



CITY OF PORTLAND ENVIRONMENTAL SERVICES



The Portland Building ■ 1120 SW Fifth Ave, Suite 613, Portland, Oregon 97204 ■ Ting Lu, Interim Director

MEMORANDUM

January 20, 2026

To: Robert Fraley (COP-PWB)

From: Roslyn Gray, PE (COP-BES)

RE: Cottrell Pond: Multnomah County SEC-wr Review – Hydraulic Analysis

The following memo documents compliance with Multnomah County Zoning Code **39.5045 WATERCOURSE RELOCATION AND ALTERATION**.

Project Background

The proposed project will restore an impounded watercourse to a naturally flowing stream channel with associated floodplain and riparian habitat. The purpose of the project is to improve water quality within Johnson Creek and to restore fish passage through the project site.

The proposed watercourse “alteration” is to return the stream and floodplain to a condition similar to its pre-impoundment condition.

The proposed stream restoration project is not within any identified floodways, special flood hazard areas, or other areas of delineated flood hazard.

Existing Conditions & Flood Storage

The subject impoundment is an existing inline earthen dam that measures approximately 110 LF long and 10 high. A length of 24” dia. CMP culvert serves as the point of discharge through the dam. A wooden weir fixed to the inlet of the 24”

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dia. CMP culvert impounds Johnson Creek to typical pond elevation of 628.5'. A subtle saddle along the northern surface of the dam provides an approximate auxiliary spillway elevation of 231.0' and approximately 2.5 ft of freeboard. As such, the reservoir provides roughly 136,000 cubic feet of flood storage above the typical pond surface elevation. The contributing watershed measures approximately 0.6 square miles; thus, the flood storage capacity of the Cottrell Pond reservoir is equal to less than 0.1 inches of runoff from the contributing watershed.

Hydrologic modeling of the 100-year 24-hour storm = 4.4 in (Portland-modified NRCS Type 1A). With an estimated time of concentration, $T_c = 20$ minutes the reservoir storage is fully utilized within the first hour of the event. Because the reservoir is overwhelmed well before peak inflow, the pond provides no attenuation of the base flood. That is, a full reservoir during peak flow conditions offers the same flood storage as no reservoir.

The limited flood storage capacity of the existing Cottrell Pond was evidenced on December 9, 2025 when a 2.5 yr flood event overwhelmed the reservoir and crested the northern portion of the dam. The former landowner shared that the dam overtops periodically.

Conclusion

By observation, the flood storage volume of the Cottrell Pond is less than the volume of runoff routed through the reservoir during the 2.5 yr flood event (ref. Dec 9 overtopping) and therefore is inconsequential during flood events greater than the 2.5 yr event including the 100-yr base flood. When the dam is removed, flood events will pass freely through the altered portion of the watercourse. Because the impounded conditions do not provide flood storage that results in flood attenuation, and because the post-project conditions will convey flood waters freely, **the flood carrying capacity for the altered or relocated portion of the watercourse will be maintained, consistent with Watercourse Relocation and Alteration standard MCC 39.5045(A)(1).**

Since the reservoir provides no attenuation of the base flood, the flow rate passing through the pond and reaching downstream properties is limited only by the conveyance capacity of the 36" culvert under Cottrell Road, which will remain unchanged. Since the grade of the proposed watercourse "alteration" (i.e., naturalized stream channel) will be *lower* than existing grade of the impounded creek (i.e. ponded water surface elevation), **the area subject to inundation by the base flood discharge will not be increased, consistent with standard MCC 39.5045(A)(2).**

Removal of the dam will *decrease* base flood levels through the altered reach, because floods will flow through a lowered, naturalized, un-impounded stream channel. Removal of the dam will not result in increased base flood levels downstream because downstream conditions are controlled by the 36" culvert in Cottrell Road, not the subject impoundment which is overwhelmed at much smaller flood events than the 100-yr base flood. For these reasons, **the alteration or**

relocation will cause no measurable increase in base flood levels, consistent with standard MCC 39.5045(A)(3).

Sincerely,

Roslyn Gray, P.E.

Supervising Engineer



Expires 06/30/2027