SMOOTH HILL LANDFILL DRAFT ORC CONSENT CONDITIONS –

UPDATED IN RESPONSE TO PANEL COMMENTS AND ORC REPLY

A. Schedule 1 – General Conditions Relevant to All Consents

1. The detailed design, construction, operation, closure and aftercare of the landfill (including all associated discharges of contaminants to land, water, and air), and construction of the road upgrades must be undertaken in general 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. *Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design*, Boffa Miskell, May 2021, including attached Appendices 1 – 16.

    b. *Waste Futures Phase 2 – Workstream Smooth Hill Landfill, Landfill Concept Design Report,* GHD, updated May 2021, and associated concept design drawings listed on drawing sheet *12506381-01-G001, Rev 2*, except where replaced by the following updated drawings -

        i. *General Arrangement Plan, drawing sheet 12506381-01-C102*, updated 19 April 2022.

        ii. *Water Monitoring Locations, drawing sheet 12506381-01-C309*, updated 28 April 2022.

        iii. *McLaren Gully Road Improvements Plan, drawing sheets 12506381-01-C606 and C607*, updated 7 April 2022.

        iv. *McLaren Gully Road Constrained Section Plan and Detail, drawing 12506381-SK270, Rev B*, 26 April 2022.

    c. Responses to further information requests provided by the consent holder dated 31 May 2021, and 4 August 2021.

    d. Evidence provided by the consent holder dated 29 April 2021.

2. An alternative design or methodology to that proposed in the consent documents specified in general condition 1 may be used if:

    a. The adverse effects of the activity are demonstrated by the consent holder to be the same or less than the consented design or methodology; and

    b. The alternative design or methodology has been provided under general condition 24 to the Independent Peer Review Panel for review and confirmation, followed by the Otago Regional Council for certification in accordance with the process in general conditions 18 and 19; or

    c. The alternative design or methodology has been incorporated into the Landfill Management Plan required under general condition 14 and provided to the Independent Peer Review Panel for review and confirmation, followed by the Otago Regional Council for certification in accordance with the process in general conditions 18 and 19.

<u>Community Liaison Group (CLG)</u>

3. The consent holder must, at least 6 months prior to construction of the landfill commencing, invite the community to establish and maintain a Community Liaison Group (CLG) for the purpose of facilitating ongoing engagement between the consent holder and community on the construction and operation of the landfill in accordance with general conditions 4 – 9.

4. The consent holder must invite the Otokia Creek Habitat and Marsh Habitat Trust and all residents who own property within 2km of the landfill site to the first meeting of the CLG. Persons who live more than 2km from the landfill must not be excluded from the meeting should they wish to attend. At the first meeting of the CLG, those persons in attendance must nominate up to 5 persons to attend future meetings, as representatives of the community.

5. In addition to the persons nominated under general condition 4, the CLG must also invite the following parties to participate as members of the CLG:

    a. A member of the local community board (who shall be invited to act as Chairperson of the CLG).

    b. A member of the Independent Peer Review Panel.

    c. Two representatives of the consent holder/operator.

6. The consent holder must offer members of the CLG the opportunity of a quarterly site inspection, and a quarterly meeting for the first 5 years, and annually thereafter, and provision of any information to which the Otago Regional Council is entitled by virtue of the conditions of resource consent at the consent holders' expense. The time, date, and venue of any meeting or site inspection must be notified to members of the CLG at least 15 working days prior to the meeting or site inspection.

7. The consent holder must invite a representative from the Otago Regional Council as consent authority to attend site inspections and meetings in an observer capacity.

8. The purpose of the quarterly meetings of the CLG will be:

    a. For the consent holder to explain progress on the landfill construction and operation.

    b. Present and discuss any monitoring results and/or reporting as required by the conditions of the resource consents.

    c. Hear any community issues or concerns with the landfill construction and operation and discussing/considering means of addressing those issues or concerns.

    Minutes of any quarterly meeting must be taken by the consent holder and distributed to the members of the CLG.

9. In the event that a member of the CLG nominated under general condition 4 no longer wishes to be part of the CLG, the consent holder must invite a replacement member in accordance with general condition 4.

    Advice Note: In the event that it is not possible to establish a CLG or convene meetings through lack of interest or participation from the invitees, then such failure to do so will not be deemed a breach of these conditions.

<u>Independent Peer Review Panel</u>

10. The consent holder must at least 6 months prior to construction of the landfill commencing, establish and retain at its own cost, an Independent Peer Review Panel. The purpose of the Independent Peer Review Panel is, where required by a condition of this consent, to review and confirm whether the detailed design, construction, operation, and closure of the landfill, and the management of environmental effects has been undertaken by appropriately qualified personnel in accordance with the conditions of this consent and good practice.

11. The Independent Peer Review Panel must comprise at least three persons who together must be:

    a. Independent of the consent holder, and planning, design, construction, management, and monitoring of the site.

    b. Qualified and experienced in landfill design, construction, and management.

c. Qualified and experienced in geotechnical, groundwater, and surface water aspects.

d. Qualified, and experienced in terrestrial and freshwater ecology.

12. The consent holder must not request the Independent Peer Review Panel to commence any work until the Otago Regional Council confirms in writing it is satisfied that the Independent Peer Review Panel meet the requirements of condition 11. The members of the Independent Peer Review Panel may be changed at any time, as agreed in writing with the Otago Regional Council.

13. The consent holder must commission the Independent Peer Review Panel to prepare an annual report, on the adequacy of the following matters in relation to meeting requirements of the resource consent:

    a. Any management or monitoring plans reviewed during the year.

    b. Any designs reviewed during the year.

    c. Construction activities undertaken including, but not limited to:

        i. Site preparation, including hydrogeological and geotechnical issues.

        ii. Toe embankment construction.

        iii. Liner construction.

        iv. Stormwater system construction.

        v. Leachate collection system installation.

        vi. Landfill gas collection system installation.

    d. Landfill operation including, but not limited to:

        i. Water control, including groundwater, stormwater and leachate management.

        ii. Waste acceptance and placement.

        iii. Daily and intermediate cover placement.

        iv. Leachate system management.

        v. Landfill gas system management.

    e. Monitoring results and records.

    f. Final capping and rehabilitation.

    g. The adequacy of measures in the Landfill Management Plan in managing adverse environmental effects, including bird strike risk to aviation.

    This report must be informed by at least the following:

    a. A review of the landfill annual monitoring report required by general condition 67.

    b. Review of designs and management plans submitted during the year required by general conditions 14, 17, 21 and 27.

    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.

    The report must be forwarded to Te Rūnanga o Ōtākou, Otago Regional Council, and Dunedin International Airport Limited prior to 1 May each year, unless otherwise agreed in writing. The consent holder must make the report publicly available on its website.

Landfill Management Plan

14. The detailed design, construction, operation, closure, and aftercare of the landfill must be undertaken in accordance with a Landfill Management Plan (LMP).

15. The Landfill Management Plan must be developed by the consent holder, in consultation with Te Rūnanga o Ōtākou, with the overall objective of setting out details of the practices and procedures to be adopted to achieve compliance with the conditions of resource consent.

16. The Landfill Management Plan must address how the following matters will meet any requirements, limits, or restrictions set out by the consent conditions:

    a. The stages and order of landfill development, including matters to be completed prior to each stage.

    b. Construction and testing of the lining system.

    c. Landfill gas, leachate, groundwater and stormwater management.

    d. Erosion and sediment controls during construction and operation.

    e. Types of waste to be accepted and those that are prohibited.

    f. Waste acceptance control and monitoring the types of waste accepted.

    g. Methods of placing and covering waste, including highly odorous and special waste.

    h. Management of the active landfill area.

    i. Fire preparedness and response management.

    j. Odour and dust management.

    k. Noise management.

    l. Litter management.

    m. Plant and animal pest management, including bird control.

    n. Monitoring procedures, including locations, parameters, frequency, detection limits, and trigger levels.

    o. Landfill inspections and maintenance.

    p. Emergency management and contingency response procedures.

    q. Complaints response procedures.

    r. Record-keeping and reporting requirements.

    s. Final landfill capping, post settlement height, shape and contours of the land.

    t. Landfill closure and after-care.

17. The Landfill Management Plan must also include the following sub-management plans:

    a. Landfill Operational Bird Management Plan – refer condition 56 of the Discharge of Waste and Leachate to Land resource consent.

    b. Vegetation Restoration Management Plan – refer general condition 60.

    c. Freshwater and Wetland Monitoring and Management Plan – refer general condition 63.

Management Plan and Design Certification

18. The management plans required by general conditions 14 - 17 and the detailed design details required by condition 24 must be submitted by the consent holder to the Independent Peer Review Panel for review and confirmation that they have been prepared by appropriately qualified personnel in accordance with the conditions of this consent and in accordance with good practice. Where there is disagreement between the consent holder and the Independent Peer Review Panel, this must be explained in writing and submitted to Otago Regional Council along with the relevant management plan or detailed design.

19. The management plan or detailed design and the Independent Peer Review Panel feedback must be provided to the Otago Regional Council at least 20 working days prior to construction commencing, for certification that the management plan or detailed design complies with the conditions of this consent.

    Advice Note: The function of the Independent Peer Review Panel is not a substitute of Otago Regional Council's function in auditing compliance with consent conditions. Otago Regional Council will make the ultimate determination regarding whether the consent holder has achieved compliance with the conditions of this consent.

20. This resource consent and a copy of the Otago Regional Council certified version of any management plan and design details required by this consent must be kept on site at all times, and the consent holder must ensure all relevant personnel are made aware of each plan's contents.

Management Plan Review and Amendment

21. By 1 July each year, the consent holder must in consultation with Te Rūnanga o Ōtākou, complete a review of the management plans required by general conditions 14 – 17 to ensure that the management practices contained within them remain adequate to ensure compliance with the conditions of the consents. If amendments are made to a management plan, the amended plan must be submitted to the Independent Peer Review Panel for review and confirmation, and to the Otago Regional Council for certification following the procedures set out in general conditions 18 and 19.

22. The consent holder may make amendments to any approved management plan required by general conditions 14 – 17 at any time. Any amendments must be made in consultation with Te Rūnanga o Ōtākou and submitted to the Independent Peer Review Panel for review and acceptance, and to the Otago Regional Council for certification following the procedures set out in general conditions 18 and 19.

Design and Construction

23. All investigations, detailed design, and supervision of construction of the landfill must be undertaken by suitably qualified personnel experienced in such works, or works of a similar nature.

24. Prior to commencing the construction of any:

    a. Landfill toe bund;
    b. Landfill liner for an area;
    c. Groundwater collection system;
    d. Leachate collection and storage system;
    e. Landfill gas collection and destruction system;
    f. Stormwater drainage, treatment, and discharge system; or
    g. Final capping.

    the consent holder must submit a design report with specifications, and design drawings to the Independent Peer Review Panel for review and acceptance, followed by the Otago Regional Council for certification in accordance with the process in general conditions 18 and 19. Construction must not commence until Otago Regional Council has confirmed certification.

25. The consent holder must hold a site meeting with Otago Regional Council compliance staff prior to the commencement of the construction of the landfill, and construction of each subsequent landfill stage for the purposes of demonstrating how the requirements of this resource consent and any certified management plan will be complied with during construction.

26. The consent holder must hold a site briefing for all contractors prior to the commencement of the construction of the landfill, and construction of each subsequent stage of the landfill for the purposes of identifying the requirements of this resource consent and any certified management plan that must be complied with during construction.

27. The completed works specified in general condition 24 must be confirmed by suitably experienced Chartered Professional Engineer (CPEng) that they have been completed in accordance with the design certified by the Otago Regional Council. A Construction Quality Assurance (CQA) report must be prepared and submitted by the consent holder to the Independent Peer Review Panel and Otago Regional Council within 3 months following completion of the works referred to in this condition.

Operation

28. The consent holder must appoint and retain an appropriately qualified and experienced person to supervise the operation of the landfill.

29. The active landfilling area must not exceed 1000m^2 at any time.

30. The active landfilling area must not exceed 300m^2 at any time when the daily fire danger rating for the site is very high, extreme, or very extreme for forestry as reported by the New Zealand Fire Weather System.

    Advice Note: The New Zealand Fire Weather System (FWS) is operated by the National Institute of Water and Atmospheric Research (NIWA) on behalf of Fire and Emergency New Zealand (FENZ) to monitor fire danger.

31. The full extent of the active landfill area must be monitored by a camera system at all times during daylight hours and camera images must be provided on the consent holder's website at no greater than 60 minutes intervals.

32. Except where required by condition 33, all waste must covered at the end of each working day with at least:

    a. non-combustible compacted soil cover to a minimum depth of 150 millimetres; or

    b. non-combustible alternative materials that perform to an equivalent or higher standard to 150 millimetres soil cover to ensure management of odour and birds.

33. All special waste, highly odorous waste, medical waste, commercial, and industrial waste containing putrescible material must be covered immediately, and not later than 30 minutes following placement with at least:

    a. non-combustible compacted soil cover to a minimum depth of 150 millimetres; or

    b. non-combustible alternative materials that perform to an equivalent or higher standard to 150 millimetres soil cover to ensure management of odour and birds.

34. There must be no waste that remains uncovered overnight.

35. Daily cover must be removed before refuse placement at the start of each day. As a minimum, windows must be cut through the previous layer of daily cover sufficient to allow the free flow of leachate from the new waste layer to the underlying layers.

36. All areas where further waste will not be placed for three months, must be covered with non-combustible compacted intermediate soil cover to a minimum depth of 300 millimetres; and grass cover must be established by hydroseed, except where within 10m of the active landfilling area.

37. A final capping layer must be constructed once filling of any area is fully completed. The final cover layer must 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, and grassed, except where within 10m of the active landfilling area.

38. Alternative final capping specifications to those specified in general condition 37 may be used where they provide equivalent or better performance and are submitted to the Independent Peer Review Panel for review and confirmation, followed by the Otago Regional Council for certification in accordance with the process in conditions 18 and 19 that it meets this condition.

39. The final cap must be graded and incorporate drainage so as to prevent ponding of stormwater and erosion and cracking of the capping surface.

40. During operation, closure, and aftercare of the landfill, a walkover inspection of the landfill operational area must be undertaken at least monthly, and immediately following storm events greater than 50% Annual Exceedance Probability (AEP) to check for:

    a. Vegetation die off;

    b. Cracking of the final cap surface;

    c. Subsidence and erosion;

    d. Landfill gas leaks and odour;

    e. Leachate break out through the cap;

    f. Waste protruding through the cap; and

    g. Stormwater system overflows or damage

    Any defects must be remedied by the consent holder as soon as practicable. A report on the inspection and details of any remedial actions must be forwarded to the Independent Peer Review Panel and Otago Regional Council within 1 month of each inspection.

<u>Monitoring</u>

41. The consent holder must in collaboration with Te Rūnanga o Ōtākou, prepare a plan specifying how Te Rūnanga o Ōtākou will be involved in both baseline monitoring and ongoing monitoring of the effects of the landfill operation. The plan must include but not necessarily be limited to the following:

    a. The specific components of the monitoring programme that Te Rūnanga o Ōtākou will be involved in, and the nature of that involvement.

    b. Agreed resourcing and support to be provided for Te Rūnanga o Ōtākou participation in the monitoring programme.

    c. A process for periodic review of the plan by the consent holder and Te Rūnanga o Ōtākou.

    The plan must be submitted to Otago Regional Council before the date of commencement of baseline monitoring. Any amendments to the plan arising from a review under general condition 41(c) must be provided to Otago Regional Council within 3 months of the review.

42. An automatic weather station that continuously and accurately records wind speed and direction, temperature, relative humidity, and rainfall must be installed, operated, and maintained on the site in a location that is free from obstructions. The weather station must be serviced and calibrated by a suitably

qualified and experienced technician at least annually to ensure accurate monitoring. Wind speed and direction must be measured at a height of between 5m and 10m above ground level. Wind speed data shall be appropriately corrected to provide a measurement equivalent to a height of 10m. The instruments, site location, operation, maintenance and calibration are to be in accordance with the requirements of *AS/NZS 3580.14:2014 'Methods for sampling and analysis of ambient air – Part 14: Meteorological monitoring for ambient air quality monitoring applications'*.

Groundwater and Surface Water Monitoring

43. The groundwater monitoring wells and piezometers described in **Table 1** below as shown on drawing 12506381-C309 must be installed at least 36 months prior to construction to enable collection of groundwater level and groundwater quality data.

Table 1 – Groundwater Monitoring Wells / Piezometers

Monitoring well / piezometer	Description
GW1	Additional monitoring well to be installed with screen between 90-85m RL (down hydraulic gradient deep GW system)
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 m RL (up hydraulic gradient deep GW system)
GW6	Existing well BH09
GW7	Additional monitoring well to be installed with screen between 99-96m RL (shallow GW system).
BH202	Existing well BH202 (deep GW system)
WT1 – WT6	Piezometers to be installed to enable monitoring of sub-surface water levels within wetlands within the site.
Landfill transect wells	Additional four groundwater monitoring wells to be installed within and downgradient of the landfill footprint to form a transect(s) in the direction of shallow groundwater flow to the wetland in the vicinity of wetland monitoring locations WT2 to WT4 with a screen at an elevation that allows monitoring of water levels in the shallow groundwater system.

44. All ground monitoring wells and piezometers in general condition 43 must be located and installed under the direction of a suitable experienced hydrologist/hydrogeologist, and any wells must be constructed in accordance with *NZ4411:2001 Environmental Standard for Drilling of Soil and Rock.*

45. All groundwater monitoring wells and piezometers in general condition 43 must be maintained to prevent the ingress of contaminants and ensure accurate monitoring. In the event of a well or piezometer being

destroyed or unsuitable for sampling, the consent holder must replace it with a well or piezometer in the same general location within 3 months of the issue arising.

46. Water monitoring to collect baseline groundwater level and quality data, and surface water level and quality data must commence at least 36 months prior to commencement of construction of the landfill to inform the development of trigger levels at the following locations:

    a. monitoring wells GW1 – GW7, and BH202 described in general condition 43,

    b. surface water monitoring locations SW1 – SW7 (and SW8 if access is available from the landowner) shown on drawing 12506381-C309.

    Sampling of groundwater must occur at least every 3 months and sampling of surface water every month for the 36-month baseline monitoring period. Monitoring and sample analytes must be for the full suite of parameters set out in **Attachment 1** for those locations.

47. Automated monitoring equipment must be installed and automated collection of baseline data must commence at least 36 months prior to the commencement of construction of the landfill to inform the development of trigger levels occurs at the locations described in **Table 2** below and as shown on drawing 12506381-C309. The consent holder must submit GPS references (in both NZTM2000 and WGS84 formats) for each monitoring location to Otago Regional Council prior to the commencement of monitoring. Monitoring must be for the parameters and the frequency set out in **Table 2**.

Table 2 – Automated Baseline Data Collection

Monitoring Location	Monitoring Parameter	Minimum Frequency of Monitoring	Minimum Precision
Wetlands			
WT1	Water Level	Hourly	0.01 m
WT2			
WT3			
WT4			
WT5			
WT6			
Groundwater			
GW1	Water Level	Hourly	0.01 m
GW2			
GW3			
GW4			
GW5			
GW6			

Landfill Transect Wells			
Surface Water			
SW7	Water Level	Hourly	0.01 m
	Water Velocity		0.1 m/s
	Soluble Nitrate	Daily	0.5 mg/L
	Soluble Ammonia		0.5 mg/L
	Electrical conductivity		5 uS/cm
	Dissolved Oxygen		1 mg/L
	Temperature		1°C
SW8/SW3*	Water Level	Hourly	0.01 m
	Water Velocity		0.1 m/s
	Soluble Nitrate	Daily	0.5 mg/L
	Soluble Ammonia		0.5 mg/L
	Electrical conductivity		5 uS/cm
	Dissolved Oxygen		1 mg/L
	Temperature		1°C

** Advice Note: Where permanent access to location SW8 for monitoring cannot be secured for continuous monitoring, equipment must be installed at location SW3.*

48. Rainfall data must be collected at least daily over the 36-month baseline monitoring period stipulated in general condition 46 and 47 at the automatic weather station at the site required under condition 42.

49. At the conclusion of the 36-month baseline monitoring period identified in condition 46 and 47:

    a. On-site rainfall data must be compared with the baseline groundwater and wetland water level data from each monitoring well, and piezometer to identify when recharge from rainfall has influenced measured water levels.

    b. The baseline groundwater and surface water data must be reviewed to confirm or make any required adjustments to the conceptual site model and predicted environmental effects to groundwater and surface water described in the report *Smooth Hill Landfill Assessment of Effects to Groundwater,* GHD, Updated May 2021.

    c. The baseline monitoring results for the entire 36-month monitoring period, along with any updates to the conceptual model must be reported to the Independent Peer Review Panel as part of the submission of the Landfill Management Plan under general condition 18.

50. The Landfill Management Plan required under general condition 14 must include practices and procedures for the long-term monitoring of groundwater and surface water during operation, informed by the completion of baseline monitoring under general conditions 46 and 47 to achieve the following:

    a. Confirm erosion and sediment controls are effective.

    b. Identify potential leachate discharge to the environment to confirm the efficacy of the landfill liner and leachate collection systems.

    c. Protection of the receiving environment downgradient and downstream of the landfill.

    d. Ensure compliance with the relevant conditions of this consent.

51. The monitoring practices and procedures for groundwater and surface water in the Landfill Management Plan must include the following as a minimum:

    a. Groundwater and surface water quality monitoring locations, parameters, frequency, detection limits, and trigger levels for each monitoring location and monitoring parameter. As a minimum this is to include monitoring requirements detailed in general conditions 52 - 57 below.

    b. Hydrological and water level monitoring requirements for the wetlands within the site and the unnamed tributary of Ōtokia Creek, including locations, parameters, frequency, detection limits, and trigger levels for each monitoring location and each monitoring parameter.

    c. Contingency response procedures to be undertaken in the event of trigger level exceedance. As a minimum this is to include actions detailed in general condition 54 below.

    d. Monitoring methodology.

    e. Record keeping and reporting requirements.

52. Water quality trigger levels must be developed and included in the Landfill Management Plan for the indicated parameters set out in **Attachment 1** to detect whether groundwater quality is being adversely affected by leachate leakage; and whether surface water quality is being adversely affected by leachate, and suspended sediment, when monitored at the following locations:

    a. Monitoring wells GW1 – GW7, and BH202 described in general condition 43.

    b. The manhole outlet from groundwater collection system prior to discharge to the unnamed tributary of Ōtokia Creek.

    c. During stage 1 works, the sediment retention pond prior to discharge to the unnamed tributary of Ōtokia Creek. During subsequent stages, the attenuation basin prior to discharge to the unnamed tributary of Ōtokia Creek.

    d. The surface water monitoring points shown as SW1 – SW7 (and SW8 if access is available from the landowner) on drawing 12506381-C309.

53. The baseline water data collected under general condition 46 and 47 must be used to establish trigger level values for the indicated parameters in **Attachment 1**. Development of trigger levels must meet the following requirements:

    a. Trigger levels for groundwater and surface water quality must be calculated as the mean plus three standard deviations for parameter concentrations measured during the 36-month baseline monitoring (mean plus and minus three standard deviations for pH). Trigger levels must be reviewed every 5 years, with the lessor of the then existing trigger levels or those calculated from the proceeding 5 years monitoring data to be adopted. The review is to ensure changing land use over time (forestry cycles), slow rate of improvement over time, and variability in baseline water quality are accounted for.

b. Trigger levels for suspended sediments in surface water (SW1 – SW8) for flows must be the greater 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 – SW8) for flood events (where out of channel flows occur), shall be based on visual inspection with no conspicuous adverse change in colour or visual clarity after reasonable mixing occurring in the receiving waters.

54. During operation of the landfill the monitoring of groundwater levels and quality, and surface water levels and quality outlined in **Table 3** below must occur and be assessed against the trigger levels established under general condition 52, and the results reported annually to the Te Rūnanga o Ōtākou, the Independent Peer Review Panel and Otago Regional Council in accordance with general condition 67. Where there is any exceedance of the water quality trigger levels caused by leachate or sediment, the specified actions must be implemented.

Table 3 – Operational Groundwater and Surface Water Monitoring and Actions

Monitoring Point as shown on drawing 12506381-C309	Frequency	Parameters	Consent holder monitoring location specific actions where trigger levels are exceeded	Consent holder actions for all trigger level exceedances
Manhole outlet from the sub-liner groundwater drainage system prior to discharge to the unnamed tributary of Ōtokia Creek or abstraction for non-potable water supply.	Continuous	• Electrical conductivity (uS/cm) • pH • Temperature • Turbidity • Ammoniacal nitrogen (mg/L)	The manhole outlet from the groundwater collection system must be closed within 1 hour following any exceedance being detected, and groundwater redirected to the leachate collection system. Contaminated groundwater must 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. Validation of any continuous monitoring result must be undertaken through inspection of the instrument, recalibration (if needed), and retesting to confirm the result. An additional monitoring round must be undertaken no later than 1 week following any confirmed continuous monitoring exceedance or monthly monitoring exceedance being detected and analysed for the full parameter suite outlined in **Attachment 1**.	An investigation must be undertaken into potential causes and a report 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, statistical analysis of water quality, 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		
Groundwater monitoring wells as GW1 – GW7 – and BH202	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	An additional monitoring round must be undertaken no later than 1 week following any exceedance being detected and analysed for the full parameter suites outlined in **Attachment 1**.	

		quarterly monitoring cycle per year		
During stage 1 works, the sediment retention pond prior to discharge to the unnamed tributary of Ōtokia Creek During subsequent stages, the attenuation basin prior to discharge to the unnamed tributary of Ōtokia Creek.	Continuous (when flows occur)	• Electrical conductivity (uS/cm) • pH • Temperature • Turbidity • Ammoniacal nitrogen (mg/L)	The outlet from the sediment retention pond or low flow outlet from the attenuation basin must be closed immediately following any exceedance being detected in the event that leachate contaminated stormwater is flowing to the unnamed tributary of Ōtokia Creek. Contaminated stormwater must 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. Validation of any continuous monitoring result must be undertaken through inspection of the instrument, recalibration (if needed), and retesting to confirm the result. An additional monitoring round of the surface water monitoring points SW1 – SW7, and a sample from the sediment retention pond or attenuation basin, must 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.	
Surface water monitoring points shown as SW1 – SW6, surface water monitoring point shown as SW7 (located at the McLaren Gully Road culvert),	Either: Weekly (when flows occur). If continued periods of surface water discharge occur, then	Basic suite of parameters set out in **Attachment 1**to be monitored, except that the full suite of parameters to be monitored in one weekly monitoring cycle per year	All known downstream surface water abstractors within the McColl Creek catchment, and Te Rūnanga o Ōtākou must be notified of any exceedance no later than 1 day following the exceedance being detected. An additional monitoring round must be undertaken no later than 1 week following any exceedance	

and SW8 if access is available (located downstream of the downstream pond).	monitoring will occur weekly. Or: As otherwise specified in the Landfill Management Plan.		being detected and analysed for the full parameter suites outlined in **Attachment 1**.	
		• Suspended solids (g/L) • Turbidity (NTU)	Discharges from the stage 1 sediment retention pond and attenuation basin must be sampled for suspended solids and compared with sampling from the adjacent contributing catchment. Sediment controls must be adjusted if the results show that the sediment loads from the sediment retention pond or attenuation basin are the cause of the exceedance.	

55. Continuous monitoring of the sub-liner groundwater drainage system, sediment retention pond for the stage 1 area, and attenuation basin under general condition 54 must meet the following requirements:

    a. Continuous monitoring of electrical conductivity, pH, temperature, turbidity, and ammonia must occur.

    b. The monitoring system must be configured so that exceedance of monitoring trigger levels activates an alarm notifying key site personnel.

56. The Landfill Management Plan must include contingency response procedures in the event of an exceedance of trigger levels for continuous monitoring in general condition 54. This must as a minimum include the relevant actions outlined in general condition 54.

57. All groundwater and surface water sampling required under general conditions 46 and 54 must meet the following requirements:

    a. Sampling must be undertaken at the specified locations indicated in general conditions 46 and 54.

    b. Sampling must be undertaken, or overseen by, a suitably qualified professional and collected in accordance with the relevant National Environmental Monitoring Standard (NEMS):

        i. National Environmental Monitoring Standards Water Quality Part 1 of 4: Sampling, Measuring, Processing and Archiving of Discrete Groundwater Quality Data.

        ii. National Environmental Monitoring Standards Water Quality Part 2 of 4: Sampling, Measuring, Processing and Archiving of Discrete River Quality Data.

    c. All sample analysis must be performed by a laboratory that meets International Accreditation New Zealand (“IANZ”) approved laboratory or otherwise as agreed in writing with the Otago Regional Council.

<u>Management of effects on wetland and freshwater ecological values</u>

58. Adverse effects on wetland and freshwater ecology arising from any hydrological, hydrogeological, or water quality changes associated with construction and/or operation of the landfill must be appropriately managed according to the Vegetation Restoration Management Plan and Freshwater and Wetland Monitoring and

Management Plan required by general conditions 60 and 63. Where residual adverse effects on wetland and freshwater ecology are detected via monitoring in accordance with the Freshwater and Wetland Monitoring and Management Plan required under general condition 63, any offset or compensation must use methodologies that are transparent, logical and use accepted ecological principles to derive the related offset / compensation type and quantum, such as biodiversity offset accounting methods (where relevant).

59. Annual baseline wetland ecology monitoring undertaken by a suitably qualified wetland ecologist must commence no less than 36 months prior to construction of the landfill and preparation of the Vegetation Restoration Management Plan required under general condition 60. The purpose of the monitoring is to:

    a. Delineate the extent of and determine the annual variability (if any) in extent of existing wetland habitat within wetland areas in West Gully 3, West Gully 4, and the swamp wetland as identified in the *Smooth Hill Landfill, Ecological Impact Assessment, 19 August 2020 (updated 28 May 2021)* prepared by Boffa Miskell.

    b. Establish a baseline with which to compare to any monitoring of ecological conditions during construction and operation of the landfill.

    To define and monitor the extent of the swamp wetland, vegetation transects using national wetland delineation protocols (e.g. Clarkson et al. 2013) must be carried out in a cross-section of wetland areas at the WT1, WT2-4, WT5, and WT6 locations shown on drawing 12506381-C309. 12-monthly monitoring must be undertaken between November and April at least three times prior to the commencement of landfill construction. These cross sections must occur at the same location as baseline water level monitoring sites.

    At the conclusion of the 36-month monitoring period, the baseline data must be reviewed and used to inform the Vegetation Restoration Management Plan required under general condition 60, which will detail monitoring triggers and requirements of any long-term ecological monitoring.

60. A Vegetation Restoration Management Plan based on the *Draft Smooth Hill Vegetation Restoration Plan prepared by Boffa Miskell Ltd, dated June 2021*, must be prepared by a suitably qualified ecologist with the objective of addressing the loss of or impact to, wetland and terrestrial environments caused as a result of the exercise of this consent to achieve no net loss of 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 the swamp wetland, and terrestrial environments.

    b. A summary of baseline wetland ecology monitoring that has been undertaken to inform the Vegetation Restoration Management Plan under general condition 59.

    c. Wetland restoration 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.

vi. Ground preparation, planting and maintenance specifications so that all plants used for restoration are eco-sourced from the same eco-region, are free of pest plants, and so that plant size and densities are relevant to the location of where they are being placed and relevant to the specified restoration outcomes.

vii. A detailed programme of works, including timeframes for implementation.

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. Monitoring must be based on performance standards that at a minimum must include measures of restoration planting success in terms of survival and growth.

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.

61. The Vegetation Restoration Management Plan must be certified by a suitably qualified expert in bird strike risk assessment that any proposals for restoration will not increase aviation risk from birds, and that certification must be forwarded to the Independent Peer Review Panel with the management plan for their review and confirmation in accordance with the process in general conditions 18 and 19.

62. Twice yearly baseline freshwater ecology monitoring by a suitably qualified freshwater ecologist must commence no less than 36 months prior to construction of the landfill and prior to the preparation of the Freshwater and Wetland Monitoring and Management Plan under general condition 63. The purpose of the monitoring is to:

a. Determine the extent of existing freshwater habitat and the freshwater ecology values, including macroinvertebrate and fish communities, and how these may vary naturally seasonally and in response to the changes in the surrounding land use.

b. Establish a baseline with which to compare to any monitoring of ecological conditions during construction and operation of the landfill.

The freshwater ecology monitoring must be carried out at the SW3, SW7, and SW8 (if access is available) locations shown on drawing 12506381-C309. Sampling must be undertaken during the months between December and April. These freshwater ecology monitoring sites must occur at the same location as baseline water level and quality monitoring sites.

Monitoring methods must include assessments of in-stream habitat conditions closely following national protocols (e.g., Biggs and Kilory, 2000; Clapcott et al., 2011; Harding et al., 2009), sampling of the macroinvertebrate community in accordance with protocols C1 and/or C2 of Stark et al. (2001) and Joy et al. 2013, and assessment of the fish community in following protocols of Joy et al. 2013 and/or using passive sampler devices for environmental DNA (e.g., following standard protocol of Wilderlab).

At the conclusion of the 36-month monitoring period, the baseline data must be reviewed and used to inform the Freshwater and Wetland Monitoring and Management Plan required under general condition 63, which will detail monitoring triggers and requirements of any long-term ecological monitoring.

63. A Freshwater and Wetland Monitoring and Management Plan must be prepared by a suitably qualified freshwater and wetland ecologist(s) with the objective of ensuring adverse effects to freshwater or wetland environments or indigenous species that arise from the exercise of this consent are effectively remedied or

otherwise managed to achieve no net loss of 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 surface water bodies and wetlands.

b. A summary of the baseline wetland monitoring and freshwater ecology monitoring undertaken to inform the Freshwater and Wetland Management Plan under general conditions 59 and 62.

c. A summary of the ongoing monitoring of groundwater and surface water quality and quantity as detailed by the Landfill Management Plan.

d. Pre, during and post construction monitoring methodologies with the aim of establishing any indirect effects on down catchment freshwater and wetland environments attributable to the landfill's operation. These must include performance standards in relation to maintaining or increasing the net baseline extent of wetlands and relative cover within the wetlands of indigenous wetland plant species. Monitoring may include monitoring of freshwater habitat conditions, and freshwater macroinvertebrate and fish communities in response to triggers developed as determined by the baseline monitoring data collected and the monitoring detailed in the Landfill Management Plan.

e. Avoid, remedy, and/or mitigation measures to reduce the effects on downstream freshwater and wetland environments attributable to landfill construction and operation, and any appropriate methodologies for offsetting or compensating for any residual adverse effects if they are identified through monitoring.

f. Annual reporting requirements, which will include, but not be limited to reporting on avoid, remedy, and mitigation measures used to reduce effects on downstream freshwater and wetland environments during landfill construction and operation, as well as any remedial, offset or compensatory actions undertaken.

g. Key responsibilities of onsite personnel.

h. An adaptive management and review process that includes Te Rūnanga o Ōtākou, the Independent Peer Review Panel, and Otago Regional Council.

64. The Freshwater and Wetland Monitoring and management Plan must be certified by a suitably qualified expert in bird strike risk assessment that any management measures will not increase aviation risk from birds, and that certification must be forwarded to the Independent Peer Review Panel with the management plan for their review and confirmation in accordance with the process in general conditions 18 and 19.

Complaints

65. The consent holder must provide contact details on its website that enable members of the public to contact the landfill operator at all times, including in case of emergency.

66. A complaint management, investigation, and reporting system must be maintained by the consent holder during construction, operation, closure, and aftercare of the landfill, and construction of the road upgrades to record the receipt and management of all complaints, including those regarding objectionable or offensive odour or dust. The following details must 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 response to the complainant.

All complaints must be investigated, and a response provided to the complainant. The Complaints Log must be made available to the Independent Peer Review Panel, and Otago Regional Council on request.

Annual Monitoring Report

67. The consent holder must compile an annual monitoring report on the operation of the landfill, including:

a. the status of landfill construction, completion of landfilling of any stage, and closure and aftercare activities completed during the preceding year.

b. any non-compliance with the consents or difficulties in achieving the practices and procedures in the Landfill Management Plan which have arisen in the preceding year, and the measures taken to address those.

c. any emergency management procedures and contingency response procedures of the Landfill Management Plan that were implemented during the proceeding year.

d. landfill construction, landfilling operations, and closure and aftercare activities proposed for the next year of the landfill operation.

e. collated summaries and analyses of all monitoring results and other data required under these consents.

The report must be forwarded to Te Rūnanga o Ōtākou, Independent Peer Review Panel, Dunedin International Airport Limited and Otago Regional Council by 1 March each year unless otherwise agreed in writing. The consent holder must make the report publicly available on its website.

Bond

68. In the event that Dunedin City Council transfers this consent to another entity in whole or in part, then prior to that occurring the Dunedin City Council must have in place a bond, and thereafter maintain it, to meet the requirements of general conditions 69 – 79:

69. For the avoidance of doubt this bond is not required if the Dunedin City Council remains holder of the consents but engages a contractor to operate the landfill on its behalf.

70. The amount of the bond required is to be either;

a. The sum of $5,000,000; or

b. The amount of the bond shall be initially set on the basis of cost estimates established by means of a risk assessment prepared by the consent holder, which shall be submitted to the Otago Regional Council for review and approval prior to any transfer of this consent. The amount of the bond must cover costs associated with completing work listed in general condition 75 below.

71. Once the bonded sum is set, it is to be paid to the Otago Regional Council either in cash, or the bonded sum secured by a guarantor in favour of the Otago Regional Council prior to the transfer of this consent. The guarantor and the form of the bond are to be agreed as appropriate between the consent holder and the Otago Regional Council. The bonded sum is to be held by the Otago Regional Council on trust in an interest bearing account to be called on and used to remedy any breaches of the conditions of the consents that are not remedied by the consent holder.

72. Should the consent holder and the Otago Regional Council be unable to reach mutual agreement on the form, terms and conditions, or amount of the bond, then the matter shall be referred to arbitration in accordance with the provisions of the Arbitration Act 1996. Arbitration shall be commenced on advice by either party that the amount of the bond is disputed, such notice to be given within 14 days of receipt by

the Otago Regional Council of the amount of the bond established by the consent holder. If the parties cannot agree upon an arbitrator within seven days of receiving advice that the amount of the bond is in dispute, then an arbitrator shall be appointed by the President of the Institute of Professional Engineers of New Zealand (IPENZ). Such arbitrator shall give an award in writing within 30 days after his/her appointment, unless both parties mutually agree that time shall be extended. The parties shall bear their own costs in connection with arbitration. In all other respects, the provisions of the Arbitration Act 1996 shall apply.

73. If the decision of the arbitrator is not made available by the 30th day referred to above, then the amount of the bond shall be fixed by the Otago Regional Council, until such time as the arbitrator does make his/her decision. At that stage, the new amount shall apply.

74. The amount of the consent holder's bond established under general condition 70(b) shall be reviewed every five years from it being established, by means of a risk assessment using the criteria in general condition 78. More frequent reviews may be undertaken at the Otago Regional Council's discretion (but not within 12 months of a previous review), in which case the Otago Regional Council shall provide the Consent holder with no less than 30 days notice in writing of the review. If, on review, the amount of the bond to be provided by the Consent holder is greater than the sum secured by the current bond, then within 30 days of the consent holder being given written notice by Otago Regional Council of the new amount to be secured by the bond, the consent holder and the guarantor shall execute and lodge with the Otago Regional Council a variation of the existing bond or a new bond for the amount fixed on review by the Otago Regional Council. No further waste shall be placed at the site if the variation of the existing bond is not provided in accordance with this condition.

75. Where the amount of the bond is set under general condition 70(b) following the risk assessment, the amount may vary from time to time but at any given time shall be sufficient to cover the estimated cost at that time (including any contingency) of:

    a. Remediation of any adverse effect on the environment that may arise from the site. The estimated costs shall be determined by the consent holder by means of a quantitative risk assessment to ensure that the 90 percent confidence limit on remedial action costs is provided. An experienced environmental risk assessment practitioner shall conduct such a risk assessment. The consent holders environmental risk assessment practitioner shall be approved by the Otago Regional Council and the method of conducting the risk assessment shall be made clear to the Otago Regional Council, including all assumptions drawn to conduct the assessment. The risk assessment shall include (but not be limited to) the factors listed below, the likelihood of any of these events occurring and the likely remedial costs:

        i. Excessive hydration of the landfill liner;

        ii. Excessive leachate seepage through liner;

        iii. Failure of leachate collection system;

        iv. Escape of leachate from leachate storage facilities;

        v. Surface water contamination within or beyond the boundary of the site;

        vi. Groundwater contamination within or beyond the boundary of the site

        vii. Illegal dumping of hazardous and/or inappropriate waste;

        viii. Instability of landfill batters;

        ix. Underground migration of landfill gas;

        x. Significant and ongoing odour problems;

xi. Failure of gas collection system;

xii. Landfill fires;

xiii. Erosion of landfill cap;

xiv. Slipping/mass failure of the landfill mass;

xv. Failure to establish and or maintain vegetation cover on cap.

b. Rehabilitation and closure of the site in accordance with the conditions of the consents. These works shall include:

i. Capping and re-vegetation in accordance with the details of the Landfill Management Plan;

ii. Installation of gas and leachate collection infrastructure where it is not installed progressively throughout the life of the landfill; and

iii. Decommissioning of infrastructure no longer required. The cost estimate must provide for the rehabilitation of the largest area of the landfill that may be open (filled and uncapped) at any stage. In the event that capping materials are required to be imported to the site, the consent holder shall allow for the cost of importation to be included in the estimate of costs.

c. Monitoring and management of the site and its effects both before and after closure or abandonment of the site. In this context, closure shall mean completion of capping of the final landfill cell. The bond shall provide for the total area of landfill filled at a given time. The estimation of the bond for site monitoring and management costs shall consider (but not be limited to) the following aspects:

i. Inspection of landfill cap and landfill infrastructure including leachate collection system;

ii. Repair of landfill cap and infrastructure;

iii. Landscape maintenance of vegetated landfill cap;

iv. Leachate and stormwater treatment and/or disposal;

v. Decommissioning of leachate storage tanks;

vi. Maintenance of groundwater bores and gas collection wells;

vii. Ongoing extraction and management or usage of landfill gas; and

viii. Monitoring program for:

- Groundwater;
- Surface water;
- Leachate;
- Landfill gas; and
- Birds.

d. Ensure the performance of any monitoring obligations of the consent holder under this consent, as well as any site aftercare obligations such as care of the landfill cap and pollution prevention infrastructure (Aftercare);

e. Provide for reconstruction of the landfill landform in the event of a mass movement;

f. Provide for early closure costs in the event of abandonment of the site.

76. The consent holder may apply to have the bond amended, discharged or reviewed at any time, in which case the Otago Regional Council shall advise the consent holder of its decision on the application within 60 days of it receiving the application. An application by the consent holder to amend the amount of the

bond should be supported by a risk assessment carried out in accordance with the methodology detailed in general condition 78.

77. The bond shall be maintained in favour of the Otago Regional Council for a minimum period of 25 years following closure or abandonment of the landfill site. Closure shall mean completion of capping of the final landfill cell, or closure following abandonment prior to the final landfill cell being completed. If the landfill has been monitored and a risk assessment approved by the Otago Regional Council affirms that there are no existing or potential adverse environmental effects from the landfill operation, then the Otago Regional Council may at its discretion discharge the bond before the 25-year period has concluded. The bond period may at Otago Regional Council's discretion be extended beyond 25 years if a risk assessment to the satisfaction of Otago Regional Council conducted 25 years after landfill closure indicates that the landfill continues to pose a threat to the environment.

78. The following aspects shall be considered in a risk assessment determining whether to amend or discharge the Consent holder's bond:

    a. Environmental performance (e.g. verification that groundwater is not polluted);

    b. Sensitivity of the environment;

    c. Bird strike risk to aviation

    d. Degree of waste stabilisation as reflected by the cessation of landfill gas and leachate generation; and

    e. Cap integrity.

79. All costs relating to the bond shall be paid by the consent holder, other than in relation to arbitration (see above), in which case both parties shall bear their own costs. The decision to review the discharge of the bond should be based on the risk assessment criteria and methodology given in general condition 78.

Review of Conditions

80. Pursuant to Section 128 of the Resource Management Act 1991 the consent authority may in May each year serve notice of its intention to review the conditions of this consent for the purposes of:

    a. Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which becomes evident after the date of commencement of the consent.

    b. Ensuring the conditions of this consent are consistent with any National Environmental Standards, relevant regional plans, and/or the Otago Regional Policy Statement.

    c. Ensuring the waste acceptance criteria conditions of this consent are consistent with applicable Ministry for the Environment and Environmental Protection Authority guidance, standards, and notices, including as a result of emerging contaminants.

    d. Ensuring the bird management conditions of this consent are effective to ensure there is no increase in existing bird strike risk to aviation.

    e. Reviewing the frequency of monitoring or reporting required under this consent.

    f. Amending the monitoring requirements.

    g. Requiring the adoption of the best practicable option to reduce any adverse effect on the environment.

Advice Notes

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*

- *'landfill operational extent' means areas shown as such in Appendix 2 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*

- *'active landfilling area' means the area of exposed waste.*

ATTACHMENT 1 TO GENERAL CONDITIONS

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 general condition 54:

a. The groundwater monitoring wells described in general condition 43.

b. The groundwater collection system prior to discharge to the unnamed tributary of 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 unnamed tributary of Ōtokia Creek. During subsequent stages, the attenuation basin prior to discharge to the unnamed tributary of Ōtokia Creek.

d. The surface water monitoring points shown as SW1 – SW7 (and SW8 if access is available) on drawing 12506381-C309 or as otherwise specified in the Landfill Management Plan.

Table 1 below shows which parameters must be monitored at each location. Table 1 also shows locations where trigger levels for certain parameters must be monitored. Trigger levels for each parameter are to be established in accordance with general condition 52.

For groundwater samples all metal, metalloid and trace element parameters are the dissolved fraction of water sample only. For surface water and stormwater samples all metal, metalloid and trace element parameters are both dissolved fraction and total fraction of water sample.

Table 1 – Water Quality Monitoring Parameters

	Monitoring Location							
	GW monitoring Bores GW1-GW7, BH202 and Groundwater collection system prior to discharge to the unnamed tributary of Ōtokia Creek			**Sediment Retention Pond for Stage 1, attenuation basin, and groundwater collection system prior to discharge to the unnamed tributary of Ōtokia Creek**		**Surface Water monitoring points SW1 - SW8**		
Parameter (mg/L unless stated otherwise)	**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					X	
Sulphate	X	X	X				X	
Zinc	X	X	X			X	X	X
Dissolved Reactive Phosphorus		X	X				X	X
Total Phosphorous							X	X
Ammoniacal Nitrogen	X	X	X	X	X	X	X	X
Kjeldahl Nitrogen	X	X				X	X	
Nitrite Nitrogen	x	x				x	x	x
Nitrate Nitrogen	X	X				X	X	X
Alkalinity	X	X	X			X	X	
Organic Carbon		X						

Total Volatile organic compounds		X	X				X	X
Total Semi-volatile organic compounds		X	X				X	X
PFOS + PFHxS		X					X	
PFOA		X					X	
pH (ph units)	X	X		X	X	X	X	X
Temperature (degrees Celsius)	X	X		X	X	X	X	
Electrical conductivity (µS/cm)	X	X		X	X	X	X	
Water Level (m RL)	X	X				X	X	
Flow rate (l/s)						X	X	
Suspended solids							X	X
Turbidity (NTU)				X	X		X	X

B. Discharge Waste and Leachate to Land Conditions

Purpose of this consent: to discharge solid waste and leachate to land.

Expiry date: this consent will expire on [insert date 35-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.

Pre-Construction Investigations

3. Additional geotechnical investigations must 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 must 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 must be determined during the initial stages of the detailed design process where specific confirmation is required.
4. Lime may be used for stabilisation of loess soils where they are to be used as part of a Type 1 lining system under condition 14(a). Lime must not be added to loess for use with a Type 2 lining system under condition 14(b). Alternative stabilisers, such as bentonite, can be considered for all lining systems. In addition to standard soil classification testing requirements for soil liners (including those in *WasteMINZ, Technical*

Guidelines for Disposal to Land 2018 – Appendix B, B.1 Landfill liners), the loess soil to be used for a Type 1 lining system must be assessed as part of detailed design for its suitability for re-use as a low permeable mineral liner within the landfill liner design by:

a. Determining what percentage of lime or bentonite is required to stabilise the loess and reduce its dispersivity to non-dispersive. The dispersivity test shall be undertaken in both de-ionised water and a leachate equivalent solution; and

b. Assessing the change, if any, in the Atterberg limits of unstabilised loess against stabilised loess. The Atterberg limits shall be determined using NZS 4402:1988 Test 2.4; and

c. Using a triaxial cell, assessing the change, if any, in saturated hydraulic conductivity of a re-compacted stabilised sample of loess across a range of moisture contents and strains, using first de-ionised water, then a leachate equivalent solution.

5. A minimum of five tests must be undertaken on the loess under condition 4 to ensure a representative result is obtained. The results of this testing must inform the landfill design and assessment of the suitability of lime stabilised loess as a component of the liner design. Stabilised loess will be assessed as not acceptable if there is an increase in hydraulic conductivity of the material caused by suspected brittle micro-fracturing. The tests must be carried out on representative samples of loess taken from areas intended to be used as borrow areas for loess liner materials. Should additional borrow areas be identified later, then further samples, representative of those additional borrow areas, must be taken and tested in a similar manner.

6. If loess is identified as unsuitable for use as a mineral component of the landfill liner in accordance with conditions 4 – 5, alternative materials must be considered as part of the liner design. Where an alternative and remote source for the mineral liner component is required, the material must be confirmed as being suitable in accordance with the same level and type of pre-characterisation testing as the loess under conditions 4 – 5.

7. Site Specific Probabilistic Seismic Hazard Assessment (SSSHA) must be undertaken as part of detailed design of the landfill to ensure seismic risks are addressed so the landfill's 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 and construction of the landfill, in particular for permanent and temporary slopes, must be modified as necessary to incorporate any changes in seismic design parameters identified by the SSSHA.

8. The detailed design of the landfill must demonstrate the short (construction and operation) and long-term (closure to post closure) stability of all cut and fill slopes of the landform. This must 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 $\geq$1.5, and for the seismic load case where the factor of safety is <1 in the pseudo-static seismic load case, the displacement method must be considered as per Section 6.3.2 of the Waka Kotahi NZTA Bridge Manual (3rd Edition Oct 2018).

9. The detailed design of the landfill must 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 must 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 must 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 must be included as part of the detailed design documentation provided to the Independent Peer Review Panel for review and confirmation that the construction materials align with any assumptions made as part of the slope stability analysis.

Landfill Liner and Groundwater and Leachate Collection Systems

10. The landfill must be designed, progressively constructed, and operated with a:
    a. Groundwater collection system beneath the landfill liner to manage groundwater levels beneath the landfill liner.
    b. Landfill liner to isolate leachate from the underlying strata.
    c. Leachate collection system to remove leachate from the landfill.
    d. Leachate storage and management facilities to temporarily store leachate prior to its removal from the site.
11. The groundwater collection system must be 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.
12. The groundwater collection system must be maintained to enable ongoing operation at all times and restored as soon as practicable in the event of a malfunction or fault. The Landfill Management Plan required by general condition 14 must include maintenance practices and procedures for the groundwater collection system.
13. The lining system for the base of the landfill (the portion of the liner that is generally less than 4% crossfall, and continuing 5 horizontal metres up the side slopes) must, as a minimum, comprise the following lining system (from top to bottom):
    i. 300 mm layer of leachate drainage material;
    ii. Protection geotextile;
    iii. 1.5 mm HDPE geomembrane;
    iv. Geosynthetic clay liner (GCL); and
    v. 600 mm compacted soil with a coefficient of permeability $k < 1 \times 10^{-9}$ m/s.

    Lime stabilised loess must not be used as part of this lining system.
14. The lining system for the side slopes of the landfill must, as a minimum, comprise one of the following two lining systems:
    a. Type 1 Lining system (from top to bottom):
        i. 300 mm layer of leachate drainage material;
        ii. Protection geotextile;
        iii. 1.5 mm HDPE geomembrane; and
        iv. 600 mm compacted soil (clay) with a coefficient of permeability $k < 1 \times 10^{-9}$ m/s.
    b. Or Type 2 lining system (from top to bottom):
        i. 300 mm layer of leachate drainage material;
        ii. Protection geotextile;

iii. 1.5 mm HDPE geomembrane;

iv. Geosynthetic clay liner (GCL); and

v. 600 mm compacted soil with a coefficient of permeability $k < 1 \times 10^{-8}$ m/s.

15. Alternative lining and leachate drainage systems to those specified in conditions 13 and 14 may be used where they provide equivalent or better performance and are submitted to the Independent Peer Review Panel for review and confirmation, followed by the Otago Regional Council for certification in accordance with the process in general conditions 18 and 19 that it meets this condition.

16. If stabilised loess is used as a component of the liner system, it must be batch processed (by weight) prior to placement. As a minimum, the quality control for the batch processing must monitor the dosing of the stabiliser, record where each batch is placed, and core samples recovered for validation testing of non-dispersive behaviour.

17. The installation of the landfill lining system must 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 must be prepared and must 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 certified by the Otago Regional Council under general condition 24. This report must be submitted to the Independent Peer Review Panel within 3 months following completion of the works referred to in this condition.

18. The leachate collection system must:

    a. Be designed to meet the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill

    b. Be designed 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. Provide leachate pumping systems in accordance with relevant standards in relation to landfill gas (e.g. *AS/NZS 2381.1.1:2005*).

19. The leachate collection system must be operated 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.

20. The leachate storage and management facilities must be provided as follows:

    a. Leachate storage and management facilities must be designed for a capacity 50% greater than the calculated maximum leachate volume produced over a three-day period for any stage of operation of the landfill, as calibrated against the previous two year's monitoring records of leachate produced. The calculated maximum leachate volume and the leachate storage and management facilities must be described in the Landfill Management Plan required by general condition 14.

    b. 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 must be designed to accommodate the calculated storage and flow rates based on the leachate which would be generated by a 1% Annual Exceedance Probability (AEP) storm event for the extent of landfill to be developed over that two-year period.

21. On-site standby electrical supply must be provided at all times to ensure that the operation of the leachate collection system is not interrupted through loss of mains power supply.

22. The leachate collection systems and leachate storage and management facilities must be maintained to enable ongoing operation at all times and restored as soon as practicable in the event of a malfunction or fault. The Landfill Management Plan required by general condition 14 must include maintenance practices and procedures, including but not limited to a regular programme for jetting and flushing of the leachate collection system.

23. Effective measures must be implemented to minimise stormwater infiltration and runoff into areas of exposed landfill liner, open waste, and the leachate collection system from areas outside the landfill footprint. The Landfill Management Plan required by general condition 14 must include practices and procedures for stormwater diversion away from areas of exposed liner.

24. The level of leachate in the landfill and the volume of leachate that has been pumped from the landfill to the leachate storage facilities must be recorded daily. This record must be provided to the Independent Peer Review Panel and Otago Regional Council upon request and no less than annually.

25. A sample of leachate from the landfill must be collected from the landfill every 6 months and assessed against the full list of parameters identified in **Attachment 1**, and results provided to the Independent Peer Review Panel and Otago Regional Council within 1 month of results being received.

Waste Acceptance and Placement

26. Smooth Hill landfill must not be open to the general public for the disposal of waste. Waste must be consolidated off-site prior to transport in bulk to Smooth Hill landfill.

27. Food and garden organic waste streams must be collected separately from the general waste stream and processed separately and off site to minimise disposal of this material at Smooth Hill landfill.

28. 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 such that putrescible waste makes up less than 10% of the waste going to Smooth Hill landfill (by weight). To assist achieve this, practices and procedures must be included in the Landfill Management Plan required by general condition 14 that provide for:

    a. Removal of putrescible waste at the source, including auditing of kerbside bins to prevent receipt of high levels of putrescible contaminated waste, and public education aimed at reducing contamination in kerbside bins.

    b. Ensuring all general waste from all sources is deposited at the Bulk Waste Transfer Station prior to consolidation and transfer to Smooth Hill, except that commercial waste transporters may deliver general waste directly to Smooth Hill without being sorted at the Bulk Waste Transfer Station only if the operator has a valid Waste Acceptance Agreement with the Dunedin City Council at the time of delivery that requires less than 10% putrescible material of the total waste (by weight).

    c. To the extent practicable, ensuring removal of putrescible waste from general waste at the Bulk Waste Transfer Station prior to consolidation and transfer of general waste to Smooth Hill landfill. Where putrescible waste contamination cannot be removed from general waste, such waste must be quarantined and transferred separately to Smooth Hill for disposal as special waste in accordance with condition 43 below.

    d. Ensuring all organic food and garden waste that is contaminated with general waste, and all recycling material that is contaminated with organic food and garden waste is screened to separate organic contaminated waste prior to processing. Organic contaminated waste must be

quarantined and transferred separately to Smooth Hill for disposal as special waste in accordance with condition 43 below.

e. Undertaking an annual assessment using the procedures in the *Solid Waste Analysis Protocol*, Ministry for the Environment, March 2002 of the general waste received at the Bulk Waste Transfer Station ,and from commercial waste transporters directly at Smooth Hill, to confirm whether the waste received at Smooth Hill is less than 10% putrescible material of the total waste (by weight). The results of the annual assessment must be provided to the Independent Peer Review Panel, Dunedin International Airport Limited, and Otago Regional Council within 1 month of the assessment being completed.

29. Materials accepted into the landfill must be limited to the following as defined by the *WasteMINZ Technical Guidelines for Disposal to Land 2018*:

    a. municipal solid waste (MSW)

    b. household waste

    c. commercial waste

    d. industrial waste

    e. construction and demolition waste

    f. clean fill material

    g. managed fill material

    h. contaminated soil

    i. treated hazardous waste

30. No hazardous waste as defined by the *WasteMINZ Technical Guidelines for Disposal to Land 2018* must be accepted for disposal.

31. No liquid wastes must be accepted for disposal. The definition of liquid waste is any waste that contains free liquid on arrival at the landfill, or has a solids content of less than 20%, except such waste that passes the USEPA Paint Filler Liquids Test (EPA Method 9095A).

32. Waste acceptance criteria for the materials in condition 29 must be developed and included in the Landfill Management Plan required by general condition 14. The waste acceptance criteria must give effect to the following:

    a. Conditions 30 and 31.

    b. The list of prohibited waste as defined in the *WasteMINZ Technical Guidelines for Disposal to Land 2018* or any updated or equivalent replacement New Zealand issued guidelines.

    c. Landfill waste acceptance criteria for class 1 landfills identified in Appendix D of the *WasteMINZ Technical Guidelines for Disposal to Land 2018*, or any updated or equivalent replacement New Zealand issued guidelines or standards.

    d. Landfill disposal standards and notices issued by the Environmental Protection Authority under the Hazardous Substances and New Organisms Act 1996.

33. Medical wastes must only be accepted in accordance with NZS4304:2002 Healthcare Waste Management or subsequent amendments.

34. Asbestos must only be accepted in accordance with the Health and Safety in Employment (Asbestos Regulations) 2016 or subsequent amendments.

35. Material accepted into the landfill must meet the waste acceptance criteria included in the Landfill Management Plan. Any waste not meeting the criteria must not be accepted for disposal at the landfill.

36. The consent holder must review the waste acceptance criteria in the Landfill Management Plan annually , and prepare a report identifying any changes and/or additions required to give effect to any changes in applicable Ministry for the Environment and Environmental Protection Authority guidance, standards, and notices, including as a result of emerging contaminants. The report must be provided as part of the annual review of the Landfill Management Plan under general condition 21 to the Independent Peer Review Panel for review and confirmation, followed by certification by the Otago Regional Council in accordance with the process in general conditions 18 and 19.

37. Waste must only be delivered to Smooth Hill Landfill by Dunedin City Council, and/or commercial waste transporters who hold a valid Waste Acceptance Agreement with the Dunedin City Council confirming the material meets the waste acceptance criteria in the Landfill Management Plan.

    Advice Note: for the purposes of this condition 'waste acceptance agreement' means a contract held between the disposer of waste and the Dunedin City Council that sets out the requirements for the disposal of any waste, including the rights of the landfill operator to inspect, challenge, sample, test, and reject waste.

38. A notice must be placed at the landfill entrance which identifies the wastes that are unacceptable at the landfill.

39. Municipal solid waste, household waste, commercial waste, industrial waste, and treated hazardous waste must be transported to the landfill in sealed truck and trailer units or bins. All other waste transported to the landfill must be covered if there is any potential for litter or debris leaving the vehicle.

40. Waste deliveries must only be received at the landfill between the hours of:

    a. Monday to Friday 8.00am – 6.00pm.

    b. Saturday and Sunday 9.00am – 5.00pm.

    Waste deliveries must not be received at the landfill on Easter Friday, Christmas Day, New Year's Day, and the morning of Anzac Day (until 1pm).

41. Random visual inspections of incoming loads for the presence of hazardous waste must be undertaken by the landfill operator at a minimum rate of 1 in 50 loads and tipping of all waste must be supervised. The Landfill Management Plan required by general condition 14 must include practices and procedures for waste inspection and rejection of loads that contain hazardous waste.

42. Otago Regional Council must be immediately notified if any waste delivery vehicle is turned away from the landfill that contains waste that does not comply with the consent conditions or waste acceptance criteria in the Landfill Management Plan.

43. Quarantined special waste received at Smooth Hill under conditions 28(c) and (d) must be:

    a. pre-booked to ensure preparations are made including ensuring cover material is available at the disposal location; and

    b. prioritised for disposal ahead of more general waste and loads and covered immediately to meet the requirements of general condition 33.

44. The Landfill Management Plan required by general condition 14 must include specific practices and procedures for the pre-acceptance, handling, and placement of quarantined special waste. This must include as minimum requirements for prioritising placement and covering of waste as required by general condition 33, and conditions 43(a) and (b).

45. Records must be maintained of:

a. the quantities and types of waste accepted and rejected; and

b. load inspections; and

c. disposal locations of highly odorous and special waste

These records must be included in the annual report provided to the Independent Peer Review Panel and Otago Regional Council under general condition 67.

46. Waste must only be discharged onto, or into, land within the landfill liner extent shown on drawing 12506381-01-C201.

47. Waste placement and compaction must be undertaken so as to protect the landfill liner and ensure waste stability.

Bird management

48. A Southern Blacked Backed Gull Management Plan must be prepared by a suitably qualified person within 6 months of the granting of this consent. The purpose of the plan is to manage Green Island landfill food availability and the breeding success of the existing southern blacked backed gull population at Dunedin breeding sites where access is feasible with the objective of reducing the existing level of bird strike risk to aviation prior to the closure of the Green Island landfill. The plan must be developed in consultation with the Te Rūnanga o Ōtākou, the Department of Conservation, and Dunedin International Airport Limited. As a minimum the plan must include:

a. Outcomes of consultation completed with key stakeholders.

b. A monitoring regime which enables identification of breeding sites, baseline population characteristics, and how the population responds to management actions.

c. Measurable targets for the reduction of the population.

d. Description of management actions and methods to be implemented to limit breeding success at key breeding sites where access is feasible, and limit landfill food availability at Green Island landfill leading up to its closure.

e. Procedures for liaison with and sharing of information with Te Rūnanga o Ōtākou, the Department of Conservation, and Dunedin International Airport Limited.

a. An adaptive management and review process.

The finalised plan must be provided to Otago Regional Council, and implementation of the plan by the consent holder must commence as soon as it is finalised.

49. Monthly baseline bird monitoring by a suitably qualified ornithologist over at least a 12-month period must occur prior to the preparation of the full risk assessment under condition 51. The purpose of the monitoring is to supplement monitoring previously completed to inform the resource consent application, and:

a. Determine the year-round behaviour patterns of key bird species and their populations in the Dunedin area, especially black-backed gulls.

b. Confirm how southern black-backed gulls have responded to management initiatives undertaken as part of the Southern Blacked Backed Gull Management Plan under condition 48.

c. Establish a baseline estimate of risk at and around Dunedin Airport through structured regular surveys that allow risk assessment models to be updated.

50. The bird monitoring under condition 49 must be conducted by the consent holder in accordance with the methods in the *Draft Smooth Hill Bird Management Plan prepared by Boffa Miskell Ltd and Avisure, dated June 2021,* and *Smooth Hill Preliminary Bird Hazard Assessment, Avisure, May 2021*, and include:

a. On airport surveys at Dunedin International Airport (where access is provided by Dunedin International Airport Ltd).

b. Off-airport surveys at three locations in close proximity to Dunedin Airport.

c. Green Island landfill surveys.

d. Surveys of key bird habitats across the Dunedin area and surrounds.

e. Pre-development Smooth Hill site surveys.

The bird monitoring must inform the updated risk assessment under condition 51.

51. A full bird strike risk assessment must be completed by a suitably qualified expert at least 6 months prior to construction of the landfill commencing for the purposes of confirming the landfill will not increase the existing level of bird strike risk, taking into account the results of bird monitoring required by condition 49. The risk assessment must address the limitations outlined in the *Smooth Hill Preliminary Bird Hazard Assessment, Avisure, dated May 2021*, and consider the following:

a. Species (behaviour, mass, tendency to flock or roost communally).

b. Land use / activity type.

c. Location relative to Dunedin International Airport and the approach / departure paths.

d. Location relative to nearby land uses that may also attract, or have the potential to attract, birds.

e. Species strike risk based on Dunedin Airport strike data.

f. Recommended landfill operational procedures and bird control and deterrence measures to ensure that there is no increase in bird strike risk to aviation resulting from the construction, operation, and closure of the landfill.

The risk assessment must be provided by the consent holder to the Otago Regional Council, Independent Peer Review Panel and Dunedin International Airport Limited and used to inform the Landfill Operational Bird Management Plan under condition 56.

52. The consent holder must appoint a Bird Control Officer responsible for overseeing bird management at the site prior to the operation of the landfill commencing and retain someone in this position for the duration of the landfill's operation. The Bird Control Officer must be suitably trained to undertake the following responsibilities:

a. Ensuring bird sightings at the site are recorded in the bird registers under condition 54.

b. Identifying when bird trigger levels are exceeded, notifying Dunedin International Airport within 1 hour of the trigger level being exceeded, and initiating and overseeing management actions under condition 55.

53. The consent holder must ensure the following measures are put in place prior to the operation of the landfill commencing, and maintained to enable responsive implementation of the management actions in condition 55:

a. Anti-roosting strips must be installed on the roofs of all landfill buildings.

b. A bird shooting contractor must be engaged and retained who is registered with the Department of Conservation.

c. All approvals necessary for handling and using bird controls poisons must be obtained.

d. A design and specifications for wires and a bird exclusion net over the active landfill area, and a list of pre-approved contractors for supply of materials and installation of the wires and net must be prepared and maintained.

54. The following bird registers must be maintained on site and updated daily by the consent holder during operation of the landfill:

a. The number and species of birds with an individual body weight exceeding 50 g sighed (as per condition 56(f) these species will be listed in the Landfill Operational Bird Management Plan).

b. The number and species of birds killed by shooting at the site.

c. Where known, the number and species of birds killed by poison at the site.

d. The date and number of bird threshold trigger breaches with condition 55 at the site.

e. The date/s bird control measures in condition 55 are implemented and the duration of implementation.

f. A success register that documents how effective bird control measures are / were in reducing bird species with an individual body weight exceeding 50 g to meet the trigger levels in condition 55.

g. Sightings of eastern falcon at or near the landfill (this will help inform if it is appropriate to use falcon decoys as a potential bird control option).

The registers must be provided monthly to the Otago Regional Council, Independent Peer Review Panel and Dunedin International Airport Limited.

55. Where the bird registers in condition 54 record the presence of any bird species with an individual body weight exceeding 50 g (as per condition 56(f) these species will be listed in the Landfill Operational Bird Management Plan), the following actions must be undertaken in accordance with the practices and procedures in the Landfill Operational Bird Management Plan under condition 56. Once remediation is undertaken and trigger levels are complied with, the consent holder may de-escalate management actions to the lowest compliant level.

	Trigger level	**Management Action**
a.	Where at any time there are less than 20 individuals with a typical adult body mass greater than 50 g.	Implementation of the landfill operational procedures set out in the Landfill Operational Bird Management Plan. Implementation of bird deterrence and control measures, including dispersal of birds from the active landfilling area.
b.	Where at any time there are more than 20 individuals with a typical adult body mass greater than 50 g.	Notify Dunedin International Airport within 1 hour. In addition to the above, progressive implementation of lethal bird control measures, including: a. Shooting of non-protected species, followed by b. Poisoning of non-protected species, followed by c. Colony control of Southern Blacked Backed Gulls by reactivating the Southern Black Backed Gull Management Plan under condition 48. and Initiation of preparations for implementing the bird control measures in (c) below.

c.	Where the lethal bird control measures in (b) above are unsuccessful and at any time there are more than 20 individuals from a species greater than 50 g, or combined numbers of these species exceeds 100 individuals.	Notify Dunedin International Airport within 1 hour. In addition to the above, implementation of additional bird deterrence and control measures, including: a. Installation of wires above the active landfilling area. b. Bailing waste c. Initiation of preparations for implementing the bird control measures in (d) below, including ensuring the pre-approved contractors under condition 53(d) have the materials and resources immediately available for preparation of a net.
d.	Where there are more than 12 breaches of the threshold in (c) above in any 12-month period	Notify Dunedin International Airport within 1 hour of explicitly identifying a breach of the 12-month threshold. Installation of a bird exclusion net over the active landfilling area. For remaining landfill area, implementation of the landfill operational procedures set out in the Landfill Operational Bird Management Plan.

Advice Note: For the purposes of this condition black-billed gulls, red-billed gulls, harrier hawks, eastern falcon, and paradise ducks are protected species that must be not be shot or poisoned.

56. A Landfill Operational Bird Management Plan, in accordance with the *Draft Smooth Hill Bird Management Plan* prepared by Boffa Miskell Ltd and Avisure, dated June 2021, must be prepared by a suitably qualified person with the objective of addressing the management of birds to ensure that the landfill and any associated wetland restoration will not increase the existing level of bird strike risk to aviation. The plan must be developed in consultation with Dunedin International Airport Limited and Te Rūnanga o Ōtākou. As a minimum the plan must include:

    a. Background information covering the attraction of birds to landfills and bird strike risk with aircraft.

    b. Description of the baseline bird monitoring completed under condition 49 across all seasons, and information on what the waste stream will consist of, and how it will be handled.

    c. Description of the outcomes of the bird strike risk assessment completed under condition 51.

    d. 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 full risk assessment required by condition 51.

    e. Detailed operational practices and procedures, including for reducing putrescible/organic waste, daily cover of waste, minimising the extent of the active landfilling area, minimising open earthworks and pools of water, and reducing barren areas.

    f. Bird species greater than 50 g that must be managed to zero densities daily.

    g. Detailed operational practices and procedures for bird deterrence and control methods, including triggers and management actions in accordance with condition 55.

    h. Training and key bird management responsibilities of onsite personnel including the Bird Control Officer.

    i. Liaison with and sharing of information with Dunedin International Airport Limited on bird management in accordance with general conditions 13 and 67, and conditions 48 – 59 of this consent.

j. Maintenance of bird registers in accordance with condition 54.

k. A bird monitoring regime which enables comparisons to be made between the baseline (pre-operation) bird monitoring under condition 49 to assess aviation strike risk and success of bird management at the landfill.

l. An adaptive management and review process in accordance with conditions 57 – 59.

57. The plan must be provided to Dunedin International Airport Limited for review and feedback, before being submitted to the Independent Peer Review Panel for review and acceptance, followed by certification by the Otago Regional Council in accordance with the process in general conditions 18 and 19. Following operation of the landfill commencing, an annual bird strike risk assessment must be completed by a suitably qualified expert for the purposes of confirming the landfill operation has not increased the existing level of bird strike risk, taking into account the effectiveness of the management actions in condition 55, and the results of bird monitoring required by condition 56(k). The risk assessment is to consider the following:

a. Species (behaviour, mass, tendency to flock or roost communally).

b. Land use / activity type.

c. Location relative to Dunedin Airport and the approach / departure paths.

d. Location relative to nearby land uses that may also attract, or have the potential to attract, birds.

e. Species strike risk based on Dunedin Airport strike data.

f. Recommended changes to the landfill operational procedures and bird control and deterrence measures.

The annual risk assessment must be provided to the Independent Peer Review Panel and Dunedin International Airport Limited and used to inform reviews of the Landfill Operational Bird Management Plan under conditions 58 and 59.

58. The consent holder must prior to the operation of the landfill commencing invite Dunedin International Airport Limited to establish a Bird Management Operational Group for the purposes of facilitating ongoing engagement between the consent holder and Dunedin International Airport on landfill bird management and aviation bird hazard issues.

a. In addition to Dunedin International Airport, the group must comprise the consent holder, and the landfill operator (if any).

b. The consent holder must offer Dunedin International Airport Limited the opportunity to meet twice during the first year of operation, and annually thereafter, to review the effectiveness of the management actions in condition 55 and the Landfill Operational Bird Management Plan, under condition 56 for the purposes of:

i. Whether there is a need escalate the management actions outlined in condition 54 sooner than required by the trigger levels.

ii. whether any improvements are required to the Landfill Operational Bird Management Plan.

c. Any member of the Bird Management Operational Group may call an urgent meeting to address an aviation bird hazard issue in connection with the operation of the landfill.

d. A representative from the Otago Regional Council as consent authority must be invited to attend meetings in an observer capacity.

e. Minutes of any meeting must be taken by the consent holder and distributed to the members of the group, the Independent Peer Review Panel, and the Otago Regional Council.

Advice Note: In the event that Dunedin International Airport Limited does not want to form a Bird Management Operation Group or convene meetings, then such failure to do so will not be deemed a breach of these conditions.

59. Following any meeting under condition 58 the consent holder must (if necessary) update the Landfill Operational Bird Management Plan. The updated plan must be provided to Dunedin International Airport Limited for review and feedback, before being submitted, along with any feedback from DIAL to the Independent Peer Review Panel for review and confirmation, followed by certification by the Otago Regional Council in accordance with the process in general conditions 18 and 19.

Landfill Fire Prevention and Response

60. No burning must occur anywhere on the landfill site, and combustible materials must not be stockpiled over the landfill footprint.

61. The active landfilling area must be under the observation or surveillance of the landfill operator at all times during the operating hours.

62. A 10m wide firebreak free of combustible vegetation and material must be maintained around the landfill footprint at all times.

63. A minimum stockpile of 1500m^3 of inert cover material must be maintained adjacent to the landfill stage in operation for fire response.

64. A minimum fire water supply of 400m^3 must be maintained on the site, with 200m^3 each located near the main site entrance and emergency entrance from Big Stone Road respectively.

65. At times when the when the daily fire danger rating for the site is very high, extreme, or very extreme for forestry as reported by the New Zealand Fire Weather System:

    a. The firebreaks required under condition 62 must be inspected daily and any combustible vegetation or material removed.

    b. Landfill staff trained in fire response must be on site during operating hours.

    Advice Note: The New Zealand Fire Weather System (FWS) is operated by the National Institute of Water and Atmospheric Research (NIWA) on behalf of Fire and Emergency New Zealand (FENZ) to monitor fire danger.

66. The Landfill Management Plan required under general condition 14 must include practices and procedures prepared by a suitably qualified person to ensure risk of landfill fires is prevented as far as practicable, and any fires are promptly detected, responded to, and extinguished, and to achieve the conditions of this consent. The practices and procedures must be developed in consultation with Fire and Emergency New Zealand (FENZ) and must include the following as a minimum:

    a. Description of key site features, the scale and type of landfilling operations, operating hours, and normal on-site workforce, after hours arrangements, potential fire ignition risks.

    b. Fire prevention measures to be implemented to prevent fires from igniting in the landfill and any other areas of the site.

    c. Fire detection procedures to be implemented during operating hours and afterhours, including confirmation of daily fire danger rating, supervision of the active landfilling area, and monitoring of combustion gases, hot spots, subsidence, and smoke.

    d. Fire reporting and notification procedures to emergency services, neighbours, and regulators, including a directory of notification contact details.

    e. Fire risk mitigation and readiness features, including:

i. Site access road network.

ii. Main and emergency entrance gate locations.

iii. Water source locations and details of water access for fire response.

iv. Landfill cover procedures and how they serve to mitigate fire risk (and any variations to these in particular circumstances).

v. Soil cover supply available for fire response.

vi. Perimeter and other fire break locations specifications, and maintenance.

vii. On-site command point for control and coordination of any fire response operations.

viii. On-site equipment types, capabilities, and availability for fire response.

ix. Staff fire response training requirements

x. Readiness requirements for after-hours response.

f. Fire response procedures to be implemented for surface and sub-surface fires, including:

i. Fire response organisation, including persons responsible for manging the response, operating on-site equipment to be used, and arrangements for control transfer and support when emergency services arrive at the site.

ii. Operating procedure for fire response, including application of water, soil cover, and air exclusion.

iii. Operating procedures for ensuring personnel, equipment and the site are safe in the event of a spreading fire.

iv. Any triggers and procedures for clearing the site of personnel not needed for response.

v. Procedures for monitoring and reporting smoke and fumes from fires.

vi. Procedures for residual fire risk monitoring after the fire is reported as contained or extinguished.

vii. Procedures for managing leachate and overland flow of water generated through fire-fighting.

viii. Procedures for diversion of incoming waste during fire response.

g. Incident reporting and cause investigation protocol.

h. Protocol for review and evaluation of fire causes, effectiveness of fire prevention, detection mitigation and response measures, and process for continuous improvement, including conducting regular simulated fire drills.

Advice Note: In addition to the measures above, landfill gas monitoring management measures contained in the Discharge of Landfill Gas and Landfill Flare Emissions to Air resource consent [insert consent ref] are relevant to landfill fire prevention and response.

Litter and pests

67. Windblown litter must be prevented from the leaving the active landfilling area as far as practicable, and the build-up of litter within the site and surrounding the site boundaries must be monitored, and material removed on an at least weekly basis. The Landfill Management Plan required by general condition 14 must include practices and procedures for litter management, including but not limited to control methods, inspections, and removal.

68. Increases in pest plants, mammalian pests (rodents and mustelids), and feral cats within the landfill operational extent above current populations due to the operation of the landfill must be prevented. The Landfill Management Plan required by general condition 14 must include practices and procedures for pest management, including but not limited to suppression methods and monitoring.

Advice Notes:

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*
- *'landfill operational extent' means areas shown as such in Appendix 2 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*
- *'landfill footprint" means areas shown as the final filled landform for stages 1-4 in Appendix 2 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*
- *'active landfilling area' means the area of exposed waste.*

b. Any outline plan of works application submitted to the Dunedin City Council for the construction and, operation of the landfill within the landfill designation under section 176A of the Resource Management Act should address the following matters as relevant to the application:

i. Ensure there is no clearance of indigenous vegetation, earthworks, or landfill operations in West Gullies 1, 2, 3, and 4, the Swamp Wetland, downstream Valley Floor Marsh Wetland and/or intermittent or perennial streams as identified in the Smooth Hill Landfill, Ecological Impact Assessment Prepared for Dunedin City Council, Boffa Miskell, 19 August 2020 (updated 28 May 2021).

ii. Construction of the landfill occurs in accordance with an Eastern Falcon Management Plan based on the Draft Smooth Hill Falcon Management Plan, Boffa Miskell Ltd, dated June 2021, prepared by a suitably qualified ornithologist to ensure any adverse effects on any New Zealand Eastern falcons nesting at the site during construction are effectively avoided or otherwise managed following the effects management hierarchy. The plan must be developed in consultation with Te Rūnanga o Ōtākou.

iii. Construction of the landfill occurs in accordance with a Lizard Management Plan based on the Draft Smooth Hill Lizard Management Plan, Boffa Miskell Ltd, dated June 2021 prepared by a suitably qualified herpetologist to ensure any adverse effects to lizards during construction are effectively avoided or otherwise managed following the effects management hierarchy. The plan must be developed in consultation with Te Rūnanga o Ōtākou and the Department of Conservation following their guidelines for lizard salvage and transfer in New Zealand.

iv. Screen planting along the boundary with Big Stone Road, and along the north-eastern edge of the landfill facilities area is planted in accordance with the Landscape Mitigation Plan, Boffa Miskell Limited, 29 April 2022 prior to the first waste being accepted, and maintained.

v. *Construction of the landfill occurs in a way that avoids damage to any known archaeological site, and implements an accidental discovery protocol to manage effects on any undiscovered archaeological sites.*

vi. *The landfill site is securely fenced, and gates closed outside of operating hours.*

vii. *Heavy vehicles associated with the landfill use the State Highway 1 – McLaren Gully Road – Big Stone route, unless a hazard is present on this route which renders it inoperable.*

viii. *Transport of leachate from the site occurs in accordance with Waka Kotahi New Zealand Transport Agency Land Transport Rule 45001/2005: Dangerous Goods 2005, or any updated or replacement New Zealand equivalent guidelines or standards.*

C. Discharge of Landfill Odour and Dust and Landfill Gas and Flare Emissions to Air conditions

Purpose of this consent: to discharge odour, dust, landfill gas, and landfill flare emissions to air for the purpose of operating a landfill.

Expiry date: this consent will expire on [insert date 35-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.
3. There must be no odour or dust beyond the boundary that is noxious, dangerous, offensive or objectionable in the opinion of a suitably qualified and experienced authorised officer of the Otago Regional Council.

   Advice note: The determination of an offensive or objectionable effect must take into account the FIDOL factors and be made based on the guidance provided n Section 4.1.1 and Table 6 of the Ministry for the Environment Good Practice Guide for Assessing and Managing Odour (2016) or Section 4.2.1 and Table 8 of the Ministry for the Environment Good Practice Guide for Assessing Dust (2016).

Odour

4. Leachate conveyance and storage facilities must be sealed to minimise the discharge of odour as far as practicable.
5. No composting operations must occur on the site.
6. Odour from the disposal of wastes must be minimised to meet the requirements of condition 3. The Landfill Management Plan required by general condition 14 must include practices and procedures for odour management, including but not limited to management of the size of the active landfilling area, application of daily cover, use of odour suppression sprays, and monitoring.
7. To minimise odour emissions during handling of highly odorous wastes the following measures must be implemented:

   f. Highly odorous loads must only be received between the hours of 9.30am and 4.00pm.

   g. Deliveries of highly odorous wastes must be pre-booked, to ensure preparations are made including ensuring cover material is available at the pit location.

   h. Wastewater sludges, biosolids, and screenings must 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, and loads must be confirmed by the commercial waste transporter as meeting this requirement under

the terms of a valid Waste Acceptance Agreement with the Dunedin City Council at the time of pre-booking delivery.

i. Holding deliveries of unexpected highly odorous waste loads on site until preparations identified in (b) above are in place to enable disposal.

j. Deliveries of highly odorous wastes must be prioritised for disposal ahead of more general waste and loads and covered immediately to meet the requirements of general condition 33.

k. The Landfill Management Plan required by general condition 14 must include practices and 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 must include as minimum requirements for prioritising the placement and covering of highly odorous waste as required by condition 7(e), using special odorous waste placement areas that maximise separation distances to receptors, and the use of odour suppressing sprays/cannons.

Advice Note: For the purposes of this condition, "highly odorous wastes" include, but are not limited to:

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.

Dust

8. A wheel wash must be used by all vehicles leaving the site that have travelled on unsealed roads and surfaces within the site.

9. A minimum water supply of 200m^3 must be maintained on the site for dust suppression.

10. Effective measures must be implemented to minimise dust emissions to meet the requirements of condition 3. The Landfill Management Plan required by general condition 14 must include practices and procedures for dust management, including but not limited to water suppression of dust on unsealed roads and surfaces within the site, stabilisation of earthworks and stockpiles, cleaning of the site access and sealed roads within the site, and imposing vehicle speed limits within the site.

Landfill gas baseline monitoring and landfill gas risk assessment

11. A landfill gas monitoring bore network must be installed around the perimeter of the landfill at least 18 months prior to waste being accepted to enable the collection of baseline ground gas data, and to enable the future detection of landfill gas escaping laterally from the landfill and identify its location. This bore network must meet the minimum landfill gas monitoring bore requirements of the *Best Practice Environmental Management Guidelines: Siting Design, Operation, and Rehabilitation of Landfills*, EPA Victoria 2015.

12. All monitoring bores must be constructed in accordance with *NZ4411:2001 Environmental Standard for Drilling of Soil and Rock*, and *Best Practice Environmental Management Guidelines: Siting Design, Operation, and Rehabilitation of Landfills*, EPA Victoria 2015.

13. Monitoring to collect baseline ground gas from the monitoring bore network must commence at least 12-months prior to waste being accepted to establish background ground gas data and inform the Landfill Gas Risk Assessment (LFGRA) required under condition 14, and the development of monitoring trigger levels.

Sampling of ground gas must occur monthly for 12-months for the full suite of parameters set out in **Attachment 2**.

14. At the conclusion of the 12-month baseline monitoring period identified in condition 13, a detailed Landfill Gas Risk Assessment (LFGRA) must be completed to confirm:

    a. Potential landfill gas related risks at the site, including potential sources of landfill gas, emission pathways, receptors of emissions from the site.

    b. Locations, parameters, and frequencies for LFG monitoring, including any amendments required to the monitoring bore network.

    c. LFG management measures.

    The detailed LFGRA must further consider / investigate organic mudstone / lignite as a potential source of ground gas at the site. The LFGRA along with the monitoring results for the entire monitoring period must be provided to the Independent Peer Review Panel as part of the submission of the Landfill Management Plan under general condition 14.

15. The LFGRA required under condition 14 must be reviewed and updated at least every 5 years, or more regularly if new residential receptors establish closer to the site than residential properties in existence at the date of this consent, waste tonnages increase beyond 60,000 tonnes per year, or monitoring of LFG in accordance with condition 33 identifies LFG emissions that regularly exceed trigger levels.

<u>Landfill gas collection and destruction system</u>

16. The landfill must be designed, progressively constructed, and operated with a landfill gas collection and destruction system suitable for the anticipated rate and quantity of landfill gas generated by the landfill, which addresses the risks identified by the Landfill Gas Risk Assessment (LFGRA) in condition 14 or 15 above and meets the minimum requirements of the *WasteMINZ Technical Guidelines for Disposal to Land 2018* for a class 1 landfill, and Regulations 25, 26 and 27 of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004.

17. The landfill gas collection and destruction system must be designed, constructed, operated, and maintained to minimise potential oxygen ingress into the landfill waste (including to prevent the risk of sub-surface landfill fires) and maximise the rate of extraction of landfill gas.

18. The landfill gas collection system must be designed and installed to prevent puncture of the landfill liner by system components. In particular any vertical wells or pipes installed for the collection of landfill gas must terminate at a distance above the liner that will ensure that they will not puncture the liner, including as a result of waste settlement.

19. All extraction wells shall be connected to the gas extraction system as soon as practicable, and in any case, not longer than 6 months after placing wastes within the radius of influence of the wells. Passive flares with flame arresters shall be allowed to burn the gas venting from the wells prior to connection to the gas extraction system.

20. All extracted landfill gas must be combusted in a flare(s) which meets the following requirements:

    a. A principal flare(s) that has been designed, installed, operated and maintained in accordance with the requirements of Regulations 25, 26 and 27 of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004.

    b. Subject to the requirements of condition 20(a), the principal flare(s) must be operated at all times unless it has malfunctioned or is shut down for maintenance.

c. A backup landfill gas flare(s) that meets the requirements of Regulation 27(3) of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 must be operated if the principal flare is not operating.

21. There must be no visible emissions, excluding water vapour, light, or heat haze from any landfill gas flare.

22. The following parameters must be continuously monitored at the inlet to the flare and the results reported annually to Te Rūnanga o Ōtākou, the Independent Peer Review Panel and Otago Regional Council in accordance with general condition 67:

    a. Gas flow rate (m^3/hr)

    b. Suction pressure (mb)

    c. Methane (%v/v)

    d. Carbon dioxide (%v/v)

    e. Oxygen (%v/v)

    And within the flare:

    f. Temperature of combusted gas within the flare (^{0}C)

23. The concentration of oxygen in the landfill gas measured at the inlet to flare must not exceed 5% v/v oxygen.

24. The installation of the landfill gas collection and destruction system must be subject to independent construction quality assurance (CQA). On completion of each stage of the collection system construction a CQA report must be prepared and must include all of the test results, a description of the observations undertaken and certification that the system has been installed in accordance with the specification certified by the Otago Regional Council under general condition 24. This report must be submitted to the Independent Peer Review Panel within 3 months following completion of the works referred to in this condition.

25. On-site standby electrical supply must be provided to ensure the operation of landfill gas flare equipment is not interrupted through loss of mains power supply.

26. The landfill gas collection and destruction system must be maintained to enable ongoing operation at all times and restored as soon as practicable in the event of a malfunction or fault.

27. The Landfill Management Plan required under general condition 14 must include practices and procedures prepared by a suitably qualified person to ensure:

    a. Landfill gas is collected and destroyed.

    b. Ensure escape of fugitive landfill gas, exposure of people to landfill gas/landfill gas related odour are minimised.

    c. Risk of landfill fires are prevented as far as practicable.

    d. Achieve the conditions of this consent.

    As a minimum the landfill gas management practices and procedures of the Landfill Management Plan must include the following as a minimum:

    a. Description of key site information relating to landfill gas management, including site layout, geology and hydrogeology, and local meteorology.

    b. Estimates of landfill gas generation and recovery for the landfill, including method, assumptions, and results.

c. Description of the design of the landfill gas collection and destruction system, including wells, laterals, manifolds, and flare system, and the staging and timing of installation.

d. Quality assurance procedures for installation of the landfill gas collection and destruction system,

e. Operation and maintenance procedures for the landfill gas collection and destruction system, including operating criteria and parameters, system monitoring plan (parameters, frequencies, locations) trigger levels for relevant parameters including methane, carbon dioxide, oxygen, balance and carbon monoxide, response actions for trigger level exceedances, system operation and adjustment and system maintenance.

f. Landfill gas perimeter and surface monitoring locations, parameters, frequency, trigger levels, and methodology for each monitoring location and monitoring parameter, including contingency response procedures in the event of trigger level exceedance. As a minimum this is to address the monitoring requirements in condition 33 below.

g. Record keeping and reporting requirements.

Landfill gas perimeter and surface monitoring

28. Where the LFGRA under condition 14 identifies the need for amendments to the monitoring bore network, including any additional bores, those amendments shall be made in advance of waste being accepted, or within 6 months following completion of any updated LFGRA under condition 15.

29. All monitoring bores must be maintained to enable ongoing monitoring. In the event of a bore being destroyed or unsuitable for sampling, the consent holder must replace it with a bore in the same general location within 3 months.

30. The Landfill Management Plan under general condition 14, must include practices and procedures for the long-term monitoring of landfill gas emissions during operation, informed by the completion of the LFGRA under conditions 14 or 15 to achieve the following:

    a. Identify potential escape of fugitive landfill gas to the environment at or near source to confirm the efficacy of the landfill gas management system or need for remedial actions.

    b. Protection of the health and safety of people on and beyond the site who may be at risk of being exposed to landfill gas emissions.

    c. Prevent and identify landfill fires.

31. Trigger levels must be developed and included in the Landfill Management Plan for at least those parameters in **Attachment 1** relevant to detect landfill gas escape, when monitored at the following locations:

    a. The landfill gas monitoring bore network.

    b. Areas of intermediate cover as required under general condition 36.

    c. Within buildings and structures, and sub-surface pits.

    d. The surface of the final landfill cap.

    The baseline gas data collected under condition 13, and the LFGRA under conditions 14 or 15 must be used to establish typical ranges for each parameter and establish trigger values for these ranges suitable to detect landfill gas escape.

32. The concentration of methane measured at the surface of the landfill areas within intermediate or permanent final capping must not exceed 5,000 parts of methane per million parts of air.

33. During operation of the landfill, landfill gas concentrations must be measured as follows:

a. at least monthly at the landfill gas monitoring bore network,

b. at least monthly at areas of intermediate cover, within buildings, structures, and sub-surface pits, and the surface of the final landfill cap, with such monitoring to be undertaken with a Flame Ionisation Detector or equivalent. Monitoring must not be undertaken immediately following heavy rainfall or during strong wind speed.

Concentrations must be assessed against the trigger levels established under condition 31 and the results reported annually to Te Rūnanga o Ōtākou, the Independent Peer Review Panel and Otago Regional Council in accordance with general condition 67. Where there is any exceedance of the trigger levels, an investigation must be undertaken into potential causes. A report must 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 likely causes of the exceedance, detailed actions to be taken to prevent further trigger level exceedances and proposed follow up monitoring.

Advice Note – Favourable metrological conditions for methane surface monitoring include those where weather and ground conditions are dry with less than 0.5mm of rain having fallen for at least two days, and instantaneous wind speed is less than 25km/hr (ideally 5 – 10km/hr).

Advice Notes:

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*
- *'active landfilling area' means the area of exposed waste.*

ATTACHMENT 1 TO DISCHARGES TO AIR CONDITIONS

Table 1 below sets out the monitoring parameters to detect landfill gas escape, when monitored at the following locations in accordance with condition 33:

a. The landfill gas monitoring bore network.

b. Areas of intermediate cover

c. Within buildings and structures, and sub-surface pits

d. The surface of the final landfill cap.

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 condition 31.

Table 1 – Landfill Gas Monitoring Parameters

	Monitoring Location			
Parameter	**The landfill gas monitoring bore network**	**Areas of intermediate cover**	**Within buildings and structures, and sub-surface pits**	**The surface of the final landfill cap**
Gas flowrate (litres/hour)	X			
Methane (%v/v)	X	X	X	X

Oxygen (%v/v)	X			
Carbon dioxide (%v/v)	X			
Carbon monoxide (ppm)	X			
Hydrogen sulphide (ppm)	X			
Residual nitrogen (%v/v), calculated as the balance of methane, oxygen, carbon dioxide, carbon monoxide, and hydrogen sulphide.	X			
Ambient temperature (^{O}C)	X			
Gas pressure (mb)	X			
Barometric pressure (mb)	X			

E. Discharge of Stormwater and Collected Groundwater to Water conditions

Purpose of this consent: to discharge stormwater and collected groundwater to an unnamed tributary of the Otokia Creek for the purpose of operating a landfill.

Expiry date: this consent will expire on [insert date 35-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.

Stormwater management systems

3. The landfill must be designed and constructed with a stormwater system that is sized and configured to collect and divert stormwater away from open sections of the landfill and discharge it to the unnamed tributary of the Otokia Creek.
4. All stormwater that comes into contact with waste must be directed to the landfill leachate collection system.
5. Other than stormwater captured under condition 4, stormwater and collected groundwater from the site must be discharged to the unnamed tributary of Ōtokia Creek as follows:
    a. Stormwater collected within the area of Stage 1 of the landfill development must be discharged via a pipe through the toe bund to the unnamed tributary of Ōtokia Creek, until 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 must be directed to the attenuation basin for infiltration to ground, and discharge to the unnamed tributary of Ōtokia Creek.
    c. Collected groundwater which is not otherwise taken for non-potable water supply must be discharged immediately to the unnamed tributary of the Ōtokia Creek.
6. Suitable scour protection must be placed at the outlet and spillway of the attenuation basin, to prevent scour.
7. Stormwater discharge systems must be maintained to enable ongoing operation at all times and restored as soon as practicable in the event of damage or faults.

Vehicle wash bay and wheel wash

8. The vehicle wash bay must 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 must be directed to a sediment retention pond prior to discharge to the unnamed tributary of Ōtokia Creek.

9. The wheel wash must 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 must be directed to the landfill attenuation basin or the leachate collection system.

Management of spills

10. Releases of fuel, oil, and similar contaminants to the environment must be prevented and any spills must be contained and remediated as soon as practicable. The Landfill Management Plan required by general condition 14 must include practices and procedures for the prevention of spills and contingency measures in the event that a spill takes place.

Erosion and sediment control

11. Sediment generation and runoff from the site and into receiving waterbodies must be minimised as far as practicable. Best practice stormwater, erosion and sediment control management measures must be implemented during the construction, operation, closure, and aftercare of the landfill, 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 each landfill stage, soil stockpile areas, and vehicle wash bay is directed to and treated in sediment retention ponds, prior to discharge to the landfill attenuation basin or the unnamed tributary of Ōtokia Creek.

    d. Temporary measures such as silt fences, sediment traps, and temporary cover and stabilisation are installed to minimise the transport of sediment from exposed soil surfaces and stockpile areas.

    e. Areas where earthworks activities are undertaken are progressively stabilised with vegetation or other means as soon as practicable upon completion.

12. Sediment retention ponds for each landfill stage, soil stockpile areas, and the vehicle wash bay must be installed and operational before work in the relevant catchment commences. The sediment control ponds must be designed to manage a 10% AEP (Annual Exceedance Event) storm event, with provision to pass a 1% AEP storm event.

13. All erosion and sediment control measures must 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 sediment control 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.

14. The Landfill Management Plan required under general condition 14 must include practices and procedures prepared by a suitably qualified person to ensure best practice erosion and sediment controls are

implemented to ensure sediment generation and runoff from the site and into receiving waterbodies is minimised as far as practicable, and to achieve the conditions of this consent. As a minimum the erosion and sediment control practices and procedures of the Landfill Management Plan must include the following as a minimum:

a. Description of the location, staging, and volume of earthworks, including the volume of earthworks to be stockpiled, re-used, and disposed off-site.

b. Description of construction methods.

c. Description of the location and types of erosion and sediment controls to be implemented.

d. Details of progressive stabilisation of completed exposed areas.

e. Responsibilities for implementing and managing controls.

f. Maintenance procedures for sediment and erosion controls.

g. Inspection and monitoring procedures of the effectiveness of controls, including those required by general conditions 40, and 54 – 57.

h. Contingency response procedures to be undertaken in the event of unexpected sediment discharges during the works and to respond to extreme weather events.

i. Procedures for decommissioning redundant erosion and sediment controls.

j. Record keeping and reporting requirements.

Advice Notes:

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*

- *For the purpose of this consent, the term 'stormwater' means water running off from any impervious surface such as roads, carparks, roofs, as well as any other surface run-off that is collected and/or intercepted.*

F. Take and Use of Groundwater from Landfill Groundwater Collection System Conditions

Purpose of this consent: to take and use groundwater from a groundwater collection system for the purpose of operating a landfill.

Expiry date: this consent will expire on [insert date 6-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.

Take and use of groundwater

3. The take of groundwater must not exceed 87m^3/day and 1,600m^3/year.
4. The take of groundwater from the groundwater collection system must only be used for:
    a. non-potable water supply, and the quantity taken for this purpose must not exceed 50m^3/day, and
    b. any groundwater that is not taken for this purpose must be discharged immediately to the unnamed tributary of Ōtokia Creek, or
    c. leachate contaminated groundwater must instead be directed to the leachate collection system in accordance with general condition 54.

Measuring and recording of take of groundwater

5. The take of groundwater under condition 3 must be measured and recorded as follows:
    a. Prior to the first exercise of this consent, the consent holder must install a:
        i. Water meter that will measure the rate and volume of water taken to within an accuracy of +/- 5%. The water meter must be capable of output to a datalogger.
        ii. A datalogger that time stamps a pulse from the datalogger at least once every 15 minutes and has the capacity to hold at least twelve months data of water taken; and
        iii. A telemetry unit which sends all of the data to the Otago Regional Council.
    b. The consent holder must provide telemetry data once daily to the Otago Regional Council. The consent holder must ensure data compatibility with the Otago Regional Council's time-series database and conform with Otago Regional Council's data standards.

c. Within 20 working days of the installation of the water meter/datalogger/telemetry unit and any subsequent replacement of a water meter/datalogger/telemetry unit and at 5-yearly intervals thereafter, and at any time when requested by the Otago Regional Council, the consent holder must provide written certification to the Otago Regional Council signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:

   i. Each device is installed in accordance with the manufacturer's specifications; and

   ii. Data from the recording device can be readily accessed and/or retrieved in accordance with the conditions above.

d. The water meter/datalogger/telemetry unit must be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions.

e. All practicable measures must be taken to ensure that the recording device(s) are fully functional at all times.

f. The Consent Holder must report any malfunction of the water meter/datalogger/telemetry unit to the Otago Regional Council within 5 working days of observation of the malfunction. The malfunction must be repaired within 10 working days of observation of the malfunction and the consent holder must provide proof of the repairs to the Otago Regional Council within 5 working days of the completion of repairs.

Advice Note: the water meter, data logger and telemetry unit should be safely accessible by the Consent Authority and its contractors at all times. The Water Measuring Device Verification Form and Calibration Form are available on the Otago Regional Council' website.

<u>Advice Notes:</u>

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*

G. Diversion and Damming of Surface Water within the Landfill Site conditions

Purpose of this consent: to dam and divert surface water for the purpose of operating a landfill.

Expiry date: this consent will expire on [insert date 35-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.

Stormwater management systems

3. The landfill must be designed and constructed with a stormwater system that is sized and configured to collect and divert stormwater away from open sections of the landfill and discharge it to the unnamed tributary of the Otokia Creek.
4. The permanent stormwater perimeter drain, other permanent drainage diversion channels and culverts, and attenuation basin that will be in service for greater than 5 years must be designed and constructed to manage a 1% AEP (Annual Exceedance Probability) storm event and must be designed such that if this capacity is exceeded the preferential (secondary) flow path is, as far as practicable, away from the landfill.
5. Temporary stormwater infrastructure that is intended to be used for less than 5 years must be designed to manage at least a 10% AEP (Annual Exceedance Probability) storm event. The stormwater infrastructure must be designed such that if this capacity is exceeded the preferential (secondary) flow path is, as far as practicable, away the landfill.
6. Suitable scour protection must be placed within the landfill perimeter drain where design flows exceed 0.8m/s to prevent scour.
7. The attenuation basin must be covered with a net or an array of closely spaced wires to prevent the basin attracting birds.
8. Stormwater systems, including the landfill perimeter drain, diversion channels and culverts, and attenuation basin, must be maintained to enable ongoing operation at all times and restored as soon as practicable in the event of damage or faults.

Advice Notes:

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*

- *For the purpose of this consent, the term 'stormwater' means water running off from any impervious surface such as roads, carparks, roofs as well as any other surface run-off that is collected and/or intercepted.*

H. Earthworks and Vegetation Clearance Land Use Conditions

Purposes of this consent:

- To undertake earthworks within 100m of a natural wetland that may result in the partial drainage of wetlands for the purpose of constructing a landfill.
- To restore a swamp wetland within the site.
- To undertake vegetation clearance and earthworks within 10m of natural wetlands for the purposes of constructing a landfill and upgrades to McLaren Gully Road.

Expiry date: this consent will expire on [insert date 35-years from issuing]

General

1. This consent will lapse [insert date 10-years from issuing] unless given effect to before that date.
2. This consent is also subject to the relevant general conditions listed in Schedule 1 – General Conditions. In the event of differences or conflict, between the general conditions and the conditions below, the specific conditions below shall prevail.

Vegetation clearance and earthworks within landfill site

3. Vegetation clearance and earthworks within 10m of any natural wetland must ensure:
    a. No machinery must be operated from within the bed of any natural wetland..
    b. Mixing of construction materials, and the refuelling and maintenance of vehicles, machinery, and equipment, must be done outside a 10 m setback from any natural wetland.
    c. There is no erosion of the bed or bank of any natural wetland.
    d. There is no smothering of indigenous vegetation in the natural wetland by debris and sediment.
    e. Best practice stormwater, erosion and sediment control management measures are implemented to ensure sediment generation and runoff from the site and into natural wetlands or receiving waterbodies is minimised as far as practicable.
    f. All cleared vegetation and debris within 10 m setback of any natural wetland is removed at the conclusion of the works.

    Advice Note: Best practice stormwater, erosion, and sediment controls are required to be implemented in accordance with Discharge Permit RM20.280.XX.

Restoration of Swamp Wetland within the Landfill Site

4. All wetland restoration works must be undertaken in accordance with the Vegetation Restoration Management Plan required by general condition 60.

Vegetation Clearance and Earthworks for Road Upgrades

5. Vegetation clearance and earthworks within 10m of any natural wetland must ensure:
    a. No machinery must be operated from within the bed of any natural wetland.
    b. Mixing of construction materials, and the refuelling and maintenance of vehicles, machinery, and equipment, must be done outside a 10 m setback from any natural wetland.
    c. The points at which water flows into and out of any natural wetland does not change.
    d. There is no erosion of the bed or bank of any natural wetland.
    e. There is no smothering of indigenous vegetation in the natural wetland by debris and sediment.
    f. Best practice stormwater, erosion and sediment control management measures are implemented to ensure sediment generation and runoff from the road construction works into natural wetlands or receiving water bodies is minimised as far as practicable.
    g. All cleared vegetation and debris within 10 m setback of any natural wetland is removed at the conclusion of the works.
6. Prior to commencement of any road upgrade earthworks, an Erosion and Sediment Management Plan (ESMP) must be prepared by a suitably qualified person which includes methods to ensure effective management of erosion and sedimentation during earthworks including measures to:
    a. divert clean runoff away from disturbed ground;
    b. control and contain stormwater run-off;
    c. manage sediment laden run-off from the road construction works; and
    d. protect any existing drainage infrastructure sumps and drains from sediment run-off.
    e. manage dust
7. The earthworks for the road upgrades must be undertaken in accordance with the ESMP.
8. Should the consent holder cease, abandon, or stop work on site for a period longer than 6 weeks, the consent holder must first take adequate preventative and remedial measures to control sediment discharge/run-off and dust emissions and must thereafter maintain these measures for so long as necessary to prevent sediment discharge or dust emission from the road upgrade earthworks.
9. At the end of the road upgrade earthworks (or earlier, if physical conditions allow) the slope and batters must be immediately adequately top-soiled and vegetated (e.g. hydro-seeded) as soon as possible to limit sediment mobilisation.

Advice Notes:

a. For the purposes of this consent:

- *'site' means the landfill site as shown and described in section 4.1 of the Smooth Hill Landfill, Assessment of Environmental Effects for Updated Design, Boffa Miskell, May 2021.*