The following review of the above mentioned project located within the legal jurisdiction of the Brown’s Creek Watershed District (BCWD) was conducted to determine compliance with the BCWD rules for purposes of the engineer’s recommendation to the Board of Managers for its determination of the permit application.

Applicant: Hagstrom Builder

Permit Submittal Date: June 22, 2020

Completeness Determination: June 22, 2020

Board Action Required By: August 22, 2020

Review based on BCWD Rules effective April 1, 2020

Recommendation: Approval with conditions

GENERAL COMMENTS

The Hawkins residential construction project is proposed at 9694 75th Street North on a 28.1 acre parcel, approximately 2000 feet west of Keats Avenue North, on the north side of 75th Street North (CSAH 12) in the city of Grant. There is an existing gravel road extending into the property with no other improvements. There are ten wetlands throughout the parcel, and it is located in a subwatershed that contributes to a landlocked basin (does not have a natural outlet at or below the water elevation of the 10-day precipitation event with a 100-year return frequency). Five of the wetlands receive stormwater from the proposed development on the parcel. No disturbance is proposed in the catchment areas of the remaining five wetlands.

The project involves widening, extending, and paving of the gravel road, construction of a house, septic system, patio, pool, barn, and landscaping (Figure 1). The total proposed disturbed area is 2.7 acres, of which 0.6 acres (26,000 square feet) will be impervious. Stormwater will be managed by three rain gardens.

Recommendation: The BCWD Engineer recommends approval with the conditions listed herein.
Figure 1: Proposed Hawkins Residence
Rule 2.0—STORMWATER MANAGEMENT

Under 2.2(b)ii of the rule, the project triggers the application of Rule 2.0 Stormwater Management because greater than 10,000 square feet of impervious surface is proposed. The project does not propose disturbance of the existing gravel drive (though it will be paved and expanded), therefore the criteria apply only to the net additional impervious surface and disturbed areas on the project site. This project is outside of the Diversion Structure Subwatershed and was reviewed for compliance with the criteria in Rule 2.4.1 (a).

The project involves disturbance of 2.7 acres with a net addition of 0.6 acres of impervious. The disturbed areas will be de-compacted and vegetated to restore the soil structure and permeability which have been accounted for in the stormwater analysis according to Rule 2.5.1.

The property is located on the western BCWD hydrologic divide, with 24.7 acres draining to the northeast, into the BCWD, and 3.4 acres draining to the southwest, out of the BCWD. (The site – and all disturbance and proposed impervious area – is within BCWD's jurisdiction.)

Three rain gardens are proposed to manage stormwater for the project.

*Note, the storage volume label for Rain Garden #3 is incorrect and should be revised from 3,663 cubic feet to 663 cubic feet. The Rule 2.0 analysis is based on the correct Rain Garden #3 volume of 663 cubic feet.*

Rate Control

According to BCWD Rule 2.4.1(a)(i), an applicant for a stormwater management permit outside the Diversion Structure Subwatershed must demonstrate to the District that the proposed land-altering activity will not increase peak stormwater flow from the site, as compared with the pre-settlement condition, for a 24-hour precipitation event with a return frequency of two, 10, or 100 years for all points where discharges leave the site.

☒ Rule Requirement Met

*HydroCAD modeling of pre-settlement and post-project site conditions was used to analyze rate control. A comparison of the modeled peak flow rate at both discharge locations is included in Table 1 and Table 2. The results demonstrate that the proposed project meets the rate control standard.*

<table>
<thead>
<tr>
<th>Event</th>
<th>Pre-settlement Runoff Rate (cfs)</th>
<th>Proposed Runoff Rate (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-year (2.80&quot;)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>10-year (4.16&quot;)</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>100-year (7.20&quot;)</td>
<td>5.0</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Table 2 - Peak Discharge Rates (Northeast – Driveway and House)

<table>
<thead>
<tr>
<th>Event</th>
<th>Pre-settlement Runoff Rate (cfs)</th>
<th>Proposed Runoff Rate (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-year (2.80”)</td>
<td>0.9</td>
<td>0.2</td>
</tr>
<tr>
<td>10-year (4.16”)</td>
<td>2.3</td>
<td>2.0</td>
</tr>
<tr>
<td>100-year (7.20”)</td>
<td>6.2</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**Volume Control**
According to BCWD Rule 2.4.1(a), an applicant for a stormwater management permit outside the Diversion Structure Subwatershed must provide volume control equaling the 5-year, pre-settlement runoff within a landlocked basin or a subwatershed draining to a landlocked basin.

☐ Rule Requirement Met

The applicant submitted soil boring data to support the design depth and time to draw the water down in the rain gardens. Runoff will be pretreated through the grass prior to discharging to the rain gardens.

**HydroCAD modeling of pre-settlement and post-project site conditions was used to analyze volume control to both discharge points from the property. The comparison of the modeled volumes in Table 3 demonstrates that the volume control standard is met.**

**Table 3 - 5-Year, 24-Hour Event Discharge Volume Comparison**

<table>
<thead>
<tr>
<th>Discharge Location</th>
<th>Pre-settlement Volume (ft³)</th>
<th>Post-Development Volume (ft³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southwest</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Northeast</td>
<td>9,674</td>
<td>5,388</td>
</tr>
</tbody>
</table>

**Pollutant Loading**
According to BCWD Rule 2.4.1(a)(iii), an applicant for a stormwater management permit outside the Diversion Structure Subwatershed must demonstrate to the District that the proposed land-altering activity will not at the downgradient property boundary or to an onsite receiving waterbody, increase annual phosphorus loading as compared with the pre-development condition.

☐ Rule Requirement Met

The Minimum Impact Design Standards (MIDS) Calculator was used to demonstrate compliance with Rule 2.4.1(a)(iii). Modeling for each drainage area is presented in Table 4.

The annual phosphorus loading is reduced for drainage leaving the property to the northeast and no change in phosphorus loading is anticipated to the southeast. The impact of widening the driveway to the on-site wetlands was reviewed. The District Engineer finds that the change in phosphorus loading from 0.03 to 0.04 pound per year is well within the margin of error inherent in the MIDS calculator. The post-project phosphorus load will be unchanged to the wetlands.
**Table 4 - Annual Phosphorus Loading**

<table>
<thead>
<tr>
<th>Discharge Location</th>
<th>Pre-development (lbs)</th>
<th>Proposed (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>0.20</td>
<td>0.03</td>
</tr>
<tr>
<td>Southeast</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>On-site Wetland # 3, 5, 7 (each)</td>
<td>0.03</td>
<td>0.04</td>
</tr>
</tbody>
</table>

**Lake/Wetland Bounce**

According to BCWD Rule 2.4.1(a)(iv), an applicant for a stormwater management permit outside the Diversion Structure Subwatershed must demonstrate to the District that the proposed land-altering activity will not increase the bounce in water level or duration of inundation, for a 24-hour precipitation event with a return frequency of two, 10, or 100 years in the subwatershed in which the site is located, for any downstream lake or wetland beyond the limit specified in Appendix 2.1.

☐ Rule Requirement Met

*Wetlands 3, 5, 7, 8 and 10 receive stormwater from the developed portions of the project.*

*HydroCAD modeling of existing and proposed conditions indicates that Wetlands #8 and #10 will receive less volume of stormwater and at a lower discharge rate from the proposed development than the existing condition (up to the 100-year event). Wetlands 3, 5 and 7 receive the same amount of runoff under existing and proposed conditions for events up to the 100-year event. By exceeding the Stormwater Rule Standards, and retaining more volume on site for the 100-year, 24 hour event, the flow to the wetlands will not bounce them higher, nor will the duration of inundation exceed the limits specified in Appendix 2.1.*

**Maintenance**

According to BCWD Rule 2.6, all stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed. Permit applicants must provide a maintenance, inspection and, if required, monitoring plan that identifies and protects the design, capacity and functionality of onsite and offsite stormwater management facilities; provides specifications, methods and a schedule for the inspection and maintenance in perpetuity of the facility, with documentation retained onsite and available to the District on reasonable notice; and contains at a minimum the requirements in the District’s standard maintenance declaration. The maintenance plan will be recorded on the title in a form acceptable to the District.

☐ Rule Requirement Met with Conditions

*The District Engineer does not find that a monitoring plan is reasonably necessary for the proposed stormwater facilities. However, the applicant did not provide a maintenance declaration which is a permit requirement.*
**Rule 2.0 Conditions:**

2-1. Provide a draft maintenance declaration for the rain gardens for District review and approval, then documentation of recordation after approval.

2-2. Provide a revised construction plan correcting the label on Rain Garden #3 from 3,663 cubic feet to 663 cubic feet.

**Rule 3.0—EROSION CONTROL**

According to BCWD Rule 3.2, all persons undertaking any grading, filling, or other land disturbing activities which involve movement of more than fifty (50) cubic yards of earth or removal of vegetative cover on five thousand (5,000) square feet or more of land shall submit an erosion control plan to the District, and secure a permit from the District approving the erosion control plan. The proposed project triggers the application of Rule 3.0 Erosion Control because more than 5,000 square feet of vegetative cover will be removed for construction, thus triggering the Rule.

☐ Rule Requirements Met with Conditions

The erosion and sediment control plan includes the following:

- Silt fence along the edge of project area
- Rock construction entrance
- The applicant supplied a restoration and maintenance plan for the floodplain mitigation areas and road embankment involving six inches of organic topsoil, native seed mixes, and yearly weed and invasive species control. The District Engineer concurs that this approach will meet the requirements of paragraph 3.2.2(m), as applicable to the floodplain mitigation areas and road embankment.

To meet the criteria of BCWD Rule 3.2, the erosion and sediment control plan must include:

- Revised erosion control plan addressing the following (BCWD 3.2.2).
  - Inclusion of project implementation schedule timing erosion and sediment control measures first and that the rain gardens will be protected from construction sediment
  - Perimeter protection of rain garden areas (fencing, biolog, or other measure) to prevent impacts such as compaction or siltation during construction
- Provide a landscaping plan addressing the following (BCWD 3.2.2 (m)).
  - Specification of seed mixture and erosion prevention measures (blanket, mulch, etc.) to be used for disturbed area restoration (other than the floodplain fill mitigation areas).
  - Specification for rain garden planting (plants, plugs, mulch, etc.)

The following conditions must be addressed in the erosion and sediment control plan to comply with the District’s requirements:

**Rule 3.0 Conditions:**

3-1. Update Erosion Control Plan with revisions as required in comments above.

3-2. Provide a landscaping plan
Rule 4.0—LAKE, STREAM, AND WETLAND BUFFER REQUIREMENTS
According to BCWD Rule 4.2, buffers are required on land that is adjacent to Brown’s Creek or other applicable water resources and is subdivided or subject to a new primary use.

☐ Rule Not Applicable to Permit. *The property has not been subdivided or subject to a new use since 2000. This project does not require subdivision or rezoning of land adjacent to Brown’s Creek or other water resources. Therefore, this rule is not triggered.*

Rule 5.0—SHORELINE AND STREAMBANK ALTERATIONS
According to BCWD Rule 5.2, no person may disturb the natural shoreline or streambank partially or wholly below the ordinary high water mark of a waterbody, without first obtaining a District permit.

☐ Rule Not Applicable to Permit. *There are no proposed shoreline or streambank alterations.*

Rule 6.0—WATERCOURSE AND BASIN CROSSINGS
According to Rule 6.2, no person shall use the beds of any waterbody within the District for the placement of roads, highways and utilities without first securing a permit from the District.

☐ Rule Not Applicable to Permit. *There are no proposed watercourse or basin crossings. The driveway passes several wetlands but does not cross any of them.*

Rule 7.0—FLOODPLAIN AND DRAINAGE ALTERATIONS
According to Rule 7.2, no person shall alter or fill land below the 100-year flood elevation of any waterbody, wetland, or stormwater management basin, or place fill in a landlocked basin, without first obtaining a permit from the District. No person shall alter stormwater flows at a property boundary by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet, without first obtaining a permit from the District.

☐ Rule Requirement Met with Conditions

*The project involves the filling of land below the 100-year flood elevation of four of the wetlands in order to widen the driveway from 10 feet wide to 14 feet wide. The District Engineer concurs with the applicant’s engineer, Charles Plowie Sr., PE, calculation that 31 cubic yards of material will be placed in the existing floodplain of the wetlands. In turn, 31 cubic yards of material will be excavated at the same elevation, in an adjacent area of the wetlands to mitigate the floodplain filling, thus meeting 7.3.1 required criteria for floodplain filling.*

According to Rules 7.3.2 & 7.3.3, all new and reconstructed buildings must be constructed such that the lowest floor is at least three feet above the 100-year high water level or one foot above the natural overflow of a waterbody, open stormwater conveyance, or constructed basin within a landlocked basin. The calculated 100-year high water level of landlocked wetland #10 is 1000.5 feet. The highest overflow for the constructed rain gardens is 1030.0 feet.

*The construction plan Site Grading Note #1 states “No lowest floor elevation determined. Consult watershed or engineer to determine if lowest floor elevation needs further analysis.” The construction plan also includes proposed building floor elevations of 1031.0 (Barn), 1032.0 (House), and 1024.0 (Lookout). The required separation from the rain garden overflow is met for the house and barn. The*
grading plan includes positive slope away from the foundation where the lookout is proposed in which case flow from the rain garden will not intersect the building. Due to the 23.5 foot separation between the waterbody high water level and the elevations on the plans, it is presumed that it is reasonably certain that the three-foot separation standard is met for the landlocked wetland. However, documentation of the lowest floor must be included in the plans.

**Rule 7.0 Conditions:**

7-1. Update the construction plan to include the building lowest floor at an elevation of 1003.5 or higher and remove Site Grading Note #1.

**Rule 8.0—FEES**

Fees for this project as outlined below:

1. Rule 2.2b Stormwater Management $3,000  
2. Rule 3.0 Erosion Control - grading 1.0 – 4.99 acres $1,250  
3. Rule 7.0 Floodplain and Drainage Alterations $500

**TOTAL FEES**  
$4,750

**Rule 9.0—FINANCIAL ASSURANCES**

Financial assurances for this project are as outlined below:

1. Grading or Alteration (2.49 acres disturbed x $2,000/acre) $4,982  
2. Stormwater Management Facilities (125% of Rain gardens) $43,715

**Rule 10.0—VARIANCES**

According to BCWD Rule 10.0, the Board of Managers may hear requests for variances from the literal provisions of these rules in instances where their strict enforcement would cause undue hardship because of circumstances unique to the property under consideration.

No variances have been requested

**RECOMMENDED CONDITIONS OF THE PERMIT:**

The following is a summary of the remaining tasks necessary to bring the project into compliance with the BCWD Rules in all respects other than where variances are requested as discussed above:

1. Address all stormwater management requirements (Conditions 2-1 & 2-2).  
2. Address all erosion control requirements (Condition 3-1 & 3-2).  
3. Address all floodplain & drainage alteration requirements (Condition 7-1).  
4. Replenish the fee deposit to $4,750 (BCWD Rule 8.0). If the permit fee deposit is not replenished within 60 days of receiving notice that such deposit is due, the permit application or permit shall be deemed abandoned and all prior approvals shall be revoked and collection proceeding shall begin on unpaid balances.  
5. Provide the required financial assurances (BCWD Rule 9.0):  
   a. Total grading or alteration assurance ($4,982)  
   b. Stormwater management assurance ($43,715)
STIPULATIONS OF APPROVAL:

1. Note that the permit, if issued, will require that the applicant notify the District in writing at least three business days prior to commencing land disturbance. (BCWD Rule 3.3.1)

2. Provide the District with demonstration, such as photographic documentation, of de-compaction and incorporation of compost for all disturbed soils.

3. Provide the District with As-built record drawings showing that the completed grading and stormwater facilities conform to the grading plan.