



Campbell River Environmental Committee

CREC, PO Box 20092 STN. A, Campbell River, B.C., V9W 7Z5

Upland Excavating Ltd.

October 18, 2016

Re: Comments to Upland Excavating Ltd. consultation for application No. 107689

Dear Brian Fagan,

With respect to Upland Excavating Ltd.'s application No. 107689, on behalf of the Campbell River Environmental Committee (CREC), I would like to bring the following concerns to your attention. Specifically,

1. Upland's consultant originally stated, in print, that Rico Lake does not drain to Mclvor Lake. CREC subsequently determined this to be untrue. It was found that Rico Lake, in fact, does flow to Mclvor Lake via groundwater. Mclvor Lake being part of the Campbell Lake system, is the source of the City of Campbell River's domestic water supply in both the near and long term.

Upland's Final Hydrology Report now states, " Based on the static groundwater elevations at the Site and the lake levels, the movement of water will be from Mclvor Lake toward the Site and from Rico Lake toward Mclvor Lake."

This is concerning due to:

- **The risk of groundwater drainage from the proposed landfill to Rico Lake is poorly defined and needs more investigation.**
- The final elevation of the proposed landfill will be approximately 190 meters above sea level, much higher than Rico Lake. Contaminated soil is proposed to be used for cover. The proposed ditches and swales may overflow in rain events. Recent events at the Shawnigan Lake landfill should pose a wise reminder to all.
- It appears only surface water samples have been taken from Rico Lake. Water quality sampling is needed for the bottom depth of Rico Lake. Also due to the exceedance of sulphide in Rico Lake, which is an indicator of exceedances in the sediment, sediment sampling is required.

Upland's consultant, GHD, recommended that the direction and magnitude of groundwater flow between the Site and Mclvor and Rico Lakes should be further investigated.

Dr. Gilles Wendling, Hydrologist and President of GW Solutions, recommends an array of westward and eastward monitoring wells to investigate groundwater drainage.

2. CREC requests investigation and clarification of the Campbell River and Quinsam River Watershed Divide. The divide map provided by GHD, Upland's Consultant, shows the watershed divide going around the eastern tip of Rico Lake and north up Upland's west property border and gives the source as the BC Water Resources Atlas. GHD's interpretation of the watershed divide differs considerably from that on the government website. This discrepancy supports the need for a more fuller understanding of groundwater movement under and adjacent to the Uplands property. Further, GHD's comment of a hydraulic connection between the lakes as a muted connection is a concern as any connection where the possibility of contaminated groundwater reaching Mclvor Lake is unacceptable.

3. CREC has concerns surrounding leachate groundwater drainage to Cold Creek, the water supply for the Quinsam River Hatchery, and drainage to the Quinsam River.

Upland's Reports identify all groundwater drainage going east and southeast from their site.

Dr. Gilles Wendling estimates that groundwater moves in an east - northeast direction and groundwater transiting the property has the potential to "daylight" approximately 2 km east of the site in small tributaries to the Quinsam River.

Dr. Gilles Wendling's Review also states that it appears that the proposed downgradient monitoring well may not be located downgradient of the pond where infiltration of treated effluent will take place.

A DFO commissioned report by Northwest Hardwoods shows flow from Mclvor Lake to Cold Creek. *"The critical feature around this block is the source of water for the Cold Creek and its' tributaries. This water is being pushed out of Mclvor lake by hydrostatic pressure through the gravel substrate and emerging out of the banks that surround this watershed. This feature has resulted in very high quality water for the hatchery..."*

4. Upland's site sits over a large sand and gravel High Vulnerability IIA Class Aquifer. This classification means that the aquifer has high vulnerability to contamination from surface sources.

A 2010 Environment and Climate Change Canada publication confirmed the threat that municipal landfills pose to groundwater quality: *"Among the more significant point sources [of groundwater contamination] are municipal landfills and industrial waste disposal sites. When either of these occur in or near sand and gravel aquifers, the potential for widespread contamination is the greatest."* Source, Environment and Climate Change Canada (2010) *Groundwater Contamination*

5. Treatment to "Drinking Water Standards" is not assured to be met.

9.8.2 of the Draft Design Operation and Closure Plan (Draft DOC) identifies parameters that are forecast to exceed BC Contaminated Sites Regulation Criteria in untreated leachate, i.e.: Ammonia, Chloride, Phenols, Sulphate, LEPH, Arsenic, Boron, Copper, Iron, Magnesium, Manganese, Sodium and Zinc. The report also states that treatment of some of these parameters may prove ineffective.

Manganese may not be treatable to Drinking Water Quality and Chloride and Sulphate are not subject to biological degradation.

The fact that the demolition and construction waste may include contaminated waste and that Upland intends to landfill asbestos is missing from 4.3, Waste Acceptance, of the 2016 Design, Operations and Closure Plan.

6. Upland's report states that Hydrocarbons and Volatile Organic Compounds are expected to be found in contaminated soil and that contaminated soil is likely to increase the concentrations of these contaminants in leachate. These contaminants could include gas, oil, alcohol, acids, chloride, hydroxide, mercury, toluene and xylene to name a few.

Nilex Civil Environmental Group provided a Chemical Compatibility Chart for the HDPE liner Upland proposes to use. Hydrocarbons and Volatile Organic Compounds are not compatible to that liner, depending on their strength.

7. Seismic assessment for the long term and creep settlement, which will never end, are identified as "tolerable"

An EPA Report identifies that "creep" is the deformation of a material over a prolonged period of time and under constant pressure. Under sustained constant loading, the material will elongate and break.

Also that "stress cracking" leads to small cracks and even holes in the geomembrane, that allow leakage through the membrane.

The bentonite clay liner that Upland also plans to install may seep, as demonstrated by the one Quinsam Coal installed under their 2 South open pit. All liners are permeable.

8. Other concerns include:

- It can be expected that leachate flow rates will increase once field capacity has been reached.
- Periodic removal of sludge accumulated in the aeration lagoon will be required. Sludge can be removed by vacuum truck and conveyed to an excavated infiltration area in the active face.
- Swales and drainage ditches overflow in rain events. Infiltration areas reaching the vulnerable aquifer may allow leachate to groundwater flow off site.
- **No off site well monitoring to track a leachate plume.**

9. At 14.2 of Upland's (DOC)-Groundwater, " The objective of the groundwater monitoring program is to detect the extent and magnitude of potential contamination to groundwater associated with landfilling activities, ensure regulatory compliance, and to identify the need to mitigate potential environmental risk."

A 2001 Environment Canada publication stated that, "It is now accepted that all landfills will eventually release leachate to the surrounding environment and therefore all landfills will have some impact on the water quality of the local ecosystem." Source, Environment Canada (2001) *Threats to Sources of Drinking Water and Aquatic Ecosystem Health in Canada - Landfills and Waste Disposal*

When it comes to our Drinking Water or the Quinsam River Hatchery Water Supply or the Quinsam River, Zero risk is acceptable. Once our Drinking Water, groundwater or aquifer are contaminated, there is no "FIX".

10. It is CREC's opinion that Upland's current application is not consistent with the Comox Strathcona Solid Waste Management Plan. Upland's landfill is identified as a private DLC waste disposal facility and does not include deposit of contaminated soil or a leachate treatment facility.

11. According to the City of Campbell River's legal representative and the legal opinion of the UVic Environmental Law Centre, Upland Excavating Ltd. does not have the correct zoning for their proposed application.

The word "likely", used throughout Upland's reports, to identify very important results is not proof. Likely is not acceptable proof that our drinking water, the Quinsam River Hatchery water supply nor the Quinsam River will be safe from Upland's proposed landfill. Studies giving definite proof are needed.

CREC asks that all requests made by GW Solutions Review, attached with our letter, and CREC be fulfilled before this application advances to Draft OC and regulatory comment period.

Given that Upland's site is in an area sensitive to our drinking water, the Quinsam River Hatchery water supply and the Quinsam River, CREC requests this application be subject to the Precautionary Principle.

The precautionary principle by definition: https://en.wikipedia.org/wiki/Precautionary_principle.

Yours sincerely,
The Campbell River Environmental Committee,
Per,

Leona Adams, President
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Cc

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