May 10, 2017 Reference No. 088877

Mr. Allan Leuschen
Senior Environmental Protection Officer
Authorizations – South
Environmental Protection Division
Ministry of Environment
2080 Labieux Road
Nanaimo, BC V9T 6J9

Dear Mr. Leuschen:

Re: Permit Fee Calculation
Upland Landfill – Waste Discharge Application
7295 Gold River Highway, Campbell River, British Columbia

GHD Limited (GHD) is submitting this letter to the Ministry of Environment (MOE) on behalf of Upland Excavating Ltd. (Upland) to respond to Item 11 in MOE's letter entitled "*Application for an Operational Certificate under the Environmental Management Act on behalf of Upland Excavating Ltd. (Upland),"* dated October 6, 2016 (Letter). A copy of the Letter is presented as Attachment 1.

1. Background

The permit fee calculation is required in support of the Waste Discharge Application (Application) for the Upland Landfill (Landfill) submitted on May 27, 2016. The Application is filed under Tacking Number 335965 and Authorization Number 107689. The following technical reports were submitted in support of the Application to present the design, technical studies, and investigations completed by GHD and Upland:

- Technical Assessment Report
- 2016 Design, Operation, Closure Plan
- Hydrogeology and Hydrology Characterization Report
- 2016 Geotechnical Investigation Report
- 2017 Financial Security Plan

The Letter requests additional information related to the Application be developed and submitted to the MOE. Item 11 of the Letter requests "*the proposed maximum (annual) authorized discharge rate for the refuse discharge, and maximum (annual) authorized discharge rate and concentration(s) for the treated leachate discharge".*

GHD initially responded to the Letter with a proposed approach and timeline in a letter dated December 7, 2016. This letter has been prepared in accordance with GHD's December 7, 2016 response.

2. Permit Fee Regulation

The Permit Fee Regulation applies to any authorization to discharge under a regulation including operational certificates (OC). The Permit Fee Regulation requires that a permit holder, or in this case OC holder, pay annually a fee for each permit held by the permittee. The fee for each permit is calculated by adding the base fee for the permit type (refuse, air, effluent, etc.) to the sum of the fees for each discharge authorized under the OC. The base fee for each permit type is $100.00.

For this Application the MOE has indicated that a permit fee for both waste (refuse) and effluent (treated leachate) are applicable.

3. Permit Fee for Waste Discharge

3.1 Permit Fee for Waste

The permit fee for waste if dated after April 2006 is $0.74 per tonne of refuse disposed.

3.2 Upland Maximum Annual Waste Discharge

The proposed maximum discharge rate for the Landfill is 45,000 tonnes per year.

3.3 Upland Permit Fee for Waste Calculation

The calculated permit fee if $0.74 per tonne multiplied by 45,000 tonnes plus $100 base fee. The total annual Permit Fee for waste is $33,400.00.

4. Maximum Annual Discharge Rate and Concentration for Treated Leachate

4.1 Permit Fee for Treated Leachate Discharged to Ground

The permit fee for effluent, if dated after April 2006, is based on the individual constituent concentrations and ranges from $4.01 to $273.24 per tonne disposed. The specific fee per tonne discharged for each constituent can be found in Schedule C of the Permit Fee Regulation and in the attached Table 1. The fee for total suspended solid is reduced to 10 percent of the permit fee if effluent is discharged to ground, as it is for this Application.

4.2 Permit Fee Per Cubic Metre of Treated Leachate

GHD has forecasted the treated leachate quality in the 2016 Design, Operations, and Closure Plan (DOCP, GHD 2016) for the Landfill. The forecasted treated leachate quality is shown with a range from minimum to maximum forecasted constituent concentration in milligram per litre (mg/L). The forecasted leachate quality is shown in the attached Table 2. GHD used the maximum forecasted treated leachate concentration as the forecasted maximum annual average treated leachate concentration, as shown in

Table 2. GHD has classified the forecasted parameter concentrations as below or equal to the Contaminated Site Regulation Schedule 6 Drinking Water Use standards, using blue and grey, respectively. GHD converted the maximum annual average concentration to tonne per cubic metre (tonne/m^3). The fee per tonne shown in the Section 4.1 was multiplied by the tonne/m^3 for each constituent. The fees for all constituents were summed and expressed as a dollar per cubic metre of treated leachate. The calculated permit fee per cubic metre is $0.34.

4.3 Maximum Annual Discharge Rate and Permit Fee

GHD forecasted the annual leachate generation from the Upland landfill in the DOCP (GHD 2016). GHD has used the annual leachate generated as the maximum annual discharge rate of treated leachate. The attached Table 3 presents the maximum annual discharge rate. The maximum annual discharge rate was multiplied by $0.34 as calculated in Section 4.2. The total Annual Permit Fee per year for the discharge of treated leachate is presented in Table 3. During the first year of operation, denoted by 2017, the permit fee for treated leachate is $4,592.74 plus the $100.00 base fee for a total of $4,692.74.

5. Total Permit Fee

The total permit fee for the first year of landfill operation is calculated to be $38,092.74.

GHD trusts this letter will provide the MOE with the information requested in item 11 of the MOE letter dated October 6, 2016. Should you have any questions or require additional information please do not hesitate to contact the undersigned.

Sincerely,

GHD

Gregory D. Ferraro, P. Eng.

Shauna Sturgeon, P. Eng.

SS/sz/08

Encl.

cc: Terry Stuart – Upland Excavating Ltd.
Mark Stuart – Upland Excavating Ltd.
Brian Fagan – Upland Excavating Ltd.

Treated Leachate Discharge Permit Fee per Tonne of Contaminant
Upland Landfill – Waste Discharge Application
7295 Gold River Highway, Campbell River, British Columbia

Constituent	Fee Per Tonne
Ammonia	$102.91
AOX	$273.24
Arsenic	$273.24
BOD	$20.64
Chlorine	$273.24
Cyanide	$273.24
Fluoride	$102.91
Metals	$273.24
Nitrogen and Nitrates	$41.13
Oil and Grease	$68.61
Other Petroleum Products	$68.61
Other Solids	$13.66
Phenols	$273.24
Phosphorus and Phosphates	$102.91
Sulphates	$4.01
Sulphides	$273.24
Surfactants	$68.61
Suspended Solids	$13.66
Other contaminants not otherwise specified	$13.66

Source

Environmental Management Act - Permit Fee Regulation,
B.C. Ref. 299/92, effective September 1, 1992 with
amendments up to B/C/ Reg. 132/2016, June 9, 2016

Table 2

Permit Fee Calculation Per Contaminant in Treated Leachate
Upland Landfill – Waste Discharge Application
7295 Gold River Highway, Campbell River, British Columbia

Constituent	Units	Forecasted Upland Landfill Treated Leachate Concentrations [1]		Forecasted Maximum Annual Average Treated Leachate Concentration [2]	Permit Fee Regulation Price per Tonne Discharged [3]	Maximum Upland Landfill Treated Leachate Concentrations [4]	Price per Cubic Metre [5]
		Minimum mg/L	Maximum mg/L	mg/L	$/tonne	tonne/m³	$/m³
GENERAL CHEMISTRY							
Alkalinity (total)	mg/L	50	250	250	$0.00	0.00025	$0.00
Ammonia-N	mg/L	0.10	3	3	$102.91	0.000003	$0.00
BOD	mg/L	3.5	17.5	17.5	$20.64	0.0000175	$0.00
Chloride (Cl) (dissolved)	mg/L	16.7	250	250	$0.00	0.00025	$0.00
COD	mg/L	15	150	150	$13.66	0.00015	$0.00
Conductivity(4)	us/cm	200	7500	7500	$0.00	0.0075	$0.00
Hardness	mg/L	750	2500	2500	$0.00	0.0025	$0.00
pH(4)	pH units	6	8	8	$0.00	0.000008	$0.00
Phenols	mg/L	0.0005	0.01	0.01	$273.24	0.00000001	$0.00
Sulphate (S04)	mg/L	25	500	500	$4.01	0.0005	$0.00
Sulphide	mg/L	0.001	0.05	0.05	$273.24	0.00000005	$0.00
Total Suspended Solids (TSS)	mg/L	5	75	75	$1.37	0.000075	$0.00
Total Dissolved Solids (TDS)	mg/L	1000	5000	5000	$13.66	0.005	$0.07
Total Kjeldahl Nitrogen (TKN)	mg/L	1.05	21	21	$41.13	0.000021	$0.00
Phosphorus	mg/L	0.1	0.5	0.5	$102.91	0.0000005	$0.00
HYDROCARBONS							
HEPH	mg/L	0.5	2	2	$68.61	0.000002	$0.00
LEPH	mg/L	0.125	0.5	0.5	$68.61	0.0000005	$0.00
METALS							$0.00
Aluminum	mg/L	0.1	1	1	$273.24	0.000001	$0.00
Arsenic	mg/L	0.00025	0.01	0.01	$273.24	0.00000001	$0.00
Barium	mg/L	0.05	0.7	0.7	$273.24	0.0000007	$0.00
Boron	mg/L	2.5	5	5	$273.24	0.000005	$0.00
Cadmium	mg/L	0.0001	0.0003	0.0003	$273.24	3E-10	$0.00
Calcium	mg/L	200	700	700	$273.24	0.0007	$0.19
Chromium	mg/L	0.005	0.05	0.05	$273.24	0.00000005	$0.00
Cobalt	mg/L	0.001	0.01	0.01	$273.24	0.00000001	$0.00
Copper	mg/L	0.005	0.05	0.05	$273.24	0.00000005	$0.00
Cyanide	mg/L	0.057	0.057	0.057	$273.24	0.000000057	$0.00
Iron	mg/L	0.09	6.5	6.5	$273.24	0.0000065	$0.00
Lead	mg/L	0.001	0.01	0.01	$273.24	0.00000001	$0.00
Magnesium	mg/L	10	100	100	$273.24	0.0001	$0.03
Manganese	mg/L	0.11	0.55	0.55	$273.24	0.00000055	$0.00
Mercury	mg/L	0.00001	0.00003	0.00003	$273.24	3E-11	$0.00
Molybdenum	mg/L	0.001	0.002	0.002	$273.24	0.000000002	$0.00
Nickel	mg/L	0.0075	0.02	0.02	$273.24	0.00000002	$0.00
Selenium	mg/L	0.001	0.005	0.005	$273.24	0.000000005	$0.00
Silver	mg/L	0.0001	0.00002	0.00002	$273.24	2E-11	$0.00
Sodium	mg/L	20	200	200	$273.24	0.0002	$0.05
Zinc	mg/L	0.05	2	2	$273.24	0.000002	$0.00
						Total	**$0.34**

Notes

[1] 2016 Design, Operation, and Closure Plan,GHD 2016 - Table 13.1

[2] Forecasted Maximum Annual Average Treated Leachate concentration is equal to the average of the 'instantaneous minimum and maximum Forecasted Upland LandfilL Treated Leachate Concentration s

[3] Permit Fee Regulation - Schedule 6 'if payment date after April 1/06'

[4] Maximum Leachate concentration converted to tonne per cubic metre

[5] (Permit Fee Regulation Price per Tonne Discharge) multiplied by (Maximun Upland Landfill Treated Leachate Concentration in tonne/cubic metre)

Forecasted treated leachate concentration meets the CSR Schedule 6 DW standard

Forecasted treated leachate concentration is below the CSR Schedule 6 DW standard or there is no applicable standard

Table 3

Total Calculated Permit Fee for Discharge of Treated Leachate
Upland Landfill – Waste Discharge Application
7295 Gold River Highway, Campbell River, British Columbia

Year	Stage	Total Forecasted Annual Leachate Generation (m^3) [1]	Permit Fee ($/$m^3$) [2]	Annual Fee ($) [3]
2017	1A	13,508	0.34	$4,592.74
2018	1A	13,508	0.34	$4,592.74
2019	1A	13,508	0.34	$4,592.74
2020	1B	23,132	0.34	$7,864.91
2021	1B	23,132	0.34	$7,864.91
2022	1B	23,132	0.34	$7,864.91
2023	1C	23,643	0.34	$8,038.62
2024	1C	23,643	0.34	$8,038.62
2025	2A	22,804	0.34	$7,753.30
2026	2A	22,804	0.34	$7,753.30
2027	2A	22,804	0.34	$7,753.30
2028	2B	22,686	0.34	$7,713.39
2029	2B	22,686	0.34	$7,713.39
2030	2B	22,686	0.34	$7,713.39
2031	2C	22,935	0.34	$7,798.06
2032	2C	22,935	0.34	$7,798.06
2033	2C	22,935	0.34	$7,798.06
2034	3A	18,830	0.34	$6,402.32
2035	3B	18,830	0.34	$6,402.32
2036	3C	580	0.34	$197.37

Notes

[1] Based upon the leachate generation presented in 2016 Design, Operation, and Closure Plan, GHD 2016, Table 9.4

[2] Permit Fee calculated in Table 2

[3] (Total Forecasted Annual Leachate Generation) multiplied by (Permit Fee per Cubic Meter)

Attachment A
MOE Letter dated October 6, 2016 - Additional Information Request

October 6, 2016

Tracking Number: 335965
Authorization Number: 107689

Gregory D. Ferraro, PEng
GHD Limited
greg.ferraro@ghd.com

Dear Mr. Ferraro,

Re: Application for an Operational Certificate under the Environmental Management Act on behalf of Upland Excavating Ltd. (Upland)

Thank you for the emails of May 27, 2016, and the attached information:

- Waste Discharge Application Form (WDA), May 27, 2016
- Technical Assessment Report (TAR), GHD, May 27, 2016
- Hydrogeology and Hydrology Characterization Report (HHCR), GHD, May 27, 2016
- 2016 Design, Operations and Closure Plan (DOCP), GHD, May 27, 2016
- 2016 Geotechnical Investigation (GEO), GHD, May 27, 2016
- Stakeholder Consultation Summary Report (CONSULT), GHD, May 27, 2016

GHD/Upland also recently initiated a second stakeholder review process.

In response to the information submitted, this letter details the additional information required at this time:

1. Please provide a consultation report with regard to comments/concerns received after the first stakeholder review process, and comments/concerns received as part of the recently initiated second stakeholder review process, including comments/concerns received and GHD/Upland responses.

2. The ministry Landfill Criteria for Municipal Solid Waste, 2nd Edition, dated June 2016 (Landfill Criteria), has recently been finalized and is available at http://www2.gov.bc.ca/gov/content/environment/waste-management/garbage/landfills. Please review the Landfill Criteria and provide confirmation the application/information are in accordance with the Landfill Criteria or any necessary revisions to the application/information to be in accordance with the Landfill Criteria.

3. The HHCR (s. 3.4.2) indicates there are insufficient monitoring points to accurately map the groundwater flow direction within the fractured bedrock aquifer unit; however, it is expected that flow direction will be similar to regional flow which is expected to be to the southeast towards the Quinsam River. The HHCR (s. 3.4.5, 5) also recommends the nature of the bedrock ridge extending from the southwest to

northwest of the Site and the direction and magnitude of groundwater flow between the Site and McIvor and Rico Lakes should be further investigated with three bedrock monitoring wells (MW7-16, MW8-16 and MW9-16) however the DOCP (s. 14, Figure 14.1) Environmental Monitoring Program (EMP) does not include these monitoring wells. After the recommended three bedrock monitoring wells have been installed and sampled/monitored, please provide updated hydrogeological, environmental and technical interpretations, conclusions and recommendations including with regard to the EMP.

4. The HHCR (s. 3.4.5, 4.4 & 5) recommends the installation of one additional monitoring well (MW6-16) in the overburden sand and gravel aquifer near the down-gradient site boundary before landfill development to obtain baseline water quality data, and for assessing site groundwater compliance after landfill development. The DOCP (s. 14, Figure 14.1) includes an EMP that includes 1 down-gradient monitoring well (MW6-16).

   The Landfill Criteria (s. 9) indicate that the EMP shall be developed in accordance with the Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills (Monitoring Guidelines). The Monitoring Guidelines (s. 3.3) recommend a minimum of 1 up-gradient monitoring well (2 are recommended), a well immediately adjacent to the down-gradient edge of the landfill/infiltration basin to enable sampling of 'raw' leachate, and a line of three wells situated down-gradient from the landfill and perpendicular to groundwater flow, and also indicate:
   - To facilitate early contaminant detection, monitoring wells should be located to sample groundwater from the uppermost aquifer, at the closest practicable distance from the site boundary, encompassing all possible routes to detect leachate migration. Monitors at up-gradient and down-gradient locations should generally be installed at two depths; one in the uppermost aquifer and a deeper one to assess vertical hydraulic gradients and the potential for leachate movement to depth.

   Please provide revisions to the EMP in accordance with the Landfill Criteria & Monitoring Guidelines, particularly with regard to a well immediately adjacent to the down-gradient edge of the landfill/infiltration basin, and a line of three wells situated down-gradient from the landfill and perpendicular to groundwater flow.

5. The HHCR (s. 4.1, 5) refers to Contaminated Sites Regulation (CSR) Technical Guidance (TG) 6 “Water Use Determination”, and summarizes the applicable CSR standards and WQGs that apply at the boundary of the Site as follows:
   - CSR Schedule 6 & 10 numerical Drinking Water (DW) standards
   - BC WQGs for DW and freshwater aquatic life (FWAL) along the western property boundary

   The TAR (s. 6.1.1) indicates that the CSR DW standards would apply on-site, the CSR freshwater aquatic life AW standards would not apply at the site boundary as the nearest freshwater aquatic receptor where the groundwater may potentially discharge

to is greater than 500 metres from the on-Site infiltration pond, and the water quality passing the Site boundary will meet the BC WQGs for DW. The DOCP (s. 13.3, Table 13.1) compares groundwater substance concentrations to the BC WQGs for DW.

The Landfill Criteria (s. 4.1) refers to the CSR, Generic Numerical Water Standards for the applicable water use(s) as defined in Protocol 21 "Water Use Determination" (dated December 15, 2015, effective Feb. 1, 2016, supersedes former TG 6 "Water Use Determination" dated July 2010). Protocol 21 (s. 5, Figure 3) also indicates that CSR AW Aquatic life water use applies to groundwater located beyond 500 metres of an aquatic receiving environment if the groundwater contains substances with concentrations above the aquatic life water use standards and has the potential to migrate within 500 metres of the aquatic receiving environment.

Please provide confirmation/assessment of the recommended water quality standards and guidelines that would apply on-site and at the landfill site (property) boundaries, including whether CSR AW standards would apply at the down-gradient landfill site (property) boundary. Please provide a table(s) that compares groundwater substance concentrations to the recommended water quality standards and guidelines.

6. The existing permit authorizes landfilling. Please provide the location(s), volume(s), and waste types of any on-site landfill(s), and confirmation that that all on-site waste will be relocated into the lined landfill.

7. The existing permit authorizes open burning and the DOCP (s. 6.10) proposes continued open burning. The Landfill Criteria (s. 6.6) indicates that "Open burning of wastes at the landfill site is generally prohibited. However, open burning of clean wood and yard waste may be approved in the SWMP, OC or permit if it can be demonstrated to the director that there is no viable alternative such as reuse, recycling, energy recovery, or composting. A technical assessment report satisfactory to the director shall be submitted and the open burning shall be approved in the SWMP, OC or permit. Approval must also be obtained from any other applicable fire protection authorities." Please provide a TAR certified by a qualified professional that demonstrates that there is no viable alternative to open burning, and that the proposed open burning is protective of human health and the environment.

8. The Landfill Criteria (s. 8) indicate that financial security is required for all privately-owned landfills, provides guidance regarding financial security amount, calculation and type, and indicates the DOCP shall include a financial security plan. Please provide a financial security plan in accordance with the Landfill Criteria.

9. The DOCP (s. 8) includes a surface water management plan and indicates that the design criteria make allowances for additional water that may result from snowmelt (s. 8.2.1). The Landfill Criteria (s. 5.6) indicate that the surface water management works shall be designed in accordance with criteria including the design shall make allowances for additional water that may result from snow melt and from prolonged

multi-day precipitation events. Please confirm that the surface water management works design makes allowances for additional water that may result from prolonged multi-day precipitation events.

10. The GEO report recommends leachate level monitoring in the landfill (s. 4.2, 6). The DOCP (s. 9.8.3.2) mentions leachate storage in the landfill and appears to indicate that leachate levels in the landfill will be monitored however the DOCP EMP (s. 14) does not specifically include leachate level monitoring in the landfill. The Landfill Criteria (s. 9 Monitoring Criteria, 9.1) requires leachate level monitoring in the landfill. Please provide revisions to the EMP that include leachate level monitoring in the landfill.

11. The Permit Fees Regulation (s. 3) indicates how the annual fee for a permit is calculated based on the maximum (annual) authorized discharge rate and concentration specified in the permit. Please provide/confirm the proposed maximum (annual) authorized discharge rate for the refuse discharge, and maximum (annual) authorized discharge rate and concentration(s) for the treated leachate discharge.

12. Please provide an electronic pdf siteplan (e.g. 8.5x11 inch, to scale, N arrow, high resolution, colour, clearly shows the landfill site, landfill site boundary, buffer zone, landfill footprint (to nearest 0.01 ha), facilities and works, structures, groundwater and surface water monitoring locations, etc.).

Please provide the information in electronic pdf format to PermitAdministration.VictoriaEPD@gov.bc.ca with a copy to allan.leuschen@gov.bc.ca so that processing of the application may continue. Of course, based on the additional information provided, or any other information, further additional information may be requested in future. If you have any questions or concerns, please contact the undersigned at telephone 250 751 3199 or email allan.leuschen@gov.bc.ca.

Yours truly,

A. Leuschen
Senior Environmental Protection Officer
Authorizations - South

ENCL: None

cc: Terry Stuart, Upland Excavating Ltd. terry.stuart@uplandgroup.ca