and adding the areas into the Xp-SWMM model along boundaries with Edina and Bloomington
- Making subwatershed boundary adjustments in Bloomington, as needed, to have congruent boundaries throughout the watershed
- Completing the merging of models into one large, watershed-wide model
- Running the merged model and reviewing results
- Preparing a 100-year, 24-hour inundation layer in GIS for QA/QC
- Preparing QA/QC checklists for updated model areas
- Conducting senior-level review of model results
- Addressing necessary model revisions identified during QA/QC process

A technical memo summarizing the 2020 watershed-wide model updates was prepared and provided to the District administrator.

At the December 16, 2020 board meeting, Barr presented a high-level scope of work for Phase 2 (*Flood Risk/Vulnerability Assessment- Atlas 14 and Beyond*) and Phase 3 (*Flood Risk Reduction Opportunity Analysis*) of the project. Following discussion of the scope of work, the Board requested that a revised scope for Phase 2 be provided at the January meeting to incorporate comments received from the Board and include additional detail on tasks, deliverables and costs. The Board also requested that scoping/approval of Phase 3 be delayed and reconsidered once Phase 2 is substantially completed.

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

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

- Agape Christi, 6500 Baker Road- reviewing the wetland delineation report, preparing and submitting the WCA Notice of Application
- 12600 Junction Road (Minnetonka)- desktop review of potential incidental wetland determination and approximate boundary
- Providing examples and responding to questions regarding previous water quality requirements for high-value wetlands
- Responding to questions from Hennepin County regarding WCA workload options.
- Preparing for and discussing rule revisions, and providing wetland data location information
- Responding the questions and other miscellaneous program administration