

Submission Form 16 to the Otago Regional Council on consent applications

This is a Submission on (a) limited notified/publicly notified resource consent application/s pursuant to the Resource Management Act 1991.

Submitter Details:

(please print clearly)

Full Name/s: Otago Fish and Game Council

Ilan Hadland

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Email address: Otago.planning@fishandgame.org.nz

I/ we wish to **SUPPORT** / **OPPOSE** / submit a **NEUTRAL** submission on (circle one) the application of:

Applicant's Name: Dunedin City Council

And/or Organisation: _____
Application Number: RM23.185

Location: 9 Brighton Road, Green Island

Purpose: Operation, closure, and aftercare of the Green Island Landfill

The specific parts of the application/s that my submission relates to are: *(Give details)*

The application in full.

My/Our submission is *(include: whether you support or oppose the application or specific parts of it, whether you are neutral regarding the application or specific parts of it and the reasons for your views).*

Please see the submission attached.

I/We seek the following decision from the consent authority (*give precise details, including the general nature of any conditions sought*)

Please see the submission attached.

I/we:

- Wish to be heard in support of our/my submission
 Not wish to be heard in support of our/my submission

If others make a similar submission, I/we will consider presenting a joint case with them at a hearing.

- Yes
 No

I, **am/am not** (choose one) a trade competitor* of the applicant (for the purposes of Section 308B of the Resource Management Act 1991).

**If trade competitor chosen, please complete the next statement, otherwise leave blank.*

I, **am/am not** (choose one) directly affected by an effect as a result of the proposed activity in the application that:

- a) adversely affects the environment; and
b) does not relate to trade competition or the effects of trade competition.

I, **do/do not** (choose one) wish to be involved in any pre-hearing meeting that may be held for this application.

I **do/do not** request* that the local authority delegates its functions, powers, and duties to hear and decide the application to 1 or more hearings commissioners who are not members of the local authority.

I **have/have not** served a copy of my submission on the applicant.



13/12/24

Signature/s of submitter/s

(or person authorised to sign on behalf of submitter/s)

(Date)

Notes to the submitter

If you are making a submission to the Environmental Protection Authority, you should use [form 16B](#).

The closing date for serving submissions on the consent authority is the 20th working day after the date on which public or limited notification is given. If the application is subject to limited notification, the consent authority may adopt an earlier closing date for submissions once the consent authority receives responses from all affected persons.

You must serve a copy of your submission on the applicant as soon as is reasonably practicable after you have served your submission on the consent authority.

Privacy: Please note that submissions are public. Your name and submission will be included in papers that are available to the media and the public, including publication on the Council website. Your submission will only be used for the purpose of the notified resource consent process

If you are a trade competitor, your right to make a submission may be limited by the trade competition provisions in [Part 11A](#) of the Resource Management Act 1991.

If you make a request under [section 100A](#) of the Resource Management Act 1991, you must do so in writing no later than 5 working days after the close of submissions and you may be liable to meet or contribute to the costs of the hearings commissioner or commissioners.

You may not make a request under section 100A of the Resource Management Act 1991 in relation to an application for a coastal permit to carry out an activity that a regional coastal plan describes as a restricted coastal activity.

Please note that your submission (or part of your submission) may be struck out if the authority is satisfied that at least 1 of the following applies to the submission (or part of the submission):

- it is frivolous or vexatious:
- it discloses no reasonable or relevant case:
- it would be an abuse of the hearing process to allow the submission (or the part) to be taken further:
- it contains offensive language:
- it is supported only by material that purports to be independent expert evidence, but has been prepared by a person who is not independent or who does not have sufficient specialised knowledge or skill to give expert advice on the matter.

The address for service for the Consent Authority is:

Otago Regional Council, Private Bag 1954, Dunedin, 9054

or by email to submissions@orc.govt.nz



13 December 2024
The Chief Executive
Otago Regional Council
Private Bag 1954
Dunedin. 9054
submissions@orc.govt.nz

Submission on Application by Dunedin City Council, RC No: RM23.185

This feedback is provided on behalf of the Otago Fish and Game Council (**Fish and Game**). For additional information please contact Ian Hadland using the details below.

Submitter Details

Submitter: The Otago Fish and Game Council
Contact person: Ian Hadland, Chief Executive
Email: otago.planning@fishandgame.org.nz
Office phone: 03 477 9076
Postal address: PO Box 76, Dunedin 9016


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13 December 2024
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Executive Summary

- [1] Fish and Game has submitted in a **neutral** capacity and recommends, in summary, the following relief to ensure that the potential for off-site migration of leachate is addressed, particularly regarding ecological health and recreational value.
- a. Clarify uncertainties of assessments regarding the effectiveness of the leachate collection trench in preventing off-site migration of leachate, as well as the potential ecological and human health impacts, necessitating updates to the Human Health and Environmental Risk Assessment to ensure robust evaluation and management of risks associated with leachate.
 - b. In the monitoring protocol, include enhanced monitoring measures to accurately assess off-site leachate migration in groundwater, along with explicit consent conditions requiring further ecological assessments to address potential adverse impacts on ecological health.

- c. Implement a condition to lower the leachate head, which exceeds 10 meters and poses significant risks to landfill operations and environmental safety, in accordance with WasteMINZ Guidelines.
 - d. The design of the new leachate collection trench incorporates resilience against seismic events, along with modifications and monitoring procedures for existing infrastructure to mitigate potential adverse effects.
 - e. The implementation of adaptive management should be contingent upon meeting specific principles that ensure adequate evidence and monitoring are in place to effectively manage uncertainties and mitigate environmental risks associated with leachate management.
- [2] If this relief were provided, Fish and Game expects the application would be more consistent with relevant planning documents and legislation.

Introduction

- [3] Fish and Game is the statutory manager of sports fish and game bird resources within Otago. It holds functions and responsibilities set out in the Conservation Act 1987. The organisation's functions include managing, maintaining and enhancing the sports fish and game resources of Otago in the recreational interests of anglers and hunters; representing the interests and aspirations of anglers and hunters in the statutory planning process; and advocating the interests of the Council, including its interests in habitats. This submission has been developed in line with these functions.
- [4] Due to the popularity of angling in New Zealand, the demographic Fish and Game represents when carrying out its statutory functions is significant; however, this is not always obvious. The 2013/2014 Active NZ Survey conducted by Sport and Recreation New Zealand reported that 19.5% of respondents had been fishing (including both marine and freshwater angling) in the past 12 months¹. The survey found fishing had a higher rate of participation than rugby, tramping, football, cricket and basketball for men; and that fishing had a higher participation rate than netball, tennis, snow sports and tramping for women. Within Otago, license sales have exceeded 10,000 licenses in the past two decades and in the last decade has increased to over 20,000 licenses across all categories. Participation rates estimated from the National Angling Survey² between 1994 and 2015 show that total freshwater fishing effort in the Otago Fish and Game region ranged from 180,860 to 215,430 angler-days over the fishing season.

¹ Sport and Recreation New Zealand. (2015). Sport and Active Recreation in the Lives of New Zealand Adults: 2013/14 Active New Zealand Survey Results. Wellington: Sport New Zealand.

² NIWA. (2016). Angler usage of New Zealand lake and river fisheries: Results from the 2013/14 National Angler Survey. Prepared by NIWA for Fish and Game New Zealand.

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- [5] As required by the Conservation Act 1987, Fish and Game has prepared a Sports Fish and Game Management Plan for Otago³, which has guided the development of this submission. This document describes the sports fish and game bird resources in the region and outlines issues, objectives and policies for management over the period. The document may be useful for decision makers when considering this application.

State of the Environment

- [6] Fish and Game has been involved with Kaikorai Stream for several decades. Kaikorai Stream once supported large wetland areas, bounded by mixed podocarp hardwood forest, and extensive saltmarshes in the lower reaches⁴. However, for more than 100 years, heavy industrialisation has occurred adjacent to Kaikorai Stream, resulting in poor outcomes for the stream and estuary⁵. Most pollutants which enter Kaikorai Stream are likely to enter Kaikorai Lagoon⁵. This has direct adverse impacts on ecological health within Kaikorai Stream and Kaikorai Lagoon, and indirectly impacts people who use it either recreationally or as a place to gather food.
- [7] Adverse effects on Kaikorai Stream and Lagoon from industrial and urban pressure have been documented for several decades:
- A 1992 environmental impact assessment for the existing Green Island Landfill identified records of untreated discharges from heavy industrial activities until at least the 1970s⁵.
 - GHD's 2024 surface water report demonstrates that the stream continues to be degraded by several stormwater outfalls in conjunction with nearby heavy industrial, landfilling, quarrying, and agricultural activities⁶.
 - The Boffa Miskell ecological impact assessment of the Green Island Landfill notes that severe organic pollution or nutrient enrichment is suggested by the macroinvertebrate indices score of D in Kaikorai Stream, confirming poor water quality⁴.
 - NIWA's report on estuaries in Otago showed that Kaikorai Lagoon has been categorised as D in the Estuary Trophic Index, meaning that it has a high eutrophication susceptibility due to current total nitrogen and phosphorus loads⁷.
 - The Boffa Miskell ecological impact assessment of the Green Island Landfill examination of Benthic Health Models for estuarine macrofauna suggest that the state of Kaikorai Lagoon ranges from Poor to Fair⁴.

³ Otago Fish and Game Council. 2015. *Sports Fish and Game Management Plan for Otago Fish and Game Region 2015 - 2025*. Dunedin: Otago Fish and Game Council.

⁴ Boffa Miskell. (2024). *Ecological impact assessment of the Green Island Landfill*. Prepared by Boffa Miskell for Dunedin City Council. Updated October 2024.

⁵ Beca Stevens. (1992). *Environmental impact assessment of the existing Green Island landfill*. Prepared by Beca Stevens for Dunedin City Council.

⁶ GHD. (2024). *Water Futures—Green Island Landfill Closure Surface Water Report*. Prepared by GHD for Dunedin City Council. Updated July 2024.

⁷ NIWA. (2021). *Proposed nutrient load limits for Otago estuaries*. Prepared by NIWA for Otago Regional Council.

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- In February 2021, Otago Regional Council investigated a fish kill event that occurred in Kaikorai Lagoon, linked with poor water quality, anoxic conditions, and warm water temperatures⁸.
- [8]** These outcomes are a testament to the high level of cumulative effects which are and have impacted Kaikorai Stream and Lagoon for the past century. Despite the heavily modified habitat and degraded water quality, the Kaikorai Lagoon has a high ecological value, with Kaikorai Stream having a moderate ecological value⁴. The ecosystem is under severe pressure, but it is holding on. Fish and Game expects that removing pressure on the ecosystem will allow for rehabilitation.
- [9]** The sport fish, brown trout, have been recorded within Kaikorai Stream and Kaikorai Lagoon, having been affected by the 2021 fish kill^{4,8}.

Recreational Value

- [10]** The ecological health of Kaikorai Stream and Lagoon underpins the amenity value for recreational users, particularly anglers. The proximity of Kaikorai Lagoon to Dunedin residents, along with the ease of public access is fantastic for recreational users. The proximity and accessibility of fisheries to users is a major factor in how often they will be fished. This is proven by the use of other fisheries that are located near Dunedin, such as Southern Reservoir, Tomahawk Lagoon, and Sullivan's Dam.
- [11]** However, the 2014/15 National Angler Survey (NAS) found that Kaikorai Stream contributed 319 +/- 319 angling days to the total angling effort in the Otago region, whereas the 2021/22 NAS found that this decreased to 1 +/- 1⁹. Whereas, Southern Reservoir is located at the top of the Kaikorai Stream catchment, only a 10-minute drive from Kaikorai Lagoon. Comparably, the 2014/15 NAS found that Southern Reservoir contributed 3,132 +/- 742 angling days. The 2021/22 NAS found that this adjusted to 3,791 +/- 1,134 angling days.
- [12]** Fish and Game Officers were questioned on their thoughts of the current state of Kaikorai Lagoon for recreational fishing. Fish and Game Officers are responsible for helping to undertake fish and game management and monitoring activities. They are experts in their field and are highly commended in relation to these activities. After being asked about fishing in Kaikorai Lagoon a Fish and Game Officer commented, "It's horrible [...] If you're going to go there [Kaikorai Lagoon], you want to bring something home to eat, that's not the place to go to do that." Another Fish and Game Officer commented, "It's gross, the algae, it [Kaikorai Lagoon] just looks unhealthy." When discussing the state of Kaikorai Lagoon, Fish and Game Officers also mentioned visible trash, filthy odours, and the previous fish kill which all contributed to a spoiled recreational experience.
- [13]** The history of land use around Kaikorai Stream has resulted in the adverse outcomes that we feel today, particularly in Kaikorai Lagoon. The significantly degraded water quality, and its

⁸ Wynn Williams. (2021). Review of Kaikorai Estuary Investigation. Prepared by Wynn Williams for Otago Regional Council.

⁹ NIWA. (2023). Angler usage of New Zealand lake and river fisheries: Results from the 2021/22 National Angler Survey. Prepared by NIWA for Fish and Game New Zealand. [NIWA Client report](#).
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direct effect on ecological health, diminishes the potential for recreational activities within Kaikorai Stream and Kaikorai Lagoon.

- [14] Further adverse impacts on the ecological health of Kaikorai Stream and Lagoon need to be avoided to improve the value for recreational users. Fish and Game expects that by reducing environmental pressures and allowing Kaikorai Stream and Lagoon to recover, recreational use of this area will be encouraged.

Uncertainties in Assessments and Effects

- [15] The hydrogeological model makes a fundamental assumption that the leachate collection trench intercepts all groundwater and prevents off-site migration of leachate. This assumption is concluded from the currently available groundwater data in the 2024 Groundwater Report¹⁰ (p.37). However, as Mr Baker states in response to this conclusion “I remain of the opinion that there is insufficient off-site (being outside of the leachate trench) groundwater quality and groundwater level data to be confident in this conclusion.”¹¹ (p.5).
- [16] The lack of evidence to back up this fundamental assumption could suggest that this assumption is incorrect. If this assumption is incorrect, potential leachate would be able to migrate off-site into the surface water of Kaikorai Stream, avoiding capture by the leachate collection trench. Understanding the effectiveness of the leachate collection trench to prevent off-site migration of leachate is essential to inform further decisions of leachate management.
- [17] Thus, Fish and Game agrees with the recommendation made by Mr Elliot, that: *further assessment of the potential for leachate to impact groundwater and surface water should be undertaken to assess the effectiveness of the leachate collection trench in preventing impacts to the environment, and to inform if additional measures to manage leachate are required*¹² (p.47).
- [18] The uncertainty surrounding this fundamental assumption is exacerbated by the detection of leachate indicators zinc, boron, and ammonial-nitrogen outside of the leachate trench. However, the logic used to assess the assumption is based on the premise that the guideline thresholds in the receiving environment are not exceeded. Therefore, as the guideline thresholds are not exceeded the detected leachate indicators are not considered evidence of off-site migration of leachate. As Dr Conwell states in relation to this logic, “I disagree with this logic, as there can be low level and diffuse discharges of leachate contaminants via groundwater, to the surface water receiving environment. This will result in chronic, long term cumulative impacts, which have not been assessed.”¹³ (p.12). The importance of cumulative effects on Kaikorai Stream and Lagoon cannot be understated.

¹⁰ GHD. (2024). Waste Futures—Green Island Landfill Closure Groundwater Technical Assessment. Prepared by GHD for Dunedin City Council. Updated July 2024.

¹¹ RE: RM23.185 - Green Island Landfill Groundwater Quantity and Quality Technical Memorandum 02 [SLR Tech Memo Template](#)

¹² Otago Regional Council. (2024). ORC NOTIFICATION RECOMMENDATION REPORT: RM23.185.

¹³ RE: RM23.185 - Green Island Landfill Surface Water Quality Technical Memorandum 02 [SLR Tech Memo Template](#)

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- [19] Both Mr Baker and Dr Conwell admit their concern for leachate indicators being detected off-site, Mr Baker states “The same leachate indicators have been observed in the Green Island C and D wells; however, in this case they have been attributed to reduced conditions in organic estuarine sediments. The similarity in chemical constituents, but apparent discrepancy in source, warrants further investigation.”¹¹ (p.12). Similarly, Dr Conwell states “Further to this, there is some suggestion in the ecotoxicology assessment (included in the Appendix 12 Ecological Impact Assessment Report) that there may be ecotoxicological effects due to leachate entering groundwater in the vicinity of site GI5.”¹³ (p.12).
- [20] The uncertainty surrounding the source of this off-site leachate in groundwater should be clarified to ensure that the leachate is not migrating past the leachate collection trench. Fish and Game agrees with Mr Baker’s recommendation that: *there is further investigation into the source of leachate indicators including zinc, boron, and ammoniacal-nitrogen*¹²(p.56). Further, as Dr Conwell highlighted, the uncertainty of ecotoxicological effects from leachate into groundwater should be clarified. Fish and Game agrees with Dr Conwell’s recommendation that: *further assessment of ecological effects, including ecotoxicological reviews, is recommended*¹² (p.61).
- [21] The Human Health and Environmental Risk Assessment (HHERA) is essential in identifying risks to both human health and ecological receptors. Another uncertainty is derived from the HHERA, which reaches conclusions without adequate evidence. The most significant of these conclusions is that there will be “no discernible impact on water quality”. However, as Dr Conwell states in relation to the HHERA, “As it stands, the current framework and screening method is not structured to adequately identify and assess risks to receptors (human health or ecological receptors).”¹³ (p.4). The framework of the HHERA needs to be updated to become more robust, including the evidence to reach its conclusions, particularly of the impact on water quality.
- [22] As such, we agree with Dr Conwell’s recommendation that: *future updates of the HHERA should include:*
- a. *Risk management – Guidelines AS ISO 31000:2018; (Standards Australia 2018); and*
 - b. *EIANZ Ecological Impact Assessment Guidelines (EclA) (Roper-Lindsay et al., 2018); and*
 - c. *An assessment of risk quotients*¹² (p.61).
- [23] To further improve the HHERA, cumulative effects must be considered to a greater degree. Thus, Fish and Game also agrees with Dr Conwell’s recommendation that: *statistical summaries and time trends analyses be undertaken to inform the integrated assessment of effects with respect to cumulative effects and inform the HHERA*¹² (p.62).

Monitoring Protocol

- [24] The uncertainties involving the off-site migration of leachate are enhanced due to inadequate monitoring measures which may lead to unforeseen impacts on ecological health. As Mr Baker states, "It is my view that the monitoring network around the boundary is currently insufficient to adequately represent off-site groundwater discharges."¹¹ (p.3). A robust monitoring programme is essential in understanding whether leachate is migrating off-site through groundwater. Mr Baker suggests several methods to improve the monitoring programme.
- [25] Fish and Game supports Mr Baker's recommendations that: *further deep wells are added to the monitoring programme; at a minimum, a deep well should be added to both monitoring lines 1 and 3. That a further set of monitoring wells covering the three main geological units (including the Abbottsford Formation) in the southwest corner of the property to provide more information on the potential for offsite migration of leachate and is aligned with the historic estuarine channel locations, which may form preferential flow paths. That all wells are surveyed, and information is collected on well construction, where this is available*¹²(p.56-57)
- [26] Fish and Game supports Mr Baker's recommendation that: *the modelling outputs and inherent uncertainty are validated through a robust long-term monitoring programme of groundwater levels and leachate trench outflow rates*¹² (p.57).
- [27] The outlined uncertainties results in potential for leachate being able to migrate off-site, thus having the potential to cause adverse ecological effects. However, the future Proposed Conditions of Consent do not explicitly state any requirement to undertake further ecological assessments. As Dr Conwell states in regard to further ecological assessments as a consent condition "I strongly recommend the Conditions of Consent to include a suitable condition to address this aspect."¹³ (p.12).
- [28] Thus, Fish and Game agrees with Dr Conwell's recommendation that: *a consent condition explicitly requires further ecological assessments*¹² (p.62).

Leachate Head

- [29] The leachate head in some parts of the landfill is greater than 10 m which poses a significant risk and is not consistent with WasteMINZ Guidelines. As Mr Elliot states, "However, a 10 m leachate head is considered to be significant, and is not in line with WasteMINZ Guidelines."¹⁴ (p.9). This has been considered an issue on many aspects of the landfill processes, particularly by reducing the effectiveness of landfill gas (LFG) wells. This significant leachate head is also suggested to increase the risk of leachate breakout. As Mr Baker states "However, leachate

¹⁴ RE: RM23.185 - Green Island Landfill Design and Management Technical Review Memorandum 02 [SLR Internal Memo](#)

breakout remains a risk to future land uses, and the risk could be reduced though management of leachate head.”¹¹ (p.9).

- [30] Thus, Fish and Game agrees with Mr Elliot’s recommendation that: *a condition should be posed to lower the leachate head and be based on a target leachate head derived by the Applicant for consideration by ORC*¹² (p.46).

Seismic Event Resilience

- [31] Seismic events are a realistic concern which should be planned for, particularly regarding the resilience of leachate management infrastructure to such events. As suggested by Mr Adamson, under an ultimate limit state (ULS) seismic event, the southern boundary is at the highest risk of lateral deformation which could disrupt the effectiveness of the leachate collection trench.
- [32] Thus, Fish and Game agrees with Mr Adamson’s recommendation that: *the proposed new section of leachate collection trench be designed with resilience to these deformations*¹² (p.51).
- [33] The infrastructure involved in the existing leachate collection trench can also be modified to become more resilient. Thus, Fish and Game also agrees with Mr Adamson’s recommendation that: *mitigation and monitoring procedures can be put in place for existing subsurface drainage infrastructure to limit adverse effects on persons and the environment to and within acceptable tolerance levels*¹² (p.51).

Adaptive Management

- [34] We draw your attention to the fact that if this consent is granted, it will rely heavily upon adaptive management due to insufficient information to assess impacts with certainty. If a consent is granted, adaptive management will need to be used to resolve the aforementioned uncertainties, develop an improved monitoring programme, and to create a target to lower the leachate head.
- [35] However, as the *Sustain our Sounds* decision outlined, not all circumstances are appropriate to use adaptive management for managing risk^{15,16}. Rather, thresholds are required to be met before adaptive management can be considered as part of a precautionary approach.
- [36] The threshold described in the *Sustain our Sounds* case is: *there must be an adequate evidential foundation to have reasonable assurance that the adaptive management approach will achieve its goals of sufficiently reducing uncertainty and adequately managing any remaining risk*¹⁶ (p.44).

¹⁵ Giles, H., and Barton, B. (2020). Adaptive Management Under the RMA: The Tension Between Finality and Flexibility. *New Zealand Journal of Environmental Law*.

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- [37] As listed in the *Sustain our Sounds* decision¹⁶(p.37), this threshold has been tested by the following principles:
- a. There is good baseline information about the receiving environment.
 - b. The conditions in place provide for effective monitoring of adverse effects using appropriate indicators.
 - c. Thresholds are set to trigger remedial action before effects become overly damaging.
 - d. Effects that might arise can be remedied before they become irreversible.
- [38] While these principles were considered in the factual context of the *Sustain our Sounds* case, Fish and Game suggests that they are also applicable to determining whether adaptive management is appropriate for this consent application. Fish and Game recommends that they be applied to determine whether the adaptive management approach put forward by this application is appropriate.
- [39] Within the current application, adaptive management is unsuitable as the criteria listed by the principles and threshold are not met. Mr Elliot, Mr Baker, and Dr Conwell have highlighted that the fundamental assumption (that off-site leachate migration is prevented by the leachate collection trench) has led to uncertainties, as stated above. These uncertainties particularly concern the potential adverse effects on the receiving environment, and the extent of those effects. This suggests that additional information should be collected to better understand the extent of off-site leachate effects. Thus, if the extent of adverse effects is unknown, principles c. and d. cannot be determined. Mr Baker highlighted that the groundwater monitoring protocol is currently insufficient in detecting the off-site migration of leachate. Further, Dr Conwell highlighted that due to a lack of future ecological assessments, the potential effects of off-site leachate migration to ecological health will remain uncertain. Thus, principle b. cannot be determined as well.

Summary of Relief Sought

- [40] Fish and Game reiterate the stance of a neutral capacity and recommends, in summary, the following relief to ensure that the potential for off-site migration of leachate is addressed, particularly regarding ecological health and recreational value.
- a. Clarify uncertainties of assessments regarding the effectiveness of the leachate collection trench in preventing off-site migration of leachate, as well as the potential ecological and human health impacts, necessitating updates to the Human Health and

¹⁶ SUSTAIN OUR SOUNDS INCORPORATED v THE NEW ZEALAND KING SALMON COMPANY LIMITED [2014] NZSC 40 [17 April 2014]

Environmental Risk Assessment to ensure robust evaluation and management of risks associated with leachate.

- b. In the monitoring protocol, include enhanced monitoring measures to accurately assess off-site leachate migration in groundwater, along with explicit consent conditions requiring further ecological assessments to address potential adverse impacts on ecological health.
- c. Implement a condition to lower the leachate head, which exceeds 10 meters and poses significant risks to landfill operations and environmental safety, in accordance with WasteMINZ Guidelines.
- d. The design of the new leachate collection trench incorporates resilience against seismic events, along with modifications and monitoring procedures for existing infrastructure to mitigate potential adverse effects.
- e. The implementation of adaptive management should be contingent upon meeting specific principles that ensure adequate evidence and monitoring are in place to effectively manage uncertainties and mitigate environmental risks associated with leachate management.

[41] Fish and Game thanks the DCC and ORC for the opportunity to provide feedback on this consent regarding the Green Island Landfill.

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