

SMOOTH HILL LANDFILL DRAFT CONDITIONS – 5 April 2022

ORC Conditions of Consent

A. General conditions

1. The construction, operation, closure and aftercare of the landfill and road upgrades, including all associated discharges of contaminants to land, water, and air, shall be undertaken generally in accordance with the following documents, except where modified by other conditions of this consent. In the event of differences or conflict, between the measures in the documents and the conditions, the conditions shall prevail:
 - a. [insert references to final consent documents]
2. Pursuant to Section 128 of the Resource Management Act 1991 the consent authority may in [insert month] each year serve notice of its intention to review the conditions of this consent for the purposes of:
 - a. dealing with any adverse effect on the environment which may arise from the exercise of this consent; or
 - b. requiring the adoption of the best practicable option to reduce any adverse effect on the environment.

B. Conditions to be met during detailed design, construction, and operation

General

3. All investigations, detailed design, and supervision of construction of the initial landfill development works, works for each stage of the landfill, and road upgrades shall be supervised by a suitably experienced Chartered Professional Engineer (CPEng).
4. The consent holder shall establish and retain at its own cost, an independent peer review panel to review the design, construction and operation of all stages of the landfill and road upgrades, and the management of ecological effects, and to assess whether or not the work has been undertaken by appropriately qualified personnel in accordance with the consents and good practice.

The independent Peer Review Panel shall comprise at least two persons who together shall be:

- a. Independent of the consent holder.
 - b. Independent of the planning, design, construction, management, and monitoring of the site.
 - c. Experienced in landfill design, construction, and management.
 - d. Experienced in geotechnical, groundwater, and surface water aspects of landfill design, construction and operation.
 - e. Experienced in terrestrial and freshwater ecology.
 - f. Recognised by their peers as having such experience, knowledge and skill.
 - g. Approved in writing by Otago Regional Council.
5. At least 3 months prior to commencing the construction of the initial landfill development works, a new landfill stage, and road upgrades the consent holder shall submit a design report and design drawings to the independent peer review panel for certification that it meets the requirements of the consent. The independent peer review panel shall communicate this certification to Otago Regional Council.
 6. The completed initial landfill development works, works for each stage of the landfill, and road upgrade works shall be certified by the suitably experienced Chartered Professional Engineer (CPEng) that they have been completed in accordance with the detailed design certified by the independent peer review panel. A CQA report shall be prepared and submitted to the independent peer review panel within 3 months following completion.

7. The independent peer review panel shall prepare an annual report to be submitted to Otago Regional Council prior to 1 March each year, on the adequacy of the following matters in relation to meeting requirements of the consents:
- a. Any management or monitoring plans reviewed during the year.
 - b. Any designs reviewed during the year.
 - c. Construction activities undertaken including:
 - i. Initial landfill development works.
 - ii. Site preparation.
 - iii. Liner construction.
 - iv. Leachate collection system installation.
 - v. Landfill gas collection system installation.
 - d. Landfill operation including:
 - i. Water control, including stormwater and leachate management.
 - ii. Waste compaction.
 - iii. Waste acceptance.
 - iv. Daily and intermediate cover placement.
 - v. Leachate system.
 - vi. Landfill gas system.
 - e. Monitoring and records.
 - f. Capping and rehabilitation.
 - g. Ecological management.

This report shall be based on:

- a. A review of the landfill annual monitoring report required by condition 81.
- b. Review of designs and management plans submitted during the year.
- c. Review of construction CQA reports.
- d. Any further enquiries and inspections required by the independent peer review panel to allow them to carry out their duties.

Land Stability

8. Additional geotechnical investigations shall be carried out as necessary as part of the detailed design of the landfill to generate a robust site encompassing geotechnical ground model for the site. The performance of the in-situ Henley Breccia is critical to the cut slope stability; further investigation shall include verification of the dip and dip direction of the Henley Breccia and strength assessment of the contacts between units. The location of investigation points shall be determined during the initial stages of the detailed design process where specific confirmation is required.
9. A Site Specific Probabilistic Seismic Hazard Assessment (SSPSHA) shall be undertaken as part of Detailed Design of the landfill to ensure seismic risks are addressed so the landfills performance under seismic load is consistent with an IL4 structure as defined in Table 3.2 NZS 1170.0.2004 Structural Design Actions - Part 0 General Principles ([facilities containing hazardous materials capable of causing hazardous

conditions that extend beyond the property boundaries.]) and Table 3.3 for appropriate annual probability of exceedances based on design life. The detailed design of the landfill shall use the results of the SSSHA as inputs into the slope stability modelling.

10. The detailed design of the landfill shall demonstrate the short (construction and operation) and long-term (closure to post closure) stability of all cut and fill slopes of the landform. This will be achieved by undertaking quantitative limit equilibrium slope stability assessment of the design landform and earth fill retaining bund to demonstrate a factor of safety for cut and fill slopes in the static load case of ≥ 1.5 , and for slopes where the factor of safety is < 1 in the pseudo-static seismic load case, the displacement method shall be considered as per Section 6.3.2 of the Waka Kotahi NZTA Bridge Manual (3rd Edition Oct 2018).
11. The detailed design of the landfill shall include stability analysis to verify the placement of waste achieves waste stability in the short (construction/operation) and long-term (closure/post closure) and ensures the interface friction angle at the base of the landfill between the waste and liner protects against a base slide failure or a potential circular slip failure through the base. This shall include:
 - a. Veneer slope stability analysis of the proposed liner and capping arrangements for each stage.
 - b. Waste stability analysis of the proposed landfill stages.

The analysis shall utilise site specific parameters where possible for the various materials, and/or publicly available material data where site-specific information is not available. Where publicly available material data is used, a verification programme shall be included as part of the detailed design documentation provided to the independent peer review panel for certification that the construction materials align with any assumptions made as part of the slope stability analysis.

Water Quantity

12. The landfill perimeter drain, other permanent drainage diversion channels and culverts, and attenuation basin shall be designed and constructed to manage a 1% AEP (Annual Exceedance Probability) storm event. Diversion channels shall be designed such that if this capacity is exceeded the preferential (secondary) flow path is, as far as practicable, away from the landfill. Suitable scour protection shall be placed within the landfill perimeter drain where design flows exceed 0.8m/s to prevent scouring.
13. All stormwater shall be discharged to the Ōtokia Creek as follows:
 - a. Stormwater collected within the area of stage 1 of the landfill development shall be discharged via a pipe through the toe bund to the Ōtokia Creek, until which time stage 1 is completed.
 - b. Except as provided by (a) above, stormwater from gullies upstream of the attenuation basin, the perimeter swale drain, and landfill operational areas (other than open sections of the landfill), upper facilities area, and final cap shall be directed to the attenuation basin for infiltration to ground, and discharge to the Ōtokia Creek.
14. The take of groundwater from the groundwater collection system shall only be used for non-potable water supply, and the quantity taken for this purpose shall not exceed 50m³/day. Any groundwater that is not taken for this purpose shall be discharged to the Ōtokia Creek.
15. The quantity of water taken from the groundwater collection system for non-potable water supply, quantity of leachate taken from the leachate collection system shall be recorded instantaneously and reported annually to the independent peer review panel, and Otago Regional Council.
16. The landfill perimeter drain, other permanent drainage diversion channels and culverts, attenuation basin, and groundwater collection system shall regularly inspected and maintained in perpetuity.

Water Quality

17. The landfill shall be designed and constructed with a:

- a. Landfill liner to isolate leachate from the underlying strata, and which meets the minimum requirements of the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill.
 - b. Leachate collection system to remove leachate from the landfill, and which meets the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill and configured to ensure the maximum head of leachate on the liner is no greater than 300mm over all areas of the liner under normal operating conditions, apart from the sumps.
 - c. Groundwater collection system beneath the landfill liner which is sized and configured to ensure effective sub-liner drainage and control of groundwater, with a separate groundwater quality monitoring sump from the leachate collection system.
18. The installation of the landfill lining system shall be subject to independent construction quality assurance (CQA), to include the soil and geosynthetic components of the lining system. On completion of each stage of lining system construction a CQA report shall be prepared and shall include all of the test results, a description of the observations undertaken and certification that the lining system has been installed in accordance with the specification. This report shall be submitted to the independent peer review panel.
19. Leachate storage and management facilities shall be designed for a capacity 50% greater than the calculated (as calibrated against the previous two year's results) maximum leachate volume produced over a three-day period for any stage of operation of the landfill. To demonstrate compliance with this condition, the calculated maximum leachate volume and the leachate storage and management facilities shall be described in the LMP required by condition 82.

For the first two years of operation of the landfill where there are insufficient records to calibrate the leachate storage and management systems, such systems shall be designed to accommodate theoretical storage and flow rates based on the leachate which would be generated by a 1% AEP event for the extent of landfill to be developed over that two-year period.

20. Leachate shall only be discharged onto or into land within the landfill liner extent shown on drawing 12506381-01-C201.
21. On-site standby electrical supply shall be provided to ensure the operation of the leachate collection system is not interrupted through loss of mains power supply.
22. Two additional groundwater monitoring wells at locations GW1 and GW5 as shown on drawing 12506381-C309 shall be installed at least 18 months prior to construction of the landfill to enable collection of baseline groundwater level and groundwater quality data and monitoring for leachate contamination of groundwater during operation. The additional wells at GW1 and GW5 shall be installed to monitor the deep groundwater system with a screen between 90 and 85m RL and shall be constructed in accordance with *NZ4411:2001 Environmental Standard for Drilling of Soil and Rock*.
23. The groundwater monitoring wells described in the table below as shown on drawing 12506381-C309 shall be retained to enable collection of baseline groundwater level and groundwater quality data and monitoring for leachate contamination of groundwater during operation.

Monitoring well	Description
GW1	Additional monitoring well to be installed with screen between 90-85m RL (down hydraulic gradient deep GW system). See condition 22.
GW2	Existing wells BH02a and BH02b (shallow GW system).
GW3	Existing well BH04a (shallow GW system) and BH04b (deep GW system)

GW5	Existing wells BH01a and BH01b (shallow GW system). Additional monitoring well (BH01c) to be installed with screen between 90-85 mRL (up hydraulic gradient deep GW system). See condition 22.
GW6	Existing well BH09
BH202	Existing well BH202 (deep GW system)

24. Groundwater monitoring to collect baseline groundwater level and quality data shall commence at least 18 months prior to construction of the landfill at the monitoring wells described in condition 23 , and surface water monitoring at locations SW1 – SW7 shown on drawing 12506381-C309 to collect baseline surface water level and quality data shall commence at least 36 months prior to landfill construction commencing to establish the baseline water chemistry and inform the development of monitoring trigger levels. Sampling of groundwater and surface water shall occur at least every 3 months for the 18-month monitoring period for the full suite of parameters set out in **Attachment 1** for those locations.
25. At the conclusion of the monitoring period identified in condition 24, the baseline data shall be reviewed to confirm or make any required adjustments to the conceptual site model. The monitoring results for the entire monitoring period, along with any updates conceptual model shall be reported to the independent peer review panel, prior to development of monitoring trigger levels under condition 26.
26. Following the reporting of monitoring results and any updates to the conceptual site model under condition 25, monitoring trigger levels shall be developed to achieve the following objectives:
- a. Ensure construction management controls are adequate and being operated and maintained to ensure effective operation.
 - b. Identify potential leachate discharge to the environment at or near source to confirm efficacy of the management system or the need for remedial actions.
 - c. Protection of the receiving environment downstream of the landfill by ensuring that the landfill does not have an adverse effect on water quality when compared with the current regime.

Trigger levels shall be developed for the indicated parameters set out in **Attachment 1** to detect leachate leakage effects on groundwater; and leachate, suspended solids, and turbidity on surface water quality, when monitored at the following locations:

- a. The monitoring wells described in condition 23.
- b. The groundwater collection system prior to discharge to the Ōtokia Creek, or abstraction for non-potable water supply.
- c. During stage 1 works, the sediment retention pond prior to discharge to the Ōtokia Creek. During subsequent stages, the attenuation basin prior to discharge to the Ōtokia Creek.
- d. The surface water monitoring points shown as SW1 – SW7 on drawing 12506381-C309.

The baseline water chemistry data collected under condition 24 shall be used to establish trigger level values for the indicated parameters in **Attachment 1**. Development of trigger level shall meet the following requirements:

- a. Establishment of levels for groundwater and surface water shall use a trend analysis approach to ensure changing land use over time (forestry cycles), slow rate of change over time, and variability in baseline quality are accounted for.

- b. Trigger levels for suspended sediments in surface water (SW1 – SW7) for typical flows shall be the upper limit of turbidity values recorded during baseline monitoring or the Regional Plan for Otago: Water Schedule 15 turbidity limit, whichever is higher.
- c. Trigger levels for suspended sediments in surface water (SW1 – SW7) for flood events (where out of channel flows occur), shall be based on visual inspection with a no greater than 30% increase in turbidity at the downstream boundary of the landfill site over that of adjacent contributing catchments.

Proposed trigger levels shall be provided to the independent peer review panel at least 3 months prior to construction, for certification that the trigger levels are suitable. The independent peer review panel shall communicate this certification to Otago Regional Council.

- 27. Continuous monitoring of the sub-liner groundwater drainage system, sediment retention pond for the stage 1 area, and attenuation basin under condition 28 shall meet the following requirements:
 - a. Continuous monitoring of electrical conductivity, pH, and ammonia shall occur.
 - b. The monitoring system shall be configured so that exceedance of monitoring trigger levels activates an alarm notifying key site personnel.

The landfill management plan required by condition 82, shall include response procedures in the event of an exceedance of trigger levels for continuous monitoring in condition 28. This shall as a minimum include the relevant actions outlined in condition 28.

- 28. During operation of the landfill the monitoring of groundwater level and quality, and surface water levels and quality outlined in the table below shall occur and be assessed against the trigger levels established under condition 26, and the results reported to the independent peer review panel and Otago Regional Council. Where there is any exceedance of the trigger levels caused by leachate or sediment, the specified actions shall be implemented.

Monitoring Point	Frequency	Parameters	Monitoring point and parameter specific actions where trigger levels are exceeded	Actions for all trigger level exceedances
Sub-liner groundwater drainage system prior to discharge to the Ōtokia Creek or abstraction for non-potable water supply.	Continuous	<ul style="list-style-type: none"> • Electrical conductivity • pH • Ammoniacal nitrogen 	The manhole outlet from the groundwater collection system shall be closed immediately following any exceedance being detected, and groundwater redirected to the leachate collection system.	An investigation is undertaken into potential causes. A report is provided to Te Rūnanga o Ōtākou, Otago Regional Council, and the independent peer review panel no later than 2 weeks following receipt of the additional monitoring round results. The report shall outline likely causes of exceedance, actions to be taken to prevent further trigger level exceedances and proposed follow up monitoring where necessary.
	Monthly	Basic suite of parameters set out in Attachment 1 to be monitored, except that the full suite of parameters to be monitored in one monthly monitoring cycle per year	<p>Contaminated groundwater shall be directed to the leachate collection system for disposal off site until such time as the conditions have reduced below the trigger level or it can be demonstrated that the effects of discharging the water will not result in exceedance of surface water trigger levels for locations SW1 – SW7.</p> <p>An additional monitoring round will be undertaken no later than 1 week following any exceedance being detected and analysed for the full parameter suites outlined in Attachment 1.</p>	
Groundwater monitoring wells as GW1 – GW6	Quarterly.	Basic suite of parameters set out in Attachment 1 and water level to be monitored, except that the full suite of parameters to be monitored in one quarterly monitoring cycle per year	An additional monitoring round will be undertaken no later than 1 week following any exceedance being detected and analysed for the full parameter suites outlined in Attachment 1.	
During stage 1 works, the sediment retention pond prior to discharge to the	Continuous (when flows occur)	<ul style="list-style-type: none"> • Electrical conductivity • pH • Ammoniacal nitrogen 	The outlet from the sediment retention pond or low flow outlet from the attenuation basin shall be closed immediately following any exceedance being detected in the event that leachate contaminated	

<p>Ōtokia Creek During subsequent stages, the attenuation basin prior to discharge to the Ōtokia Creek.</p>			<p>stormwater is flowing to the Ōtokia Creek. Contaminated stormwater shall be directed to the leachate collection system for disposal off site until such time as the conditions have reduced below the trigger level or it can be demonstrated that the effects of discharging the water will not result in exceedance of surface water trigger levels for locations SW1 – SW7.</p> <p>An additional monitoring round of the surface water monitoring points SW1 – SW7, and a sample from the sediment retention pond or attenuation basin, will be undertaken no later than 24 hours following any exceedance being detected and analysed for the full parameter suite outlined in Attachment 1 for SW1 – SW7.</p>	
<p>Surface water monitoring points shown as SW1 – SW6 and surface water monitoring point shown as SW7 (located at the Ōtokia Creek culvert).</p>	<p>Weekly (when flows occur). If continued periods of surface water discharge occur, then monitoring will occur weekly.</p>	<p>Basic suite of parameters set out in Attachment 1 excluding sediment and turbidity to be monitored, except that the full suite of parameters to be monitored in one weekly monitoring cycle per year</p> <ul style="list-style-type: none"> • Sediment • Turbidity 	<p>All known downstream surface water abstractors within the McColl Creek catchment, and Te Rūnanga o Ōtākou are notified of any exceedance no later than 1 day following the exceedance being detected.</p> <p>An additional monitoring round will be undertaken no later than 1 week following any exceedance being detected and analysed for the full parameter suites outlined in Attachment 1.</p> <p>Sediment controls shall be adjusted so that the site does not contribute a disproportionate sediment load downstream in comparison to the catchment above McLaren Gully Road.</p>	

29. All groundwater and surface water sampling required under conditions 24 and 28 shall meet the following requirements:
- a. Sampling shall be undertaken at the specified locations indicated in conditions 24 and 28.
 - b. Sampling shall be undertaken, or overseen by, a suitably qualified professional and collected in accordance with AS/NZS 5667.11:1998.

- c. All analysis carried shall be performed by a laboratory that meets International Accreditation New Zealand (“IANZ”) approved laboratory or otherwise as specifically certified by the independent peer review panel.
30. The construction and operation of the landfill shall not cause there to be a conspicuous change in water quality, objectionable odour, water unsuitable for consumption by farm animals, or significant effect on aquatic life in the Ōtokia Creek downstream of the discharge of stormwater from the landfill site.
31. Suitable scour protection shall be placed on the spillway of the attenuation basin to prevent scour.
32. The vehicle wash bay shall be designed, constructed, and operated to ensure water used passes through sumps with oil and sediment traps with the capacity to cater for the proposed discharge of water. Discharges from the vehicle wash bay shall be directed to a sediment retention pond prior to discharge to the Ōtokia Creek.
33. The wheel wash shall be designed, constructed, and operated to ensure used water passes through sediment traps and flocculation ponds of capacity to cater for the proposed discharge, prior to being recycled to the wheel wash. Excess discharges from the wheel wash shall be directed to the landfill attenuation basin.
34. Stormwater, erosion and sediment control management measures shall be implemented during the construction and operation of the landfill, and construction of the road upgrades, which ensure:
 - a. The area of soil surfaces exposed at any one time is minimised.
 - b. Cut off drains are installed upslope of exposed soil surfaces to intercept stormwater and minimise flow over exposed soil.
 - c. All stormwater from exposed soil surfaces within the landfill footprint is directed to and treated in sediment retention ponds, prior to discharge to the landfill attenuation basin or Ōtokia Creek.
 - d. Temporary measures such as silt fences, sediment traps, sediment retention ponds, and temporary cover and stabilisation are installed to minimise the transport of sediment from exposed soil surfaces and stockpile areas.
 - e. Completed earthworked areas are stabilised with vegetation or other means as soon as practicable.
35. All erosion and sediment control measures shall take into account site specific conditions and be designed and implemented to in accordance with Auckland Council Publication GD05 – *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region – June 2016* for the sizing of ponds, and Environment Canterbury *Erosion and Sediment Control Toolbox*, or other best practice guidelines, for the identification of the most appropriate control measures taking into account site specific conditions. Sediment control ponds will be designed to manage a 10% AEP (Annual Exceedance Event) storm event, with provision to pass a 1% storm event. Scour protection shall be placed at the outlet of sedimentation ponds to prevent scour.

Air Quality

36. Municipal Solid Waste shall be accepted for disposal only if it has been transported to the landfill in sealed truck and trailer units or bins.
37. An automatic weather station shall be maintained on site which records wind speed and direction, temperature, relative humidity, and rainfall.
38. No composting activity shall occur on the site.
39. To minimise odour emissions during handling of highly odorous wastes the following measures shall be implemented:

- a. Highly odorous loads shall only be received between the hours of 10.00am and 4.00pm.
- b. Deliveries of highly odorous wastes shall be pre-booked, to ensure preparations are made including ensuring cover material is available at the pit location.
- c. Wastewater sludges, biosolids, and screenings shall be treated with stabilised lime or an alternative that performs to an equivalent or higher standard of treatment for odour, prior to delivery to the site. Loads not complying shall be refused entry and only accepted after treatment.
- d. Holding deliveries of unexpected highly odorous waste loads until preparations identified in (b) above are in place to enable disposal.
- e. Highly odorous wastes shall be covered as soon as practicable and in any event not later than one hour following placement.
- f. The landfill management plan required by condition 82 shall include specific procedures for the pre-acceptance, handling, and placement of highly odorous wastes, including contingency measures in the event of an unexpected highly odorous waste load. This shall include as minimum requirements for prioritising the placement of highly odorous waste, covering of waste as required by condition 39(e), using special odorous waste placement areas that maximise separation distances to receptors, and the use of odour suppressing sprays/cannons.

For the purposes of this condition, “highly odorous wastes” include:

- a. Wastewater treatment sludges, biosolids, screenings.
 - b. Wastewater pump station screenings, grits.
 - c. Animal remains.
 - d. Waste from meat processes.
 - e. Woolscour, tannery, fellmongery waste.
 - f. Fish waste.
40. All waste shall at least be covered at the end of each working day with:
- a. compacted soil cover to a minimum depth of 150 millimetres; or
 - b. construction and demolition waste to a minimum depth of 150 millimetres; or
 - c. alternative materials that perform to an equivalent or higher standard to 150 millimetres soil cover.
41. No waste shall remain exposed overnight.
42. All areas where further waste will not be placed for three months, shall be covered with intermediate soil cover to a minimum depth of 300 millimetres, and grass cover established by hydroseed.
43. Leachate conveyance and storage facilities shall be sealed to minimise odour.
44. There shall be no noxious, dangerous, offensive or objectionable odour or dust to the extent that it causes an adverse effect at or beyond the boundary of the site.
45. A detailed Landfill Gas Risk Assessment (LFGRA) shall be completed prior to construction of the landfill to confirm potential landfill gas related risks at the site, including potential sources of landfill gas, emission pathways, receptors of emissions from the site, and management measures. The detailed LFGRA should further consider / investigate organic mudstone / lignite as a source of ground gas at the site. The LFGRA required under this condition shall be reviewed and updated at least every 5 years, or more regularly if there are changes to the location of potential receptors.
46. The landfill shall be designed and progressively constructed with a:

- a. Landfill liner to reduce fugitive subsurface emissions of landfill gas, and which meets the minimum requirements of the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill.
 - b. Leachate collection system to remove leachate from the landfill, and which meets the minimum requirements of the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill, and provides leachate pumping systems in accordance with relevant standards in relation to landfill gas (e.g. *AS/NZS 2381.1.1:2005*).
 - c. Landfill gas collection and destruction system suitable for the anticipated rate and quantity of landfill gas emitted by the landfill, which addresses the risks identified by the LFGRA in condition 45 above, and meets the minimum requirements of the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill, and Resource Management (National Environmental Standards for Air Quality) Regulations 2004.
47. A landfill gas monitoring bore network shall be installed around the perimeter of the landfill at least 6 months prior to waste being accepted to enable detection of landfill gas escaping laterally from the landfill and identify its location, and which addresses the risks identified by the LFGRA in condition 45 above and meets the minimum requirements of the EPA Victoria (2015) Best Practice Environmental Management guidelines.
48. Monitoring of gas emissions in the landfill gas monitoring bore network shall commence at least 6 months prior to waste being accepted to establish background ground gas data and inform the development of monitoring trigger levels.
49. Monitoring trigger levels shall be developed for those parameters relevant to detect landfill gas escape, when monitored at the following locations:
- a. The landfill gas monitoring bore network.
 - b. The surface of the final landfill cap.

The baseline gas data collected under condition 48 shall be used to establish typical ranges for each parameter and establish trigger values for these ranges. Proposed trigger levels shall be provided to the independent peer review panel for certification that they are suitable to detect landfill gas in advance of waste being accepted. The independent peer review panel shall communicate this certification to Otago Regional Council.

50. During operation of the landfill, landfill gas concentrations shall be measured at least monthly in each of the perimeter monitoring bores, and at least every 3 months at the surface of the final landfill cap, and assessed against the trigger levels, and reported to the independent peer review panel and Otago Regional Council. Where there is any exceedance, a report will be provided to Te Rūnanga o Ōtākou, the independent peer review panel and Otago Regional Council no later than 2 weeks after any exceedance is detected outlining detailed actions to be taken to reduce landfill gas detected and outlining proposed follow up monitoring.
51. During operation of the landfill, a walkover site inspection shall be undertaken at least monthly by the landfill operator. Any evidence of actual or potential landfill gas leaks, odour, cracks in the landfill surface, gas bubbles, leaks in the gas extraction system, or vegetation damage, shall be investigated. Remedial action shall be undertaken as soon as practicable where necessary to minimise fugitive emissions.
52. The landfill gas collection and destruction system shall be restored as soon as practicable in the event of a malfunction or fault.
53. On-site standby electrical supply shall be provided to ensure the operation of landfill gas flare equipment is not interrupted through loss of mains power supply.

54. A final capping layer, shall be constructed as each stage of the landfill is completed. The final cover layer shall comprise the following minimum layers, from bottom to top;
- a. 600 millimetres of compacted cohesive soils with a permeability coefficient of not more than 1×10^{-7} metres per second; and
 - b. 300mm growth media layer; and
 - c. 150 millimetres of topsoil (grassed).

Ecology

55. There shall be no clearance of indigenous vegetation earthworks, or landfill operations in West Gullies 1, 2, 3, and 4 as identified in the *Smooth Hill Landfill, Ecological Impact Assessment Prepared for Dunedin City Council, 19 August 2020 (updated 28 May 2021) prepared by Boffa Miskell*.
56. The area directly impacted by construction and operation of the landfill shall be limited to and not exceed the following maximum areas as set out in *Smooth Hill Landfill, Ecological Impact Assessment Prepared for Dunedin City Council, 19 August 2020 (updated 28 May 2021) prepared by Boffa Miskell*:
- a. (Purei) / (Yorkshire Fog – Cocksfoot) - Rautahi Sedgeland – 0.0014 ha.
 - b. (Yorkshire Fog) – Cocksfoot Grassland – 3.15 ha.
 - c. [Purei] – Wiwi/ Rautahi – Exotic Grass Rushland – 0.00027 ha.

There shall be no construction or landfill operational activities in the Swamp Wetland, Downstream Valley Floor Marsh Wetland, and/or intermittent or perennial streams. This does not apply to activities carried out during implementation of a certified Restoration Management Plan prepared in accordance with Condition 59.

57. An Eastern Falcon Management Plan based on the *Draft Smooth Hill Falcon Management Plan prepared by Boffa Miskell Ltd, dated May 2021*, must be prepared by a suitably qualified ecologist to ensure any adverse effects on any New Zealand Eastern falcons nesting at the site during construction are avoided or mitigated. The plan must be developed in consultation with Te Rūnanga o Ōtākou. As a minimum the plan must include:
- a. A summary of the impact assessment for Eastern Falcon.
 - b. Detail of onsite surveys that have been undertaken to inform the Eastern Falcon Management Plan.
 - c. Mitigation methodologies to reduce the effects on Eastern Falcon during construction.
 - d. Pre, and during construction monitoring methodologies.
 - e. Key responsibilities of onsite personnel.
 - f. An adaptive management and review process that includes Te Rūnanga o Ōtākou, the independent peer review panel, and Otago Regional Council.

The plan must be submitted to the independent peer review panel no less than 3 months prior to commencement of construction for certification that it addresses the requirements of this condition. The independent peer review panel shall communicate this certification to Otago Regional Council. The certified plan is to be implemented for the duration of any landfill construction works.

58. A Lizard Management Plan based on the *Draft Smooth Hill Lizard Management Plan prepared by Boffa Miskell Ltd, dated May 2021* must be prepared by a suitably qualified herpetologist to ensure any adverse effects to lizards during construction are effectively avoided or otherwise managed. The plan must be developed in consultation with Te Rūnanga o Ōtākou. As a minimum the plan must include:
- a. A summary of the impact assessment for herpetofauna.

- b. Detail of onsite surveys that have been undertaken to inform the Lizard Management Plan.
- c. Mitigation methodologies including salvage and relocation, and any habitat enhancement measures undertaken in accordance with condition 59.
- d. Key responsibilities of onsite personnel.
- e. An adaptive management and review process that includes Te Rūnanga o Ōtākou, the independent peer review panel, and Otago Regional Council.

The plan must be submitted to the independent peer review panel no less than 12 months prior to commencement of construction for certification that it addresses the requirements of this condition. The independent peer review panel shall communicate this certification to Otago Regional Council. The certified plan is to be implemented for the duration of any landfill construction works.

59. A Restoration Management Plan based on the *Draft Smooth Hill Vegetation Restoration Plan prepared by Boffa Miskell Ltd, dated May 2021*, shall be prepared by a suitably qualified ecologist to address the loss of or impact to freshwater, wetland and terrestrial environments caused as a result of construction of the landfill and road upgrades, to achieve no net loss of ecologically significant habitat / features in terms of type, amount, or condition. The plan must be developed in consultation with Te Rūnanga o Ōtākou. As a minimum the plan must include:

- a. A summary of the impact assessment for freshwater, wetland, and terrestrial environments.
- b. Mitigation, offsetting and / or compensation measures, which as a minimum must include:
 - i. Wetland restoration that not only includes the area of wetland to be restored itself, but also a 10 m buffer from the wetland edge, other than where the landfill toe bund is within 10 m of the wetland edge.
 - ii. Stock exclusion from any restoration area using permanent fencing including gates for access.
 - iii. Pest plant control methods, including types of pest plant species to be controlled, areas in which they are to be controlled (including targets to be met), and in which areas or circumstances gorse (or another specified plant pest) may be tolerated as a nurse crop.
 - iv. Pest animal control, including annual performance pest animal targets for the site using standardised Department of Conservation residual trap catch, tracking tunnel or chew card indices.
 - v. A process for reviewing and adapting pest plant and animal controls in the event that the performance targets are not achieved over two consecutive years. This review process must include Te Rūnanga o Ōtākou, the independent peer review panel, and Otago Regional Council.
 - vi. Ground preparation, planting and maintenance specifications. All plants used for restoration must be eco-sourced from the same eco-region and be free of pest plants. Plant size and densities must be relevant to the location of where they are being placed and restoration outcomes.
 - vii. A detailed programme of works.
 - viii. Standardised methodologies for onsite biosecurity control (bring onto site / onsite / taking off site).
 - ix. Long term success-based monitoring at year 0, 1, 3, 5, 10, 15, 25 and 30.
 - x. Key responsibilities of onsite personnel.

- c. An adaptive management and review process that includes Te Rūnanga o Ōtākou, the independent peer review panel, and Otago Regional Council.

The plan must be submitted to the independent peer review panel no less than 3 months prior to commencement of construction for certification that it addresses the requirements of this condition. The independent peer review panel shall communicate this certification to Otago Regional Council. The certified plan is to be implemented during the construction of the landfill and road upgrades, and operation of the landfill.

Advice note – where offsetting or compensation measures are applied, these shall follow best practice methods such as those set out in Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland Streams (October 2011); Biodiversity Offsetting Under the Resource Management Act: a guidance document (September 2018); or A Biodiversity Compensation Model for New Zealand: a user guide – version 1 (October 2021), or updated similar guidance. Where biodiversity offset accounting / compensation modelling approaches (BOAM / BCM) are used, the same metrics used in the development of the models shall form the basis of monitoring standards as may be required.

60. A Freshwater and Wetland Monitoring and Management Plan must be prepared by a suitably qualified ecologist(s) to ensure residual or ongoing adverse effects to any freshwater or wetland environment or indigenous species that arise from the exercise of this consent are effectively remedied or otherwise managed. The plan must be developed in consultation with Te Rūnanga o Ōtākou. As a minimum the plan must include:

- a. A summary of the impact (direct and indirect) assessment for surface water bodies and wetlands.
- b. Detail of onsite surveys that have been undertaken to inform the Freshwater and Wetland Management Plan.
- c. Pre, during and post construction (term of consent) monitoring methodologies with the aim of establishing any indirect effects on down catchment freshwater and wetland environments (particularly macroinvertebrate communities, fish communities and aquatic habitat) to be undertaken in the event that water level monitoring undertaken under condition 28 identifies an exceedance of trigger levels.
- d. A residual effects assessment that takes into account adverse effects identified from the monitoring in c. above.
- e. A process for appropriately remedying or otherwise managing residual adverse effects identified from the assessment in d. above, including methodologies for the salvage and relocation of indigenous fish species or other indigenous species as may be required.
- f. Key responsibilities of onsite personnel.
- g. An adaptive management and review process that includes Te Rūnanga o Ōtākou, the independent peer review panel, and Otago Regional Council.

The plan must be submitted to the independent peer review panel no less than 3 months prior to commencement of construction for certification that it addresses the requirements of this condition. The independent peer review panel shall communicate this certification to Otago Regional Council. The certified plan is to be implemented during the construction of the landfill and road upgrades, and operation of the landfill.

Advice note – where offsetting or compensation measures are applied, these shall follow best practice methods such as those set out in Stream Ecological Valuation (SEV): a method for assessing the ecological functions of Auckland Streams (October 2011); Biodiversity Offsetting Under the Resource Management Act: a guidance document (September 2018); or A Biodiversity Compensation Model for New Zealand: a user guide – version 1 (October 2021) or updated similar guidance. Where biodiversity offset accounting /

compensation modelling approaches (BOAM / BCM) are used, the same metrics used in the development of the models shall form the basis of monitoring standards as may be required.

61. A Plant and Animal Pest Control Programme shall be prepared prior to the commencement of construction, to ensure adverse effects on vegetation, avifauna, and herpetofauna from exotic pest plant species, and mammalian pests (rodents and mustelids) due to construction and operation of the landfill operation are minimised. The plan shall be developed in consultation with Te Rūnanga o Ōtākou. The programme shall be provided to the independent peer review panel for certification prior to construction. The independent peer review panel shall communicate this certification to Otago Regional Council. The plan is to be implemented during construction and operation of the landfill.

Bird Management

62. Smooth Hill landfill must not be available to the general public for the disposal of waste. Waste must be consolidated off-site prior to transport in bulk to Smooth Hill landfill.
63. To the extent practicable, food and garden organic waste streams must be collected and processed separately to minimise disposal of this material at Smooth Hill landfill.
64. To the extent practicable, residual putrescible waste must be removed from the general waste stream and processed separately prior to transfer and final disposal of general waste at Smooth Hill landfill.
65. A Landfill Operational Bird Management Plan, based on the *Draft Smooth Hill Bird Management Plan prepared by Boffa Miskell Ltd and Avisure, dated May 2021*, must be prepared by a suitably qualified person. The plan must be developed in consultation with Dunedin International Airport and Te Rūnanga o Ōtākou. As a minimum the plan must include:
 - a. Details of further surveys undertaken across all seasons, updated information on what the waste stream will consist of, and how it will be handled, and a review of key factors contributing to the low bird numbers at Kate Valley.
 - b. An updated risk assessment based on the information obtained under Condition 65(a).
 - c. All of the recommendations from the Preliminary Bird Hazard Assessment undertaken by Avisure, dated May 2021, or any alternative and/or additional recommendations contained in the updated risk assessment required by Condition 65(b).
 - d. A summary from a New Zealand perspective covering the attraction of birds to landfills and bird strike risk with aircraft.
 - e. Detailed methodologies regarding daily cover.
 - f. Bird species greater than 50 g that must be managed to zero densities daily.
 - g. Detailed processes of management actions if the limit in condition (f) is breached.
 - h. Detailed methodologies and actions for bird management during operation.
 - i. Key responsibilities of onsite personnel including the appointment of a Bird Control Officer.
 - j. Liaison with and sharing of information with Dunedin Airport on bird management.
 - k. Maintenance of a Landfill Operational Bird Management register including monthly compliance reporting to Dunedin International Airport and the independent peer review panel.
 - l. An adaptive management and review process that includes an annual meeting with Te Rūnanga o Ōtākou, the peer review panel, Dunedin International Airport, and Otago Regional Council. The consent holder must report to the independent peer review panel on any recommendations made by

this panel to the Landfill Operational Bird Management Plan, and any changes made to this plan as a result.

The plan must be submitted to the independent peer review panel no less than 3 months prior to commencement of construction for certification that it addresses the requirements of this condition. The independent peer review panel shall communicate this certification to Otago Regional Council. The certified plan is to be implemented during the operation of the landfill.

Archaeology

66. An archaeologist shall be retained to provide advice, recording, and reporting on any archaeological material encountered during the construction of the landfill and road upgrade works.
67. Every practical effort should be made to avoid damage to any archaeological site, whether known, or discovered during the construction of the landfill and road upgrade works.
68. Prior to the commencement of the construction of the landfill and road upgrade works, an archaeological site briefing shall be delivered to all contractors undertaking earthworks that may affect archaeology. The briefing shall outline:
 - a. The history of the site and its archaeological potential.
 - b. The standing archaeological remains to be retained.
 - c. The role of the archaeologist and requirements for archaeological involvement.
 - d. What sort of archaeological features could be expected and what they might look like.
 - e. What to do if a possible archaeological site is found and the archaeologist is not on site.
 - f. The process required to record and investigate these archaeological deposits should any be discovered.
69. The following shall occur where suspected archaeological material is encountered during construction of the landfill and road upgrade works:
 - a. Work shall cease within 25 metres of a suspected burial find, and 10 metres of any other find and the project archaeologist alerted to determine whether it is archaeological material.
 - b. Where any suspected archaeological material is Maori in origin, HNZPT and Te Rūnanga o Ōtākou. (via Aukaha) shall be notified of the discovery to enable appropriate cultural procedure's and tikanga to be undertaken. Materials are not to be removed until such time as HNZPT and iwi have responded.
 - c. Where human remains are uncovered, NZ Police, HNZPT and Te Rūnanga o Ōtākou (via Aukaha) shall be notified of the discovery to enable appropriate cultural procedures and tikanga to be undertaken. Remains are not to be removed until such time as the Police, HNZPT and Aukaha have responded.
 - d. An archaeological authority shall be obtained from HNZPT prior to any modification of an archaeological site.
 - e. All archaeological material shall be recorded by an archaeologist prior to work recommencing.
 - f. A report on any archaeological material that is encountered shall be provided to HNZPT within one year of the completion of any works affecting an archaeological site.

Waste Acceptance

70. An appropriately experienced person shall be retained to supervise the operation of the landfill.

71. Waste shall only be discharged onto, or into, land within the landfill liner extent shown on drawing 12506381-01-C201.
72. All persons delivering waste to the landfill shall hold a valid Waste Acceptance Agreement confirming the material meets the waste acceptance criteria in the consent conditions.
73. No waste, other than municipal solid waste (MSW) and hazardous wastes that meet the Ministry for the Environment Module 2: Hazardous Waste Guidelines – Class A shall be accepted for disposal.
74. Disposal of medical wastes shall be in accordance with NZS4304:2002 Healthcare Waste Management or subsequent amendments, and disposal of asbestos in accordance with the Asbestos Regulations 1998 or subsequent amendments.
75. The following wastes shall not be accepted for disposal:
 - a. Liquid waste.
 - b. Wastes or substances classified as explosive, flammable, oxidising or corrosive under the Hazardous Substances and New Organisms Act 1996.
 - c. Waste marked with an asterisk on the NZ Waste List (L Code), except solid wastes that meet the leachability limits in the Ministry for the Environment Module 2: Hazardous Waste Guidelines – Class A; asbestos labelled, packaged, and disposed of in accordance with the Asbestos Regulations 1998; and small quantities of waste containing potentially hazardous components that can be reasonably expected to be contained in the municipal waste stream.
76. A notice shall be placed at the landfill entrance which identifies the wastes that are unacceptable at the landfill.
77. Random inspections of incoming loads for the presence of hazardous waste shall be undertaken at a minimum rate of 1 in 50 loads, and tipping of all waste shall be supervised.
78. Records shall be maintained of the quantities and types of waste accepted, and load inspections, and provided annually to the independent peer review panel and Otago Regional Council.
79. Otago Regional Council shall be immediately notified if any waste delivery vehicle is turned away from the landfill that contains waste that does not comply with the waste acceptance criteria in the consent conditions.

Complaints

80. A Complaints Log shall be maintained during construction and operation of the landfill and road upgrades to record the receipt and management of all complaints, including those regarding objectionable or offensive odour or dust. The following details shall be recorded:
 - a. Type, date, and time of complaint.
 - b. Name and address of complainant (if available).
 - c. Location from which the complaint arose.
 - d. Wind direction at the time of complaint (if relevant)
 - e. The likely cause of the complaint.
 - f. The action taken as a result of the complaint.
 - g. The feedback to the complainant.

The Complaints Log shall be made available to the independent peer review panel, and Otago Regional Council on request.

Annual Monitoring Report

81. The landfill operator shall compile an annual monitoring report on the operation of the landfill, including:
- a. the status of landfilling operations on the site and work completed during the preceding year;
 - b. any problems, which have arisen in the preceding year and measures taken to address those;
 - c. activities proposed for the next year of the landfill operation;
 - d. collated summaries and analyses of all monitoring and other data required under these consents.

The report shall be forwarded to Te Rūnanga o Ōtākou, independent peer review panel, and to the Otago Regional Council by the 31st of December each year unless otherwise agreed in writing.

C. Landfill Management Plan (LMP)

82. The detailed design, construction, and operation of the landfill shall be in accordance with the provisions of a LMP, based on the *Draft Smooth Hill Landfill Management Plan* prepared by Boffa Miskell Ltd, dated May 2021, and developed in consultation with Te Rūnanga o Ōtākou. The Plan shall be provided to the independent peer review panel for certification that it addresses the requirements of this condition at least 3 months prior to construction commencing. The independent peer review panel shall communicate this certification to Otago Regional Council. The LMP shall include procedures, including monitoring and contingency actions, to ensure the detailed design, construction, operation, and aftercare of the landfill results in compliance with the conditions of these consents, and achieves the following objectives:

General:

- a. Operate the landfill in compliance with the resource consent requirements.
- b. Appropriately trained staff are retained to operate the landfill.
- c. The landfill is constructed and operated safely in accordance with all Health and Safety regulations.
- d. The design and construction of the landfill adopts appropriate Quality Assurance and Quality Control procedures.
- e. Ensure infrastructure failure or damage, including that caused by extreme events such as weather and earthquakes, are promptly detected and remedied to ensure its operation, and to protect the receiving environment.
- f. Te Rūnanga o Ōtākou is provided with the opportunity to undertake monitoring alongside specialists undertaking landfill monitoring activities.

Land stability:

- a. Seismic risks for the stability of the landfill are minimised.
- b. Risks of slope failure for the landfill are minimised.
- c. The landfill base grade slopes are stable for construction and in the long term.
- d. Placement of waste in the landfill ensures waste and landfill stability.

Groundwater and surface water flows:

- a. The ingress of stormwater into open and closed sections of the landfill is minimised.

Groundwater and surface water quality:

- a. Leachate containment is optimised through the use of a high performance landfill liner, and leachate collection and storage system, that minimises migration into the underlying soil, groundwater, and surface water.

- b. The risks of excessive liner hydration are minimised.
- c. Protection of the landfill liner from waste tipping and compaction activity.
- d. Leachate transport occurs with an incident contingency plan which meets the Ministry of the Environment Code of Practice for Transport of Hazardous and Liquid Waste.
- e. The ingress of stormwater into open and closed sections of the landfill are minimised to avoid excessive leachate generation.
- f. Stormwater that comes into contact with waste is directed to the leachate collection system.
- g. Sediment runoff from the site is effectively controlled so that that site does not contribute a disproportionate sediment load downstream in comparison to the catchment above McLaren Gully Road.
- h. Spills of fuels, hazardous substances, or other contaminants are promptly contained and remediated.
- i. Monitoring wells are regularly maintained to prevent the ingress of contaminants and protected to ensure physical damage to the wells does not occur.
- j. Erosion and cracking of the landfill cap is minimised.

Air quality:

- a. As small as practicable working landfill face is maintained to minimise odour.
- b. Potentially highly odorous waste deliveries are identified prior to disposal.
- c. All waste is covered with appropriate daily and intermediate cover material to minimise odour.
- d. Adequate water supply for dust suppression is maintained.
- e. Control odours and dust so that there is no odour or particulate matter that causes an objectionable effect at or beyond the boundary of the site.
- f. Control landfill gas through the progressive installation and operation of a landfill gas collection system in the active landfill areas.
- g. The destruction of recovered landfill gas by combustion or electricity generation.
- h. The escape of fugitive landfill gas is minimised.
- i. Erosion and cracking of the landfill cap is minimised.
- j. Ensure the health and safety of people on and beyond the site who may be at risk of being exposed to landfill gas emissions.

Terrestrial and freshwater ecology:

- a. Prevent clearance of indigenous vegetation and wetlands, and vehicle and machinery movements in areas of indigenous vegetation and wetlands outside the landfill operational footprint.
- b. Disturbance of nesting eastern falcons are avoided or mitigated in accordance with a Falcon Management Plan.
- c. Effects to lizards during construction are effectively avoided or otherwise managed in accordance with a Lizard Management Plan.
- d. Loss of wetland vegetation is mitigated and offset in accordance with a Vegetation Restoration Management Plan. Direct loss of or impact to freshwater, wetland and terrestrial environments caused as a result of construction of the landfill and road upgrades is addressed, to achieve no net loss of ecologically significant habitat / features in terms of type, amount, or condition in accordance with a Restoration Management Plan.

- e. Residual or ongoing adverse effects to any freshwater or wetland environment or indigenous species that arise from the exercise of this consent are effectively remedied or otherwise managed in accordance with a Freshwater and Wetland Monitoring and Management Plan. g. Weed encroachment into indigenous vegetation communities, and populations of animal pests within the site are kept to below current levels in accordance with a Plant and Animal Pest Control Programme.

Bird Management

- a. Birds are managed to ensure that aviation risk is kept at an acceptably low level in accordance with a Bird Management Plan.

Waste acceptance:

- a. All landfill users are aware of the Waste Acceptance Criteria and acceptance procedures.
- b. All waste received complies with the Waste Acceptance Criteria specified in the consent conditions.
- c. Prevent the disposal of hazardous waste that does not comply with the Waste Acceptance Criteria specified in the consent conditions.
- d. Accurate records of all waste accepted at the landfill, load inspections, and disposal locations are maintained.
- e. All waste being transported to the landfill is securely contained to prevent the escape of solid material or liquid from the vehicle.
- f. The landfill site is securely fenced, and gates closed outside of opening hours.

Noise:

- a. Noise from the landfill site complies with the designation conditions and is minimised where practicable.

General amenity and public health and safety:

- a. Ensure the health and safety of people on and beyond the site.
- b. All waste received complies with the Waste Acceptance Criteria specified in the consent conditions.
- c. The landfill site is securely fenced, and gates closed outside of opening hours.
- d. Prevent landfill fires from occurring.
- e. Adequate water storage for fire-fighting is maintained.
- f. Ensure that adequate fire control equipment is present on site and operable at all times.
- g. Maintain a Fire Plan in conjunction with Fire and Emergency New Zealand (FENZ).
- h. A small as practicable working landfill face is maintained.
- i. All waste is covered with appropriate daily and intermediate cover material.
- j. Prevent windblown litter outside the site boundaries.
- k. Maintain a clean and tidy site.
- l. Prevent the establishment of vermin and nuisance insect populations.

Communications and complaints:

- a. Maintain a complaints management, investigation, and reporting system.
- b. All complaints shall be promptly investigated and responded to.

83. The landfill shall be operated at all times in accordance with the current provisions of the LMP.

84. The consent holder shall annually complete a review of the LMP in consultation with Te Rūnanga o Ōtākou and the independent peer review panel to ensure that management practices result in compliance with the conditions of these consents. Any proposed revisions shall be forwarded to the independent peer review panel for certification. The independent peer review panel shall communicate this certification to Otago Regional Council.

D. Advice Notes

- a. Any new or modified culverts for the upgrade of McLaren Gully Road and Big Stone Road are to comply with the requirements of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020), or otherwise obtain resource consent under the regulations. Where resource consent is required, the advice of a suitable qualified freshwater ecologist should be sought to ensure appropriate provision for freshwater fish passage.

ATTACHMENT 1 TO OTAGO REGIONAL COUNCIL RESOURCE CONSENTS FOR DISCHARGES TO WATER

Table 1 below sets out the monitoring parameters to detect leachate leakage effects on groundwater quality; and leachate, suspended solids, and turbidity on surface water when monitored at the following locations in accordance with condition 28:

- a. The groundwater monitoring wells described in condition 22.
- b. The groundwater collection system prior to discharge to the Ōtokia Creek, or abstraction for non-potable water supply.
- c. During stage 1 works, the sediment retention pond for stage 1 prior to discharge to the Ōtokia Creek. During subsequent stages, the attenuation basin prior to discharge to the Ōtokia Creek.
- d. The surface water monitoring points shown as SW1 – SW7 on drawing 12506381-C309.

Basic and full suite parameters and trigger levels to be monitored at each location are identified with a “X” in the table. Trigger levels for each parameter are to be established in accordance with conditions 26.

Table 1 – Water Quality Monitoring Parameters

Parameter	Monitoring Location							
	GW monitoring Bores GW1-GW6, BH202 and Groundwater collection system prior to discharge to the Otokia Creek			Sediment Retention Pond for Stage 1 and groundwater collection system prior to discharge to Otokia Creek		Surface Water monitoring points SW1 - SW7		
	Basic Suite	Full Suite	Trigger level	Continuous Monitoring	Trigger level	Basic Suite	Full Suite	Trigger level
Aluminium		X					X	
Arsenic	X	X	X			X	X	X
Boron		X	X				X	X
Cadmium	X	X	X			X	X	X
Calcium	X	X					X	

Chloride	X	X					X	
Chromium		X	X				X	X
Copper	X	X	X			X	X	X
Iron	X	X				X	X	
Lead	X	X	X			X	X	X
Magnesium	X	X					X	
Manganese		X					X	
Nickel	X	X	X			X	X	X
Potassium	X	X					X	
Sodium		X					X	
Sulphate	X	X	X				X	
Zinc	X	X	X			X	X	X
Dissolved Reactive Phosphorus		X	X				X	X
Ammoniacal Nitrogen	X	X	X	X	X	X	X	X
Nitrate Nitrogen	X	X				X	X	X
Alkalinity	X	X	X			X	X	
Total VOC		X	X				X	X
Total SVOC		X	X				X	X
PFAS		X	X				X	X
pH	X	X		X	X	X	X	X
Temperature	X	X				X	X	
Electrical conductivity	X	X		X	X	X	X	
Flow rate and level						X	X	

Suspended solids						X	X	X
Turbidity						X	X	X