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Memorandum

To: City of Cle Elum, Public Works Department
From: Cameron Curtis, P.E.
Date: 9/18/2025
Subject: Stormwater and Open Space Tract Adequacy – Preliminary Review for Wildwood Ranch

The purpose of this memorandum is to summarize the preliminary stormwater analysis completed for the proposed 92-lot development and to confirm that the designated stormwater and open space tract (Tract SD-1) is adequately sized to accommodate both the required stormwater management facilities and the intended open space use.

As currently laid out, Tract SD-1 provides a total of 11,491 square feet. Of this area, approximately 3,988 square feet, or 35 percent of the tract, is occupied by the stormwater pond footprint at its maximum water surface. This leaves more than half of the tract available for open space. The pond is designed with a maximum depth of 3 feet with 2:1 side slopes, meeting the geometry requirements of the SWMMEW while also limiting the overall footprint.

Preliminary hydrologic and hydraulic modeling was performed using AutoDesk's Storm and Sewer Analysis (SSA) software. The design intent is to maximize infiltration while also controlling outflow rates through a tiered orifice system. The pond is configured to infiltrate the majority of the 2-year storm event, with a small diameter (1-inch) orifice at the pond bottom allowing a controlled release that is less than 50 percent of the pre-developed condition. A secondary orifice (12-inch) is located 1.9 feet above the bottom, designed to remain inactive during the 2-year storm but to engage during larger storm events.

The design uses a combined infiltration (volume based) and detention (flow based) system to manage stormwater runoff. As required by the City's construction standards, the 25-year, 3-hour storm and the 25-year, 72-hour events were both analyzed. For these events, the second orifice begins to function, however, the combined release rates remain less than the pre-developed peak flow and the minimum 1-foot freeboard requirement is met. For additional assurance, the 25-year, 24-hour storm was evaluated, and while the pond did not fully meet the freeboard requirement under that condition, the event was still fully contained without overtopping. Since this is not a City-required design storm, the outcome does not affect compliance. Across all modeled events, the system is designed to fully drain between storms, preserving storage availability.

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Design assumptions have been intentionally conservative. The infiltration rate used in the analysis is 0.57 inches per hour, the lower end of the NRCS range for this soil type. During the geotechnical investigations, groundwater was encountered at approximately 8 feet, providing at least 5 feet of vertical separation from the bottom of the infiltration facility. A more detailed groundwater analysis would likely confirm that a deeper facility could also be supported if needed. The pond has been designed to maintain one foot of freeboard in all required storm events.

Runoff treatment was also considered in this design, and two methods are proposed for the preliminary analysis of the site. First, the natural soils or amended soils, along with native vegetation within the stormwater pond can be used to treat water being infiltrated. Some of the water being released through the controlled outlet structure will also be treated prior leaving the pond, and the remaining water can be treated utilizing biofiltration swales located at the outlet location prior to leaving the site.

This analysis represents a preliminary assessment of stormwater feasibility and is limited to evaluations of runoff volume and peak discharge rates. It has been assumed that the entire site will drain to the pond. During detailed design, it will need to be verified that areas to the south of the pond can be effectively routed to the facility. If not, additional area near the southern boundary is available to accommodate a supplemental stormwater facility. In addition, the infiltration rate used herein has not yet been field-confirmed. If geotechnical testing establishes a lower rate than the conservative assumption applied in this analysis, pond dimensions may need to be adjusted.

In summary, the analysis demonstrates that the proposed stormwater pond can be fully accommodated within Tract SD-1, while reserving sufficient space for open space. The facility has been preliminarily designed to meet or exceed City standards, with conservative assumptions applied to infiltration rates, groundwater separation, and flow control structures. Based on these findings, we believe the tract designation is appropriate, and we recommend approval of the preliminary layout with the understanding that final engineering will provide further detail.