

Project Name | BCWD 2024 H&H Model Update and Keystone Ave N. Survey**Date** | 10/5/2023**To / Contact info** | BCWD Board of Managers**Cc / Contact info** | Karen Kill / BCWD Administrator**From / Contact info** | Ryan Fleming, PE & Alec Olson**Regarding** | Scope of Services for Phase 1 of the BCWD H&H Model Update

Background

The Brown's Creek Watershed District hydrologic and hydraulic (H&H) model has been maintained as a "living model" since 2004, meaning the model is updated when new information such as hydraulic structure survey and land altering development data becomes available. Since the last major update to the model in 2015, several changes within the watershed have occurred which require updating the model to provide the most accurate assessment of rainfall runoff characteristics and impacts in the watershed. These updates ensure the model contains the latest information available to assess existing conditions to provide technical assistance to communities and developers within the BCWD.

The 2024 budget recommendation memorandum included several tasks associated with updating the BCWD's H&H model to assist in planning and policy decisions toward drafting the next generation of the watershed management plan. Some of the proposed updates rely upon datasets that are not yet available, such as new LiDAR elevation and land cover data that is expected to be out in 2024. In the interest of expediting working toward having a current model, this scope includes tasks for which the information is readily available. This model update is phase 1 of the larger effort to bring current the BCWD's H&H model.

In September, a group of residents in the Goggins Lake watershed contacted Washington County and BCWD to express their concern with how runoff has eroded, and has been ponding on, their properties over many years. Drainage from these properties flows to the historically flood prone northern chain of lakes (School Section and Goggins Lakes). EOR is proposing to include the first step in understanding the issue which is to survey the flow paths, culverts, and depressions through the properties, and compare the information with what is in the current H&H model. If deemed necessary, the survey results will be included in a future model update.

The following is a scope of services to conduct Phase 1 of updating the BCWD H&H model and to perform the drainage survey at 13015, 13093, and 13131 Keystone Ave N in Hugo, MN in the northern region of the BCWD.

Scope of Services

1. Update Climatology and Precipitation Data

The current model has rainfall and climatology data (temperature, wind speed, and other observations needed to estimate evapotranspiration) from 2005 through 2014. We propose to update the model climatology and rainfall data library to include the growing season data collected at the BCWD's weather station, as well as recent complete year data at nearby bias-

corrected gauges using as-it-happened radar data to ready the model for multi-year continuous simulations. The benefits of this improvement include:

- Longer timeseries available to simulate a wider range of conditions when conducting feasibility studies and designing BMPs.
- Improved model accuracy from using distributed rainfall as precipitation can vary throughout the Brown's Creek watershed.
- Potential to calibrate the model over multiple years, including snow accumulation and snow melt conditions.

2. Update Model Hydraulics

Since the last model update in 2015, approximately 170 permits have been approved by the BCWD. EOR has identified thirty developments with significant changes that should be included in the BCWD H&H model. This will be to maintain the model's useful function for simulating current conditions and maintaining an up-to-date inventory of hydraulic structures throughout the BCWD. In this update, we propose reviewing the as-built plans for each permitted project and incorporating 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.
- Improved understanding how future proposed projects impact recently developed areas in future planning, feasibility, and design projects.

These developments are listed in Table 1 below.

Table 1: List of development permits

Project Name	Permit Number	Project Name	Permit Number
Stillwater Readiness Center	13-19	Boutwell Farm	18-04
Stillwater Fire Hall	14-05	Hazel Place	18-05
CSAH 15 Roundabout	15-03	Nottingham Village	18-06
CSAH 12 Improvements	15-04	Ridgecrest	18-11
Brown's Creek Cove	15-07	St Croix Valley Rec Center	18-14
Meridian Cedar Ridge	15-08	Marylane Ave Drainage Improvements	18-16
Heifort Hills	16-03	Marylane Meadows	19-01
Pizza Ranch	16-07	CSAH 15 BC Culvert	19-06
Brackey 4th Addition	16-08	TC Orthopedics	20-03
Kwik Trip	16-18	TH36_CSAH15 Interchange	20-08
Senior Living	17-04	Oak Glen Reuse	20-15
Parkwood Townhomes	17-14	Marylane Gateway	21-13
Oak Park Commons	17-16	Liberty Academy	22-07
West Ridge	17-17	Caribou	22-10
Heifort Hills Estate	18-02	Lakes of Stillwater Phase 3	23-13

3. Drainage Survey at 13015, 13093, and 13131 Keystone Ave N, Hugo, MN

- Field Survey -
 - Site topographic survey of area culverts, drainage ways, localized overflows and general storage features sufficient to identify and characterize drainage in the area.
- Data Analysis and Drainage Exhibit -
 - Review survey data to delineate subwatersheds and determine concentrated drainage routes and storages.
 - Draft exhibit & discuss with Administrator.

Summary of Tasks

Task	Description	Estimated Hours	Estimated Cost
1	Update climatology and precipitation data with radar rainfall processing	36	\$6,180
2	Update model hydraulics	190	\$24,520
3	Drainage survey at 13015, 13093, and 13131 Keystone Ave N, Hugo, MN 55038	28	\$4,840
4	Project management, coordination, documentation, and quality control	45	\$7,860
Totals		299	\$43,400

Requested Action

Consider approval of scope of services for an estimated cost of \$43,400 from account #_____.

Note, tasks 1, 2 and 4 are consistent with the 2024 budget recommendation memorandum presented to the Board during budget planning meetings. Task 3 addresses work requested after the Board's budget planning meetings occurred.