

To: Fiona Morton

From: James Blackwell

Company: Horizons Regional Council

SLR Consulting New Zealand

cc:

Date: 1 September 2026

Project No. 820.V30005.01757

**RE: APP-2006012018.03 – Karioi Wood Processing
Contaminated Land Section 92 Response Technical Review**

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1.0 Context

The below review was initially provided on 24 June 2026 and was in relation to Resource Consent Application APP-2006012018.02. The Applicant has subsequently updated the Application as APP-2006012018.03. There is no material change to the supporting information provided regarding contaminated land matters, and the technical comments provided for Application APP-2006012018.02 remain valid.

2.0 Background

Babbage Consultants Limited (Babbage) on behalf of Winstone Pulp International limited (WPI – ‘the Applicant’) has applied to Horizons Regional Council (HRC) to undertake earthworks over an area of approximately 17,146 m² at the Karioi Wood Processing facility, located at 1002 State Highway 49, Tangiwai (the Site).

Regional Earthworks Consent has been applied for as a Controlled Activity under Rule LF-LAND-R6 of the HRC One Plan, as the Permitted Activity standards are not complied with, in particular, earthworks will be undertaken over an area which exceeds 2,500 m². Consent has also been applied for the discharge of wastewater to the Whangaehu River as a Discretionary Activity.

SLR Consulting New Zealand (SLR) has been requested by HRC to review the Application with regards to Contaminated Land matters in relation to the HRC One Plan. The following documents have been reviewed as part of our review:

- Babbage, 30 April 2026. Resource Consent Application APP-2006012018.02 – Planning Report – Karioi Wood Processing.
- Babbage, 10 June 2026. Karioi Wood Processing Detailed Site Investigation (DSI) Rev2 (Update of Rev1, 23 April 2026).
- Babbage, 10 June 2026. Karioi Wood Processing Remedial Action Plan (RAP) Rev2 (Update of Rev1, 24 April 2026).
- Babbage, 14 January 2019. Memorandum Karioi Pulp Mill Bore Details.
- Babbage, 11 June 2026. Section 92A Response – APP-2006012018.02.

SLR completed an initial review of the Application in May 2026 and provided comments and requests for further information by email to HRC on 7 May 2026.

2.1 The Application

In response to the matters raised by Ngā Waihua o Paerangi Trust, the Applicant is proposing to establish a wetland system within an existing pond area in the southeast corner of the Site (refer to the 'Investigation Area' shown in **Figure 1**).



Figure 1: Plan showing proposed New Wetland Area (sourced from Babbage DSI_Rev1, 23 April 2026)

To construct the wetland, the existing pond area is to be re-profiled using approximately 10,500 m³ of cut from the existing pond, to fill low points (up to ~9,995 m³ fill). Surplus soil will be used for the construction of a protection bund. Soils will be excavated to a maximum depth of 2.20 metres below ground level (m bgl). The Babbage DSI assessed soils through test-pits across the pond / proposed wetland areas. Encountered geology was variable, with silt soils present along with pulp, and other anthropogenic material such as plastic, concrete and metal.

The new wetland is designed to 'polish' wastewater prior to discharge to the Whangaehu River. The wastewater is to be generated from a torrefaction process to be implemented at the Site and is considered to be a condensate. Information provided by the Applicant regarding the proposed process, together with condensate analytical data from a biomass boiler at a facility in Denmark, indicates that contaminant concentrations in the condensate are expected to be low. Process gases generated through the torrefaction process are proposed to be combusted in the Torr Gas burner prior to condensation. The Applicant advises that the Torr Gas burner and biomass combustion processes are designed to achieve complete combustion at around 950°C, with a flue gas residence time of greater than two seconds at temperatures above 850°C, prior to particulate treatment and condensation. The resultant condensed water vapour at the Site is to be discharged to the wetland prior to discharge to the Whangaehu River.



3.0 Further Information Requests

In our initial review (by email 7 May 2026), SLR outlined several requests for further information (RFI) from the applicant. The RFIs were issued to the Applicant by HRC under Section 92(1) of the Resource Management Act (RMA) by letter dated 18 May 2026.

A meeting was held between the Applicant's Agent and the Applicant's Contaminated Land Consultants (Babbage) and SLR (acting as Contaminated Land Technical Reviewer on behalf of HRC) on 27 May and 29 May 2026 to discuss Contaminated Land and groundwater matters respectively.

In particular, matters for which SLR required further information to fully assess the application included:

1. Confirmation from the Applicant that the extent and degree of contamination was consistent with HAZ-WC-P8.
2. Consideration of whether Per- and Poly-fluoroalkyl Substances (PFAS) are a contaminant of concern, associated with historical pulp processing activities.
3. Suitability of the soil containing pulp and anthropogenic material for reuse as material for pond profiling. In particular, the results available demonstrates the soil contains contaminants and anthropogenic material which means it does not meet the requirements of Clean Fill.
4. The soil logs provided in the DSI show that pulp is present throughout much of the soil profile. Consideration in the DSI or RAP needs to be given as to whether it is suitable to bury/encapsulate organic material under water in a likely anaerobic environment, which could give rise to the generation of methane, and potential effects thereof.
5. Confirmation of wetland construction methodology, particularly in relation to the placement of potentially contaminated soil under a wetland.

4.0 Assessment

4.1 RFI Responses

Through the discussions held with Babbage, and the S92A Response from Babbage, further information has been provided to improve clarity of the Application, specifically in regards to the reuse of Site-sourced soils for the construction of the wetland. The following is now understood:

- 1 Babbage considers that a thorough assessment of soils to be reused as part of the construction of the wetland has been undertaken as part of the DSI, and that the extent and degree of contamination has been fully investigated under HAZ-WC-P8.

It is SLRs view that predominantly only surface soils have been analysed as part of the DSI, and minimal analysis of deeper soils, which will be cut as part of the wetland construction have been analysed to assess their suitability for on-site reuse within the constructed wetland. In our view, a thorough assessment would have included more comprehensive assessment and analysis of all soils proposed to be reused across a range of depths.



In response, in the two meetings, Babbage confirmed that no further sampling or analysis would be undertaken as the results of any further analysis would unlikely alter the chosen remediation and wetland construction approach.

- 2 In the discussions held and as detailed in Rev2 of the DSI, Babbage has confirmed that PFAS was unlikely used in the pulp processes as no fluorine containing chemicals have been used (information based on discussions Babbage held with people familiar with the Site and operations). Babbage also confirmed that the pulp mill had a large fire water reservoir used for a water-based fire-fighting system. On this basis Babbage has ruled out PFAS as a contaminant of potential concern.
- 3 It is understood that soils are to be cut and filled in stages to create each wetland cell. Babbage has confirmed in discussions, and in the RAP Rev2, that the bund of each wetland cell will be created first using site-sourced soils, followed by the bulk cut and fill work to minimise potential water ingress to each wetland cell. The proposed cut and fill plan is shown in **Figure 2**.



Figure 2: Proposed Cut and Fill Plan for Wetland Construction (sourced from Babbage RAP Rev 2, 10 June 2026).

Rev2 of the RAP confirms that visible pieces of observed anthropogenic material, such as concrete, rubber, wood and plastic will be separated and not used as part of the fill material. Following all soil profiling works, it is understood that the surface will be lined with a HDPE liner across the wetland, with no site sourced soil used on top of the HDPE liner for wetland finishing or landscaping. Refer to **Figure 3** for a concept design of the proposed wetland.

Following profiling, and all cut and fill works, all soils (whether contaminated or not) will be encapsulated under a HDPE liner. The chosen liner is understood to have a hydraulic conductivity in the range of 10^{-12} to 10^{-15} m/s, with the wetland designed to



achieve near-zero seepage provided the liner is correctly installed and quality assured.

Figure 3. Concept cross-section for the proposed constructed wetland system (not to scale).

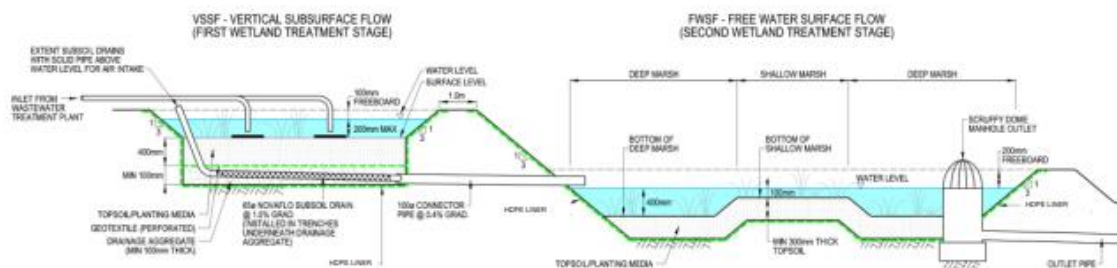


Figure 3: Concept Wetland Design (sourced from Babbage RAP Rev 2, 10 June 2026)

- 4 Further information provided has confirmed that groundwater is likely to be greater than 4.5 metres below ground level (m bgl). Elevated zinc is present at approximately 1.50 m bgl. This area will also be filled with an additional 1.50 to 2.0 m of site-sourced soils. Known contaminated soil (zinc and arsenic) are greater than 600mm above the seasonally high water table (required by HRC One Plan rule LF-LW-R36), however it is acknowledged that the vertical extent of soil sampling undertaken did not reach groundwater, with natural soils below the known pulp not encountered. Soils will also be placed on top of this area, and then encapsulated with a HDPE liner, designed to achieve minimal seepage.

Taking into consideration that not all soils have been fully characterised for contaminant concentrations in the Babbage DSI, the placed soils are to be encapsulated, within a sub-surface environment unlikely to become saturated or be within groundwater. Babbage considers it unlikely that any residual contaminants in soils to be filled would mobilise such that they would discharge to groundwater, or to the nearest surface water (540 m east). This is also taking into consideration that available data suggests that the existing zinc exceedance does not appear to be overly mobile, with a sample 50 m east (closer to the surface water receptor) containing an acceptable concentration of zinc in soil (below Ecological Soil Guideline Values). Babbage surmise that as soils in the direction of hydraulic gradient towards the Whangaehu River reported zinc concentrations below the Ecological Soil Guideline Values it was unlikely that zinc is present in groundwater source from upgradient such that it would be a discharge risk to surface water.

The proposed wetland development and remediation strategy relies on the encapsulated soil not becoming saturated such that remnant pulp within soil could degrade anaerobically and generate methane. Installation of the HDPE liner with appropriate QA is the primary method of ensuring the soils underlying the wetland do not become saturated. It is understood that the wetland design is not yet finalised, however, it is unclear on how it will be known that the liner is not leaking condensate from the wetland into the subsurface. A leak monitoring system should be considered into the wetland design.



4.2 Regulatory Assessment

The Applicant has conducted a further rule assessment under the HRC One Plan based on HRCs preliminary review that consent under LF-LW-R38 as a Discretionary Activity to address contaminants other than sediment may be required. The Applicant has concluded that consent under LF-LW-R38 is not required as the proposed activity complies as a Permitted Activity with Rules LF-LW-R34, LF-LW-R35 and LF-LW-R36. From a contaminated land perspective, SLR has not identified an additional contaminant discharge pathway arising from the proposed works that would alter the Applicant's assessment, provided the works are undertaken in accordance with the RAP and the proposed containment measures.

Consent under Rule LF-LAND-R6 as a Controlled Activity has been applied for.

4.3 SLR Conclusions

The responses from Babbage have generally adequately addressed the RFI queries raised by SLR in relation to Contaminated Land matters. The revised documentation confirms that the broad approach to earthworks at the Site is to:

- Excavate soils from across the existing pond area and use as fill for profiling prior to the construction of the wetland.
- All soils across the wetland area will be capped with a HDPE liner to isolate contaminated and potentially contaminated soils from receptors.
- The proposed design and quality assurance at construction indicate that soils beneath the wetland are unlikely to be saturated or subject to leakages, percolation or infiltration of water from surface such that residual contaminants in soils could become remobilised to groundwater. Preventing the placed soils from becoming saturated will also minimise the likelihood of anaerobic processes leading to methane generation.

The proposed re-use of site-sourced soil for the construction of the wetland provides for contaminated and potentially contaminated soils to be managed within the Site beneath the proposed engineered containment, rather than requiring off-site disposal. The updated RAP provides general and site-specific controls for the management of low-level contaminated soil and are considered sufficient for the proposed works. Completion of the earthworks in accordance with the RAP should be included as a condition of consent, specifically including the requirement to screen and separate out anthropogenic material from site-sourced soils. These wastes shall not be placed as fill as part of the wetland construction and will require appropriate off-site disposal to a consented facility.

The implementation of an Unexpected Contaminated Protocol during all earthworks at the Site is also required and should be included as a condition of consent. Should contamination be encountered, this will require appropriate characterisation by the appointed SQEP and should determine suitability of the material for use as fill as part of the construction of the wetland. If the soil is unsuitable for use as fill under the wetland, the soil will require off-site disposal to a facility consented to receive the surplus material.

The RAP should be considered a 'living' document and should be updated should any changes to the proposed methodology occur or following the discovery of unexpected contamination (if any).

Based on the further information provided SLR agrees that the soils are unlikely to be saturated such that mobilisation of contaminants or anaerobic degradation of pulp would not



be of significant concern should the HDPE liner be installed correctly, with appropriate QA. The information and volume of likely wastewater condensate also appears to suggest that contaminant concentrations would unlikely pose a risk to the environment.. Based on the information provided regarding the anticipated composition and volume of the condensate, SLR considers that leakage of condensate is unlikely to result in contaminant concentrations that would pose a significant risk to the environment. However, should the underlying soils containing organic pulp become saturated, anaerobic degradation of the pulp could potentially generate gases such as methane. A wetland monitoring, management and aftercare plan is also recommended as a condition of consent. The plan should specify the methods and frequency of leak detection monitoring, inspection and maintenance requirements, and contingency and remedial measures to be implemented if leakage is detected.

5.0 Closure

We trust this is to your satisfaction. If you have any queries, or require any further information, please do not hesitate to contact the undersigned.

Regards,

SLR Consulting New Zealand



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