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Memo

PGL File #: 0346-65.01

DATE: February 8, 2024

TO: Fisheries and Oceans Canada

FROM: PGL Environmental Consultants – Stewart Brown, Chloe Slomowitz, on the behalf of MOTI

Re: Kenyon Creek Culvert Design Amendment Rationale

The Ministry of Transportation and Infrastructure (MOTI) has been granted a *Water Sustainability Act* Change Approval under File 2010329, dated September 8, 2023 for permanent culvert replacement and stream bank stabilization works at Kenyon Creek within the Sunshine Coast Regional District. As per the conditions of the approval, the proposed Phase 2 (permanent) works within Kenyon Creek at Redrooffs Road were not included in the authorized work, as the completed culvert and baffle designs were not available at the time of submission. As noted in the approval, the Ministry of Forests requested the MOTI submit the completed design drawings as an application to amend the Change Approval.

The MOTI has completed their design drawings, and further to our August 17, 2023 meeting with the Ministry of Forests and subsequent August 14, 2023 email, the MOTI proposes to remove fish baffles from the final culvert design. Removal of the fish baffles is proposed as it has been determined that above the culvert intake, the stream would likely be limited to low-value rearing habitat and there would be minimal fish habitat available. Additionally, the 8m-high waterfall composed of exposed bedrock and angular boulders located immediately upstream of the culvert inlet serves as a permanent fish barrier on the upstream side of the culverts. The steep slope of the proposed culvert and downstream of the culvert outfall based on the gradient of the existing channel also provide challenges to allow for fish passage.

Based on our August 17, 2023 meeting, the MOTI confirmed that they would provide a memo with the rationale for the change in design, including an assessment of fish habitat value between the waterfall and inlet and immediately downstream of the culvert outlet to confirm that installation of non-fish-passable culverts are appropriate. Our assessment is provided in the following sections.

SITE CONDITIONS

The Kenyon Creek site is located at the Kenyon Creek stream crossing (Watershed Code: 900-124100) at Redrooffs Road, just east of Kenyon Road, in Sechelt, BC (UTM Zone 10U 0438021, 5481199). The Site includes an 8m waterfall to the north (upstream) of Redrooffs Road, bordering the project footprint, prior to Kenyon Creek flowing south through the temporary culverts under Redrooffs Road.

Fish occurrences within Kenyon Creek that have been documented include steelhead (*Oncorhynchus mykiss*), stickleback (*Gasterosteus* sp.) and cutthroat trout (*Oncorhynchus clarkii*) (ENV, 2022). The lower reaches of Kenyon Creek are fish accessible from Sargeant Bay up to Redrooffs Road. Cobbles, boulders, and large woody debris provide optimal fish habitat downstream of Redrooffs Road, in addition to dense canopy cover (>60%). Fish habitat below Redrooffs Road is considered suitable year-round and likely supports resident or anadromous fish species. Other local streams of similar size and character are used by coho salmon (*Oncorhynchus kisutch*) for spawning, and it is expected that Kenyon Creek is suitable for coho salmon up to the culvert at Redrooffs Road.

Prior to the interim works that were conducted in September 2022, the 700m concrete culvert was undersized and at a nearly 6.5% slope under Redrooffs Road, acting as a barrier to upstream fish movement in Kenyon Creek. The temporary repair work culverts included a primary Corrugated Steel Pipe culvert and four smaller corrugated

polyvinyl chloride (PVC) culverts to the east. All temporary culverts were perched approximately 4–5m above the creek on the downstream side of the road and did not allow for fish passage. HabitatWizard shows an observation of cutthroat trout *(Oncorhynchus clarkii)*, a non-anadromous salmonid, upstream of Redrooffs Road, although these records are from 1977 and are dated with less spatial accuracy and are unreliable. No observations were recorded since 1977.

Approximately 15m upstream of Redrooffs Road there is a vertical waterfall 8m high that prevents upstream fish migration on Kenyon Creek. Steep ravine banks surround the north, northwest, and northeast sides of the project footprint. Kenyon Creek aquatic habitat immediately upstream of the Redrooffs Road culvert includes exposed bedrock and angular boulders.

Fish Habitat Value Immediately Upstream of Redrooffs Road

Cobbles and gravels are generally lacking in Kenyon Creek between Redrooffs Road and the upstream waterfall, which are required to support spawning habitat for salmonid species. The habitat between the waterfall and the Redrooffs Road culvert is also considered low value for rearing, owning to the lack of instream cover including undercut banks and large woody debris (Photograph 1). The waterfall represents a permanent barrier to upstream migration, thus, the rearing habitat upstream of the Redrooffs Road culvert for anadromous fish species is limited to approximately 70m^2.

Photograph 1: The channel north of the culvert at the base of the waterfall, composed of predominately bedrock (May 25, 2022)

Photograph 2: Kenyon Creek inlet (provided by Urban Systems Ltd.) (June 5, 2023)

The proposed culvert will have a grade of 5% and a slope of 23.7% downstream of the culvert outfall, based on the steep gradient of the existing channel. Due to these constraints, it may not be feasible to design the proposed culvert to be fish-passable. Providing fish access upstream of the Redrooffs Road culvert may also be a detrimental exercise for fish in the long-term. By encouraging fish access without the suitable habitat available upstream, fish will expend valuable energy attempting to migrate or relocate, with little to no benefit in return.

SUMMARY

The fish habitat between the waterfall and the Redrooffs Road culvert is considered low value for rearing, owning to the lack of instream cover including undercut banks and large woody debris. The waterfall also represents a permanent barrier to upstream migration, so the low-value rearing habitat upstream of the Redrooffs Road culvert for anadromous fish species is limited to approximately 70m^2. Not providing access to 70m^2 of marginal rearing habitat is not expected to have a measurable effect on salmonid species at a local population level.

Due to the lack of potential spawning habitat and limited instream habitat for fish upstream of the Redrooffs Road culvert, as well as design constraints to achieve fish passability, PGL feels that there is justification to amend the culvert designs to not incorporate fish passage features, such as baffles.

STATEMENT OF LIMITATIONS AND CONDITIONS FOR REPORT

Complete Report

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In order to properly understand the suggestions, recommendations and opinions expressed herein, reference must be made to the whole of the Report. **PGL is not responsible for use by any part of portions of the Report without reference to the whole report.**

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Respectfully submitted,

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