

memo



Project Name | BCWD Annual Budget

Date | 8/02/2023

To / Contact info | BCWD Board of Managers

Cc / Contact info | Karen Kill, District Administrator

From / Contact info | Camilla Correll, PE and BCWD Team

Regarding | 2024 Budget Recommendations

Objectives

District staff has developed a list of potential activities for the BCWD Board of Managers to consider during its 2024 budget discussions. These activities reflect what the BCWD could undertake in 2024 and includes projects identified in the BCWD 2017-2026 Watershed Management Plan as well as initiatives identified in the BCWD Plan Amendment and the Brown's Creek Watershed Nine Key Element Bridge Document.

This list is intended to serve as a starting point for Board discussion recognizing that the BCWD Board of Managers will make the final determination on priorities for implementation in 2024.

Proposed 2024 Budget Recommendations

Potential activities are organized under the categories included in the BCWD 2017-2026 Watershed Management Plan as identified below. Only those categories with recommendations for implementation activities are included in this memorandum. Recommended activities that are not identified in the Watershed Management Plan (and would require a plan amendment prior to implementation) are *italicized* and marked "NEW". All of the recommendations are summarized in a table on the last page of this memorandum.

- Stormwater Runoff Management (see page 12 of the 2017-2026 WMP)
- Erosion, Prevention and Sediment Control (see page 17 of the 2017-2026 WMP)
- Stream Management (see page 20 of the 2017-2026 WMP)
- Lake Management (see page 25 of the 2017-2026 WMP)
- Wetland Management (see page 29 of the 2017-2026 WMP)
- Floodplain Management (see page 32 of the 2017-2026 WMP)
- Groundwater Management (see page 34 of the 2017-2026 WMP)
- Ecological Health (see page 41 of the 2017-2026 WMP)
- Monitoring and Data Collection (see page 46 of the 2017-2026 WMP)
- Regulations (see page 50 of the 2017-2026 WMP)
- Climate Change Adaptation (see page 54 of the 2017-2026 WMP)
- Education, Outreach and Stewardship (see page 59 of the 2017-2026 WMP)
- Land Conservation (see page 65 of the 2017-2026 WMP)

WATERSHED MANAGEMENT PLAN UPDATE

- BCWD Watershed Management Plan Update – The current watershed management plan was adopted in 2017 and is operational through 2026. In 2026, the BCWD will need to adopt its updated plan to reflect what it plans to accomplish in the next 10-year cycle (2027- 2036). To facilitate budget discussions for 2027, the BCWD will want the draft plan completed by June

Commented [KK1]: Summary:

Levy increase 2.6% (consistent with proposed 3% annual increase in approved ten-year management plan) = \$30,388 increase from 2023 to 2024

Total budget decrease by \$196K or -7.2% due to reduced total proposed spending in 2024

Internal services 6% of total budget and consistent with previous years

BCWD estimated market values increased 17.9% in past year, tax burden decreases 12.9% (= \$44.04 per \$100K of assessed valuation)

of 2026. As a result, district staff recommends initiating the planning process two years in advance of this date to allow for the plan development process (1+ years) and the formal review process (9 months). The BCWD has been setting aside \$25,000 annually to build the funds needed for the plan update.

Estimated cost: TBD – District staff is looking for Board direction on the scope of what it would like to address in the next 10-year watershed management plan (see BCWD Watershed Management Plan Update – Framework for Discussion).

STORMWATER RUNOFF MANAGEMENT

Includes *Monitoring and Maintenance of Stormwater Management Facilities*.

Operation & Maintenance Costs from CIP Standard Operating Procedures Manual (SOPM) – The costs in the following table reflect the anticipated annual cost from the CIP SOPM unless otherwise noted. Some of the District’s projects are approaching the age that require more substantial restoration or replacement than budgeted for annually, e.g., THPP and the IESF. The District may wish to begin planning for these additional costs in their annual budget.

Commented [KK2]: 903-0001927-0000

\$217K

See attached memo

-Assumed \$10K Enhanced Outreach plan completed in 2023

-Included DEI plan \$15K (see further in this memo under outreach)

Options to reduce budget:

-this assumes all options, can reduce options

-this provides all funding in 2024; however, could determine spread over 2025

Table 1. Projects that the BCWD has obligated maintenance activities through agreements

Project (Year Complete)	Anticipated Annual Cost
<p>THPP (Flood Mitigation - 2000) Annual inspection of structures (culverts and drop structures) and infiltration basins (when dry), inspection reporting, vegetation maintenance (spot treatments, weed whipping), prescribed burns. Create a video of how to open the gate valve and a QR code to access the information. Estimated cost for these activities is \$6,000.</p> <p>Per the THPP Trench Inspection Results memorandum presented at the May Board Meeting, EOR recommends testing the lower elevations of the infiltration basin following the protocols of a Level 2 Assessment that is used to determine infiltration capacity or rates. The cost to perform that work can be found in the following table and will take approximately 2 days to complete the field testing and 1 to 2 days to prepare a summary of the testing. This work will primarily be performed by a geotechnical testing firm using a Double Ring Infiltrometer or similar device. Estimated cost for these activities is \$6,500.</p>	\$12,500
<p>Kismet Basin (Flood Mitigation - 2001) Annual inspection of structures (culverts & drop structures) & reporting, vegetation maintenance (spot treatments, weed whipping).</p>	\$3,700
<p>State Highway 95 & 96 Fish Baffles (Habitat Improvement - 2011) Annual inspection & reporting.</p>	\$500
<p>Oak Glen Golf Course Buffer (Habitat Improvement - 2011) Biannual inspection & reporting.</p>	\$500
<p>Iron-Enhanced Sand Filter at Settlers Glen (Water Quality - 2013) (1) On-going remote monitoring with seasonal operation inspections. Coordinate pump performance inspection and vegetation maintenance with contractors (incl. estimated contractor cost), annual reporting & SOPM update - \$15,000; (2) Filter media replacement budgeting for 2025 - \$50,000</p>	\$65,000
<p>Countryside Auto Repair BMP (Water Quality - 2011) Inspections, clearing of debris, coordination of and including system vacuum cleaning of one underground tank and velocity checks (Tanks - Biennial, last conducted 2022).</p>	\$6,000
<p>Brown's Creek Floodplain Restoration Project (2014) Inspection, vegetation maintenance (mowing, invasive removal, re-plant/seed as needed).</p>	\$3,200
<p>Brown's Creek Park Rock Crib (Water Quality - 2017) Inspections, clearing of debris, coordination of and including system vacuum cleaning of one underground tank (Tanks -Biennial).</p>	\$3,700
<p>Long Lake Tributary Headcut Stabilization (Water Quality - 2018) Inspection & Reporting; vegetation maintenance and managing invasive species.</p>	\$3,600
<p>McKusick Road Water Quality Improvement Project Coordination of and including system vacuum cleaning of three underground tanks and eight sump manholes (Tanks -Biennial, last conducted 2022).</p>	\$24,700

Applewood Golf Course Reuse (Water Quality – 2022) <i>Operation and Maintenance activities.</i>	\$22,500
TOTAL	\$145,900

Commented [KK3]: 948-0000 CIP Maintenance

Table 2. Projects that the District has an interest in providing maintenance/oversight assistance

Project	Anticipated Annual Cost
<p>Norell Avenue Pond Water Quality Retrofit (2016) <i>Per the cooperative agreement, BCWD was responsible for inspections the first year following the retrofit and the City of Oak Park Heights will do inspections thereafter. The City’s MS4 permit is to cover maintenance needs for this pond. The District may wish to assist the City with inspecting the sediment depth to see that the pond sediment removal efficiency is maintained.</i></p>	\$500
<p>Indian Hills Golf Course Fen Vegetation Maintenance <i>BCWD is not responsible for the fen but has conducted this annually in the interest of maintaining the vegetation quality of this unique natural resource.</i></p>	\$4,000
<p>Oak Glen Golf Course Reuse Water Quality Project (2022) <i>The golf course is responsible for ongoing operation and maintenance (O&M). The District may consider keeping budget to see that O&M activities are being conducted. These can involve system startup and winterization guidance and coordination, monthly volume accounting end of year pump monitored volume summary (runoff reuse vs. well pumped) and update the O&M Manual.</i></p>	\$6,300
<p>Tributary Floodplain Restoration Project (2022) <i>Three years of site inspections and maintenance are currently under contract with Minnesota Native Landscapes through September 2024. However, the District may have an interest in conducting long-term operation and maintenance work such as vegetation maintenance and occasional prescribed burns. Native species seeded for the project are beginning to establish but regrowth of invasive species is likely without long-term management (i.e., spot treatments, prescribed burning, etc.).</i></p> <p><i>The District could also pursue the following types of management/restoration work along the tributary floodplain including:</i></p> <ul style="list-style-type: none"> - <i>Evaluate the banks that have more severe erosion issues to see if they self-heal as anticipated. If in the next couple of years, they aren’t improving this BCWD may want to go in and do something more active utilizing materials on-site (e.g., using harvested woody invasive species to create brush bundles for bank stabilization).</i> - <i>Pursue additional opportunities for invasive species management along the corridor. The project managed within 20-50 feet of the tributary but there is a lot of buckthorn beyond that buffer width. BCWD could use any additional budget to perform buckthorn removal outside of the buffer (e.g., similar to work completed for Millbrook buffer).</i> - <i>Could revisit the tributary repair work proposed downstream of the Jackson WMA. There is more work that could be done in this area.</i> 	\$1,000

<p><i>The headcut was a small component of the needs so additional work on this tributary would be beneficial.</i></p> <ul style="list-style-type: none"> - <i>Wetland downstream of Boutwell (between Boutwell and the rock checks installed by the BCWD previously) is also severely downcut and could benefit from an improvement which would bring the wetland elevation up. If there was landowner willingness, this would be a good spot for additional restoration activity.</i> 	
<p>Kittentail / Bluff Prairie Restoration Work Following initial invasive shrub & tree cutting within the approved MNDOT Highway Sponsorship Program project area in February 2022, EOR will continue to work with MNDOT, BCWD, and WCD as needed to conduct spot treatments of invasives and monitor re-sprouting of buckthorn within the bluff prairie.</p>	\$2,100
Brown's Creek Trail Vegetation Maintenance	\$2,400
Long Lake Shoreline Vegetation Maintenance	\$3,500
TOTAL	\$19,800

Commented [KK4]: 948-0000 CIP Maintenance...did not split out in budget in smaller categories

- **BCWD Cost-Share Program** - Expand participation in the BCWD's Cost-Share Program by targeting neighborhoods like Rutherford, Marylane Meadows, Gateway, BC Preserve to participate in a rain barrel program or a turf conversion which would offset the impact of additional (incidental) impervious coverage due to patios, decks, sheds, etc.
Estimated Cost: \$10,000 (assumption is 50 rain barrels at \$200 each)

Commented [KK5]: 914-0000 \$20K technical assistance WCD, \$30K cost-share funds

- **Chloride Source Assessment** - This assessment should include discussing road salt application with Washington County and local governments and performing a review of homeowners in the watershed that may use water softeners. As the Trend Analysis suggests, this assessment should be conducted watershed wide to address chloride loads to Long Lake and Brown's Creek. Water softener salt and road salt are the two largest sources of chloride in the Twin Cities Metropolitan Area.
Estimated Cost: \$2,500

Commented [KK6]: 964-0000...funds available in 2023 or carry forward

- **E. coli Source Reduction** - The BCWD has evaluated the sources of *E. coli* to Brown's Creek in the past. While evidence points to historic/naturally occurring sources of bacteria, the recommended action has been to continue private education to private landowners to reduce sources to Brown's Creek and coordination with Washington County. As the BCWD works towards its goal of improving stream health and increasing the number of access points along the creek, it may want to better understand the potential impacts of this water quality concern to public health and safety in this setting.
Estimated Cost: NA

Commented [KK7]: 947-0017... funds available in 2023 or carry forward

EROSION, PREVENTION AND SEDIMENT CONTROL

- **Brown's Creek Bluff Stability** - Both bluffs were surveyed in April 2021. Data analysis indicated further bluff erosion had occurred since 2016, particularly along the eastern bluff. EOR, BCWD, and DNR staff conducted a site visit in June 2021 to review site conditions and

discuss potential options for bluff stabilization. DNR staff are currently pursuing funding & developing draft design plans with a goal to implement a stabilization project in the fall of 2021 or spring 2022. The budget recommendation for 2024 includes time for EOR to assist with project design and construction plan reviews if requested by the MNDNR.

Estimated cost: \$2,500 (*This is already authorized in the 2023 budget – carry forward*)

STREAM MANAGEMENT

- Biological Assessment – The goals of BCWD’s routine fish and macroinvertebrate assessments are to develop a more robust understanding of the variability of species composition over time and to develop a long-term trend analysis of changes to the biological community in Brown’s Creek in response to on-going water quality projects implemented in the watershed.

At the May 2023 Board Meeting, Mike Majeski (EOR) and Joel Chirhart from MPCA reported on the improvements in stream health. During this presentation, the Board discussed the need to conduct macroinvertebrate sampling twice a year. The Board also discussed the changes to fish sampling given that a number of the local universities are no longer providing these services. The Board decided to reduce macroinvertebrate sampling to the collection of fall samples only.

Macroinvertebrate sampling will occur in September of 2024, and specimens will be sent to RMB Labs for taxonomic identification. The results of the assessments will be summarized in a brief technical memo that will include a comparison of 2024 data to previously collected data.

Estimated cost: \$4,000 (includes lab analysis of samples estimated at \$2,100)

Commented [KK8]: 947-0018

- Brown’s Creek Stream Restoration Project In January 2023, the Brown’s Creek Watershed District secured funding through a MPCA 319 grant to develop a 30% project design for the proposed Brown’s Creek Park Restoration Project. As part of the 30% design, EOR held a design charrette with MNDNR to discuss a preferred approach to address the degraded stream conditions within the project reach. It was agreed the design should prioritize reconnection of cutoff meanders, pattern adjustments to increase stream sinuosity, and grade control to reconnect the floodplain. Following the design charrette, EOR advanced the conceptual design and developed a 30% construction plan and cost estimate. A scope of services was prepared in July 2023 to advance the project through final design and implementation.

Estimated cost: \$90,400 (engineering fees)

Commented [KK9]: 947-0022
See memo from EOR 7-12-2023
Tasks 1-3 in 2023
Task 4 \$33,211 in 2024
Construction 2024 estimate \$430K

- Potential new project upstream of McKusick / HOA Reach - Geomorphic survey, data analysis, conceptual design and drafting, high-level construction cost estimate, and landowner outreach for project feasibility. Watershed to determine if they are interested in a project along this reach & how to fund it (watershed \$’s only, or grants like Brown’s Creek Park project). This area was second priority for restoration based on the SVAP / geomorphic assessments completed in 2022 that was recently presented to the Board in May 2023.

Option to reduce 2024 budget:
Determine amount not needed until 2025 and reduce accordingly



- **Estimated cost: \$20,000**
- **Routine drone flights of Brown's Creek** - A drone will be used to fly Brown's Creek from the headwaters wetland to Highway 95 / St. Croix to assess the corridor and to locate channel obstructions or areas of bank erosion. The flight will occur during base flow conditions and before leaf-out to maximize visibility of the creek banks. A continuous video will be developed for this reach with a summary of findings provided in the memo.
Estimated cost: \$4,700

Commented [KK10]: 947-0026 Brown's Creek Cove
Will receive additional \$320K grant in 2025, this will begin preparation for grant funds

Commented [KK11]: 959-0001

From BCWD Watershed Management Plan – Lower Priority Implementation Plan

- **Explore feasibility of using property adjacent to OGGC for location of large-scale rock crib** - During the McKusick Road water quality improvement project, the District explored the feasibility of constructing a rock crib on the downstream end of the system along Brown's Creek. While the District decided not to move forward with this component of the project, it did stub out a connection so that if the rock crib were constructed, stormwater collected along McKusick Road would be routed to the rock crib before discharging to Brown's Creek.
Before including the estimated cost of vetting this project further, District staff is interested in know if the Board is interested in proceeding with this project.
Estimated cost: TBD

Commented [KK12]: Did not include in budget
If interested, another potential option for MPCA 319 grant funds 2025

LAKE MANAGEMENT

- South School Section/ Lynch/Goggins Lakes - The Northern Chain of Lake WRAPS identified potential BMPs in the North - South School Section, and Lynch Lake watersheds through use of the PTMApp tool. The WPAPS prioritized BMPs in each lake watershed based on their cost effectiveness in terms of pounds of Phosphorus removed.

Lake Watershed	BMP Type	Cost Estimate Range	Effectiveness Estimate
North- South School Section	Six Sediment Basins	\$9K-\$30K	2 – 73 lbs P removal
Lynch Lake	Wetland Restoration, Sediment Basin, Grassed Waterway	\$2K - \$246K	2 – 125 lbs P removal
Goggins Lake			

These practices were prioritized and carried into the watershed management plan as being appropriate for the District’s cost share program. Individual projects were not carried into the WMP. No effort has been made to date to pursue these individual projects. An approach to actively pursue these projects would be to develop further schematic designs, update cost estimates and meet with interested landowners to determine interest and willingness to construct project. The existing BMP cost share program has a \$2,500 cap which would require landowners to potentially pick up a large portion of the project expense. Reviewing the cost share element of these practices may be necessary.

EOR will further investigate the feasibility & likelihood of landowner willingness of these potential projects prior to making any further recommendation.

Estimated Timeline: To be discussed at the August Board meeting

- Monitor for aquatic invasive species and implement controls as needed – BCWD has established a protocol for monitoring aquatic invasive species on School Section, Lynch, Goggins and Benz Lakes on 3 year interval. No sampling is scheduled for 2024.

Estimated cost: NA

- Regional Treatment Options in Long Lake Drainage Area
 - Marketplace Re-Use Next Steps (landowner coordination and concept design) – The analysis for stormwater harvesting and reuse in the Marketplace drainage area has been completed. EOR has drafted the report and presented the findings to the City of Stillwater for review and comment. Brett Emmons, EOR will present the findings at the July Board meeting. District staff would like the Board to provide direction on next steps at the July Board meeting before developing a cost estimate. District staff will plan to revisit this budget item at the August Board meeting.

Commented [KK13]: Community meeting scheduled for later in 2023
Did not include funding in 2024 budget

Estimated Cost: To be discussed at the August Board meeting.

- 62nd Street Pond Flood Risk Reduction Cost Share - The Long Lake flood evaluation conducted in 2020 identified a lack of freeboard from the 100-year event at the nearby Long Lake Villa buildings. The city worked with BCWD to determine flood risk reduction options in 2023 and anticipate contracting the work in 2024. This budget amount is for cost-sharing of the project and any on-going coordination that is needed.

Estimated Cost: \$15,000

- Local Long Lake Improvements - The 2017-2026 Watershed Management Plan identifies a number of potential water quality improvement projects in the Long Lake drainage area. Since Long Lake is so close to being delisted, it is recommended that the BCWD continue to monitor the lake water quality data and revisit the need for a water quality improvement project if there is a change in the trend analysis.

Estimated Cost: No additional cost at this time.

- Brewers Pond Drainage Area BMP Assessment - Water quality has been declining in Brewers Pond and erosion issues have been identified along the storm sewer outfall from Northland Avenue. Northland Avenue and Court both drain to Brewers Pond without any stormwater treatment. This feasibility study will involve reviewing treatment options along the street as well as within the drainage and utility easement for the storm sewer corridor to Brewers Pond. Initial steps will involve utility investigation, topographic survey of select areas, and soil exploration, as needed. The City of Stillwater will be engaged to gather background information and discuss potential partnerships.

- **Estimated Cost: \$15,000**

WETLAND MANAGEMENT

- Mendel Wetland - Given the 2021 drought, and lack of data, groundwater monitoring was carried through 2022. Provision for further restoration concept refinement and associated cost-benefit analysis and/or landowner engagement is recommended for 2023 (\$31,500 estimated for 2023 budget).

Estimated Cost: To be discussed at the August Board meeting.

FLOODPLAIN MANAGEMENT

- Hydrologic and Hydraulic Model Update - Since the BCWD will be starting its next Plan update in 2024, it is recommended that the District complete the following model improvements District-wide to inform the plan development process:

- Update Climatology and Precipitation Data (34 hrs/\$6,180):

The current model was last updated in 2015 and has climatology data e.g., temperature, wind speed, and other observations needed to estimate

Commented [KK14]: 929-0012
\$42K Chloride Monitoring
\$183K Feasibility

Options to reduce budget:
-reduce monitoring to fewer ponds (save \$30K)
-complete only some of feasibility tasks in 2024, spread out to 2025

Commented [KK15]: 962-0000 District-wide Ponds
Planning/Implementation

Commented [KK16]: 961-0000
Assumed \$12K spent 2023
Assumed \$35K cost for 2024

Limited data was available by 8/3/2023 - more information will be available by the board meeting workshop

evapotranspiration, and rainfall data from 2005 through 2014. In the 2024 update, we propose to update the climatology and rainfall data to include the most recent complete year available at the time of the update. In addition, we propose to use distributed rainfall data from bias-corrected rainfall. The benefits of this improvement include:

- Longer time series available to simulate a wider range of conditions when conducting feasibility studies and designing BMPs
- Improved model accuracy from distributed rainfall as precipitation can vary greatly throughout the Brown's Creek watershed.
- Update Model due to Permitted Activity (190 hrs/\$24,520):

Since the last model update, 166 permits were approved by the District. EOR has identified 30 permitted activities with changes that should be included in the District's model to maintain the model's usefulness. In the 2024 update we propose reviewing the as-built plans for these and incorporate the land use changes, BMPs, and pipe or other conveyance changes. The benefits of this improvement include:

 - Maintaining model accuracy as the watershed continues to develop and change and,
 - Improved understanding how future proposed projects impact recently developed areas in future planning, feasibility, and design projects.
- Refine and Update Storage and Depressions (44 hrs/\$5,590):

The current model includes DNR public waters and BMPs up to 2015 using the 2-foot contour data that was available at the time (smoothed lines based on 3-meter square resolution). EOR proposes using the new LiDAR data (expected available in 2024) to refine storage throughout the model. The new higher resolution data will better define flood storage for closed depressions and BMPs in the watershed. The benefits of this improvement include:

 - An improved understanding of areas in the watershed that do not discharge runoff,
 - More refined flood footprints and mapping near infrastructure, also
 - Many small closed depressional areas are important to maintain flows and water quality in the watershed.
- Update Subcatchment Boundaries and Hydrologic Parameters (44 hrs/\$5,590):

The current model was built before high-resolution land cover data was available. Therefore, hydrologic parameters such as the percent impervious were approximated using less accurate aerial imagery. In addition, many subcatchments in the model will need to be adjusted to account for new developments which the new LiDAR data can help in automating as well. In the 2024 update, EOR proposes using new high-resolution land cover data, also planned to be available in 2024, to adjust model subcatchments and parameterize the hydrologic parameters in the model to more accurate and updated values. The benefits of this improvement include:

 - Maintaining model accuracy as the watershed develops and,
 - A more accurate impervious percentage estimate throughout the watershed which is a significant driver of runoff volume and peak flows.
- Model Calibration and Validation (88 hours/\$14,040):

Model calibration and validation is a process where model results are compared to observed data within the watershed and model parameters are adjusted to ensure the model predicts flows similar to observed conditions. Calibration is required with any major model update to correct for uncertainties inherent in the input data and in the model calculation methods. In the 2024 model update, EOR proposes to calibrate and validate the model using two recent warm season periods.

- Report (100 hrs/\$15,810):
The project deliverable is expected to be the updated model and a model update report summarizing the improvements to the model.
 - Project Meetings, Project Management, Quality Control (90 hrs/\$15,820)
- Model Update Total Cost (590 hrs/\$87,550)**

Additional Optional Model Enhancements

- Groundwater Modeling (104 hrs/\$17,100):
In the 2015 model update, no groundwater modeling was included except for adding a monthly baseflow timeseries into the model at select locations. The model report suggested that including the PCSWMM groundwater module in the model would improve the model accuracy as the model struggled to simulate the receding limb of a large storm event used for calibration and underestimated flow volume in the stream. An optional task included in the 2024 model update is to add groundwater modeling which includes parameterizing aquifer parameters. The groundwater module more accurately accounts for the storage and release of the infiltrated water and how this flow interacts with lakes and streams. The benefit of adding groundwater modeling component to the model include:
 - e
- Snowmelt and Multi-year simulation (94 hrs/\$15,080)
The current standard for using the BCWD model is looking at one warm season period. An optional task EOR proposes for the 2024 model update in addition to adding groundwater above is to add snow accumulation and snow melt into the model. Unlike most Watershed Districts, the BCWD has the WOMP monitoring station which monitors flow throughout the year and provides the data needed to calibrate a model through the winter. The benefits of including snow melt and snow accumulation and a multi-year simulation includes:
 - Expanded model ability to look at snow melt driven flooding events and evaluate early spring flooding driven by rainfall with lingering effects of snowmelt and,
 - Expanded model capability to evaluate questions in the watershed requiring a long term view such as projects that may change runoff volume in the stream or water levels in closed basins or lakes.
- Future Extreme Precipitation (85 hrs/\$13,390)
Evaluate Impacts Related to Climate Change driven extreme precipitation – There are a number of methods for simulating the impacts of climate change as it relates to precipitation and extreme rainfall events. For example, the University of Minnesota has developed down-scaled precipitation data which can be used to estimate the

Commented [KK17]: 923-0000 H& H model update

Included all “additional option model enhancements” below.

\$87,550
\$17,100
\$15,080
\$13,390
\$18,160

Total = \$151K

Combined with flood risk assessment budget 923-0002 as several of these tasks accomplish that goal

Options to reduce budget:
Spread out over 2025 (but would be best to complete early 2024 to inform management planning)
Reduce optional enhancements

impacts of climate change mid- and end-of century. It has also become a common practice to use NOAA's precipitation frequency estimates with 90% confidence interval to represent more extreme (future) design events. It will be important to evaluate these scenarios as part of the watershed management planning process to better identify at-risk portions of the watershed in order to evaluate climate adaptation and resilience strategies. EOR will simulate three future design storm scenarios based on the current state of the science.

o Storm Transposition (106 hrs/\$18,160)

A relatively new approach to evaluate flooding within a community in conjunction with design storm analysis is storm transposition. Storm transposition is the process of moving a major storm event that caused significant damage in a nearby community to a different community to evaluate the impact. In the 2024 model update an optional task is to transpose a major storm included in the DNR's website Historic mega-rain events in Minnesota to the BCWD. The benefit of storm transposition include:

- Simulates real-world rainfall distribution that may show different flooding vulnerabilities than the typical design storm distribution,
- Being an actual event that occurred may resonate with stakeholders such that they are more likely to believe it can happen to them since it's not hypothetical,
- It doesn't rely on future climate projections. The climate we currently have is capable of producing the storm.

- o 2D Evaluation in Market Place - Review of the Atlas 14 100-year rainfall event in the Long Lake drainage area revealed flooding concerns around stormwater ponds within this urban area of the subwatershed. The modeled flood footprints will result in road overtopping along County Road 5, Washington Avenue, the Trunk Highway 36 Frontage Road, and Curve Crest Boulevard. The pond flooding footprints have impacted re-development decisions near the Lakeview Medical ponds and Washington Avenue Pond, e.g., Curio Dance Permit 23-10, future Lakeview EMS service center garage. Model refinements are required to better characterize the flood extent, the timing of this potential flooding, and overflow routes. It is recommended that a 2-dimensional hydraulic model be created for discrete portions of the Marketplace Area. This will allow the District to conduct a more thorough analysis of the flood risk and create visualization tools which will help the City, local businesses and residents better understand potential for flooding in this portion of the subwatershed. The Stillwater storm sewer GIS data does not contain comprehensive information for model construction. Surveying and updating the GIS with as-built information is assumed to be accomplished by the City of Stillwater or assumptions can be made within the model for invert and pipe slope. The accuracy of these parameters is less important when the objective is flooding review since storm sewer systems are often designed for the 10-year event and larger events result in overland and street flow. In addition to model construction, visualizations such as inundation mapping, reporting, and presentations to District staff, Board, and city are

assumed. Next steps will be identified, though iterations of proposed improvements would be part of a future phase.

Sub-Total Estimated cost: \$33,500

- Flood Risk Assessment – By intersecting the flood extents with other spatial datasets the BCWD can evaluate the consequences of flooding in order to prioritize the issues and opportunities. For instance, a dataset representing low-income areas and another dataset showing the areas with high infrastructure costs can be superimposed to show the areas in which flooding would have the highest social and economic impact.

Estimated cost: To be discussed at the August Board Meeting.

Commented [KK18]: See H&H Model update

GROUNDWATER MANAGEMENT

Groundwater Level Measurements

- Annual Groundwater Level Measurements - EOR recommends that BCWD continue to collect groundwater levels from its network of residential and golf course wells once every year. By sponsoring this data collection effort over several years, BCWD has started to accumulate a significant database of changing groundwater elevations over time in different aquifers and in different parts of the district. This data has been helpful in documenting and understanding the very low baseflow observed in Brown's Creek in 2013 and the extraordinarily high water levels experienced in Kimbro Basin in 2020. The data has also been useful in calibrating the regional groundwater model produced by consultants for 3M. The key value to this data has been the consistency in data collection and the duration of the data set.

Estimated cost: \$4,000

Commented [KK19]: 942-0004

Groundwater Coordination

- Continue to participate in the North and East Metro Groundwater Management Area Plan project advisory team.
- Provide government agencies with new information so that the North and East Metro Groundwater Model can be updated. DNR and Met Council continue to revise and improve the model. Working with their consultants to add BCWD data to the DNR model will help in the future when BCWD is ready to create a groundwater model that focuses on Brown's Creek.
- Continue to participate in meetings held by the Metropolitan Council to discuss the groundwater model being used to investigate the impacts of climate change on TCMA groundwater levels.
- Continue to investigate the effect of high volume pumping wells on Brown's Creek. This could include reviewing pumping records from Oak Glen golf course wells (and the new stormwater reuse system) and the City of Stillwater wells. Pumping records would be compared to changes in groundwater levels recorded in DNR observation wells and in stream piezometers (if installed in 2023).

- Continue discussing the possibility of installing other observation wells as part of MNDNR's Observation Well Program.

Total Estimated Cost: \$8,000

Commented [KK20]: 942-0011
Reduced these activities to \$4K

Assumes \$20K for Oak Glen GW Management Plan – scope still forthcoming in September

EOLOGICAL HEALTH

Items addressing ecological health are located elsewhere in the 2023 Budget Recommendations memorandum.

MONITORING AND DATA COLLECTION

- Weather Station - Continue collecting climatology data in 2023. This information is being collected to support a variety of District programs such as hydrologic and hydraulic model upgrades and calibration (which require 15-minute precipitation data), thermal modeling efforts, and other projects including the Settlers Glen iron-enhanced sand filter, THPP, and the Biological Monitoring Program. Recommend calibrating precipitation logger and making any replacements to sensors if needed.

Estimated cost: \$3,700

Commented [KK21]: 957-0000

- THPP Monitoring - The BCWD has committed to monitoring the THPP on a 3-year cycle and the last monitoring effort was completed in 2021. As a result, it is recommended that the District budget for the installation of 3 level loggers to monitor infiltration rates at the Basin 1-3 complex, as well as a temperature logger at the THPP outlet to record temperatures during discharge events. This budget include the cost to prepare a memorandum summarizing the data.

Estimated cost: \$6,500

Commented [KK22]: 903-0001

- Comprehensive Stormwater Structure Inventory - The Management Plan includes an estimated cost of \$20,000 to develop a comprehensive stormwater structure inventory database, combining and categorizing all surveyed structures with available structure data from the communities within the District. Washington County is in the process of inventorying the stormwater structures, though a completion date remains unknown. Oak Park Heights recently became an MS4 community in which the Stormwater Pollution Prevention Program requires storm sewer mapping and waterbody inventorying. It is recommended that the District's Stormwater Structure Inventory follow the completion of the community datasets. However, this may be a more valuable initiative if it were to expand county-wide which is perhaps more appropriately led by Washington County with input from all communities, watershed districts and organizations. District staff will plan to meet with Washington County to explore the need to create a clearinghouse for establishing and maintaining a centralized stormwater structure atlas.

Estimated cost: TBD (pending conversations with Washington County and Water Consortium)

Commented [KK23]: Did not include in budget

REGULATIONS

Rule Review

- Rule Revisions – As the District continues to implement its rules, it evaluates the how well the rules are understood and applied via the permitting program. The following topics have been flagged for further discussion and potential modifications to the rule language:
 - Consider changes to the rule language to allow mitigation without exacerbating onsite flood risk.
 - Evaluate simplifications to permitting and permitting thresholds to ensure we are balanced in our effort and treatment of properties (e.g., Single Family Residential) and make revisions as identified.
 - Application of pretreatment standards (currently only applies to infiltration practices).
 - Evaluating chloride management plan requirements.
 - Consider formalizing a treatment-in-lieu of requirement (e.g., something similar to Nine Mile Creek WD).
 - Evaluate how to address soil decompaction/soil amendment implementation concerns.
 - Address smaller rule language clean-up issues.

Estimated cost: \$30,000

Commented [KK24]: 909-0000

CLIMATE CHANGE ADAPTATION

See the activities identified as part of the H/H model update.

EDUCATION, OUTREACH AND STEWARDSHIP

EMWREP Activities

- Groundwater Education - Develop and implement an expanded education program for citizens and public officials on the interaction between groundwater and surface water, why water levels are so high, the value of and need to protect groundwater recharge areas and wetlands, and implementation of BMPs and LID and redevelopment strategies to protect groundwater resources.

Estimated cost: NA

- Diversity, Equity, and Inclusion (DEI) Visioning –The Brown’s Creek Watershed District (BCWD) is situated in a prime location for recreation, land stewardship, and economic development. To enhance the capacity and value of BCWD’s services and to unify the community as new changes arise, EOR recommends the BCWD develop an equity framework in advance or in tandem with the Flood Risk Assessment and the WMP Update. An equity framework will equip the BCWD with tools and knowledge to achieve the following:

- meet people where they are at,

- remove barriers that are unique to those in and around BCWD's borders,
- develop flexible policies and programs based on need, and
- implement more equitable and targeted programming strategies

Development and application of an equity framework requires taking the following actionable paths (a number of which the Board has discussed and budgeted for in previous years):

- Diversity, Equity, and Inclusion (DEI) Training (included in the 2023 budget)
- Characterizing Diverse Needs in the BCWD (included in the 2023 budget)
- Creating an Equity Framework (recommendation for the 2024 budget)
- Expanding the District's Network / Partnership Development (recommendation for 2025 budget)

Estimated cost: \$15,000

Commented [KK25]: Included in 927-0000 Management Plan

- HOA Maintenance Support – EOR to provide engineering support to address the questions people have regarding maintenance of stormwater BMPs and how to create the materials needed to provide education and outreach re: maintenance. This may include support for an annual HOA conference.

Estimated cost: \$15,000

Commented [KK26]: 910-0000 Education and Outreach

EMWREP received grant 2023 for HOA maint needs survey and an intern to assist in developing materials. This budget would supplement those efforts.

- Flood Management Program – While the discussion of Flood Management will be important to revisit as part of the watershed management plan update, the District may want to budget for those items identified during the BCWD Plan Amendment discussions which took place in 2022:

- Develop outreach and guidance materials (or make existing materials available) related to flood-risk management. (Assume \$2,500)
- Develop a request for proposals template for homeowners seeking engineering design and construction services. (Assume \$4,000)
- Provide technical assistance to homeowners experiencing or at risk of flooding. (Assume \$2,500 each instance)

Estimated Cost - \$15,750

Commented [KK27]: 923-0002 Flood Risk Assessment

LAND CONSERVATION

- Evaluate Resource Protection Needs - Review and revise land protection corridors and priorities to reflect current resource protection needs.

Estimated cost: \$20,000

Commented [KK28]: 935-0003

- Acquisition of Easements – The BCWD has been setting aside funds for the potential acquisition of property as the opportunity arises (e.g., acquisition of the property at 110th street in partnership with Washington County). The District currently has \$100K in its budget for a future acquisition and should plan to grow this by \$50K annually.

Estimated cost: \$50,000

Commented [KK29]: 935-0000

- Easement Restoration – The BCWD has an easement over the property at 110th Street which is called the Brown’s Creek Conservation Easement. In 2017 the District developed the Brown’s Creek Conservation Area Management plan which identifies restoration activities for this easement. The following budget amount builds the funds available for larger restoration efforts slated for the future.

Estimated cost: \$25,000

Commented [KK30]: 935-0002

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