memo

Project Name |	BCWD Permit 23-17 Sundance Townhomes	**Date** |	12/11/2023
To / Contact info |	BCWD Board of Managers		
Cc / Contact info |	Ryan Sailer, Timberland Partners ; Dan Sjoblom, PE / Alliant Engineering		
Cc / Contact info |	Karen Kill, Administrator / BCWD		
From / Contact info |	Camilla Correll, PE / EOR; John Sarafolean, EOR; Paul Nation, PE / EOR		
Regarding |	Permit Application No. 23-17 Engineer's Report		

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: Ryan Sailer, Timberland Partners[1]
Permit Submittal Date: *11/15/2023*
Completeness Determination: *11/22/2023*
Board Action Required By: *1/21/2024*
Review based on BCWD Rules effective April 1, 2020
Recommendation: Approve with Conditions

GENERAL COMMENTS

The applicant proposes a 17-unit multifamily townhome redevelopment on 22.83 acres in Stillwater. The project will include subdivision of five existing parcels into one; demolition of five existing single-family homes, re-grading of the entire property; construction of the townhomes and a central clubhouse; and construction of infrastructure, including bituminous roads and a stormwater-management system, along with establishment of buffer areas. The city has granted preliminary plat approval for the proposed project.

Existing Conditions: The project is located to the southeast of the intersection of Manning Avenue North and 80th Street North. The project area consists of five parcels with existing homes – a total of 2.16 acres of existing impervious area, along with wooded and prairie areas, and a manage 2 wetland complex located on the south end of the property. The south central tributary of Brown's Creek runs through the wetland complex which extends beyond the site; a total of 4.57 acres of the project site is wetland.

Proposed Conditions: The Sundance Townhomes redevelopment consists of multifamily housing townhomes, bituminous roadways, and stormwater management features (Figure 1). Stormwater

[1] The applicant has secured authorization to apply for the BCWD permit from current property owners.

from the newly created impervious surfaces will be treated by two wet sedimentation basins, stormwater reuse for irrigation, and bioretention facilities planted with trees. Storm sewer outfalls from the wet sedimentation basins(wet ponds) will convey storm water runoff to the existing wetland complex as it does under existing conditions. The project will disturb 19.16 acres, including all existing impervious, and the total proposed impervious area is 9.36 acres. With the disturbance of 50 percent or more of existing impervious surfaces onsite, subsection 2.4 of the BCWD rules applies to all impervious surfaces and disturbed areas on the project site.

Recommendation: The BCWD engineer recommends that the Board approve the application with the conditions outlined in the report.

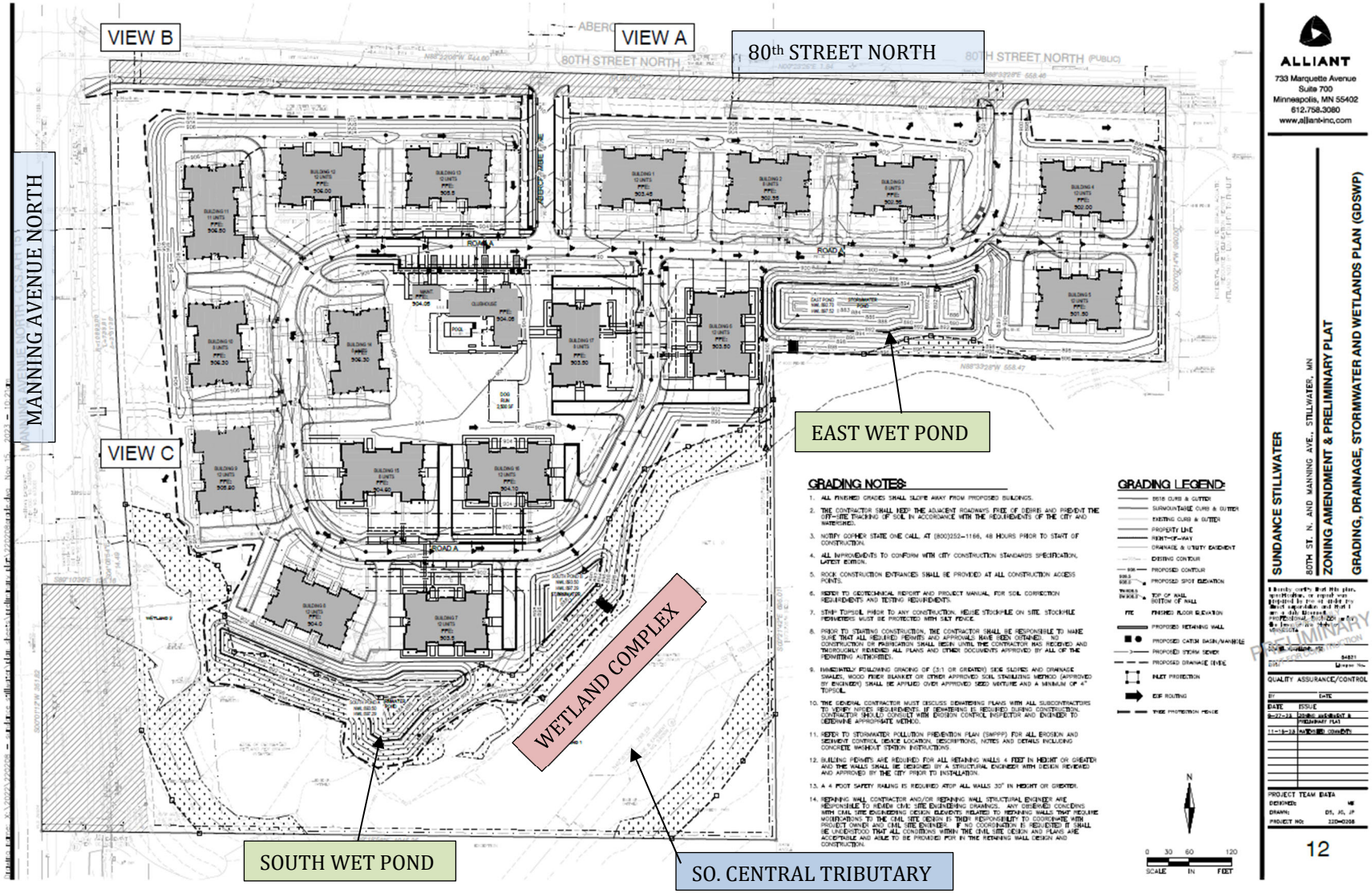

Figure 1: Site Plan

Rule 2.0—STORMWATER MANAGEMENT

Under 2.2(b) of the rules, the proposed project triggers the application of Rule 2.0 Stormwater Management because it creates one or more acres of new and/or reconstructed impervious surface. The site is located within the Diversion Structure Subwatershed, so the stormwater criteria in subsection 2.4.1(b) apply.

The stormwater management plan for the project includes:

- *Two wet ponds to provide rate control and water quality treatment.*
- *Stormwater reuse for irrigation across 5.88 acres of the redevelopment to provide volume control.*
- *Replacement planting of 192 trees with the requisite storage to allow for evapotranspiration.*

*Existing drainage from the site consists of three drainage areas: west, central, and east (*Figure 2*). The drainage areas are 4.22 acres, 15.84 acres, and 2.73 acres respectively. Under existing conditions, the stormwater runoff from the site sheet flows to the wetland complex located along the southern portion of the site. Under proposed conditions, these drainage areas are combined into two drainage areas: north and south, the drainage areas are 10.63 acres and 12.16 acres respectively (*Figure 3*). Stormwater runoff is discharged from the site to the wetland complex via storm sewer from the two wet ponds.*

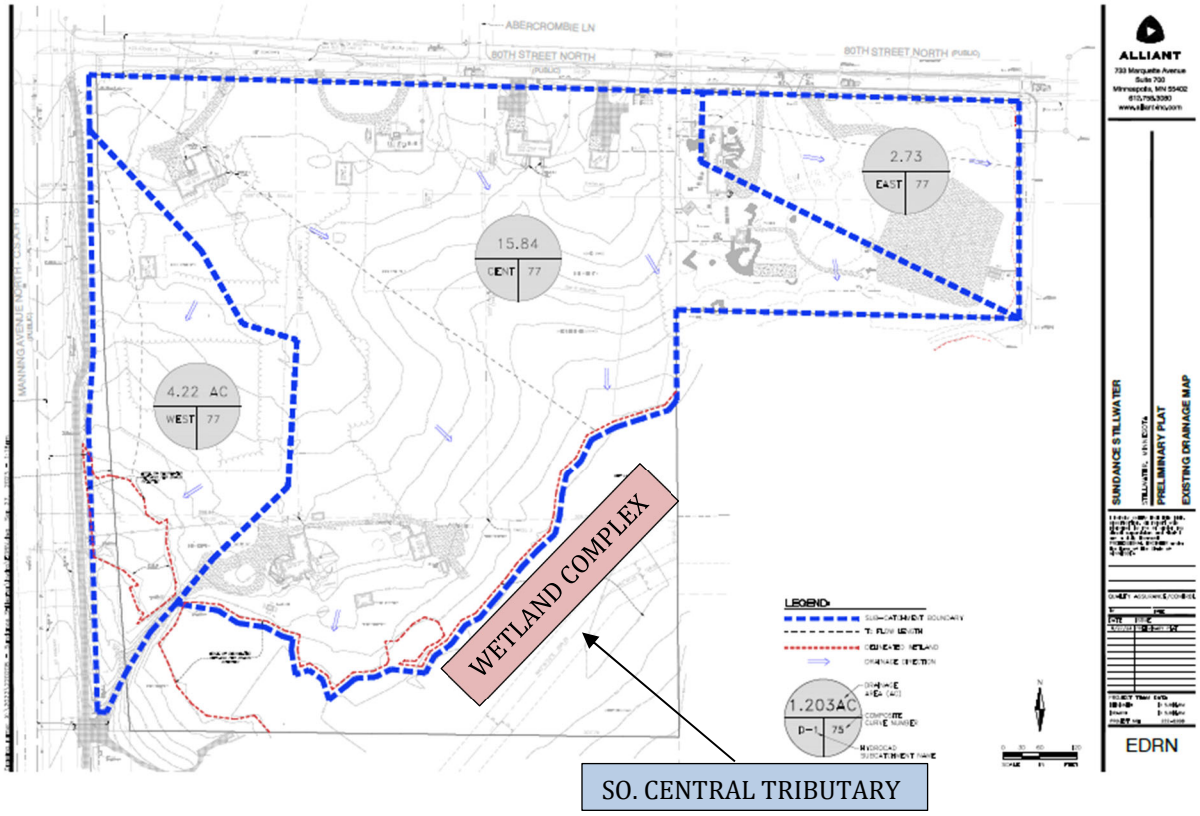

Figure 2: Existing site drainage

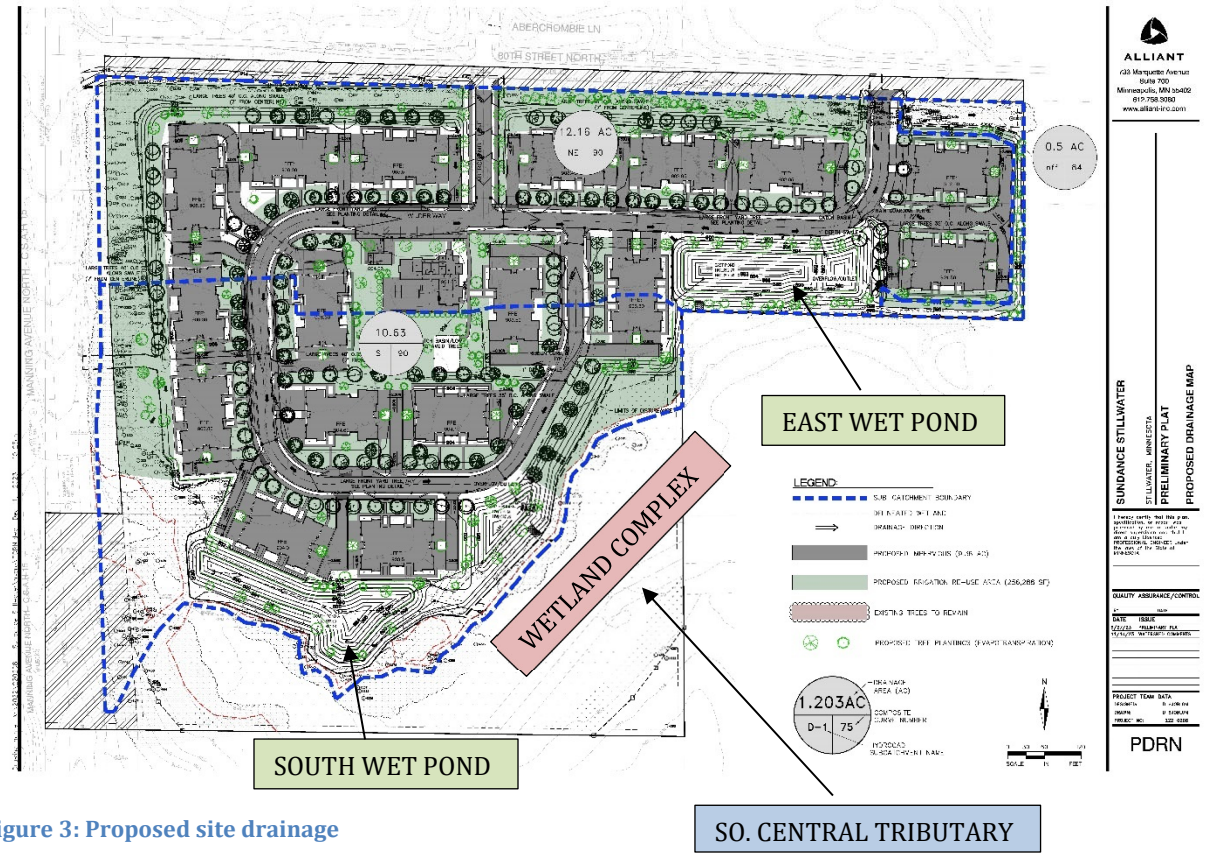

Figure 3: Proposed site drainage

Rate Control

According to BCWD Rule 2.4.1(b)(i), an applicant must submit a stormwater-management plan providing no increase in the existing peak stormwater flow rates from the site 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 with conditions.

The stormwater management plan developed for the site was evaluated using a HydroCAD model of existing and post-development site conditions. A comparison of the modeled peak flow rate is included in Table 1 and Table 2.

Table 1 – Peak Discharge Rates East

The existing east discharge point is now the northeast offsite discharge point under proposed conditions.

Event	*Existing (cfs)*	*Proposed* (cfs)*
2-year (2.80")	3.7	.06
10-year (4.17")	7.8	1.9
100-year (7.23")	18.2	3.8

Table 2 – Peak Discharge Rates South

The existing central and west discharge points are combined to create the south discharge point under proposed conditions. This includes the south pond and east pond outlets.

Event	*Existing (cfs)*	*Proposed* (cfs)*
2-year (2.80")	21.4	5.1
10-year (4.17")	45.9	29.6
100-year (7.23")	107.2	80.1

**Proposed runoff rates will be lower than what is included in tables 1 & 2 because the abstraction for the tree planting areas was not included in the HydroCAD model.*

Volume Control

According to BCWD Rule 2.4.1(b)(ii), an applicant must submit a stormwater-management plan providing retention onsite of 1.1 inches of stormwater volume from the regulated impervious surface.

A geotechnical evaluation for the site confirmed the information provided in the Washington County geologic atlas, that the area is a former glacial lake predominantly consisting of clay deposits. The soil

borings show that most of the soils fall in hydrologic soil group D. The applicant explored alternative methods for achieving volume control as described in the analysis below. Given this, the applicant asserts, and the BCWD concurs, that it is not reasonably feasible to meet the 2.4.1(b)(ii) standard of retention onsite of 1.1 inches of stormwater volume from the regulated impervious surface, and the flexible treatment options in subsection 2.4.3 apply to determine the volume-control (and water-quality) requirements for the project: "... management of volume and water quality from the regulated impervious surface [must be provided]in accordance with the following priority sequence:

(a) Retention onsite of 0.55 inches of runoff and removal of 75 percent of the annual total phosphorus loading;

(b) Retention onsite of stormwater volume to the maximum extent Brown's Creek Watershed District Rules 15 practicable and removal of 60 percent of the annual total phosphorus loading.

☒ Rule Requirement Met with conditions.

Alternative volume control options summarized in Table 3 were evaluated to identify how much volume control could be provided onsite. The applicant proposes the following practices to provide volume control:

1. ***Evapotranspiration*** *(ET) from 192 newly planted trees incorporated as part of the landscaping plan. Stormwater runoff from the buildings will be directed to 11-foot diameter by 0.5-foot deep circular depressional storage surrounding the base of planted with trees that will utilize that stormwater runoff for evapotranspiration. Evapotranspiration was calculated using guidance provided by the Minnesota Pollution Control Agency and accounts for 8,096 cubic feet (CF) of volume control. One of the assumptions made in calculating the volume-control achieved from ET is that the vegetation is 100% mature, which will not be the case for the first five to 10 years.*
2. ***Interception*** *from 192 newly planted trees incorporated as part of the bioretention facilities on site. Using the interception calculation from the Minnesota Pollution Control Agency, the newly planted trees will provide 1,808 CF of volume control.*
3. ***Stormwater Reuse*** *from the development will be sourced from the two wet sedimentation basins onsite and used for irrigation on 5.88 acres of the development. The reuse system will provide 11,330 CF of volume control.*

As Table 4 demonstrates, the stormwater management plan exceeds the 0.55 inch requirement in 2.4.3 FTO(a).

Table 3 – BMPs Evaluated

BMP	Evaluated?	Utilized?	Why or why not?
Infiltration	Yes	No	Hydrologic soil group HSG D
Harvest and Reuse	Yes	Yes	Irrigating all available green space across the site (see figure 3)
Green Roofs	Yes	No	Buildings have pitched roofs which aren't conducive to green roofs.
ET/Tree Trenches	Yes	Yes	Utilizing ET with 192 tree plantings by creating depressional storage for uptake.
Interception	Yes	Yes	Utilized with the 192 tree plantings.
Permeable Pavers/ Pavement	Yes	No	Hydrologic soil group HSG D

Table 2 – Summary of Volume Requirements for Rule 2.

Volume Control Requirement	*Required Volume (CF)*	*Provided Volume (CF)*	*% of Required Volume*
2.4.3(a) FTO (a) *0.55" over 9.36 acres*	18,687	21,234	113%

As Table 2 demonstrates, the stormwater management facilities will achieve (or exceed) the Flexible Treatment Option of 0.55 inches of retention on site. The trees planned to be planted along the roadway will address more than stormwater management and serve to address urban heat island effect, air quality, noise pollution and wildlife habitat needs.

Infiltration Pretreatment

According to BCWD Rule 2.5.2 surface flows to infiltration facilities must be pretreated for long-term removal of at least 50 percent of sediment loads.

☐ Rule Not Applicable to Permit. *There are no infiltration practices proposed.*

Water Quality

According to BCWD Rule 2.4.3, an applicant must submit a stormwater-management plan providing retention of 0.55 inches of runoff and removal of 75 percent of the annual total phosphorus loading.

☒ Rule Requirement Met.

Through the use of wet ponds and stormwater reuse by irrigation, the development meets the BCWD water quality requirement in 2.4.3(a). The wet ponds are designed to the Minnesota Stormwater Manual Design Level 3 Wet Ponds to meet removal requirements of: total suspended solids = 90%, particulate

phosphorus = 90%, and total phosphorus = 60%. Combining the wet ponds with the stormwater reuse by irrigation system, the BMPs remove: total suspended solids = 94% and total phosphorus = 76%. Again, these water quality treatment calculations do not reflect the volume reduction provided by evapotranspiration which will result in greater water quality treatment.

Lake/Wetland Bounce

According to BCWD Rule 2.4.1(b)(iii), an applicant must submit a stormwater-management plan providing no increase in 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

The wetland complex on site is adjacent to the south-central tributary to Brown's Creek. This wetland does not contain depressional storage and has a positive grade to the tributary which carries stormwater runoff further downstream. As such, there will be no increase in bounce and inundation as water routed to the wetland passes through the system and travels downstream via the south-central tributary.

The Manage 2 wetland complex has a permitted bounce for all storm events of pre-development bounce plus 1 foot. To demonstrate compliance, the increase in stormwater volume for the 100-yr storm was divided by the surface area of the wetland onsite to attain the increase in bounce. Calculations shown below demonstrate that the increase in bounce meets the BCWD rules, since the bounce for the 2-year and the 10-year would be less than the 100-year event.

$$Change\ in\ bounce = \frac{Increase\ in\ 100\ year\ runoff\ volume(acre-ft)}{Wetland\ surface\ area\ (acres)}$$

$$Change\ in\ bounce = \frac{11.371 - 8.616}{4.57} = 0.60\ ft\ < 1\ ft$$

Rule 2.0 Conditions:

2-1. Provide BCWD with the final Civil Plan Set along with the following revisions. (BCWD 2.7.9)

a. Identify which ponds are being drawn from for the irrigation reuse system on the plan set and provide an irrigation reuse supply and distribution plan outlining pump sources and irrigated areas to remain in perpetuity on the property.

b. Identify clearly on the plan set which trees will be utilized for evapotranspiration and clearly demarcate the depressional storage for each tree.

c. Submit a revised detail for the tree planting specifying that the depressional storage is required for evapotranspiration. Clearly show the dimensions for the depressional storage in the detail.

2-2. Provide a draft stormwater facility maintenance declaration for BCWD approval, then, after approval, provide proof of recordation with Washington County. A template is available under the permit section of the District's website. Include in the maintenance plan protection of all natural areas and trees to be used to meet stormwater-management requirements through evapotranspiration and interception. Include protection of all vegetated areas that must be preserved for irrigation use on the property in the maintenance plan and require in the annual documentation of the weekly depth of water to be used for irrigation along with the dates during which the irrigation system will be active. (BCWD Rule 2.6)

2-3. Provide documentation as to the status of a National Pollutant Discharge Elimination System stormwater permit for the project from the Minnesota pollution Control Agency and provide the Storm Water Pollution Prevention Plan (SWPPP) as it becomes available (BCWD Rule 2.7.15).

2-4. 100-yr HWL values on plans do not match the HydroCAD report values. Update for consistency.

Rule 3.0—EROSION CONTROL

According to BCWD Rule 3.2, all persons undertaking any grading, filling, or other land-altering 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 must 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 of land altering activities involving movement of more than fifty cubic yards of earth and removal of vegetative cover on five thousand square feet or more of land.

☒ Rule Requirements Met <u>with Conditions</u>

The erosion and sediment control plan includes:

- *Silt fence*
- *Rock construction entrance*
- *Inlet protection*
- *Dual row silt fence*
- *Rip rap at stormwater outflows*
- *Rip rap at emergency overflows*
- *Temporary seeding and blanketing*
- *Temporary sedimentation basins*

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

<u>Rule 3.0 Conditions</u>:

3-1. Provide the contact information for the erosion and sediment control responsible party during construction once a contractor is selected. Provide the District with contact information for the Erosion Control Supervisor and the construction schedule when available (BCWD 3.3.2).

3-2. Provide a dewatering plan for review and approval that provides water quality control commensurate with the classification of the downstream water resources (BCWD 3.3.2).

3-3. Provide documentation showing that existing discharge rates will be maintained throughout construction(BCWD 3.3.2).

Rule 4.0—LAKE, STREAM, AND WETLAND BUFFER REQUIREMENTS

According to BCWD Rule 4.2.1, Rule 4.0 applies to land that is (a) adjacent to Brown's Creek; a tributary of Brown's Creek designated as a public water (Minnesota Statutes section 103G.005, subdivision 15); a lake, as defined in the rules; a wetland one acre or larger; or a groundwater-dependent natural resource; and (b) that has been either (i) subdivided or (ii) subject to a new primary use for which a necessary rezoning, conditional use permit, special-use permit or variance has been approved on or after April 9, 2007, (for wetlands and groundwater-dependent natural resources other than public waters) or January 1, 2000 (for other waters).

☒ Rule Requirements Met with conditions.

Rule 4.0 applies to the site because it is adjacent to the S. Central Tributary of Brown's Creek and its adjacent wetland complex, which is larger than one acre and the proposed project involves subdivision of the property and a conditional use permit from the City of Stillwater. Both the wetland delineation and a site visit by District staff established that the tributary and the adjacent wetland complex are not groundwater dependent. The portion of the wetland complex located on the site has been identified as a manage 2 wetland and requires a buffer of 50 feet. The tributary stream buffer requires a 25-foot streamside zone, 50-foot middle zone, and a 75-foot outer zone, all of which are subsumed by the wetland complex manage 2 50-foot buffer. Within the buffer, grading and storm utilities are proposed associated with the construction of the east and south stormwater (wet) ponds. No construction activity is occurring in any of the tributary stream buffer zones. Buffer monumentation, reviewed and approved by district staff, must be provided and installed along the manage 2 wetland complex buffer edge every 200 feet.

Under Rule 4.4.1, at the time a buffer is created under Rule 4.0, the District may require a planting or landscaping plan to establish adequate native vegetative cover for area that (a) has vegetation composed of more than 30 percent of undesirable plant species (including, but not limited to reed canary grass, common buckthorn, purple loosestrife, leafy spurge, bull thistle, or other noxious weeds); or (b) consists more than 10 percent of bare or disturbed soil or turf grass.

Review of the current vegetative condition in the proposed buffer has not been assessed due to the time of year. As a stipulation of permit approval, the buffer vegetation needs to be analyzed and the project landscaping plan must be modified and approved by BCWD as needed to bring the wetland buffers into conformance with Rule 4.4.1.

Under Rules 4.4.2, Lake and Wetland Buffers; Streamside Zone of Stream Buffer. The following activities are prohibited within a lake or wetland buffer, and within the streamside zone of a stream buffer: (c) Altering vegetation, except for (i) vegetative enhancements, as approved in writing by staff; and (ii) the removal of invasive exotic species or of trees for disease control or revegetation. A tree larger than six inches in diameter at a point two feet above the ground may be removed only on

written authorization from District staff on a determination that the function of the buffer will not be diminished.

A tree removal plan was submitted for the entire site. The site tree removal plan proposes tree removal in the manage 2 wetland buffers. These trees are not specifically called out separately from the overall site. To demonstrate compliance with the rule, provide a list and description (diameters) of the trees proposed to be removed from the buffer area for the watershed district staff to review and approve.

Rule 4.0 Conditions:

4-1. Provide a draft buffer-maintenance declaration for BCWD approval, then, after approval, proof of recordation with Washington County. A template is available under the permit section of the District's website.

4-2. Submit buffer monumentation marker sign design to be approved by District staff.

4-3. Provide a list and description (diameters) of the trees proposed to be removed from the buffer area for the watershed district staff to review and approve. (BCWD Rule 4.4.2(c)).

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 securing a permit from the District.

☐ 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 may 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.*

Rule 7.0—FLOODPLAIN AND DRAINAGE ALTERATIONS

According to Rule 7.2, no person may 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 may 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.

The proposed discharge rates from the site are less than existing conditions so any excess volume above existing conditions will be discharged at a rate that allows the volume to be conveyed through the existing wetland complex and tributary system. Given this, there is no alteration of stormwater flow at the property boundary triggering the rule. However, the freeboard criteria in subsection 7.3.2 apply through operation of subsection 2.5.4; the freeboard criteria are applied here:

☒ Rule Requirements Met

According to BCWD rule 7.3.2 all new and reconstructed buildings must be constructed such that the lowest floor is at least two feet above the 100-year high water elevation or one foot above the emergency overflow (EOF) of a constructed basin.

The 100-year high water elevations, EOFs, and lowest adjacent building elevations were evaluated and meet the District's low floor requirement as demonstrated in Table 3. Stormwater flows at property boundaries remain the same from existing to proposed conditions.

Table 3 - Freeboard Requirement Summary

Stormwater Facility	*EOF*	*100-Year HWL*	*Allowable Lowest Floor*	*Lowest Proposed Floor*
East Pond	897.50	897.52	899.52	901.50
South Pond	897.50	897.29	898.50	903.50

Rule 8.0—FEES

Fees for this project as outlined below:

1. Stormwater management fee	$3,000.00
2. Erosion control fee for grading	$1,500.00
3. Shoreline and streambank alterations fee	$NA
4. Stream and lake crossings fee	$NA
5. Floodplain and drainage alterations fee	$500.00
▪ **TOTAL FEES**	**$5,000.00**

Rule 9.0—FINANCIAL ASSURANCES

Financial assurances for this project are as outlined below:

1. Grading or Alteration (19.16 acres disturbed x $2,000/acre)	$38,320.00
2. Stormwater Management Facilities (125% of facility cost)	$1,343,000.00
▪ **TOTAL FINANCIAL ASSURANCES ($5,000 Minimum Performance Financial Assurance)**	$1,381,320.00

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 the circumstances unique to the property under consideration. The Board of Managers may grant variances where it is demonstrated that such action will be keeping with the spirit and intent of these rules. Variance approval may be conditioned on an applicant's preventing or mitigating adverse impacts from the activity.

☒ Rule Not Applicable to Permit. *There are no requested variances.*

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. Demonstrate that the plan has received preliminary plat approval (BCWD Rule 1.3a).
2. Address all stormwater management requirements (Conditions 2-1 to 2-4).
3. Address all erosion control requirements (Conditions 3-1 to 3-3).
4. Address all buffer requirements (Conditions 4-1 to 4-3).
5. Replenish the Permit fee deposit to $5,000 (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 will be deemed abandoned and all prior approvals will be revoked and collection proceedings will begin on unpaid balances.
6. Provide the required financial assurances (BCWD Rule 9.0):
    a. Total grading or alteration assurance 19.16 acres ($38,320.00).
    b. Stormwater management facilities assurance ($1,343,000.00).

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 As-built record drawings showing that the completed grading and stormwater facilities conform to the grading plan.
3. During the growing season, conduct an assessment of the proposed buffer zone area to determine the vegetative composition of undesirable plant species, bare, disturbed soil or turf grass. Modify the landscaping plan accordingly and submit for District review and approval.