Points for Upland Contracting Ltd. Mine Plan Comment Letter:

Re: Upland Contracting Ltd. Mine Plan Application G-8-114, located at 7925 and 7311 Gold River Highway, in Campbell River, British Columbia.

E-mail to: Chief Inspector of Mines: SouthwestMinesDivision@gov.bc.ca

by Nov. 30, 2020

1. The mine plan Rock Quarry in the green dotted line in Figure 4.1 attached is located above Rico Lake.

"West of the bedrock ridge, groundwater flow is controlled by bedrock surface topography. Flow in this area occurs from points of high bedrock elevation within the ridge to areas of low elevation."[1]

2. Drainage is from Rico Lake to McIvor Lake, our drinking water supply. As stated in GHD Hydrogeology and Hydrology Characterization Report, May 31, 2017: "Water flows from Rico Lake to McIvor Lake."[2]

"The rock quarry area, which is approximately 52,750 m2 is shown on Figure 2.1. Drilling and blasting of rock for the production of quarry product is planned at an approximate rate of 40,000 tonnes per year. The rock cut in this area is planned to terminate at the elevation of the rim of the Pit [approximately 191(sic) amsl]"[3] * amsl = Above Mean Sea Level

3. Considering that Rico Lake drains into McIvor Lake, Campbell River's drinking water, an investigation is needed to identify the source of elevated metals in Rico Lake sediment before approving a mine permit and reclamation with waste at the Upland Contracting's site.

There are unexplained high levels of metals (aluminum, barium, calcium, iron, magnesium, sulphur, and zinc) found in Rico Lake sediment.

Leilane Barbosa Ronqui (biologist) working at UBC at the time, produced a "Rico Lake – Sediment and Water Surface Assessment"[4] report following an Oct. 11, 2018 Upland Excavating Ltd. sampling of Rico Lake sediment.

4. Investigation of a potential shallow aquifer and groundwater elevation from the northeast corner of Upland's site is not provided in the Upland Contracting Ltd. Mine Plan Application report. Investigation into potential groundwater flow from Upland's northeast corner into McIvor lake is needed.

5. Request the BC Ministry of Energy, Mines and Petroleum Resources (MOM) not permit reclamation with contaminated soil or waste unless and until the potential risks identified by expert hydrogeologists (Waterline Resources Inc. and GW Solutions) have been properly investigated and addressed.

"The role played by the groundwater regime in the fractured bedrock aquifer still needs to be defined. This should particularly be taken into account in case of a catastrophic accidental event (e.g., resulting from a large earthquake) that would cause movement of landfilled waste and interruption of the drainage system (in addition to loss of integrity of the liner system). This scenario should be addressed (taking into account the time it would take to address and remediate the situation under such circumstances) and illustrated to confirm that the water quality of both Rico Lake and the receiving environment east of the landfill would not be affected".[5]

"There is a possibility that groundwater from the landfill area could migrate toward Rico Lake if the water level in Rico Lake fell below the ponded water level in the infiltration ponds or gravel pit,

(emphasis added) i.e.below 170 m AMSL under normal operating conditions or below 173 m AMSL if the gravel pit was flooded. In this case the water would only flow west toward Mclvor Lake if the Mclvor Lake level was lower than Rico Lake level. As noted above BC Hydro's current minimum operational water elevation for Mclvor Lake is 174 M AMSL, therefore in a situation where Rico lake levels are low enough to induce groundwater flow from the landfill to Rico Lake the surface water gradient would most likely be from Mclvor Lake to Rico Lake. The potential for groundwater to be a pathway for contamination of Rico Lake could be mitigated by ensuring that the lake level is maintained above the water level in the infiltration ponds and gravel pit. Ongoing monitoring of water levels in Rico Lake and the bedrock and sand and gravel aquifer would help clarify the nature of the hydraulic connection between the lake and the proposed landfill."[6]

6. Upland Contracting Ltd. needs to provide **g**roundwater elevation in mine plan areas listed below:

Area 2, Area 5, Area 1-2021, Area 1-2022, Area 1-202. Groundwater elevation is also not provided for the original landfill and the western and southwestern bedrock ridge.

7. Background sampling is needed for offsite-locations east, northeast and southeast of Upland's site as well as water and sediment sampling for Rico Lake as recommended by GW Solutions.

"The groundwater monitoring program should include locations along the eastern property boundary, in particular along the northeastern boundary. This should be done to properly define the groundwater regime and groundwater quality baseline, and to differentiate potential impacts originating from Upland property and impacts associated with the regional landfill."[7]

8. "The monitoring program should include water and sediment sampling of Rico Lake, as a control measure to confirm that Upland's activities are not affecting the regional drinking water supply."[8]

Attached: Figure 4.1

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References:

1. **GHD** 2020 Mine Plan, Appendix F, Page 4
https://crecwebcom.files.wordpress.com/2020/10/0800135_upland-now-referral-package.pdf

2. **GHD Hydrogeology and Hydrology Characterization Report, May 31, 2017, Page 17**
https://crecwebcom.files.wordpress.com/2019/03/2017-05-31-ghd-hhcr.pdf

3. **GHD** 2020 Mine Plan - Upland Sand and Gravel Pit, Page 8
https://crecwebcom.files.wordpress.com/2020/10/0800135_upland-now-referral-package.pdf

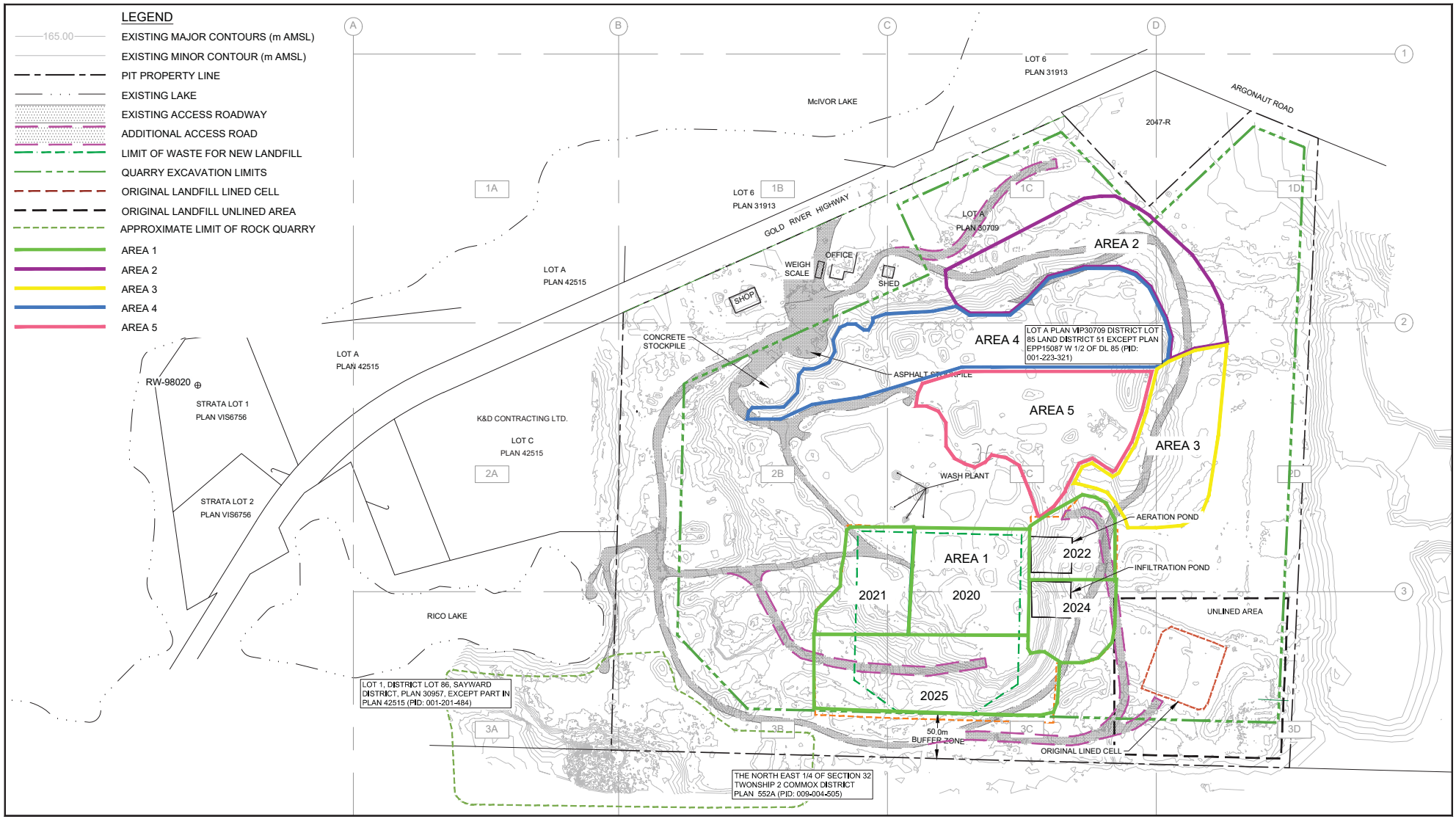
4. **Leilane Barbosa Ronqui (biologist) "Rico Lake – Sediment and Water Surface Assessment"**
https://crecwebcom.files.wordpress.com/2019/09/rico-lake-assessment_leilaneronqui.pdf

5. **Review of GHD Technical Responses Task 7 and Task 8 - Upland Landfill – Waste Discharge Application Tracking Number 335965 and Authorization Number 107689 7295 Gold River Highway, Campbell River, British Columbia, p. 19**
https://crecwebcom.files.wordpress.com/2019/01/2019jan02-uplands-review-gws-1.pdf

6. Waterline Resources Inc. Hydrogeological Review of the Proposed Upland Landfill, 2.1 p.10
https://crecwebcom.files.wordpress.com/2019/03/waterline-resources-inc.-report-feb-25-2019-2.pdf

7. Shallow Aquifer – Request for Characterisation and Monitoring - Waste Discharge Application Tracking Number 335965 and Authorization Number 107689 7295 Gold River Highway, Campbell River, p.4
https://crecwebcom.files.wordpress.com/2019/07/2019june21-uplands-mws.pdf

8. Shallow Aquifer – Request for Characterisation and Monitoring - Waste Discharge Application Tracking Number 335965 and Authorization Number 107689 7295 Gold River Highway, Campbell River, p.4
https://crecwebcom.files.wordpress.com/2019/07/2019june21-uplands-mws.pdf



SOURCE: TOPOGRAPHICAL SURVEY DATED DEC. 18, 2018 PROVIDED BY UPLAND CONTRACTING.

0 40 80 120m

UPLAND CONTRACTING
SAND AND GRAVEL PIT
2020 MINE PLAN

PROGRESSIVE MINE DEVELOPMENT

11188156-03
Apr 29, 2020

FIGURE 4.1

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