

# Engineer's Report

April 17, 2019

## Normandale Lake Water Quality Improvement Project:

Lake levels in Normandale Lake have rebounded to normal levels; in fact, it took only one week to refill the lake to its normal water level due to rainfall and greater-than-average snowmelt runoff that occurred between March 7th and March 14th. Rachel Contracting intends to remove much of the turtle fencing along the lake perimeter in mid-April, once the ground is thawed and dried out enough to avoid damage.

In late-March, several large floating masses that appeared to be sediment were observed over portions of the lake surface, which prompted some curiosity from staff and park users. After a site investigation and brief literature search, it was concluded that the large floating masses were upheaval of the frozen soft sediments from the lake bottom. Similar occurrences have been documented at other winter drawdown locations, where frozen sediment can loosen and float to the surface since the frozen masses are lighter than water. Since late-March, the floating ice/sediment masses appear to have diminished.



Aerial view of the central and east (outlet) side of Normandale Lake on March 27, 2019.



Aerial view of the central and east (outlet) side of Normandale Lake on April 10, 2019.



Photo of floating frozen sediment mat during March 27, 2019 field investigation.



Shovel blade hits frozen conditions several inches below the surface of the floating mat (March 27, 2019).

Comprehensive aquatic plant monitoring will be conducted in summer and fall of 2019 to measure the success of the lake drawdown in controlling curly-leaf pondweed (CLP). Monitoring will include aquatic plant surveys and plant biomass assessments of the lake in June and August. CLP sediment turion (a type of overwintering bud that can produce new plants) sampling will be conducted in October to assess the potential for curly-leaf pondweed regrowth. An aquatic plant survey will also be completed for the portion of Nine Mile Creek directly upstream of Normandale Lake, between I-494 and West 84<sup>th</sup> Street, in June and August to identify and document the extent of CLP in this portion of the creek and plan for a potential 2020 herbicide treatment.

**Normandale Lake Water Quality Improvement Project (continued):**

An alum treatment of Normandale Lake will be completed this spring to reduce the release of phosphorus from lake bottom sediments (i.e., internal loading) during summer months. A request for quotes for the alum treatment was sent out and four quotes were received. The quotes ranged from \$124,659.20 to \$298,714.40, with the low quote submitted by HAB Aquatic Solutions, LLC, of Lincoln, Nebraska. The District has executed an agreement with HAB and will issue a notice to proceed on April 10, 2019. HAB tentatively plans to conduct the alum treatment in early-May.

**Edina Stream Stabilization Project:** Phase II of the project reached substantial completion at the end of October. The substantial completion deadline was December 31, 2019 so the project was completed ahead of schedule.

Barr worked on a maintenance plan to establish clear roles for the District and the city of Edina for addressing future maintenance needs.

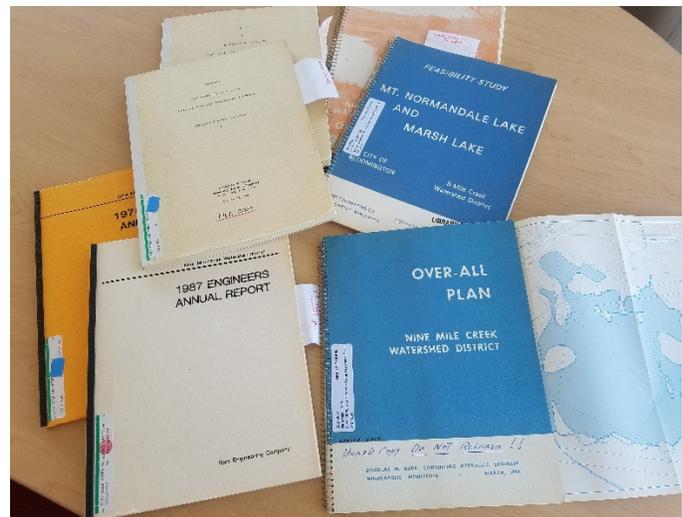
Barr also completed a brief walk-through of the stabilization sites to review the condition of the stream following the high flows in March. A few isolated erosion areas were identified, but most of the project held up well during the high flows, despite minimal vegetation growth in Phase II. A remediation approach was discussed with Administrator Anhorn.

**Bush Lake Outlet Project:** No new activities.

**Lake Cornelia and Lake Edina Use Attainability Analysis (UAA):** Barr continues to wrap up the Use Attainability Analyses (UAAs) for North and South Lake Cornelia and Lake Edina. The draft UAA report is nearing completion; we anticipate providing a draft to NCMWD staff within the next two weeks. Results of the analysis will be presented to the Board in May or June, depending on other agenda items at the upcoming monthly Board meetings.

**Pentagon Park Stormwater Management (in partnership with the cities of Edina and Bloomington):** No new activities.

**Nine Mile Creek Watershed District 60th Anniversary Story Map:** Design team members (District and Barr staff) have finalized the Story Map content outline and GIS specialists have begun developing a working draft. Once the outline is translated to a rough Story Map draft, content optimization can begin. Additional content, including interviews with former District staff and Board members, is being organized through mid- to early-May. Roll-out of the Story Map is planned for June in advance of the 60th anniversary celebration.



Annual reports and planning documents from the past 60 years were reviewed to find quotes, drawings, and data that would add relevant and interesting content to the Story Map.

**District Office (Discovery Point):** Discovery Point has undergone dramatic changes since site restoration efforts began in 2016. Barr has recently updated the Discovery Point Ecological Master Plan to document detailed information from the first two years of restoration efforts, including limits of each phase and species installed. The master plan now includes information regarding the sites remaining ash trees as well as several pages of photographs highlighting restoration progress. The updated master plan document is currently being reviewed and when approved, will be printed and bound for display at Discovery Point.

The Discovery Point Restoration areas have been stable through winter. Additional plant installations will take place in the spring of 2019; another volunteer event, including the installation of 750 native forbs, is scheduled for May 30th.

## Seed Mixes

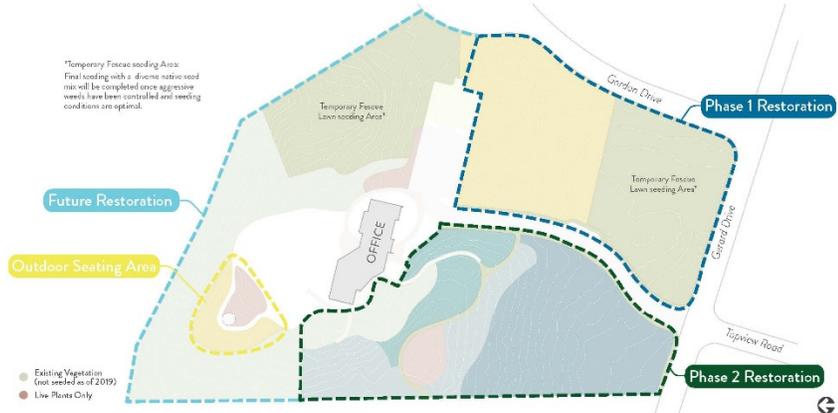
### ● HIGH DIVERSITY WOODLAND SEED MIX

- Grasses**  
*Bromus caryophyllus* (Sideoats Grama)  
*Bromus tectorum* (Kalm's Brome)  
*Bromus horridus* (Hairy Wood Choe)  
*Dryas octopetala* (Butterbrush Grass)  
*Dryas villosa* (Silky Wild Rye)  
*Panicum capillare* (Switchgrass)  
*Solidago serotina* (Little Bluestem)  
*Schizanthus serotinus* (Beak Grass)  
**Sedges & Rushes**  
*Carex florida* (Common Wood Sedge)  
*Carex lasiocarpa* (Plains Owl Sedge)  
*Carex lasiocarpa* (Common Carex Sedge)  
*Carex lasiocarpa* (Ovary Sedge)  
*Carex lasiocarpa* (Slender Wood Sedge)  
*Carex lasiocarpa* (Field Owl Sedge)  
*Carex lasiocarpa* (Pennsylvania Sedge)  
*Carex lasiocarpa* (Straight Stylad Wood Sedge)  
*Carex lasiocarpa* (Early Stylad Wood Sedge)  
*Carex lasiocarpa* (Long-leaved Sedge)  
*Carex lasiocarpa* (Common Fox Sedge)  
*Carex lasiocarpa* (Barney's Rush)

- Forbs**  
*Achillea millefolium* (Wild Yarrow)  
*Aster laevis* (Wild Leek)  
*Aster spicatus* (Tall Thimbleweed)  
*Aster spicatus* (Rue Anemone)  
*Aster spicatus* (Cask-in-the-Palms)  
*Achillea millefolium* (Pike Milkweed)  
*Callitriche occidentalis* (Blue Cohosh)  
*Erythronium americanum* (Big-leaved Aster)  
*Lactuca canadensis* (Pachy Root)  
*Pentstemon digitalis* (Fogwallow Beardtongue)  
*Sanguinaria canadensis* (Bloodroot)  
*Solidago nemoralis* (Solomon's Plume)  
*Solidago nemoralis* (Starry Solomon's Plume)  
*Symplocos tinctoria* (Heart-leaved Aster)  
*Symplocos tinctoria* (Hearth Aster)  
*Thalictrum flavum* (Goad's Rue)  
*Thalictrum flavum* (Early Meadow Rue)  
*Thalictrum flavum* (Ohio Spineflower)  
*Thalictrum flavum* (Ballroot)

### ● PRAIRIE GRASS SEED MIX

- Grasses**  
*Bromus caryophyllus* (Blue Grama)  
*Dryas octopetala* (Canada Wild Rye)  
*Bromus caryophyllus* (Sideoats Grama)  
*Schizanthus serotinus* (Little Bluestem)



### ● HIGH DIVERSITY SEED MIX (SAVANNA AREAS)

- Grasses**  
*Andropogon gerardii* (Big Bluestem)  
*Bromus caryophyllus* (Sideoats Grama)  
*Bromus tectorum* (Kalm's Brome)  
*Dryas octopetala* (Butterbrush Grass)  
*Dryas villosa* (Silky Wild Rye)  
*Solidago serotina* (Field Manna Grass)  
*Solidago serotina* (Switchgrass)  
*Schizanthus serotinus* (Little Bluestem)  
*Sorghastrum nutans* (Indiangrass)  
**Sedges & Rushes**  
*Carex florida* (Common Wood Sedge)  
*Carex lasiocarpa* (Plains Owl Sedge)  
*Carex lasiocarpa* (Ovary Sedge)  
*Carex lasiocarpa* (Slender Wood Sedge)  
*Carex lasiocarpa* (Field Owl Sedge)  
*Carex lasiocarpa* (Plains Sedge)  
*Carex lasiocarpa* (Long-leaved Sedge)

- Forbs**  
*Achillea millefolium* (Red Baneberry)  
*Aster spicatus* (Wild Garlic)  
*Aquilegia scopulorum* (Prairie Hyacinth)  
*Andropogon gerardii* (Pike Milkweed)  
*Aster spicatus* (Cask-in-the-Palms)  
*Aster spicatus* (Big-leaved Aster)  
*Achillea millefolium* (Cask-in-the-Palms)  
*Thalictrum flavum* (Canada Milk Weeds)  
*Aquilegia scopulorum* (Columbine)  
*Compositae americana* (Tall Bellflower)  
*Scaligeria thurberiana* (Blue Cohosh)  
*Sanguinaria canadensis* (Purplish Red)  
*Conium maculatum* (Prairie Cow-wheat)  
*Erythronium americanum* (Flowering Spurge)  
*Erythronium americanum* (Wild Geranium)  
*Nelumbo lutea* (Western Sunflower)

- Forbs**  
*Lespedeza bicolor* (Round-headed Bush Clover)  
*Waldia serotina* (Wild Bergamot)  
*Waldia serotina* (Spotted Blue Bell)  
*Chamaecrista nictitans* (Stiff Goldenrod)  
*Chamaecrista nictitans* (Large-flowered Beardtongue)  
*Sagittaria arifolia* (Bloodroot)  
*Solidago nemoralis* (Solomon's Plume)  
*Polypogon monspeliensis* (Solomon's Seal)  
*Panicum capillare* (Virginia Mountain Mint)  
*Nelumbo lutea* (Long-headed Coneflower)  
*Helianthus annuus* (Black-eyed Susan)  
*Rubus idaeus* (Sweet Black-eyed Susan)  
*Solidago nemoralis* (Old Field Goldenrod)  
*Typha latifolia* (Goad's Rue)  
*Thalictrum flavum* (Early Meadow Rue)  
*Thalictrum flavum* (Hairy Yarrow)  
*Thalictrum flavum* (Culver's Root)  
*Zizia aurea* (Golden Alexander)

### ● WOODLAND SEED MIX

- Grasses**  
*Bromus caryophyllus* (Blue Grama)  
*Dryas octopetala* (Kalm's Brome)  
*Dryas octopetala* (Canada Wild Rye)  
*Dryas octopetala* (Butterbrush Grass)  
*Dryas octopetala* (Virginia Wild Rye)  
*Dryas octopetala* (Silky Wild Rye)  
**Sedges & Rushes**  
*Carex lasiocarpa* (Partridge Sedge)  
*Carex lasiocarpa* (Pennsylvania Sedge)  
*Carex lasiocarpa* (Field Owl Sedge)  
*Carex lasiocarpa* (Long-leaved Sedge)

### ● FESCUE LAWN SEED MIX

- Grasses**  
*Festuca rubra* (Creeping Red Fescue)

New pages included in the Discovery Point Ecological Master Plan document summarize the first two phases of restoration activities and detail what native species were installed.

**Regional Stormwater Volume Reduction Opportunity Study:** Barr will be presenting the results of the regional stormwater volume reduction opportunity study to NMCWD's technical advisory committee (TAC) on April 23, 2019.

**Groundwater/Surface-Water Interaction Study and Assessment of Surface Water Vulnerability to Changes in the Groundwater System:**

Barr has kicked off this study to assess how groundwater and surface water interact across the Nine Mile Creek watershed and then use that data to identify surface waters and wetlands that may be particularly sensitive to changes in the groundwater system.

Understanding how changes in the groundwater system may affect surface water levels, stream flow, and water quality is an important component of long-term planning and protection of water resources in the Nine Mile Creek watershed. How connected, or disconnected, surface waters are to the groundwater system affects how they may respond to seasonal changes (drought), long-term climate change, or anthropogenic stresses (groundwater pumping).

Barr has begun the first step in the project, which is compiling pertinent information from a variety of sources, including groundwater and lake level data that NMCWD has collected for decades. A request for additional data has been sent to the cities located within the Nine Mile Creek watershed. We anticipate data compilation will be completed by mid-May and preliminary study results will be available by early-July.

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

- Evaluated wetland buffers for the Pentagon Park site.
- Responded to comments in Westwood’s buffer memo and reviewed existing and proposed wetland assessments and buffer information for the Friendship Village site.

**Status of Permitted Construction Projects:** Barr staff completed the monthly inspections of permitted sites between March 28 and April 5, 2019. An abbreviated version of the monthly inspection report is provided for the Managers review. Of the 179 sites inspected, 34 of the sites require corrective action or follow-up. The full inspection report is available upon request.