From:	Kate Madsen
To:	Norm Hill (norm@tehira.co.nz); "Hori Awa"
Cc:	"Awhina Harding"; "Wikitoria Tane"; "James Gleeson"; "Mark Pelan"; "Shawn McLean"
Subject:	Gleeson Hui Last Night
Date:	Thursday, 1 July 2021 8:15:33 AM
Attachments:	image001.png Waste Acceptance Criteria as at 30 June 2021.docx

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Morena Norm,

Thank you for facilitating the hui on Monday night – it was great to meet so many members of your wider whanau. And thank you for the quick response regarding an outcome – we look forward to receiving this in writing.

In terms of queries I said I would follow up on, please see below:

Composition of existing historic fill in FA3 (from PDP Memo):

- Consists of silty clay and mudstone remnants with occasional minor sands/gravel.
- Layers are not continuous; thickness is approximately 20m deep.
- The other pre-fill geology consists of Waikato Coal Measures (mudstone/fine grain sandstone) and Newcastle Greywacke (silt and clay)
- This confirms the historic fill is consistent with the pre-fill geological formations.
- There is little likelihood of the historic fill forming a saturation zone or aquifer, as there is no continuous layer.
- Following rainfall events, some perched water could sit within the historic fill.
- Based on the lithology of the historic fill (silty clay and remnant of mudstones), the permeability of this unit is likely to be very low
- The long-term inflow to the deep subsoil drain (from historic fill material layer) is calculated to range between1.8m3/d to5.6m3/d – this is to flow to a separate discharge pipe for testing and treatment before discharge.

Erosion and Sediment Pond Design:

- The erosion and sediment control approach meets or exceeds Waikato Regional Council standards, as described below (from our Southern Skies Environmental specialist)
- The diversion/bund channels proposed above the fill to intercept and divert flow from outside the gully are designed for a 100 year flood event (WRC guidelines require design for 5 year storm)
- The sediment retention pond (SRP) is sized in accordance with the regional guidelines – being Waikato Regional Council Technical Report No. 2009/02 *Erosion and Sediment Control Guidelines for Soil Disturbing Activities, January 2009* (TR2009/02).
- The sizing is based on the contributing catchment area, which in this case is 5.25ha (52,500m^2). TR2009/02 requires SRPs to be sized at an equivalent ratio of 2% or 3% of the contributing catchment, depending on slope gradient and slope length. In this case the SRP has been sized at the larger, 3% ratio and will have a minimum storage capacity of 1575m^3 i.e. a 3% ratio of 52,500m^2.
- The SRP functions via three discharges mechanisms. First, ponded water is decanted off via the floating T-bar decants. If inflows exceed the decant rate for long enough the water level will rise and spill into a primary spillway (manhole riser). If inflows continue at a rate

that exceeds the combined decant and manhole flow rate, it can eventually spill over the secondary spillway, which is sized to carry flows up to the 100 year storm event.

- The frequency that the secondary spillway would activate is hard to predict because it depends on a lot of factors, including how dry the pond is before rain, how closely spaced rain events are, and the intensity and volume of rain events.
- The pond volume up to the primary spillway (manhole riser) is the equivalent to approximately a 2 year event. But the pond function must be considered across the full range of events that it can carry.
- The SRP is also required to have a forebay, which must be a minimum of an additional 10% of the pond volume, i.e. another 157.5m^3 in addition to the 1575m^3 pond volume. The forebay provides significant treatment efficiency benefits and is where much of the sediment drops out.

Waste Acceptance Criteria:

Please see attached table of Waste Acceptance Levels as currently stands this has been drafted, reviewed, peer reviewed and accepted as reasonable by all experts involved, both representing Council and Gleeson

vibration from trucks:

While some low level forms of vibration may be experienced by persons in dwellings that are close to roads, it is unlikely that road-traffic related vibration levels would be high enough to cause any damage to buildings.
In most cases, problematic vibration arises from a defect in the road surface such as poor condition of the tarseal, potholes, rutting or a poor transition to a manhole cover, and is a council issue. Note that vibration can travel further if underground services are poorly constructed or if services are leaking. The soil type in an area is also a factor – vibration travels farther in hard/stiff soils, such as in and around Huntly. The formation of a 'Community Liaison Group' will allow for any issues like this to be raised early, and give Gleeson the opportunity to be a part of the problem solving and solution. Gleeson take pride in their trucks and their drivers, and are always seeking to improve the quality and delivery of services. Their door is always open for a discussion, whether at the quarry with Shawn or at head office with James and or Mark.

How contaminants are managed (from the site they come from through to deposition at Managed Fill site):

Protecting water quality starts at the beginning. Before any load arrives at site, it has been tested to determine whether the level of contaminants in the soil meets the Waste Acceptance Criteria (see attached). If it fails testing, it cannot come to Fill Area 3. They apply to be accepted.
The following protective measures have to be complied with:

- site log book which records content of the loads, truck numbers, volumes of soil, where it came from
- Fill from a site with contaminated soil is only accepted where it has been sampled, tested and approved for importation
- At least 2 loads per day are screened with XRF portable X-Ray to check for any inconsistency.
- Visual inspection of every load coming in –unacceptable, quarantined for testing, to be

removed (checking no timber, green waste etc)
- Random analytical testing at one sample per 500m³ of fill (about every 15 trucks)
- For concentrations of boron above 45 mg/kg, lead above 250 mg/kg, nickel above 65 mg/kg and zinc above 400 mg/kg in fill materials will require Synthetic Precipitation Leaching Procedure (SPLP) testing to be carried out on the fill materials prior to acceptance into the landfill, to demonstrate that elevated concentrations of these elements will not mobilise under conditions likely to be present in the fill area.
- Two days a year, independent audit taking random load sampling of no less than 5 trucks/day testing arsenic, boron, cadmium, chromium, copper, lead, nickel, zinc, petroleum hydrocarbons and BTEX
- Annual report to council & Independent 'end of life' composite sampling of each fill site
- Each load is deposited in the fill site using GPS Coordinates, so it can be found if any later issues – then it has to be dug up and removed.

IN terms of protecting the clarity of the water:

- Daily rainfall is recorded & storm-based sampling system (results will represent 'worst case scenario').
- Pond discharges sampled for clarity (higher the reading in cm, the clearer the water), pH, TSS and turbidity monthly and when 20mm of rainfall has been recorded over the previous 24 hrs.
- Quarry rainfall records since 2007 – so 13 years of records from quarry ponds –approx. 19 storm events/ year.
- At the quarry, the water clarity level standard is 6 cm with this equating to about 100 g/m3 of Total Suspended Solids
- pH sampling with be recorded and act as a trigger to assess effectiveness of chemical treatment

in terms of managing contaminants at/after discharge:

- Sediment controls as above minimise the discharge of contaminants into the receiving environment.
- samples taken 4x/year for lab analysis, monitoring dissolved aluminium, arsenic, boron, cadmium, chromium, copper, lead, nickel, zinc, petroleum hydrocarbons and pH
- Site specific guidelines/triggers to be developed – note significant discharge only occurs during storm events
- To derive receiving water quality criteria value, ANZECC water quality guidelines for 95% freshwater species protection are used as a base.
- Adjustments made for dilution occurring within waterways
- Reasonable mixing within receiving water body (Waikato River)
- If exceeded, repeat monitoring within 2 weeks; if still high review ESCP and FMP to determine corrective actions and implement within 2 months
- If repeat exceedances, evaluation of ecological effect and proportionate ecological compensation undertaken

I trust this information is helpful in our ongoing collaboration in achieving best outcomes for the land and water we all seek to protect.

tēnā koutou

Kind Regards,
Kate Madsen
Director – Paua Planning

Environmental & Social Impact Assessments - Resource Consents - Planning Advice and Action
Phone: +64 9 4422959
Mobile: +64 21 944583
Email: kate@pauaplanning.co.nz
178 Bawden Road R.D 2 Dairy Flat Albany Auckland 0792 New Zealand

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