Engineer's Report

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Normandale Lake Water Quality Improvement Project

An aquatic plant survey was conducted in Normandale Lake and upstream portions of Nine Mile Creek in June. An additional aquatic plant survey will be completed in August and a fall curly-leaf pondweed turion survey of Normandale Lake will be completed in the fall of 2021. Water quality monitoring in Normandale Lake is underway and will continue throughout the summer, including near the inlet of Nine Mile Creek and at the routine monitoring location on the east side of the lake.

Dissolved oxygen levels are being monitored monthly this summer along five transects in Normandale Lake (lines on image represent approximate transect locations)

Edina Stream Stabilization Project

There were no new construction or maintenance activities associated with the project.

Barr and District staff have been working with the City of Edina as they prepare for long term contracting for future maintenance of the Phase 1 and Phase 2 reaches. A field walk of the Phase 1 and 2 reaches of the creek was completed with City staff and their consultant on June 8th in conjunction with future maintenance obligations. A follow-up meeting was held with District, City of Edina, and Barr staff on July 14, 2021. Barr staff continue to work with District staff and legal counsel regarding maintenance agreement language.

Bush Lake Shoreline Vegetation Management

Barr staff continue to coordinate with the vegetation management contractor, including a July 15, 2021 site inspection.

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Holiday-Wing-Rose Chain of Lakes Use Attainability Analysis/Water Quality Study

Activities for the Holiday-Wing-Rose Chain of Lakes Use Attainability Analysis (UAA) Update are progressing. Barr has made progress on the existing conditions in-lake model calibrations and is gaining insight on nutrient loading concerns.

Additionally, NMCWD and the City of Minnetonka continue to work together closely to develop a StoryMap and online survey that will be posted on the City of Minnetonka's webpage. The StoryMap will include background information on lake ecology, lake characteristics, and the goals of the UAA study. The survey will inquire about how residents use the lake, their perceptions of water quality, and their interest in committing to lake water quality improvements by managing fertilizer use and other activities such as shoreline buffers. The StoryMap and survey will tentatively be posted in late-August, with an in-person public engagement meeting in mid-September. Residents will be notified of the StoryMap, survey and meeting through a mailing. Results of the survey and information gathered at the meeting will inform management and educational recommendations for Holiday, Wing, and Rose lakes.

Arrowhead Lake and Indianhead Lake Use Attainability Analysis/Water Quality Study

Activities for the Arrowhead Lake and Indianhead Lake Use Attainability Analyses (UAA) updates are progressing. Barr has made progress on the existing conditions in-lake model calibrations and is gaining insight on nutrient loading concerns.

Additionally, the public engagement survey is still underway. On July 7, the District mailed paper copies of the survey to residents and the online version will continue to be posted until August 16. At the end of July, the District mailed out reminder post cards, asking residents to participate in the survey if they hadn't had time yet. At the end of July, 16 participants had mailed back surveys and 7 responses were posted online.

The online survey can be found here: https://ninemilecreek.typeform.com/to/A2Z4Rb9L

Results of the survey will inform management strategies and educational recommendations for Arrowhead and Indianhead lakes.

Discovery Point Restoration and Building Addition Rain Garden and Landscape

Planting and the final construction items related to the rain garden and remaining restoration have been completed. No work was completed this period. On-going restoration and site management tasks going forward will include monthly site visits, site-wide herbicide application to control woody invasive re-sprouts, garlic mustard, and narrowleaf bittercress.

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

Bids on the Rosland Park BMP Project were opened on Tuesday, July 20th, with 5 bids received. A memo dated July 21, 2021 summarizing the bids was provided to the Board of Managers and discussed at the July regular board meeting. A copy of the memo is attached at the end of the Engineer's Report.

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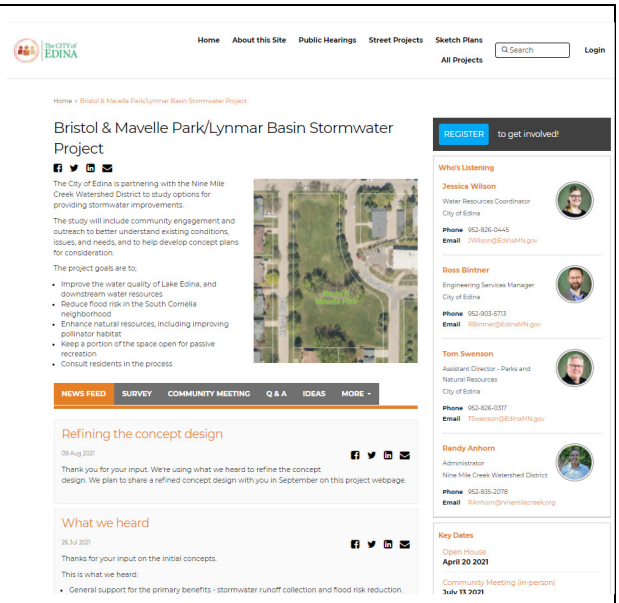
Lake Cornelia and Lake Edina Water Quality Improvements: *Lynmar Basin Stormwater Retrofit Concept Plan*

Two concept plans were developed and shared with interested residents at a community meeting on July 13, 2021 and on the City of Edina's project website. The two rain garden concept designs offer similar flood reduction and water quality benefits. Attendees and other survey respondents generally preferred Concept 2, which includes a more ornamental plant palette and a path alignment that preserves valued open play space. The feedback period from the public on the two concept plans is complete and the final concept is being updated and project cost estimate prepared.



Screenshot from project page on City of Edina's Better Together Edina site, a web-based public engagement platform to provide information and solicit feedback from residents and interested stakeholders.

The revised concept plan will be summarized in a brief report, which will be completed for staff review by early-September. The information will be presented to the Board at the September 15th regular meeting and shared with the Edina City Council at their September 21, 2021 meeting. The next steps before ordering the project would be to complete a feasibility study and conduct a public hearing.

Atlas 14 Flood Risk and Resiliency, Phase II

July was a busy month for the project- the Barr team completed calibration of three rainfall events and round two of our planned quality assurance / quality control (QAQC) review. With calibration complete, we conducted the preliminary flood mapping and identification of potentaillly impacted structures and roadways. QAQC of the preliminary flood inundation mapping and impact mapping is currently underway, and we are evaluating options for sharing the preliminary results with stakeholders for review (e.g., figure PDFs, Google Earth review files, ArcGIS Online web map, etc.). We anticipate sharing results with stakeholders at our second project Technical Advisory Comment (TAC) meeting tentatively scheduled for August 26, 2021. After receiving stakeholder review comments, the watershed-wide model will be finalized and final flood inundation and impact mapping will be completed.

Barr continued to make progress on Task 4: quantifying potential flood damage costs and Task 5: risk analysis for pipe failures or clogging at creek crossings. We have completed our high-level review of crossing failure impacts at all Nine Mile Creek pipe crossing locations and anticipate sharing results with stakeholders at our upcoming TAC meeting. We are currently reviewing and selecting 5-7 individual crossings for more detailed modeling review (e.g., model crossing failure during base flow conditions, 50-percent clogged condition during a large rainfall event event, and 100-percent clogged condition during a large rainfall event).

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As discussed in the June Engineer's Report, the calibration effort took longer than expected due primarily to long model run times and dynamic modeling start conditions for each run (i.e., base flow conditions in the creek vary by event and have a notable impact on calibration results for several rainfall events). We are slightly ahead of schedule on several other tasks, including quantifying potential flood damage costs and conducting the crossing failure risk analysis. Overall, we are about two weeks behind schedule with regard to stakeholder review and finalizing model results.

Screen shot of project schedule, with August highlighted in dark blue box.

Wetland Conservation Act (WCA) and NMCWD Wetland Rule Administration

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

- SuperValu Corp Campus- conducting a site review
- Southwest LRT- participation in combined agency status meeting regarding temporary wetland impacts
- Shady Oak Lake outlet- reviewing WCA Notice of Decision and revising application, permitting coordination
- Blake Road reconstruction- submitting WCA Notice of Decision for no WCA wetland determination
- Other miscellaneous program administration

Other- Dry Weather Conditions

Dry weather conditions continued throughout July, with only 0.9 inches of precipitation measured at the Minneapolis-St. Paul International Airport, a 3.2 inch departure from the 30-year (1991-2020) normal precipitation for July. Based on the August 5th U.S. Drought Monitor, all of central and southern Minnesota continue to be categorized in at least Moderate Drought, with most of Hennepin County categorized in Severe Drought.

The dry weather conditions have had a significant impact on flows in Nine Mile Creek. As shown below, flows at the three continuous flow gaging stations operated by the District were quite low at the beginning of August, then increased following the August 7-8 rainfall. Note that the flows in early-

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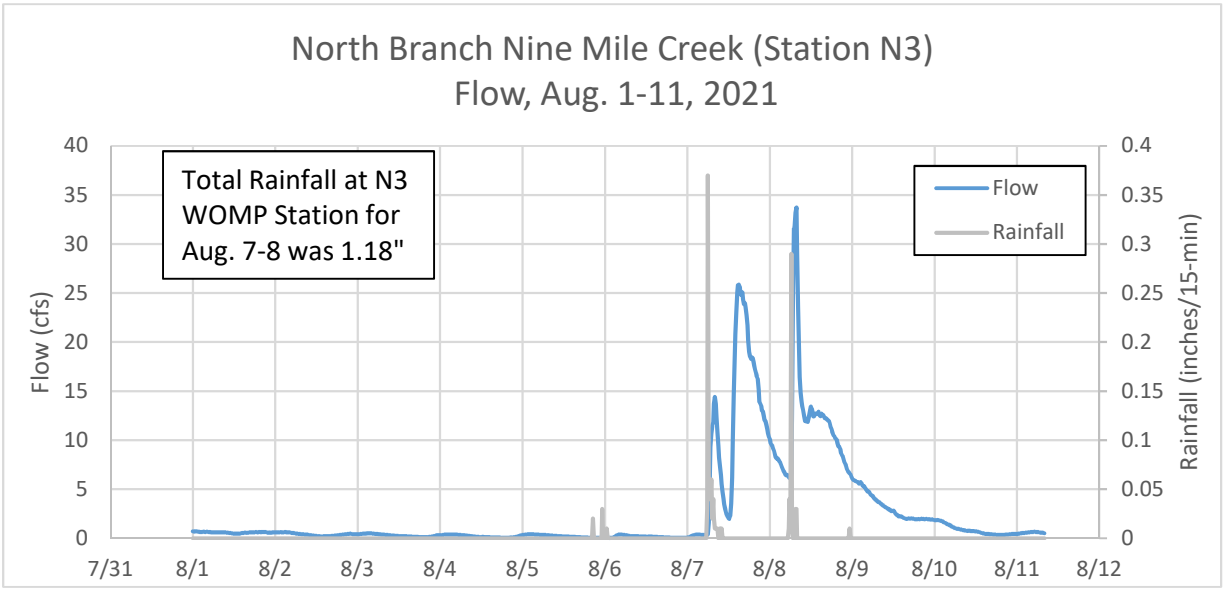
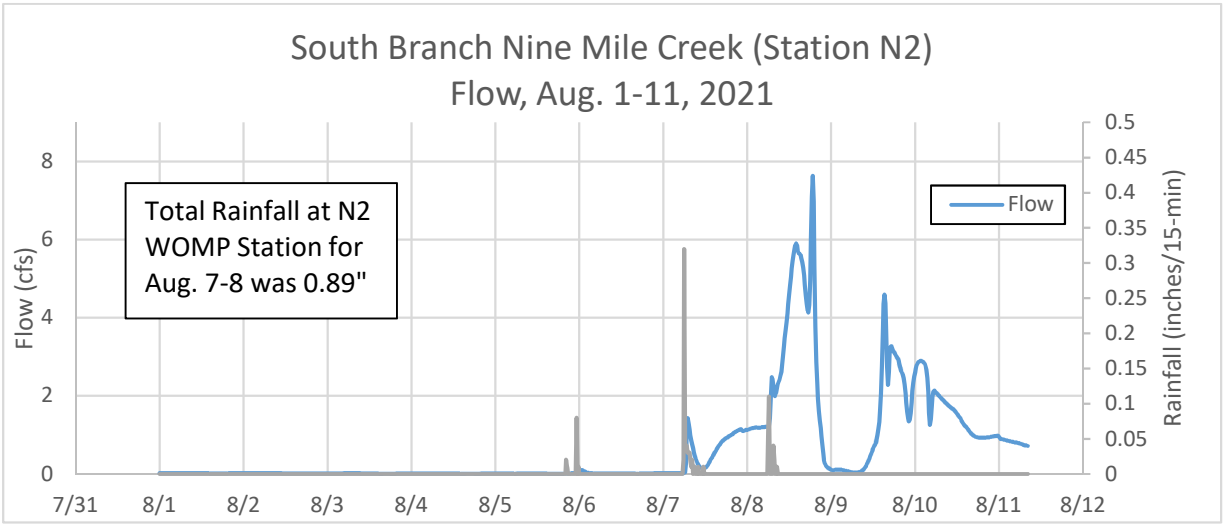
August may be higher than shown in the graphs below, as the flow rating curves (data relationship used to estimate flow based on depth measurements) may not have enough data points at such low depths to accurately estimate flow. For example, in the South Branch, flow depths at the beginning of August were approximately 0.2 feet, which likely corresponds to a flow of 0.5-1 cfs. Barr field staff hope to conduct additional manual flow measurements during low-flow conditions to improve the accuracy of the rating curve(s) at these low depths.

The dry weather conditions have also resulted in drops in lake levels in many cases, with lower lake levels hindering some monitoring efforts this summer. However, while generally lower than recent years, lake levels remain well above the low lake levels that occurred periodically in many lakes during 2012-2014. The maintained lake levels are, in part, a reflection of groundwater levels that remain relatively high. Historic lake levels observations for several locations through the end of July are shown in graphs below.





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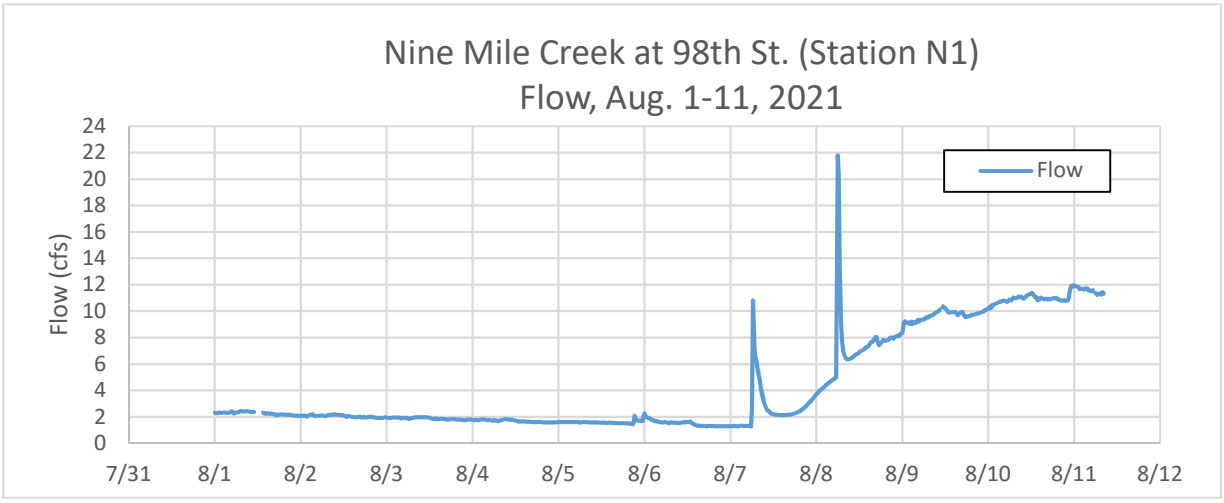

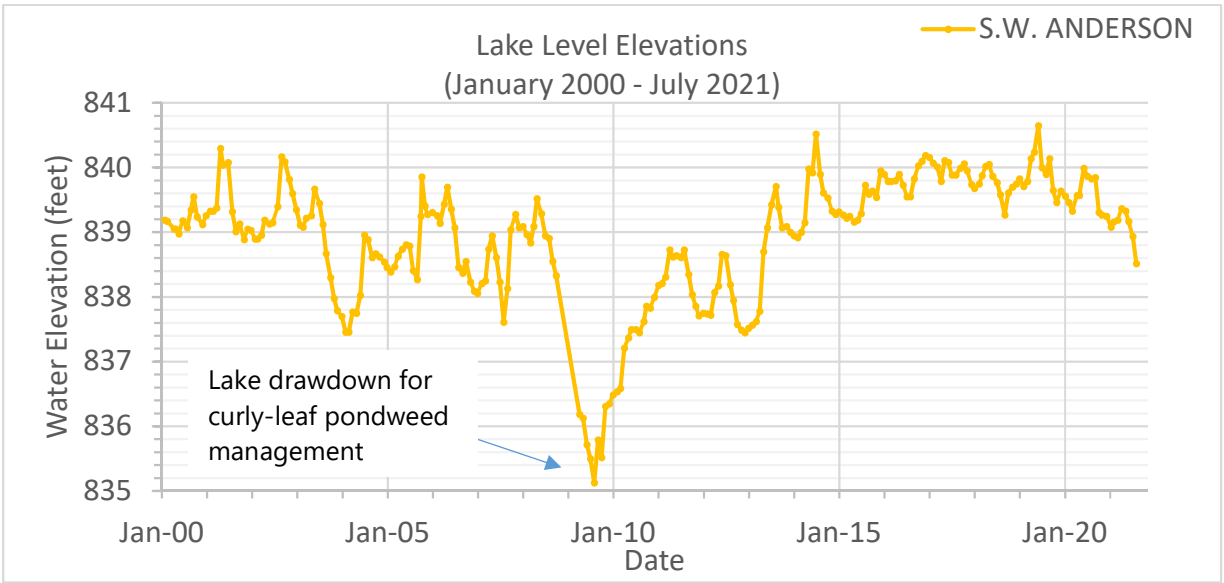

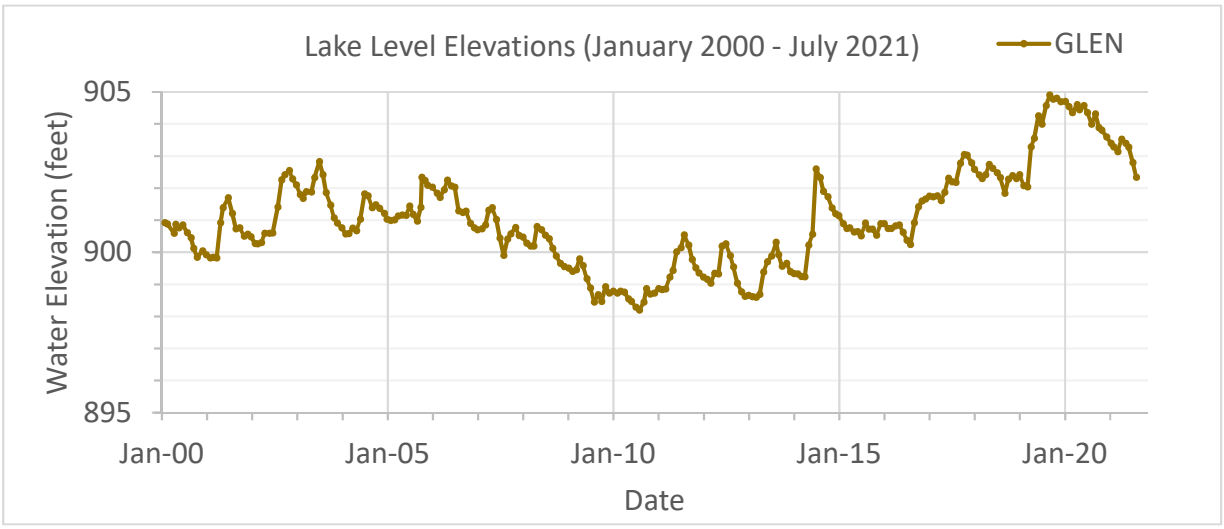

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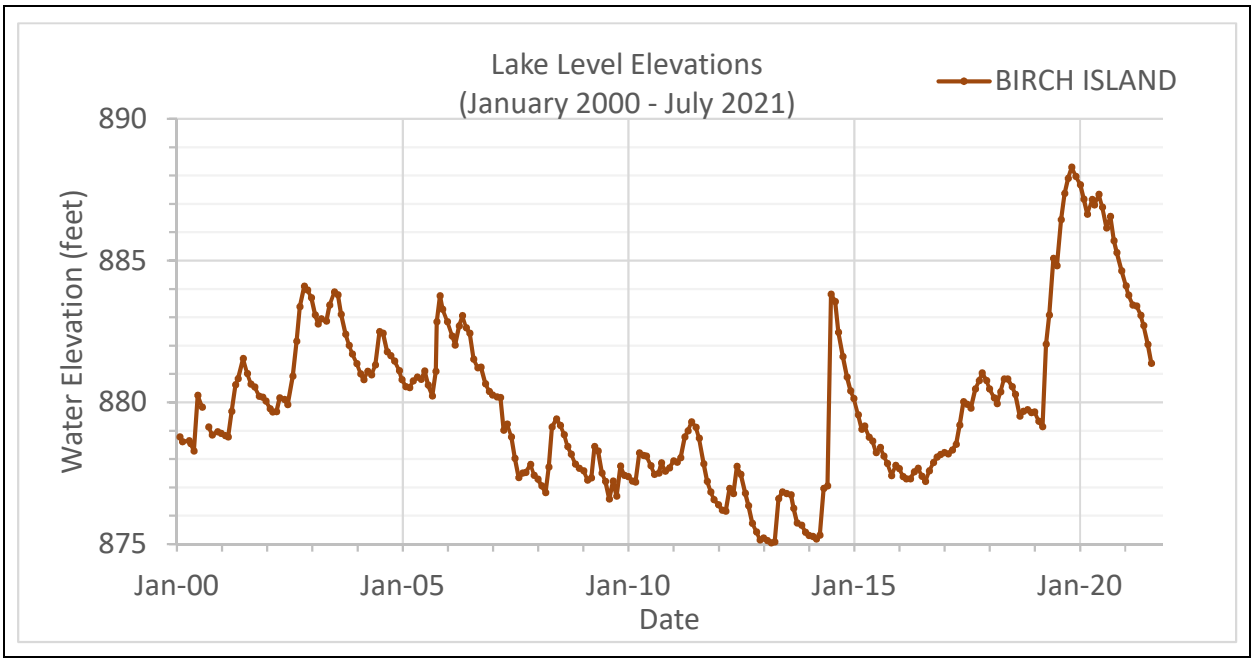

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engineering and environmental consultants

BARR

Memorandum

To: Nine Mile Creek Watershed District Board of Managers
From: Janna Kieffer, P.E. and Kurt Leuthold, P.E.
Subject: Rosland Park BMP Bids
Date: July 21, 2021
Project: 23271725.02
c: Randy Anhorn, NMCWD Administrator

Barr completed design of the Rosland Park BMP project in mid-June and the project was issued for bid on June 19, 2021. Bids were due on July 20, 2021. Five bids were received, with an apparent low bid of $1,213,660.95 from Pember Companies, Inc. Table 1 summarizes the five bids received in comparison with the Engineer's Opinion of Probable Cost.

Table 1. Summary of Bids Received for Rosland Park BMP Project

Contractor	Bid
Pember Companies	$1,213,660.95
St Paul Utilities	$1,241,358.00
Urban Companies	$1,286,368.00
Minger Construction Co. Inc.	$1,316,467.20
Lametti and Sons, Inc.	$1,569,295.00
Engineer's Opinion of Probable Cost	$720,768.00[1]

[1] Engineer's opinion of probable cost at 100% design was originally $742,000, but adjusted to reflect revised quantities based on an addendum issued on July 16, 2021.

As shown in Table 1, the project bids came in well above the engineer's opinion of probable cost. Most of the significant bid items were above the engineer's opinion of probable cost, with some significantly higher. The higher-than-anticipated bids likely reflect increased costs in the construction market due to high demand, material shortages and supply chain issues, labor shortages, and the unique/custom nature of the project, which can increase contractor uncertainty for certain bid items. The close proximity of the lowest three bids suggests that the bids received are a good representation of the cost to complete the project in the current construction market.

As identified at the November 2020 regular board meeting, the planning-level cost estimate for the current design concept was approximately $1,200,000, with a -15%/+20% range of $980,000 to $1,400,000. This estimated cost included a 30% construction contingency and an estimated 30% of

construction cost for engineering and design (see attached). Table 2 summarizes the total anticipated project costs based on the apparent low bid received, including construction contingency and engineering and design costs incurred to date and anticipated through construction completion.

Project Component	**Estimated Cost**
Construction bid (based on apparent low bid by Pember Companies, Inc.)	$1,213,661
Construction contingency (10%)	$121,366
Engineering and design, spent through 7/16/21[1]	$235,000
Construction observation and administration estimate[2]	$40,000
Total	$1,610,027

[1] Includes design, treatment media evaluation, permitting, bidding, and project administration generally following December 2020 board guidance to move forward with revised design concept 2a.

[2] Estimate based on assumption of 8 week construction schedule in fall 2021, with 4 weeks of intensive construction observation (4 hours/day, 5 days/week), 4 weeks of less-intensive observation, and 12 hours/week construction administration. Estimate also assumes 30 additional hours for project wrap up in spring 2022.

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**	SHEET:	1	OF	2
		BY:	KJN2	DATE:	11/6/2020
		CHECKED BY:	KAL	DATE:	11/13/2020
ENGINEER'S OPINION OF PROBABLE PROJECT COST		APPROVED BY:		DATE:	
PROJECT:	2020 Rosland Park Feasibility Design	ISSUED:		DATE:	
LOCATION:	Nine Mile Creek Watershed District	ISSUED:		DATE:	
PROJECT #:	23/27-1725.02	ISSUED:		DATE:	
OPINION OF COST - SUMMARY		ISSUED:		DATE:	

Engineer's Opinion of Probable Project Cost

DRAFT

Rosland Park Above Ground Filter

Scenario III (aka Scenario 2A) Feasibility Design (Treat Low Flows from Swimming Pool Pond, Treat flows from North Cornelia during dry conditions, discharge to North Cornelia)

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization (10%)	LS	1	$63,000.00	$63,000.00	1,2,3,4,5,6
B	Traffic Control	LS	1	$5,000.00	$5,000.00	1,2,3,4,5,6
C	Inlet Protection	Each	4	$250.00	$1,000.00	1,2,3,4,5,6
D	Orange Construction Fencing	LF	1,700	$5.00	$8,500.00	1,2,3,4,5,6
E	Silt Fence	LF	850	$4.00	$3,400.00	1,2,3,4,5,6
F	Street Sweeping	HR	20	$175.00	$3,500.00	1,2,3,4,5,6
G	Utility Relocation	LS	1	$5,000.00	$5,000.00	1,2,3,4,5,6
H	Clearing and Grubbing	LS	1.0	$4,000.00	$4,000.00	1,2,3,4,5,6
I	Excavation for Vault & Placement as Fill on site	CY	150	$20.00	$3,000.00	1,2,3,4,5,6
J	5 HP Pump, MH structure, electrical panel, and controls	Each	1	$100,000.00	$100,000.00	1,2,3,4,5,6
K	Power supply for pump	LF	350	$25.00	$8,750.00	
L	Aeration MH with internal pipes - 72" dia., 8' deep	LS	1	$10,000.00	$10,000.00	1,2,3,4,5,6
M	Area Drains,pipe and river rock for filter discharge (Nyloplast)	Each	3	$2,000.00	$6,000.00	1,2,3,4,5,6
N	Shallow Area Drain downstream of Area Drains (Nyloplast)	Each	1	$1,500.00	$1,500.00	1,2,3,4,5,6
O	Overflow MH - 72", 7' deep (connect to existing pipes)	Each	1	$9,000.00	$9,000.00	1,2,3,4,5,6
	MH - 48", 7' deep (North Cornelia 12" pipe)	Each	1	$6,000.00	$6,000.00	1,2,3,4,5,6
	Existing SPP Outlet Structure Modifications	LS	1	$50,000.00	$50,000.00	1,2,3,4,5,6
P	North Cornelia Pump Intake Debris Screen	Each	1	$8,700.00	$8,700.00	1,2,3,4,5,6
Q	12" Flexible Pump Intake Pipe in SPP	LF	0	$100.00	$0.00	1,2,3,4,5,6
R	12" Pump Intake pipe under parking lot	LF	120	$40.00	$4,800.00	1,2,3,4,5,6
S	Pump Discharge pipe to aertion MH	LF	20	$35.00	$700.00	1,2,3,4,5,6
T	12" Pipe from Aeration MH to Flow Distribution weir	LF	20	$35.00	$700.00	1,2,3,4,5,6
U	Flow spreader Weir/pipes into Vault	LS	1	$5,000.00	$5,000.00	1,2,3,4,5,6
V	Pipe to Ex CB - 12" PVC	LF	180	$30.00	$5,400.00	1,2,3,4,5,6
W	Connect to Existing CB	Each	2	$1,000.00	$2,000.00	1,2,3,4,5,6
X	12" Pipe from North Cornelia to Pump MH	LF	600	$40.00	$24,000.00	1,2,3,4,5,6
	12" Flexible Pump Intake Pipe in North Cornelia	LF	30	$100.00	$3,000.00	1,2,3,4,5,6
Y	3/4" Crushed Rock with Geotextile under vault (2 ft thick)	CY	150	$50.00	$7,500.00	1,2,3,4,5,6
Z	Reinforced Concrete - Slab (1200sf x 8")	CY	30	$1,000.00	$30,000.00	1,2,3,4,5,6
AA	Reinforced Concrete - 6" Walls (6' deep vault)	CY	24	$1,000.00	$24,000.00	1,2,3,4,5,6
BB	Reinforced Concrete - Footing	CY	20	$1,000.00	$20,000.00	1,2,3,4,5,6
CC	Vault Grate cover-FRP and cross supports	SF	1,200	$40.00	$48,000.00	1,2,3,4,5,6
DD	Vault Railing	LF	100	$150.00	$15,000.00	1,2,3,4,5,6
EE	6" CPEP underdrain and outlet pipe for Filter Cell	Each	3	$2,000.00	$6,000.00	1,2,3,4,5,6
FF	Drainage layer under filter- 6" depth Granular Filter Aggregate	CY	20	$80.00	$1,600.00	1,2,3,4,5,6
GG	Cell 1-CC17 Filter media (2 ft depth)	CY	27	$100.00	$2,700.00	1,2,3,4,5,6
HH	Cell 2-CC17 and Iron Filter media (2 ft depth)	CY	27	$120.00	$3,240.00	1,2,3,4,5,6
II	Cell 3-Spent Lime (total 3 ft depth)	CY	12	$100.00	$1,200.00	1,2,3,4,5,6
	Cell 3 - Pool Sand (total 3 ft depth)	CY	28	$850.00	$23,800.00	1,2,3,4,5,6
JJ	Concrete Wall Facing (105' x 5')	SF	525	$50.00	$26,250.00	1,2,3,4,5,6
KK	Curb and Gutter Installation	LF	100	$50.00	$5,000.00	1,2,3,4,5,6
LL	Remove and replace bituminous and agg base	SY	600	$60.00	$36,000.00	1,2,3,4,5,6
MM	Pond Shoreline Restoration	LS	1.0	$4,000.00	$4,000.00	1,2,3,4,5,6
NN	Turf Re-Establishment (Restoration)	SY	200	$5.00	$1,000.00	1,2,3,4,5,6
OO	Erosion Control Blanket	SY	200	$4.00	$800.00	1,2,3,4,5,6
PP	Backwash Vault System	LS	1	$60,000.00	$60,000.00	1,2,3,4,5,6
QQ	Backwash Piping and Valves	LS	1	$25,000.00	$25,000.00	1,2,3,4,5,6

				CONSTRUCTION SUBTOTAL	$683,000.00	1,2,3,4,5,6,7,8
				CONSTRUCTION CONTINGENCY (30%)	$205,000.00	1,2,3,4,5,6,7,8
				ENGINEERING AND DESIGN (30%)	$267,000.00	1,2,3,4,5,6,7,8
				ESTIMATED TOTAL CONSTRUCTION COST	**$1,155,000.00**	1,2,3,4,5,6,7,8
ESTIMATED ACCURACY RANGE		**-15%**			**$982,000.00**	5,8
		20%			**$1,386,000.00**	5,8

NN	Public Art	LS	1	$100,000.00	$100,000.00	1,2,3,4,5,6
				ADDITIONAL ITEMS SUBTOTAL	**$100,000.00**	1,2,3,4,5,6,8

Notes

[1] Limited design work completed (feasibility level)

[2] Quantities Based on Design Work Completed.

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

[4] Minimal Soil and Field Investigations Completed.

[5] This Design Level (Class 3, 10 - 40% design completion per ASTM E 2516-116) cost estimate is based on screening/conceptual discussion. 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 Construction Cost as the project is defined is -15% to +20%. 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] Estimated costs are for construction and do not include maintenance, monitoring, or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

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