Smooth Hill Landfill

Combined Decision Report
Dunedin City Council
Otago Regional Council

9 September 2022

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1.0 Introduction

1.1 Appointments

[001] We, Rob van Voorthuysen (Chair), Jan Caunter and Ros Day-Cleavin acting under delegated authority from the Otago Regional Council (ORC) and the Dunedin City Council (DCC – Regulatory) have been appointed to hear and decide resource consent applications lodged by Dunedin City Council (DCC) for the proposed Smooth Hill landfill.

1.2 Report format

[002] This combined Decision report contains our decisions on the consents sought from both DCC – Regulatory and the ORC. In section 3 we deal with the DCC – Regulatory consents and in section 4 we deal with the ORC consents. In the remainder of this section (section 1) we deal with background matters that are relevant to a greater or lesser degree for both regulatory authorities, followed by process matters (section 2).

1.3 Designated site

[003] The Smooth Hill landfill site was first included in a notice of requirement (NOR) in 1995 and the district plan that the NOR related to became operative in April 2004. That designation (labelled D659) was included in the Proposed Dunedin City Council Second Generation Plan (2GP) and confirmed by the 2GP Hearings Panel.[1] D659 authorises the use of the "*Proposed Smooth Hill Landfill*" site for "*proposed landfilling and associated refuse processing operations and activities*" and supersedes the Operative District Plan and 2GP policy and rule provisions that would otherwise apply to the site.[2] Conditions imposed on the D659 relate to an extended lapsing date, the requirement for a landscape plan and noise limits.

[004] The consequence of D659 is that the only land use consents required from DCC – Regulatory at this time relate to the proposed upgrades to McLaren Gully Road (including its intersection with State Highway 1) and Big Stone Road.

[005] To be clear, the existence of D659 means that no land use resource consents are required from DCC - Regulatory for the construction and operation of the landfill within the designated site. We have no jurisdiction to consider the effects of the landfill activities that D659 authorises.

[006] We record that it is not our role to revisit the designation process. However, a number of submitters opined about what they considered to be a lack of transparency regarding the 'roll over' of D659. As part of her end of hearing report to us, the DCC – Regulatory Section 42A Report author (consultant planner Kirstyn Lindsay) helpfully attached[3] a copy of the 2GP hearing panel's recommendations and reasons relating to D659. The reasons state:

> "We accept that, like many of the provisions in the 2GP, this process may not have been noticed by people who might want to comment on it. However, the requiring authority has followed the statutory process and is entitled to a decision. We also note that Designation D659 Proposed Smooth Hill Landfill is an existing designation in the Operative Plan which has been rolled over to the 2GP. Therefore, it has already been through a public process."

[007] We do not comment further on the alleged 'lack of transparency'.

[008] RMA s176A means that an outline plan of the public work or project to be constructed on designated land must be submitted by the requiring authority (in this case the DCC) to the territorial authority (DCC – Regulatory) to allow the territorial authority to request changes before construction is commenced. We

[1] There were only two submissions on the designation and no appeals against it. EIC, Chris Henderson, paragraph 46 and Opening submissions, paragraph 36.
[2] RMA section 176(1) states that if a designation is included in a district plan, then section 9(3) does not apply to a public work or project or work undertaken by a requiring authority under the designation.
[3] Appendix 3.

understand that the DCC intends to lodge an outline plan at a later date following the completion of the landfill's detailed design and so consideration of the outline plan and its contents does not form part of our decision-making process.

1.4 Activity description

[009] The nature of the site, the surrounding area and the proposed landfill activities are described in substantial detail in the application documents, the DCC's evidence[4] and legal submissions[5] and the Section 95 and Section 42A Reports prepared by both DCC – Regulatory and the ORC. Readers of this Decision are encouraged to refer to those documents to gain a full understanding of the landfill proposal, but by way of a brief overview some of the more salient points are (subsequent sections of this Decision describe some aspects of the proposal in more detail):

- The landfill site is located in a rural area around 28km southwest of Dunedin in the rolling hills between the Taiari Basin and the South Island east coast. Until 2017 the site was covered by a mature pine forest, but following the harvesting of those trees the site now comprises of a mixture of scrub, bare earth, forestry waste and newly planted pine seedlings. The local topography is rolling to steep hill country and the landfill site is consequently largely concealed from view;
- The land uses surrounding the landfill site and along McLaren Gully Road and Big Stone Road primarily consist of commercial plantation forestry on large landholdings, although some areas of pastoral farming exist adjacent to the landfill site's north eastern boundary and at the bottom end of McLaren Gully Road;
- Two houses are located along McLaren Gully Road around 1km from the SH1 intersection and 1.7km from the landfill site. Two other houses are located in the hills between Big Stone Road and the coast, around 380m and 605m southeast of the landfill site respectively;
- The proposed Class 1 landfill is now[6] intended to have the following key components:
    - The landfill footprint area is 18.6 ha;
    - It will have a gross waste capacity of 3.3 Mm^3 and net waste capacity[7] of approximately 2.94 Mm^3 (equivalent to approximately 2.35 M tonnes) that over the landfill's projected life span of around 40 years will allow for the placement of 60,000 tonnes of waste per annum;
    - It will only receive waste from commercial waste companies or bulk loads in accordance with waste acceptance criteria and procedures and it will not be open to the public. The public will take their waste to DCC transfer stations and any waste that cannot be diverted will be transported to the Smooth Hill landfill;
    - It will cater to municipal solid waste, construction and demolition waste, some commercial and industrial wastes as well as hazardous waste that meets the leachability limits in the Ministry for the Environment (MfE) guidelines for Class A landfills[8]. Contaminated soils and special wastes that meet these criteria will also be accepted, including biosolids from the Green Island Waste Water Treatment Plant;
    - The construction, filling and final capping of the completed landfill will occur progressively in four stages;
    - The landfill will include ancillary infrastructure to enable the operator to contain, collect, manage, and dispose of leachate, landfill gas, groundwater, stormwater and surface water runoff. The majority of that infrastructure is intended to be located within a facilities area situated on a high platform to the east of the landfill and accessed from Big Stone Road (upper facilities area);

[4] Including Sandra Graham (DCC CEO), Richard Coombe and summarised by Maurice Dale.
[5] Legal submissions on behalf of Dunedin City Council as Applicant, 11 May 2022, Project Overview.
[6] The original consent application was lodged in August 2020 and was for a landfill with a footprint of 44.5ha, a net waste capacity of 6.2 million cubic metres and an expected life of 55 years. Opening submissions, paragraph 15.
[7] Net waste capacity takes into account the volume occupied by drainage infrastructure plus intermediate and final capping.
[8] MfE, 2004, Module 2: Hazardous Waste Guidelines Landfill Waste Acceptance Criteria and Landfill Classification, Ministry for the Environment

- The site will also include staff and maintenance facilities, a site office and carparking, a weighbridge, a wheel wash and a workshop;
- Environmental monitoring systems will be established;
- Landscape perimeter planting and ecological mitigation and offsetting planting will be undertaken;
- Upgrades (widening and sealing) to McLaren Gully Road (including its intersection with SH1) and Big Stone Road will be undertaken to facilitate vehicle access to the site; and
- Aftercare of the landfill will include ongoing operation and maintenance of the landfill gas, leachate and permanent site stormwater systems; maintenance of the landfill cap; maintenance of remaining site infrastructure; and ongoing environmental monitoring, reporting and event response.

[010] We discuss the landfill formation and leachate management in more detail in section 4 of this Decision.

1.5 Alternatives

[011] The RMA only requires a consideration of alternative locations (or sites) or receiving environments in limited circumstances, by way of section 105(1) (where there is a discharge) and Schedule 4 clause 6(a) if it is likely that the activity will result in any significant adverse effect on the environment. Subject to the imposition of appropriate conditions of consent, we do not consider that Schedule 4 clause 6(a) would be triggered in this case, but as the issue of alternative sites and the DCC's historical site selection process was raised by many submitters we discuss that matter here. Having said that, we repeat that it is not our role to revisit D659 which is now in place.

[012] An extensive site selection process covering 32 possible sites was completed by BECA in1992 to identify a landfill site to replace the Green Island landfill at the end of its life. That process utilised ecological, physical, social and economic criteria and ultimately led to the DCC deciding that the life of the Green Island landfill would be extended, and that the Smooth Hill site would be secured to provide a future long-term solution. We note that the Green Island landfill is currently expected to reach the end of its functional life sometime between 2024 – 2029.

[013] During 2018 and early 2019 the DCC undertook a Programme Business Case (PBC) process to identify a preferred medium to long-term waste and diverted material system for Dunedin. At that time the DCC engaged consulting engineers Stantec to assess the costs and risks associated with developing the designated Smooth Hill site. Stantec confirmed the technical feasibility of the site and did not highlight any fundamental reasons for not proceeding with the consenting process, effectively confirming the early 1990s site selection process conclusions.

[014] As submitted by counsel[9] for the DCC in reply *"… the full elected Council considered the principal alternatives, and having evaluated their relative benefits and costs (both financially, but also environmentally, practically and culturally) and determined in their assessment Smooth Hill was the preferred alternative to pursue for consent*."

[015] We note that as part of its Waste Futures programme the DCC has recently reviewed its Waste Minimisation and Management Plan, with a new Plan (adopted in May 2020) designed to reduce and divert waste from landfills. This led to the DCC resolving to establish a new kerbside collection service from mid-2023 which involves "… *the "four bins plus one" system [that] will allow for most putrescible waste to be removed from the waste that is dealt with at the Smooth Hill facility. The system enables the separation of food waste from green waste and will provide better options for processing and reusing the materials and ultimately reducing carbon emissions*."[10] The four bins are for food waste, glass, mixed recycling and refuse.[11]

[9] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraph 43.
[10] EIC Sandra Graham, paragraph 45.
[11] EIC Chris Henderson, paragraph 30.

[016] Notwithstanding our earlier finding regarding Schedule 4 clause 6(a) regarding some of the concerns expressed to us by submitters, we understand that in relation to the consideration of alternatives several principles can be derived from case law, including:

- The site or method should be a suitable one, but it does not have to be the most suitable or the only suitable site;
- An applicant is not required to demonstrate that their proposal is the best use of resources out of available alternatives, nor to undertake a full cost-benefit analysis of alternative locations or methods;[12]
- Alternative sites and methods should be practicable;[13]
- It is not the decision maker's role to substitute its own judgment for that of the applicant;[14] and
- Provided the application is consistent with the sustainable management purpose of the RMA, little weight should be given to the question of alternatives.

[017] In terms of section 105(1) of the RMA and the matter of "*any other receiving environment*", it is evident to us that the DCC has considered a range of practical alternative receiving environments, including those that were suggested to us by some submitters such as extension of the existing Green Hill landfill, out of district waste disposal options and incineration (waste to energy).[15]

[018] Importantly in our view, it is also evident from the evidence of Edward Ellison[16] that Te Rūnanga o Ōtākou were involved in the original site selection process and are fully supportive of both the process and the outcome. Mr Ellison[17] stated in evidence:

> *"The Dunedin City Council reviewed 32 possible sites in 1992 as part of succession planning for the Green Island landfill. I was involved in this selection process on behalf of Te Rūnanga o Ōtākou. Impacts on mahika kai resources formed an important part of the consideration for Te Rūnanga in assessing alternative sites. Smooth Hill was identified as the preferred site for a landfill.*
>
> *The continued use of the Green Island site for a landfill is not supported by Te Rūnanga and is inconsistent with our aspirations for the restoration of Kaikarae as a mahika kai. The development of a Class 1 landfill at Smooth Hill is supported by Te Rūnanga to enable the closure of the Green Island landfill.*
>
> *Dunedin City Council as part of the Waste Futures programme has evaluated alternative options to the development of a landfill at Smooth Hill, including out of district waste disposal and incineration of waste. Trucking waste to existing landfills outside the district is unacceptable to mana whenua. … Similarly, the incineration of waste is not supported by mana whenua."*

[019] Consequently, while some submitters question the selection of the Smooth Hill site,[18] having regard to case law principles and the evidence before us, we are satisfied that the DCC has undertaken a reasonable site selection process and a reasonable consideration of alternative receiving environments, leading to the initial selection and later confirmation of the Smooth Hill site being suitable.

[020] Having come to that conclusion, it is now our role to assess the effects of the applications before us and their consistency with the relevant statutory instruments.

[021] Before we do so, we wish to briefly comment on the evidence of Ciaran Keogh, a witness called by Dunedin International Airport Limited (DIAL) who purported to address feasible alternative landfill locations. We can do no better than to quote directly from the applicant's Reply submissions[19] which we agree with:

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[12] *Meridian Energy Limited v Central Otago District Council* [2011] 1 NZLR 482
[13] *Maungaharuru-Tangitu Trust v Hawke's Bay Regional Council* [2016] NZEnvC 232, [2017] NZRMA 147 at [152]-[170].
[14] *Tainui Hapu v Waikato Regional Council* (A063/2004) at paragraph [148].
[15] EIC Chris Henderson, paragraphs 47 to 60.
[16] Chair of Aukaha.
[17] EIC Edward Ellison, paragraphs 31 to 33.
[18] Including S Laing and S&A Ramsey.
[19] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraph 15.

> *"…Mr Keogh despite claiming to be an independent expert provided evidence that was essentially advocating for use of "our landfill", being that operated by Nash and Ross… This was in addition to claiming both technical and evaluative expertise, and claiming expertise based on the qualifications of an employee …Mr Keogh's evidence is not able to qualify as independent, nor objective, and is not in accordance with the Code of Conduct for expert witnesses. It should therefore be put to one side and given no weight."*

1.6 Waste minimisation and reduction

[022] Some submitters questioned the appropriateness or rigour of the DCC's waste management regime, querying the need for a new landfill. Relevantly, as set out in Attachment 12[20] to the ORC Section 42A Report, Policy 7.4.8.of the Regional Plan: Waste for Otago states:

> *To promote alternatives to landfills as a means of waste disposal.*

[023] The explanation behind the policy states "*Landfills should be considered only where other alternatives such as waste minimisation, cleaner production, recycling, or other methods of waste disposal have failed or are impracticable to implement*". While that policy direction is arguably more relevant to the designation process for the landfill, we nevertheless address the issues of waste minimisation and reduction here.

[024] DCC CEO Sandra Graham and Chris Henderson[21] for the applicant confirmed the proposal to construct a landfill at Smooth Hill sits within the context of the DCC's wider Waste Futures programme that was initiated in early 2018 as a programme of work aimed at identifying and procuring the best waste solution for Dunedin, with the intention that it move to a zero-waste future and a more circular economy.[22]

[025] Key performance indicators for Waste Futures include the minimisation of waste, minimisation of carbon dioxide emissions from waste, cost-effectiveness of the service to ratepayers, reduced environmental impacts as a result of waste operations and refuse collection and kerbside recycling that meets customer expectations.[23] Waste Futures includes the rollout of a new kerbside collection system for the City and developing waste diversion facilities. Ms Graham's evidence set out in detail the three phases of Waste Futures. As we noted in section 1.5 of this Decision where we discussed the matter of 'alternatives', the applicant is now in Phase 3, which includes the DCC's decision to move to a "four bins plus one" collection comprising a food waste bin, a recycling bin, a general rubbish bin, a glass bin plus an optional green waste bin.[24] This new kerbside collection service is intended to begin in mid-2023.

[026] Waste Futures is intended to reduce the amount of waste going to landfill overall and, in the case of food and garden waste, to reduce the amount of putrescible waste contained in the general waste stream. That is clearly a matter of interest to us, particularly in terms of bird strike and odour which we discuss in sections 4.2.13 and 4.2.16 of this Decision respectively. Mr Henderson stated:[25]

> *"The removal of the majority of organic wastes from the waste stream, combined with the additional waste diversion facilities, will result in an estimated 27% reduction in annual waste to landfill and a 24% reduction on associated annual carbon emissions."*

[027] Relevant to the waste stream that will be received at Smooth Hill, the DCC is also developing a Resource Recovery Park. This will be located at Green Island and will include waste diversion facilities including an organics processing facility, a mixed recyclables sorting facility, a plastics granulation facility, a centrally located rummage store and a bulk waste transfer station.[26]

[20] Paragraphs 27 to 29.
[21] Group Manager of the Waste and Environmental Solutions Group at DCC.
[22] EIC Chris Henderson, paragraph 12.
[23] EIC Chris Henderson, paragraph 16.
[24] EIC Sandra Graham, paragraphs 28-47.
[25] EIC Chris Henderson, paragraph 35.
[26] EIC Sandra Graham, paragraph 46.

[028] Nevertheless, despite the Waste Futures initiatives and as noted by Ms Graham, there remains a shorter term need to provide for waste disposal and for the Smooth Hill landfill facility to be established.[27] Mr Henderson explained why some alternatives to a new landfill at Smooth Hill had not been pursued by the applicant.

[029] There will be no public access to the Smooth Hill site. General waste from the Council collections, commercial collections (other than commercial operators who hold a valid Waste Acceptance Agreement with the Dunedin City Council), and the general public will be deposited at the bulk waste transfer station prior to consolidation and transferred to the Smooth Hill site. Mr Henderson confirmed that different waste classes will be directed to different waste facilities.

[030] Many submitters raised concerns about the putrescible and odorous waste proposed to be accepted at Smooth Hill, which we address in more detail in our discussion of odour and bird strike effects in sections 4.2.16 and 4.2.13 respectively. In his additional evidence responding to the evidence of submitters, Mr Henderson noted:[28]

> *"Although DCC has already committed to separating putrescible waste to the greatest extent possible, achieving complete separation would require a screening process that is impossible to implement, therefore, disposal of residual general waste must be to a class one facility".*

[031] Given the importance placed by the applicant on minimising the amount of putrescible waste going to landfill, we explored with the Mr Henderson the practical means by which this would be achieved via collections and the sorting of waste at the bulk waste transfer station. He told us that waste emptied into collection trucks is compacted as the truck travels around its collection route and rubbish bags in the truck tend to burst through this process. By the time the waste arrives at the bulk waste transfer station for checking, the putrescible waste is more easily identified and can be removed. If a large load of putrescible waste is deposited into a truck for some reason, that can contaminate the whole truck load and the load would then be treated as a special load and disposed of accordingly.

[032] Regarding the DCC's wider Waste Futures programme, some submitters also raised concerns about the need for a landfill at all, relying on Policy 7.4.8 of the RP: Waste, which requires the consideration of alternatives to landfills. We addressed alternatives in section 1.5 of this Decision and do not revisit that matter here.

1.7 Risk

[033] As discussed elsewhere in this Decision, risk is particularly relevant to our assessment of bird strike effects, but it is also relevant to our assessment of other effects such as possible degradation of the local environment, a subject raised by many submitters who were concerned that the proposed landfill would adversely affect water quality in the Ōtokia Creek and Brighton Beach and that would in turn reduce their enjoyment of local outdoor recreational opportunities such as walking, cycling, swimming and surfing. Some submitters suggested that even the risk of that occurring would adversely affect them.

[034] Mr Garbett addressed perceptions of risk in his opening submissions.[29] He referred us to the RMA's definition of environment and submitted that effects on the environment may include actual or potential effects on people and communities near the proposal, or the social, economic, aesthetic and cultural conditions enjoyed by those people and communities. He went on to submit that perceptions of risk are not themselves effects on the environment, citing the Environment Court decision in *Shirley Primary School v Christchurch City Council* where the Court stated, "we have found that such fears can only be given weight if they are reasonably based on real risk." [30] Similar points were made in a brief legal opinion from Michelle Mehlhopt[31] that formed part of the ORC Section 42A Report.

[27] EIC Sandra Graham, paragraph 8.
[28] Additional evidence Chris Henderson, 17 May 2022, 3rd bullet point.
[29] Garbett opening submissions, paragraphs 96-99.
[30] *Shirley Primary School v Christchurch City Council* [1999] NZRMA 66 at [193].
[31] Solicitor at Wynn Williams.

[035] We accept Mr Garbett's submission that concerns or fears that may not amount to a "real risk" should not feature in our assessment of the actual and potential effects of the landfill proposal. However, as will be evident from many parts of this Decision, some issues raised by submitters, particularly through their experts, are in fact "real issues" as evidenced by the applicant's response to them. That includes the potential for contamination of the Ōtokia Creek and the risk of bird strike, both of which we address in subsequent sections of this Decision.

1.8 Community Consultation

[036] Numerous submitters we heard from were concerned about what they considered to be the DCC's inadequate community consultation for the proposed Smooth Hill landfill. We note that under s36A of the RMA there is no duty for a consent applicant to consult any person about consent applications. Accordingly, we make no findings regarding the DCC's 'community consultation'. We also make no findings regarding any consultation that the DCC may be required to undertake for the landfill under other legislation, including the Local Government Act.

[037] Having said that, it is acknowledged good practice for applicants to undertake consultation so that they may be better informed regarding community views on a project. The related issue for us is to be confident that all relevant potential adverse effects are 'on the table' and that we have adequate information regarding those effects so as to enable us to make an informed decision on the applications.

[038] In that regard we asked the applicant, and the applicant agreed, to commission a 'Quantitative Human Health Risk Assessment' assessing the proposed discharges to surface and ground water, in light of the concerns expressed by submitters about potential contamination of the Ōtokia Creek and Brighton Beach seawater. We discuss that further in sections 2.6 and 4.2.7 of this Decision. Other than that, we were satisfied with the adequacy of the information presented as part of the hearing process.

[039] We discuss the matter of a 'community liaison group' in section 4.2.22 of this Decision.

1.9 Climate change

[040] Some submitters raised the issue of climate change. Climate change will have an impact on rainfall at the site and therefore potentially on the discharge of stormwater and contaminants (including leachate) from the landfill operation.

[041] Section 7(i) of the Act requires us to consider the effects of climate change. However, in this case, given the site is not at risk of flooding or coastal erosion, there are no typical 'climate change' effects relevant to our assessment of the applications.

[042] We note that some submitters firstly raised the issue of greenhouse gas emissions and climate change effects in terms of the landfill gas that will be emitted from the landfill, and secondly from the use of vehicles transporting waste to the landfill. The first matter is not within our scope to consider as section 70A of the RMA directs that we must not have regard to the effects of such discharges on climate change. The second matter is also not relevant as the use of the vehicles transporting waste to the landfill does not require consent. We therefore do not need to make any findings on those matters. Nevertheless, we briefly address them in light of our earlier discussion of the DCC's Waste Futures programme, which includes the intention to reduce carbon emissions.

[043] The proposed landfill site is some 28km south of Dunedin. It is intended that waste will be transported by truck, and only by commercial operators. There is no doubt that trucks accessing the site will generate some level of greenhouse emissions, and more than might be expected if trucks continued to transport waste to the Green Island landfill, which is closer to Dunedin City. As noted by Ms Lindsay, the applicant considers that the average number of truck movements is expected to reach approximately 25 per day. Countering the effect of those vehicular movements is the applicant's intent to reduce the amount of waste going to landfill and to separate out its waste into distinct categories for processing. That will have some

climate change benefits, reducing greenhouse gas emissions in the form of landfill gas that might otherwise arise from a landfill receiving putrescible wastes.

1.10 Detailed design and management plans

[044] As is common for major infrastructural projects such as this, the DCC has yet to complete its final detailed landfill design and its associated stormwater and leachate management systems. It has also not completed the detailed design of various intended environmental monitoring programmes. Consequently, the DCC intends to rely on a suite of management plans that will be submitted to either or both of DCC – Regulatory and the ORC. These include:

- Landfill Management Plan incorporating:
  - Construction Noise Management Plan
  - Lizard Management Plan
  - Landscape Management Plan
  - Freshwater and Wetland Monitoring Management Plan
  - Landfill Operational Bird Management Plan
  - Vegetation Restoration Management Plan

[045] In his evidence that formed part of the Reply submissions, Mr Dale advised[32] that the specific requirements for the separate Receiving Waters Environment Management Plan, Fire Preparedness and Response Plan and Landfill Gas Operational Management Plan (which were originally proposed to be produced) had been omitted and those matters would instead be encapsulated into the overall LMP framework. However, the applicant wished to retain flexibility to develop specific sub-management plans for those (and other) matters under the overall umbrella of the LMP if that was ultimately preferred by the landfill operator. We find that to be appropriate, noting that the LMP, and any 'topic specific' management plans that form part of it, will be reviewed by the Peer Review Panel and thereafter certified by the ORC.

[046] We note that the Landfill Management Plan (LMP) will guide the construction, operation, maintenance, and aftercare of the landfill and it will appropriately be developed in accordance with the WasteMINZ guidelines.[33] For the applicant, Richard Coombe[34] considered that a Peer Review Panel was appropriate to provide third party review of the design, development and operation of the landfill and provide transparency to stakeholders and the public.[35] We agree.

[047] However, we consider that the Peer Review Panel must have a person qualified and experienced in the assessment of aviation bird strikes. That results in a Peer Review Panel with four members as opposed to the three members suggested by the applicant.

[048] The above approach is consistent with the landfill assessment criteria 7.6.1.2(d) and (j) in the RP: Waste that we are to have regard to and which read respectively:

> *The extent to which the landfill proposal reflects the industry standard for landfills, as represented in the Waste Management Institute New Zealand's Technical Guidelines for Disposal to Land (August 2018);*
>
> *The landfill development and management plan or landfill closure plan prepared for the site.*

[049] We observe that management plans are commonly used for major construction projects. We understand management plans to be a suitable mechanism for ensuring that conditions are complied with and detailed

[32] Reply evidence, Maurice Dale, paragraphs 8 and 13(k).
[33] The ORC section 95 Report advised that clause 7.6.11 of the Otago Regional Plan: Waste requires the preparation of a landfill development and management plan in the form prescribed in Appendix 2 of that Plan. Plan Change 1 amends that clause and requires a site specific management plan be prepared in accordance with the WasteMINZ Technical Guidelines for Disposal to Land (August 2018).
[34] GHD Senior Project Manager specialising in solid waste, contaminated land remediation and construction management.
[35] EIC Coombe, paragraph 47.

environmental effects are managed appropriately. Management plans avoid cluttering the conditions with excessive detail, particularly with regard to how certain construction works, mitigation actions or environmental monitoring will occur. The caveat is that each management plan must be detailed in a consent condition that specifies the purpose or objective of the plan; ideally which conditions it is designed to assist with implementing; the minimum contents of the plan; who is to prepare it; and who else should be consulted or involved in that process. Ideally, consent conditions should also set out a process for reviewing or amending a management plan as a project proceeds. If there is conflict between a management plan and the conditions, then the conditions must prevail.

[050] Commonly conditions will specify that a management plan is to be submitted to the appropriate council and thereafter 'certified', which for all intents and purposes is an approval process. As we discuss later in this Decision, in this case the ORC reporting officer has recommended[36] (and the DCC initially agreed) that the management plans should be certified by an independent peer review panel. We considered that was not appropriate as the management plans must be certified by the relevant regulatory authority, namely either DCC-Regulatory or the ORC. The Peer Review Panel can of course assess and recommend certification (or not) to the respective council. At the commencement of the hearing, counsel for the applicant Michael Garbett helpfully agreed with that proposition when we put it to him.

[051] The recommended conditions did not originally specify a management plan certification process and we suggested that they should, referring the applicant to the 'Management Plan Certification Process' conditions imposed on the QLDC designation for the Queenstown Town Centre Arterial by the Expert Consenting Panel under the COVID-19 Recovery (Fast-Track Consenting) Act 2020 as an example of suitable conditions.

[052] In Reply counsel for the DCC submitted that Ms Lennox had advised that ORC compliance staff had an aversion to conditions that provide for the ORC to "certify" that certain requirements have been met especially in regard to material of a highly technical nature. The ORC officers preferred the wording "confirmed acceptance". We find that to be rather odd feedback from the ORC, because simply "confirming acceptance" could imply nothing more than noting the receipt of the document or management plan. In that regard we agree with counsel for the applicant who submitted:[37]

> *"The condition drafted by Mr Dale provides for a "certification" role – which requires the consent authority to certify that the management plans meet the criteria required by the consent, as approved by the hearing panel. Clearly ORC staff can engage advice or any expert to assist in carrying out this conventional "certifier" role. It is submitted that this is the appropriate role for the ORC, whereas wording proposed by ORC to "accept" plans, would result in an unlawful delegation of discretion to the ORC."*

[053] We have incorporated a 'certification' role for the ORC. We note that to be a routine approach and one that has been incorporated into consents for other projects requiring consents from the ORC that we are familiar with.

1.11 Other authorisations or approvals

[054] For completeness we note that other authorisations or approvals may be required to construct the Smooth Hill landfill, including:

- Any obstruction (landform, buildings) within the designated airport obstacle limitation surfaces, requires approval from Dunedin International Airport Ltd;

[36] ORC S42A Report, section 6.1.1

[37] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraphs 74 to 79. Counsel also referred to the well-known case law that judicial duties cannot be delegated so that a consent authority's power to grant consent is be left to an officer's discretion, but that it is lawful for an officer to certify that a condition of consent has been complied with. *Wedd v Auckland Council*, [2020] NZEnvC 82, at [38] and *Re Canterbury Cricket Assoc Inc* [2013] NZEnvC 184, at [25]-[26].

- Works required to upgrade the SH1 / McLaren Gully Road intersection requires approval from Waka Kotahi NZTA;
- Works resulting in the destruction or modification of any archaeological site require an authority from Heritage New Zealand Pouhere Taonga (HNZPT);
- Works disturbing or requiring the catching and release of protected wildlife (including lizards) require an authority from the Department of Conservation (DOC); and
- The road realignment required for the upgrade of McLaren Gully Road and Big Stone Road involves the acquisition of private land for road, right of support easements, and stopping of road. We understand that is to be progressed under the Public Works Act 1981.[38]

[055] This is not uncommon for major infrastructural projects such as this and it does not inhibit our ability to assess and decide on the RMA consent applications before us. It may however influence the consent conditions or advice notes that we might impose.

2.0 Process matters

2.1 Amended application

[056] The consent applications were originally made in August 2020 but they were revised in May 2021 and again in April 2022. It is the revised applications which we assess in this Decision Report.

2.2 Resource Management (National Environmental Standards for Freshwater) Regulation 2020 (NES-FM)

[057] Counsel for both the Royal Forest and Bird Protection Society (Forest and Bird)[39] and the Submitter Group[40] raised the issue of additional consents required under the NES-FM.

[058] Counsel for Forest and Bird submitted that "… *once s43B(7) is analysed and applied, the Application's most stringent activity status under the NES-FM, regs 52 and 54 is non-complying. Forest & Bird further submit that because the most stringent activity status is non-complying and the ORC's s42A Report says the Application does not pass through either of the s104D gateway tests that the regional consents should be declined.'*

[059] Counsel for the Submitter Group did not fully endorse the submissions of Forest and Bird, but her submission raised the issue of RMA section 91 for us to consider.

[060] We understand that at the time the DCC consent applications were lodged (August 2020) consent was not required under the NES-FM. That original application has not been withdrawn, but it has been amended subsequent to its lodgement (to reduce the landfill's scale and to avoid impacting directly on wetlands) in May 2021. We note that it is not unusual for applications to be reduced in scale, often as a result of submitter concerns. That does not alter the application's consent category given section 88A of the RMA preserves the activity status of the application at the time the application was originally lodged. We note that there is no dispute between the ORC and the applicant in this regard.

[061] As noted by Ms Lennox, on 7 April 2022 the applicant further amended the application to realign the proposed road carriageway to avoid any direct impact on wetlands located alongside McLaren Gully Road. Accordingly, consents were not required under NES-FM Regulations 52, 53 and 57 for the road upgrade. However, Ms Lennox suggested that consent was still required under the NES-FM as follows:

- Regulation 39: Vegetation clearance within, or within 10 m of, wetlands for the purpose of wetland restoration.
- Regulation 52: For activities that will occur outside, but within a 100 m setback from, a natural wetland

[38] Opening submissions, paragraph 39.
[39] Legal Submission on Behalf of the Royal Forest and Bird Protection Society of New Zealand Inc, 19 May 2022; paragraph 2.
[40] Verbal submissions, later recorded in Further Points of Counsel for Submitter Group dated 24 May 2022.

- Earthworks associated with landfill construction;
- The taking and use of groundwater from the sub-surface drainage system;
- Damming of water in the Attenuation Basin; and
- Diversion of surface runoff.

- Regulation 54: Vegetation clearance and earthworks within 100 m of a natural wetland including for
  - Vegetation clearance and earthworks for the purpose of landfill construction and road upgrades;
  - The taking and use of groundwater;
  - The damming of water in the Attenuation Basin;
  - The diversion of surface runoff; and
  - The discharge of water from the Attenuation Basin and sediment retention pond

[062] We received Memoranda[41] from Ms Mehlhopt on 17 June 2022 and 31 August 2022 advising that the Environment Court's decision on Plan Change 8 to the RP: Water amended clause (b) of Policy 10.4.2 to read "*Is nationally or regionally significant important infrastructure, and has specific locational constraints*". That policy now brings the landfill within the definition of "specified infrastructure" in the NES-FM. The consequence is that consent under the above regulations would not be required and instead consent would be required under Regulation 45 as a discretionary activity for the 'Construction of specified infrastructure' within 10m of a natural wetland for earthworks and vegetation clearance; and also for the taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from a natural wetland.[42] Maintaining or operating the landfill would either be a permitted activity under Regulation 46 or a restricted discretionary activity under Regulation 47.

[063] The applicant addressed the matter of the NES-FM in Reply submissions[43] saying:

> *"Firstly, and most importantly the application was lodged in the knowledge of the NES and expressly identified the regulations that the application contravened and identified consent was required under the relevant regulations. This was identified on page 76 of the application. …The application was first lodged in August 2020, and was amended in May 2021. Both versions identified relevant regulations under the NES-FM. … Thirdly, Counsel for the Otago Regional Council submitted that a resource consent authorises an activity, and it does not authorise breach of a particular rule. … This means in this particular case that there was no legal duty on the Applicant to seek consent under specified rules. Even if rules are incorrectly identified (which is not the case here), this does not invalidate an application."*

[064] Counsel went on to submit:[44]

> *"This application directly addressed the activity proposed, and also identified the relevant regulations that applied, being regulations 52, 53, 54, 57, 38 and 39 of the NES-FM. This part of the application was amended in track changes in May 2021 when the landfill footprint was reduced."*

[065] We are satisfied that the DCC applications included any consents required under the NPS-FM.

[066] Even if we are wrong about that, and consents under the NES-FM have not yet been sought by the applicant then that would require us to consider whether or not under section 91[45] of the RMA we should determine not to proceed with the hearing of the applications on the reasonable grounds that those NES-FM applications be made before proceeding further (for the purpose of better understanding the nature of the DCC's Smooth Hill proposal) . In light of the extensive range of lay and expert evidence presented, we are

[41] Memorandum of Counsel on Behalf of Otago Regional Council, 17 June 2022; Memorandum of Counsel on Behalf of Otago Regional Council, 31 August 2022.
[42] No 'non-complying activity' consents would be required under the NEW-FW.
[43] Submissions in reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraphs 18 to 24.
[44] At paragraph 29.
[45] Section 91(1)(b) RMA.

satisfied that all relevant issues are squarely 'on the table' before us and we have a sound understanding of the nature of the Smooth Hill proposal. Accordingly, we would determine that we should continue with the hearing of the applications that have been lodged.

[067] We discuss the consent categories of the applications in subsequent sections of this Decision, but suffice to say we are not persuaded by Forest and Bird's submission that the applications should be declined for the reasons that they cite. Even if we are wrong about that, and if the applications should for some reason relating to the NES-FM been 'bundled' as a non-complying activity, as will be evident from the remainder of this Decision, we are satisfied that the applications could pass through one if not both of the section 104D[46] 'gateways'.

[068] Finally, we note that in his evidence that formed part of the DCC's Reply submissions, Mr Dale advised that he had recommended conditions within the consent for earthworks and vegetation clearance to manage the following activities for which consent is triggered under the NES-FM:

- Earthworks within 100m of a natural wetland that results in partial drainage of a wetland;
- Vegetation clearance and earthworks within 10m of a natural wetland; and
- Restoration of a natural wetland.

[069] We find that to be appropriate.

2.3 Written approvals and notification

[070] No written approvals were provided.

[071] The applications were publicly notified with the period for submissions closing on 15 November 2021. We note that the standard submission period was doubled given the scale and complexity of the applications.

2.4 Submissions received

[072] The DCC – Regulatory received 12 submissions (six opposing, five neutral and one in support) which are summarised in Table 1 of the DCC Section 42A Report. We adopt that summary and note that three of the submissions were made on ORC submission forms and raise matters outside the scope of our DCC delegations.[47] We also note that Te Rūnanga o Ōtākou, Forest and Bird and John Finlayson were the only submitters on the DCC land use consent who either provided pre-circulated evidence or appeared at the hearing.[48] Forest and Bird presented legal submissions but no evidence.

[073] The ORC received 283 submissions (272 opposing, nine neutral and two in support) which are summarised in Attachment 14 to the ORC Section 42A Report, with the 'key issues' arising being listed in section 3.2 of that Report. We adopt that summary, but do not repeat it here for the sake of brevity. The applicant advised that approximately 190 submissions were from individuals and families living in the vicinity of the proposed landfill site.[49]

[074] We record that we have read and had regard to all the submissions that were lodged, regardless of whether or not the submitter appeared before us at the hearing.

2.5 Site visit

[075] We undertook a site visit on the afternoon of Monday 16 May 2022 accompanied by Hilary Lennox and at the site we were accompanied by Nick Eldred (GHD) and Rachael Eaton (Boffa Miskell) who were familiar with the site but did not give evidence at the hearing. We viewed the junction of Big Stone Rd and McLaren Gully Road, traversed the site on foot down to the proposed toe of the landfill and observed the 'swamp wetland' at the proposed base of the landfill. We observed the unnamed tributary and the valley floor marsh

[46] Particular restrictions for non-complying activities.
[47] Mandie & Brian Lungley, Russell Walker and John Finlayson.
[48] Submitter James Malloy spoke to the road upgrade and realignment works, but was not a submitter on the DCC application. DCC End of Hearing Section 42A Report, paragraph 7.
[49] EIC Sandra Graham, paragraph 68.

wetlands from McLaren Gully Road. We then drove down Big Stone Road to Brighton Beach and the outlet of Ōtokia Creek.

2.6 Hearing

[076] We conducted a hearing in the Fullwood Room at the Dunedin Centre over five days commencing on Tuesday 17 May 2022. Copies of the evidence and legal submissions that were presented are held by the respective councils. We do not summarise that material here, but we refer to it in the remainder of this Decision where appropriate. We took our own notes of any verbal answers to questions that we posed.

[077] We adjourned the hearing on 25 May 2022 pending receipt of the applicant's written closing or Reply submissions which we received on Friday 12 August 2022.

[078] As noted earlier, during the hearing we asked the applicant to undertake what we called a 'Quantitative Public Health Risk Assessment' (now called a Quantitative Human Health Risk Assessment or QHHRA) regarding the potential contamination of the Ōtokia Creek from the discharges of contaminants to land and water for which consents have been sought from the ORC. While requested by us to assist us with considering the matters raised by submitters who undertake recreational activities in and along the Ōtokia Creek and in the waters at Brighton Beach, the QHHRA nevertheless comprised new evidence. We therefore issued Minute 3 which set out a process whereby relevant submitters[50] and the ORC Section 42A Report authors could comment on the QHHRA prior to the applicant providing its Reply submissions.

[079] To assist the applicant with preparing their Reply submissions we issued Minute 4 on 27 May 2022 which contained a list of matters (suggested or requested during the hearing) to be addressed.

[080] We closed the hearing on Friday 26 August 2022 having concluded that we required no further information from any of the participants.

3.0 Dunedin City Council consents

[081] We were assisted by a Section 42A Report authored by Kirstyn Lindsay. In her initial Report Ms Lindsay recommended granting the consents sought from the DCC (subject to the imposition of consent conditions) and in her end of hearing Report she maintained that recommendation.

3.1 Consents required

[082] The land use consent required from DCC – Regulatory relates solely to the proposed widening and upgrading of McLaren Gully Road (including its intersection with State Highway 1) and Big Stone Road. We confine our assessment to those particular activities.

[083] Dunedin currently has two district plans, the 2006 Dunedin City District Plan (2006 District Plan) and the Proposed 2GP. Ms Lindsay outlined the various rules that were triggered by the proposed roading upgrades under each district plan[51] as did Mr Dale.[52] Without repeating that level of detail here we simply note and agree with their conclusions that in overall terms the applications are to be bundled and assessed as a discretionary activity.

[50] Those who had provided expert evidence on water quality matters.
[51] DCC Section 42A Report, paragraphs 26 to 49.
[52] EIC Maurice Dale, paragraph 44.

3.2 Effects assessment

3.2.1 Permitted baseline

[084] When forming an opinion for the purposes of section 104(1)(a) of the RMA we may disregard an adverse effect of an activity on the environment if a national environmental standard or a plan permits an activity with that effect.[53] We accept Ms Lindsay's advice[54] that:

- the road upgrades that fall within the existing formed road corridor or legal road are a permitted activity; and
- all public vehicle movements, including the heavy vehicle movements associated with permitted farming and forestry activity, on the existing road network are also permitted.

[085] We record that we have exercised our discretion to disregard the effects of the second, but not the first, of those particular activities.

3.2.2 Traffic and transport

[086] The planned route for access to the proposed Smooth Hill landfill site is via SH1, McLaren Gully Road and then along a short section of Big Stone Road between the end of McLaren Gully Road and the proposed landfill entrance. The local roads are unsealed and of variable width. The intersection of McLaren Gully Road with SH1 is a priority T intersection, while the intersection of Big Stone Road and McLaren Gully Road is an uncontrolled 3-way intersection.

[087] As we noted earlier, the landfill site is designated and the landfill operation within the designated site requires no further land use consents. It is the authorised activities within the designated site that will generate traffic on the wider roading network (including SH1) and those effects are outside the scope of our consideration of the road widening land use consents before us. Regardless, as we noted in section 3.2.1, vehicle movements on the public roads are a permitted activity.

[088] Ms Lindsay listed[55] what her initial traffic advisor (DCC Transportation Planner Logan Copland) considered to be 'key considerations'.[56] The first of these was "*The ability of the surrounding transport network to cater for the anticipated additional vehicle movements, including heavy vehicle movements once the facility is operating*." In light of the preceding paragraph, we have not assigned any weight to that matter.[57] In saying that we note that the Landfill Management Plan and temporary traffic management plans will require that heavy vehicles utilise the SH1-McLaren Gully Road-Big Stone Road access route during both construction and operation, except in emergency situations where access via that route is impassable.[58]

[089] We have instead focused on:

- the upgrades to McLaren Gully Road and Big Stone Road; and
- the McLaren Gully Road / State Highway 1 Intersection upgrades.

[090] On the first matter, for the applicant Andrew Whaley[59] advised that those roads in their current arrangement have substandard geometry (particularly width and visibility) to safely accommodate two-way traffic. Those issues would be exacerbated with the increased traffic demands arising from the routine operation of the landfill including increased usage by heavy commercial vehicles. To mitigate those effects, the applicant had proposed widening, re-grading and sealing of the road to the site entrance.[60]

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[53] Section 104(2) of the RMA.
[54] DCC S42A Report, paragraph 57.
[55] DCC S42A Report, paragraph 69.
[56] Mr Copland was unavailable for the hearing and was represented by Antoni Facey, a consultant Transport Planner contracted by DCC.
[57] We note that Mr Whaley concluded that both McLaren Gully Road and Big Stone Road have low existing traffic flows and the anticipated traffic demands arising from the landfill would be easily accommodated. EIC Andrew Whaley, paragraph 7.
[58] EIC Andrew Whaley, paragraph 50.
[59] GHD Ltd Operations Manager for Transport.
[60] EIC Andrew Whaley, paragraph 33.

[091] Mr Copland concluded that the proposed typical cross-section and design parameters as set out in the applicant's integrated transport assessment (ITA) prepared by GHD were generally appropriate for the anticipated use of these roads.

[092] Ms Lindsay advised that Mr Facey had recommended the preparation of road safety audits for the roads in accordance with the NZTA Road Safety Audit Procedures for Projects Guidelines 2013 at the design stage and the post construction stage "*as a further layer of safety*". She recommended conditions accordingly. We find that to be a suitably cautionary approach, particularly in light of the recreational use of those roads that currently occurs, as was highlighted to us by a range of submitters.

[093] The road widening and realignment works will have construction related effects for current users of the roads. Ms Lindsay recommended[61] that (based on advice from Mr Facey) it was preferable to rely on the Temporary Traffic Management Plan required by the Roading Control Authorities (RCAs) under the NZ Code of Practice for Temporary Traffic Management (COPTTM) rather than requiring the preparation of the separate Construction Traffic Management Plan (CTMP). We agree and, on that basis, we simply refer to the Temporary Traffic Management Plans in the DCC land use conditions. We note that the Temporary Traffic Management Plan will need to manage ongoing co-ordination with traffic generated by forestry and logging operations, and manage access to several residential properties that use McLaren Gully Road and Big Stone Road as their main vehicle access. However, we do not consider that to be problematic.

[094] Regarding the main site access into the designated landfill site from Big Stone Road (located approximately 350m southwest of the McLaren Gully Road/Big Stone Road intersection), Mr Copland was concerned about the available sight distance to the northeast being affected by a crest on Big Stone Road. Mr Whaley confirmed sight distances would be considered during the detailed design with those details to be provided to DCC-Regulatory prior to construction. The main site access design will also undergo Road Safety Audit prior to construction.[62] We agree with Ms Lindsay that the sight distance matter can be dealt with as part of the detailed design of the road and upgrade works, which we note will require certification from the DCC's Transportation Manager.

[095] Turning to the SH1 / McLaren Gully Road intersection upgrades, Mr Whaley advised that as the Level of Service (LOS) on the McLaren Gully Road approach to the intersection was anticipated to be below acceptable levels in the future, following consultation with Waka Kotahi, upgrades to the existing SH1 / McLaren Gully Road intersection were proposed.[63] We note Waka Kotahi lodged a neutral submission seeking the imposition of three routine conditions which the applicant has agreed to and on that basis did not attend the hearing. We are satisfied that those agreed conditions are appropriate.

[096] Submitters A & M Granger requested that McLaren Gully Road and Big Stone Road be sealed up to 731 Big Stone Road, which is approximately 750 m south of the entrance to the landfill and beyond the junction with McLaren Gully Road. Mr Whaley advised[64] that it was not anticipated there would be demand for waste disposal from south of the landfill entrance and so it was not necessary to extend the sealing of 731 Big Stone Road. We agree.

[097] For completeness, while not directly related to the land use applications before us, we note two matters related to the operation of the landfill:

- Regarding the effects of road runoff, we note that for the applicant Allen Ingles[65] considered that operational landfill vehicle movements on McLaren Gully Road would be relatively low at around 25 truck movements per day and the proposed development would include sealing of the road. He concluded that given the low-level traffic movements and the reduced vehicle wear and sediment loads

[61] DCC End of Hearing Section 42A Report, paragraph 23.
[62] EIC Andrew Whaley, paragraph 48.
[63] EIC Andrew Whaley, paragraphs 27 to 29.
[64] EIC Andrew Whaley, paragraph 57.
[65] GHD Ltd Technical Director for the water sector.

associated with sealing, any adverse effect on water quality in adjacent waterways would be less than minor and the sealing could result in a net improvement;[66] and

- Mr Whaley advised[67] that the roading improvements would allow sufficient space to accommodate horse riders, the safety of which will be influenced primarily by driver behaviour rather than an engineered solution.[68] He considered that the provision of a wider carriageway with a shoulder plus swales to both sides provided for increased separation for equestrians and traffic compared to the existing situation. He also considered that the improvements would be able to safely accommodate recreational cyclists[69] and the change from unsealed to sealed carriageway would be beneficial. Regarding Brighton Road (heavily used by cyclists) we note that that applicant will require heavy trucks to use SH1 and McLaren Gully Road and not Brighton Road. That would also be the preferred route for private contractors.[70]

[098] We find that a consideration of traffic and transport matters does not weigh against a grant of consent.

3.2.3 Noise

[099] The issue of noise arising from the widening of the access road and the operation of the landfill itself was of concern to a number of submitters, particularly those living in the area.[71] Regarding the operation of the landfill, as we have discussed earlier, the landfill site is designated. As pointed out in the evidence of Christian Vossart[72] for the applicant, condition 3 of the designation reads:

> Noise generated by any activity on the site shall comply with the following standards within 50 metres of the nearest house existing at the date on which the designation becomes operative - 55Dt/40Nt dBA. (NB These levels are subject to an adjustment of minus 5dBA for noise emissions having special audible characteristics.)

[100] While we cannot revisit the merits of that condition, we note Mr Vossart's conclusions that construction noise emanating from within the landfill site will not exceed L_{Aeq} 54 dB at the nearest residence (731 Big Stone Road which is some 400m distant from the landfill site) and landfill operational noise will meet that standard 215m away from an excavator, bulldozer and waste compactor all operating in close proximity to each other.[73]

[101] Regarding construction noise arising from the proposed road widening works (which is a matter that we must consider) Mr Vossart advised that the nearest noise sensitive receivers were located at 108 McLaren Gully Road and 109 McLaren Gully Road. He was confident that provided a minimum separation distance of 40m was maintained between construction equipment and the houses at those properties, then compliance with the daytime construction noise limits of $L_{Aeq(15min)}$ 75 dB and L_{Amax} 90 dB set out in Rule 4.5.4.1 of the 2GP would be achieved.[74] We heard no qualified evidence to the contrary.[75]

[102] Ms Lindsay noted[76] that the applicant had offered to have a Construction Noise Management Plan (CNMP) prepared by an acoustic specialist which would address the requirements of NZS6803: 1999 Acoustics – Construction Noise. The CNMP would include measures to mitigate noise transmission from construction activity to the existing residential dwellings at 108 and 109 McLaren Gully Road. We find that to be appropriate and agree with Ms Lindsay[77] that the CNMP should be prepared as a matter of course prior to

[66] EIC Allen Ingles, paragraph 48.
[67] EIC Andrew Whaley, paragraph 62.
[68] This was of concern to submitters including the Brighton Pony Club and S Hart.
[69] An issue of concern to submitters including P Hasler, Cycling Otago.
[70] EIC Andrew Whaley, paragraphs 69 to74.
[71] Including Blair Judd and Sarah Ramsey.
[72] GHD Technical Director of Acoustics.
[73] EIC Christian Vossart, paragraphs 29 to 33.
[74] EIC Christian Vossart, paragraphs 26 and 27.
[75] We also note that noise management from within the landfill site will form part of the Landfill Management Plan to ensure BPO mitigation measures are incorporated into the works in order to minimise noise emissions and ensure ongoing compliance is achieved at noise sensitive receivers.
[76] DCC S42A Report, paragraph 117.
[77] DCC End of Hearing Section 42A Report, paragraph 34.

the commencement of road works, as we understand was suggested by the DCC-Regulatory advisor Darren Humpheson.[78]

[103] While no submissions were made in respect of road noise, we note that Rule 9.3.6.7.(h) of 2GP-AP-1 states that vehicles operating on public roads are exempt from the noise limits specified under the rule.[79] Having said that, we note that the proposed chip seal on the upgraded roads is anticipated to significantly reduce traffic generated noise.[80]

3.2.4 Litter

[104] Submitters, including the Mosgiel Taieri Community Board, were concerned about litter. While this is not relevant to the land use consents required for the road widening works, we note that Mr Coombe confirmed that waste delivery trucks would be covered to avoid loss of litter in transit. He also advised that the active fill area receiving waste would have portable litter fences located downwind of the waste placement area to catch litter that may be mobilised during windy conditions. Litter caught on the fences would be removed on a regular basis as detailed in the Landfill Management Plan. We find that to be appropriate and note that the management of litter is comprehensively addressed in the ORC consent conditions.

3.2.5 Indigenous biodiversity

[105] Originally the road widening works would have encroached on around 0.53ha of wetlands. This was initially reduced to around 16.5m^2 (0.0017ha) of encroachment through localised narrowing of the road cross-section (elimination of roadside swales), potentially requiring localised mini-retaining structures and safety or sight barriers at the pavement edge. Mr Whaley advised that further design refinements[81] had eliminated any encroachment into the wetlands. He was satisfied that those refinements could be made without unduly compromising the road safety.[82]

[106] The avoidance of the roadside wetlands meets the request of submitter Forest and Bird who sought that "*no earthworks for the landfill or road upgrades to occur within, or within 100m of natural wetlands where those earthworks may result in the partial drainage of the wetland*." Despite the avoidance of encroachment into roadside wetlands, the applicant still intends to enhance the West Gully 4 wetland area and has offered conditions to that effect. We discuss that further in section 4 of this Decision.

[107] The road widening works will still unavoidably disturb the existing roadside vegetation. Ms Lindsay advised that in terms of the indigenous vegetation clearance rules[83] in the district plans, the applicant now intends to remove 2.97m^2 of Yorkshire Fog –Cocksfoot Grassland. While arguably of a *de-minimis* scale, we understand that the Yorkshire Fog –Cocksfoot Grassland may provide threatened fauna habitat for the Southern Grass Skink lizard which is a species classified as At Risk – Declining and the McCann's Skink lizard – classified as Not Threatened. Those lizards may also reside in non-indigenous rank grass adjoining McLaren Gully Road and Big Stone Road. For the applicant Samantha King[84] advised that the proposed management regime for reducing and mitigating potential adverse effects on lizards adopted an effects management hierarchy that included remediation (buffer planting), salvage and relocation of lizards if required and habitat restoration and predator control within West Gully 3. Importantly, in terms of the roadside rank grass vegetation itself, for the applicant Dr Jazz Morris[85] considered that habitat had no ecological significance and negligible ecological value.

[108] Ms Lindsay relied on the assessment undertaken by former DCC Biodiversity Advisor Richard Evans.[86] We understand his conclusions to be that the Draft Lizard Management Plan submitted with the application

[78] Technical Director of Acoustics at Tonkin & Taylor Ltd.
[79] EIC Christian Vossart, paragraph 28.
[80] DCC S42A Report, paragraph 119
[81] Undertaking localised adjustment (lateral adjustments of up to 1m) of the road alignment within the proposed roading corridor, adjustments to the road height locally, or by the installation of retaining walls at the road edge.
[82] EIC Andrew Whaley, paragraphs 37 to 39.
[83] 2GP rules 10.3.2.2.a.ii.2 and 10.3.2.3.a.iii and 2006 DP rule 16.6.2.
[84] Wildland Consultants Limited Senior Herpetologist.
[85] Boffa Miskell Limited ecologist.
[86] DCC Section 42A Report, paragraphs 89 to 106.

described a detection and salvage regime for lizards along the roadsides prior to construction and that, provided the detection and salvage regime was sufficiently robust to identify and relocate a high proportion of lizards present, the adverse ecological effects should be low. Ms Lindsay concluded that the effects of the proposed indigenous vegetation removal were acceptable.

[109] We agree, and note that the proposed Lizard Management Plan (LMP) would be based on the Draft Smooth Hill Lizard Management Plan prepared by Boffa Miskell Ltd, dated June 2021. In our view that is a very conservative approach given the nature and scale of the potentially affected roadside indigenous fauna habitats. In that regard Ms Lindsay advised that management of the disturbance and the catch and release of protected wildlife (in this case the above-mentioned lizards) defaults to the Wildlife Act 1953 and for which a section 53 authority from the Director-General of Conservation (DOC) would be required.

[110] Ms Lindsay considered it was reasonable to assume that a Lizard Management Plan would be required from DOC and she invited us to consider whether or not the DCC land use consent should duplicate that requirement.[87] Noting the broad range of matters listed in section 53(5) of the Wildlife Act that the Director-General may impose conditions on, we come to the same conclusion as Ms Lindsay.

[111] We firstly note that we have no ability to extend the coverage of the LMP to the designated site as appeared to be sought by some submitters. Secondly, in light of Ms Lindsay's recommendation we have amended the recommended LMP condition to state that it applies only if a Lizard Management Plan is not provided to DOC as part of an application for a Wildlife Act 1953 authority. That will avoid unnecessary duplication.

[112] We have also amended the requirements of the LMP in recognition of the *de-minimis* scale of the affected indigenous vegetation and the modified nature of the roadside rank grass areas. We considered the recommended wording to be disproportionally onerous in light of those matters.

[113] For completeness we note two further matters:

- In answer to our questions Josh Markham[88] advised that the endangered Eastern Falcon nests in tall trees and would not nest in the roadside vegetation affected by the proposed road widening activities. Accordingly, we find there is no need for the consent holder to produce an "Eastern Falcon Management Plan"; and
- For the applicant Tanya Blakely[89] advised that the road upgrades might include upgrading or extending culverts at watercourse crossing locations. That has the potential to impede the movement of fish along and between waterbodies. However, she noted that if new structures were built or existing structures were upgraded or modified, they would need to be in accordance with the design, monitoring and maintenance parameters set out by the National Environmental Standard for Freshwater (NES-FM).[90] That would ensure fish passage is maintained or improved.

3.2.6 Landscape and visual amenity

[114] Neither the designated landfill site nor the road widening and realignment activities for which land use consent is required are identified as part of any outstanding natural feature, outstanding natural landscape or significant natural landscape in any of the operative or proposed regional or district plans.

[115] The potential adverse effects of the road widening and realignment activities primarily relate to the formation of cut batters (up to 7.6m high) that will be scarified and hydroseeded where possible or otherwise left to weather and tie-in with the surrounding vegetation. There will also be areas of fill up to 6m high and some localised removal of existing gum trees within the road reserve in the vicinity of 108 and 109 McLaren Gully Road.

[87] DCC End of Hearing Section 42A Report, paragraph 16.
[88] Tonkin and Taylor Senior Terrestrial Ecologist engaged as a technical reviewer by the ORC.
[89] Boffa Miskell Limited Ecologist, Senior Principal and Technical Leader – Sciences.
[90] EIC Tanya Blakely, paragraph 56.

[116] For the applicant Rhys Girvan[91] considered that potential viewing audiences were primarily limited to transient views from users of adjoining roads, including parts of McLaren Gully and Big Stone Roads. Beyond such areas, views of the proposed road upgrades would largely occur in transient views by road users. No residential dwellings will have direct views of larger areas of cut or fill which might otherwise have increased adverse visual effects. Potential longer distance partial and glimpse views of the works might also occur from three dwellings along Big Stone Road; however, they were enclosed by intervening plantation forest.[92]

[117] Mr Girvan conceded that some temporary localised adverse effects would occur as a result of proposed earthworks necessary to upgrade McLaren Gully Road. He considered that those effects would remain associated with an established road corridor and gradually reduce as exposed surfaces become naturalised and areas of proposed hydroseeding become established.[93] We find those adverse effects are no more than minor (or low using Mr Girvan's terminology).

[118] Mr Girvan advised[94] that a minimum 10 m wide planted strip[95] would be established along the boundary with Big Stone Road. At the hearing Mr Girvan confirmed that the planted strip in question will be located within the designated site and so that matter is not relevant here.

[119] Ms Lindsay referred to an assessment undertaken by the DCC's Landscape Architect, Mr Luke McKinlay.[96] She concluded that the landscape and visual effects of the proposal would be acceptable, subject to a condition of consent relating to hydroseeding of cut faces. We agree and, in our view, the adverse landscape and visual effects of the road widening and realignment activities are no more than minor.

3.2.7 Historic heritage and archaeology

[120] Ms Lindsay noted that while sections of the McLaren Gully Road upgrade fall within a DCC Archaeological Alert Layer, there were no scheduled sites within those sections and there are no listed items on the New Zealand Heritage List / Rarangi Korero.[97]

[121] The applicant's assessment[98] in its AEE concluded that there was the possibility of encountering remains such as post holes for fence lines, rubbish dumped over the fence in the road reserve or pre-1900 road surfaces and infrastructure such as culverts or drains. At the hearing Megan Lawrence[99] (the author of the applicant's archaeology assessment) tabled a map showing the location of four such sites along (but not proximate to) McLaren Gully Road.

[122] While the risk of encountering those sites is low, given they are set back from the road, the applicant has nevertheless offered consent conditions requiring an archaeological site briefing from an archaeologist to be delivered to all contractors undertaking earthworks and setting out procedures to be followed where suspected archaeological material is encountered during road upgrade works. Ms Lawrence confirmed that if previously unrecorded archaeological sites were exposed, they would be recorded, analysed, and reported on in accordance with standard archaeological practices. That requirement would be included in the conditions of any archaeological authority issued by HNZPT for the proposed works and are also captured in the proposed conditions of consent.[100]

[123] In her end of hearing report[101] Ms Lindsay advised that as there are no District Plan scheduled heritage items within the affected land, she considered that archaeological matters were best managed by an

[91] Boffa Miskell Limited landscape architect.
[92] EIC Rhys Girvan , paragraphs 11 and 36.
[93] EIC Rhys Girvan , paragraph 32.
[94] EIC Rhys Girvan , paragraph 24.
[95] Including a mix of faster growing exotic plantation species and indigenous trees which would provide an enduring visual screen.
[96] DCC S42A Report, paragraphs to 107 114.
[97] DCC S42A Report, paragraph 136.
[98] An Archaeological Assessment, prepared by New Zealand Heritage Properties Limited, updated May 2021.
[99] Principal Archaeologist at New Zealand Heritage Properties.
[100] EIC Megan Lawrence, paragraph 27.
[101] Paragraph 17.

archaeological authority process under the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPT Act). She then recommended omitting conditions that would duplicate the functions of Heritage New Zealand in its administration of the HNZPT Act. She continued to support the engagement of a site archaeologist and site briefings for contractors. We accept those recommendations.

[124] Some submitters[102] opined about the potential impact of the Smooth Hill proposal on the cultural and archaeological significance of the Ōtokia landscape. However, in response we simply note the evidence of Te Rūnanga o Ōtākou given by Edward Ellison who stated:[103]

> *"While Smooth Hill forms part of a wider wahi tupuna (ancestral landscape) between the Taiari Plain and the coast, I do not believe there are sites of significance to Te Rūnanga located within the project area. There are no identified cultural sites or place names listed on Ka Huru Manu (the Ngai Tahu Atlas) within the project area."*

[125] We find that potential adverse effects of the road realignment and widening works on historic heritage and archaeology are no more than minor can be appropriately managed by conditions of consent.

3.2.8 Tangata whenua values and interests

[126] Te Rūnanga o Ōtākou represents the interests of mana whenua for Smooth Hill and the Taiari Plain. The applicant submitted a cultural impact assessment (CIA), prepared by Aukaha Limited[104], updated May 2021, with the application. The CIA was supportive of the applications and sought controls around sediment and dust control, waterway protection, enhancement and monitoring. These matters were all included in the recommended conditions of consent. We also note that the submission lodged by Te Rūnanga o Ōtākou sought that the applications be granted for the following reasons:

> *Mana whenua support the proposed amendment to the landfill footprint to avoid impacts on wetlands within the designated area, and the proposed wetland restoration. The amended landfill design significantly reduces the effects of the Smooth Hill landfill on wai maori.*
>
> *Mana whenua acknowledge that the Green Island landfill is reaching capacity and that a new Class 1 landfill is needed in order to avoid trucking waste outside of the district. Te Rūnanga o Ōtākou support the application, subject to the adoption of the mitigation measures proposed in the amended cultural impact assessment lodged as part of the application.*

[127] Evidence on behalf of Te Rūnanga o Ōtākou from Edward Ellison and Yvonne Takau[105] described the cultural context and principles that are relevant to Te Rūnanga o Ōtākou's support for the construction of a landfill at Smooth Hill. Regarding the land use consents required from DCC – Regulatory Mr Ellison[106] advised:

> *"In accordance with our tikanga, it is for Te Rūnanga o Ōtākou as the representative of mana whenua to assess the cultural impacts of activities within our takiwa.*
>
> *Te Rūnanga o Ōtākou supports the amendments to the design of the landfill and alignment of McLaren Gully Road to avoid impacts on wetlands, and the proposed amendments to the draft conditions of consent to provide for the mauri of wai maori and te taiao and to protect taoka species."*

[128] Ms Takau[107] advised:

> *"While the applicant has now realigned the proposed road carriageway to avoid any direct impact on wetlands located alongside McLaren Gully Road, the restoration of 0.49ha of wetland is proceeding as planned.*

[102] Including Ms Valenski and witness Anne Mauger.
[103] EIC Edward Ellison, paragraph 56
[104] A consultancy based in Dunedin and owned by Te Runanga o Waihao, Te Runanga o Moeraki, Kati Huirapa Runaka ki Puketeraki, Te Runanga o Otakou and Hokonui Runanga.
[105] Planner at Aukaha.
[106] EIC Edward Ellison, paragraphs 21 and 60.
[107] EIC Yvonne Takau, paragraph 16 and 18.

Te Rūnaka has determined that the mitigation measures and significant reduction in the landfill footprint incorporated into the application by way of the variations, together with provision for ongoing monitoring and engagement with Te Rūnaka, is sufficient to manage the potential impacts on their values, as discussed by Mr Ellison in his evidence."

[129] We find that a consideration of tangata whenua values and interests does not weigh against a grant of consent.

3.2.9 Earthworks, stormwater, erosion and sediment control

[130] The road widening and realignment will involve reasonably substantial earthworks. Ms Lindsay advised that the final design of cut and fill slopes will be further addressed through detailed design to ensure that they are stable and the detailed design of the road upgrades will be informed by geotechnical investigations and be in accordance with the DCC Code of Subdivision and Development 2010. She also advised that the DCC's engineering consultants (Stantec) considered that the cuts had been designed at a suitable batter angle by a suitably qualified engineer and the proposed fill batters were typical for embankment fill.

[131] Stormwater, erosion and sediment runoff will be managed by an Erosion and Sediment Management Plan (ESMP) prepared in accordance with best practice guidelines, including Auckland Council GD05 - Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region – June 2016, and the Environment Canterbury Erosion and Sediment Control Toolbox. The ESMP will be reviewed by the independent peer review panel recommended by the ORC reporting officer and thereafter certified by DCC - Regulatory. We note the use of an ESMP to be a routine and acceptable approach for earthworks such as those proposed here.

[132] We find that a consideration of earthworks, stormwater, erosion and sediment control matters does not weigh against a grant of consent.

3.2.10 Positive effects

[133] The road widening and upgrades will have the positive effect of enabling the designated landfill site to be developed and used for its intended purpose. Those works will also result in an improved road safety environment for the existing users of the roads, including the forestry related heavy vehicles. We find that weighs in favour of granting consent.

3.2.11 Other submitter issues

[134] Submitters David Cormack on behalf of Wenita Forest Products and Adrian Green on behalf of Saffhill Forest Estates Ltd were concerned about impacts of the road realignment on their ability to meet the 2GP setback to roads required for forestry activities. Those submitters did not appear at the hearing and so we were unable to query what relief they sought. However, from the road alignment drawings attached to Ms Lindsay's End of Hearing report we discerned that some existing young trees might need to be removed, but note that to be a matter for discussion between the consent holder and the affected landowners.

[135] George and Eunice McLeod were concerned about impacts on stock movements across the road from one block to another. However, that relates to vehicular traffic arising from the operational use of the designated landfill site which is not a matter relevant to our consideration of the land use consent for road widening and realignment. Having said that we note that for the applicant Mr Whaley advised that the safe movement of stock on a public road is the responsibility of the person(s) moving the stock and the hazards associated with stock movements once the landfill was operational would not be measurably greater than what arises now from the infrequent traffic using the roads.[108] We heard no evidence to the contrary.

[136] Many submitters were concerned that 'rubbish trucks' utilising the landfill might travel along Brighton Road and then Big Stone Road to get to the landfill. As discussed in section 3.2.2 of this Decision, that matter is outside our jurisdiction. Nevertheless, we note that the applicant has offered conditions requiring its

[108] EIC Andrew Whaley, paragraphs 77 and 78.

employees and contractors to use the preferred route (SH1 – McLaren Gully Road) and we have imposed those conditions accordingly. That may give submitters some comfort.

3.2.12 Overall findings on effects

[137] In light of the preceding assessments, our overall finding is that with regard to the land use consent required from DCC – Regulatory, the effects of the road widening and realignment are either no more than minor or can be suitably avoided, remedied, mitigated or offset by the imposition of appropriate conditions of consent.

3.3 National environment standards and other regulations

[138] Ms Lindsay advised that no Hazardous Activities and Industries List (HAIL) activities had been identified within the designated landfill site or the roadside margins and so the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) did not apply and resource consent was not required under the NESCS. We heard no evidence to the contrary.

[139] Regarding the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-FM) we note that, as was pointed out by Ms Lindsay, NES-FM regulation 5(b) states that the regulations "*do not deal with the functions of territorial authorities under section 31 of the Act*".

[140] No other relevant[109] national environmental standards or regulations were brought to our attention and we are not aware of any.

3.4 National policy statements

[141] We are not aware of any national policy statement being relevant to our consideration of the land use consent required from DCC – Regulatory, other than the National Policy Statement for Freshwater Management 2020 (NPSFM).

[142] Under Objective 2.1(1)(a) of the NPSFM we must prioritise the health and well-being of water bodies and freshwater ecosystems. Under Policy 6 there is to be no further loss of extent of natural inland wetlands, their values are to be protected, and their restoration is to be promoted. Under Policy 7 the loss of river extent and values is to be avoided to the extent practicable and under Policy 9 the habitats of indigenous freshwater species are to be protected.

[143] We discuss the NPSFM in more detail in section 4.4 of this Decision in terms of the consents required from the ORC, but regarding the land use consent required from DCC – Regulatory we are satisfied that the road widening and realignment works are consistent with the NPSFM.

3.5 Regional policy statements

[144] The Regional Policy Statement for Otago (RPS) 1998 has been revoked and the Partially Operative Regional Policy Statement for Otago (PORPS) was made partially operative on 15 March 2021. Ms Lindsay set out what she considered to be the relevant provisions of the PORPS[110] and she concluded:[111]

> *"The proposal is considered to enable the upgrade of transport infrastructure that will increase freight efficiency and will provide for the functional needs of essential services. It proposes to maintain indigenous biological diversity and remedy (through the wetland enhancement) adverse effects on those values which contribute to the significance of the area or habitat. Conditions are volunteered to protect archaeological sites. The proposal is assessed as generally consistent to the PORPS."*

[145] We agree with and adopt Ms Lindsay's assessment of the PORPS provisions.

[109] In terms of section 9(3) of the RMA.
[110] Objectives 3.1, 3.2, 4.3, 4.4, 5.2, 5.4; and Policies 3.1.2, 3.1.9, 3.2.2, 4.3.1, 4.3.2, 4.4.6, 5.2.3, 5.4.6, 5.4.6A.
[111] DCC S42A Report, paragraph 151.

3.6 District Plan

[146] Ms Lindsay undertook a comprehensive assessment of the relevant objectives and policies of the Operative District Plan (2006) and the 2GP District Plan. Those provisions covered the topics of indigenous vegetation, earthworks, transport, environmental issues, temporary activities, public health, natural environment, mana whenua and heritage. Ms Lindsay concluded that the applicant's proposal was consistent with the relevant provisions.

[147] For the applicant Mr Dale agreed with Ms Lindsay and he concluded that the proposal was fully consistent with the relevant provisions of the Proposed 2GP. He considered that the 2006 District Plan was no longer relevant because with the revision of the road upgrades to avoid the wetlands, the land use consents relating to the indigenous vegetation clearance provisions of the 2006 District Plan (which remain in effect) are no longer triggered.[112]

[148] We agree that the applicant's proposed road widening and realignment works are consistent with the relevant district plan provisions. In making that finding we note in particular that regarding some of the more substantive matters arising from the applications:[113]

- there will be a net gain biodiversity values resulting from the 0.49ha wetland enhancement volunteered by the applicant;[114]
- sediment and dust controls will minimise, as far as practicable, the risk of sediment entering waterbodies;[115]
- the widening and realignment of McLaren Gully Road and Big Stone Road and the upgrading of the intersection with SH1 will better provide for the needs of road users, including existing forestry and residential activities;[116] and
- a Construction Noise Management Plan will ensure adverse noise effects will be minimised to the extent practicable.[117]

3.7 Section 104(1)(c) other matters

[149] No other matters were brought to our attention.

3.8 Part 2 matters

[150] We are aware of the case law which outlines that if the lower order statutory instruments appropriately deal with Part 2 matters, then no further assessment of Part 2 matters is required. We find that recourse to Part 2 matters would not add anything to the statutory instrument assessments that we have set out in preceding sections of this Decision.

3.9 Consent conditions

[151] Ms Lindsay recommended a suite of consent conditions as part of her End of Hearing Report For the applicant a suite of recommended conditions was attached to the Reply submissions that built on those developed by Ms Lindsay. We have generally adopted the Reply version of conditions, but have simplified the conditions relating to lizards and archaeology. We have also amended the wording of many of the conditions so that they impose enforceable obligations on the consent holder.

[152] We note that the applicant sought a ten-year lapse date which we find to be appropriate.

[153] It is conceivable that the conditions imposed by us may contain errors. Accordingly, should the applicant or DCC – Regulatory identify any minor mistakes or defects in the attached conditions, then we are prepared to issue an amended schedule of conditions under s133A of the RMA correcting any such matters.

[112] EIC Maurice Dale, paragraphs 21 and 43.
[113] We list the relevant plan objectives while noting that the policies 'flesh out' those provisions.
[114] Operative Plan Objective 16.2.1 and 2GP Objectives 10.2.1 and 10.2.2.
[115] Operative Plan Objective 17.2.3 and 2GP Objective 8A.2.1.
[116] Operative Plan Objective 20.2.1 and 2GP Objective 6.2.1.
[117] Operative Plan Objective 21.2.3 and 2GP Objectives 9.2.2 and 10.2.1

Consequently, any minor mistakes or defects in the amended conditions should be brought to our attention prior to the end of the 20-working day period specified in section 133A of the RMA.

3.10 Determination

[154] We grant the land use consent required from DCC – Regulatory for the proposed upgrades to McLaren Gully Road (including its intersection with State Highway 1) and Big Stone Road, subject to the consent conditions set out in Appendix 1.

[155] Our reasons are detailed in the body of this Decision, but in summary they include:

- Potential adverse effects of the proposal are either minor; minimised to the extent practicable or are otherwise suitably avoided, remedied, mitigated or offset by the imposition of appropriate conditions of consent; and
- The proposal is consistent with the relevant statutory instruments.

4.0 Otago Regional Council consents

4.1 Consents required

[156] Resource consents are sought from the Otago Regional Council (ORC) as follows:[118]

- Discharge Permit to discharge waste and leachate onto land, to discharge landfill gas, flared exhaust gases, dust and odour to air, and to discharge water and contaminants from an Attenuation Basin and sediment retention ponds to water, for the purpose of the construction and operation of a Class 1 landfill;
- Water Permit to take up to 87 m^3/day and 1,600 m^3/yr of groundwater, and use of up to 50m^3/day of groundwater, for the purpose of managing groundwater collected beneath a Class 1 landfill;
- Water Permit to divert surface water within the Ōtokia Creek catchment for the purpose of the construction and operation of a Class 1 landfill;
- Water Permit to dam water within an Attenuation Basin for the purpose of the construction and operation of a Class 1 landfill;
- Relevant consents under the NPS-FM as discussed in section 2.2 of this Decision.

[157] The applicant sought a consent duration of 35 years for all consents, except for the water permit to take groundwater for which a 6-year duration was sought in order to comply with Policy 10A.2.2 of the Regional Plan: Water for Otago which became operative on 5 March 2022.[119]

[158] Ms Lennox listed the rules triggered by the applications under the relevant ORC regional plans.[120] It was common ground between the ORC consultant reporting officer (Hilary Lennox) and the applicant's planner (Maurice Dale) that applying s88 of the RMA[121] and having applied the bundling principle, the consents required from the ORC are to be assessed as discretionary activities.

[159] As outlined in the ORC Section 42A Report[122] and the evidence of Maurice Dale[123], on 7 April 2022 the DCC amended the application to realign the proposed road carriageway to avoid any direct impact on wetlands located alongside McLaren Gully Road. Accordingly, land use consent is no longer sought under RPW Rules 13.1.2.1, 13.2.3.1 and 13.5.3.1.

[160] Mr Dale advised that series of piezometers or water levels loggers will need to be installed within and adjacent to wetlands as a consequence of proposed changes to hydrological monitoring outlined in Mr Kirk's

[118] ORC Section 42A Report, section 2.1.
[119] ORC Section 42A Report, Attachment 2.
[120] ORC Section 42A Report, Table 1.
[121] The NES-FM regulations 52 and 54 trigger the need for non-complying activity resource consents, however the NES came into force on 3 September 2020, which was after the date of the lodgement of the applications. ORC Section 42A Report, Table 1 and EIC Maurice Dale paragraph 37.
[122] Section 2.2
[123] Paragraph 36 and his footnote 7.

evidence.[124] No resource consents for these monitoring instruments have been applied for to date, but we do not see any issue with consents being sought for those activities at a later time.

4.2 Effects assessment

[161] Ms Lennox advised that a detailed description of actual and potential effects on the environment of the proposed activities, together with the ORC's review of the applicant's assessment of those effects, was provided in Section 7 of the September 2021 ORC Notification Recommendation Report. She advised that her Section 42A Report focussed on matters that remained unresolved at the time of writing the Notification Recommendation Report. We record that we have read the ORC Notification Recommendation Report.

[162] We note that the RP: Waste contains assessment criteria for landfills that we are to have regard to. We refer to specific criteria at the commencement of each effects assessment section that follows, but here we note two criteria that are generally relevant to all of our effects assessments. These are criteria 7.6.1.2(g) and (h) which respectively read:

> *(g) The characteristics of the receiving environment including the current and likely future uses of that environment including residential activities;*
>
> *(h) The mitigation measures, safeguards, and contingency plans to be undertaken to prevent or reduce the actual and potential adverse environmental effects including on residential activities;*

[163] We record that we have regard to those criteria along with the other specific RP: Waste assessment criteria set out in the following sections. We note that the RP: Water and the RP: Air do not contain similar 'assessment criteria', although they do of course contain objectives and policies that we must have regard to.

4.2.1 Permitted baseline

[164] When forming an opinion for the purposes of subsection 104(1)(a) of the RMA we may disregard an adverse effect of the activity on the environment if a national environmental standard or a plan permits an activity with that effect.[125] Ms Lennox was silent on the permitted baseline but Mr Dale suggested that we could disregard the effects of activities permitted under the regional plans, including the discharge of stormwater from the road upgrades; discharge of dust to air from the construction of the road upgrades; drilling of land outside of wetlands to install groundwater and landfill gas (LFG) monitoring bores and the LFG collection system.[126] We find that to be a reasonable suggestion and so it is one that we have adopted.

4.2.2 Landfill and liner design

[165] The applicant has sought consent to discharge waste and leachate onto land and to discharge water and contaminants from an Attenuation Basin to water.

[166] Assessment matter 7.6.1.2(f) of the RP: Waste requires us to have regard to "*Potential contamination of soil or water*." Assessment matter 7.6.1.2(i) requires us to have regard to "*The extent to which the landfill proposal reflects the industry standard for landfills, as represented in the Waste Management Institute New Zealand's Technical Guidelines for Disposal to Land (August 2018)*." In our view these RP: Waste matters are relevant to our consideration of the applicant's proposed landfill and liner design.

[167] Additionally, assessment matter 7.6.1.2(e) in the RP: Waste requires us to have regard to "*The location of the landfill relative to any water body, areas prone to erosion, inundation or subsidence, and areas of cultural, conservation or historic significance*." In our view that assessment matter is relevant to our consideration of the applicant's geotechnical evaluation of the landfill site. In that regard, the applicant has not sought an earthworks consent from the ORC and we confirmed with Ms Lennox that no such consents are required. Earthworks within the designated site D659 are authorised by that designation. However, the applicant has sought consent to discharge waste onto land and in order to manage the potential adverse

[124] EIC Maurice Dale, paragraph 39.
[125] Section 104(2) of the RMA.
[126] EIC Maurice Dale, paragraph 52.

effects of that discharge is it important that the waste is stored securely which in turn relies on the stability of the landfill.

[168] The proposed landfill has been designed by Mr Coombe for the applicant and reviewed by Tony Bryce (Project Director at Tonkin and Taylor) for the ORC. The details of the concept design were fully set out in the application documents and were summarised in Mr Coombe's evidence. The landfill has been designed to comply with the WasteMINZ Disposal to Land Guidelines typically adopted throughout New Zealand.[127]

Landfill design

In his evidence Mr Coombe outlined a number of design features intended to minimise potential adverse effects. Briefly, these are:[128]

- Minimising the landfill footprint and maximising the waste depth to increase void efficiency;
- Utilising the natural landform at the head of two minor gullies to minimise surface water impacts and earthworks;
- Providing a stable structure to retain the waste;
- Using materials on the site to assist with fill and other design features;
- Constructing the attenuation basin in the gully south of the landfill where there are no wetlands;
- Locating the access for trucks to the landfill in the facilities area that is graded at 4%;
- Achieving stable waste placement by the construction of the toe embankment at the outset of construction and through design of a relatively small landfill base. Waste will be placed in the "bowl" of the landfill and supported on all sides as early as possible; and
- Installing the leachate system in its entirety early in the process and enabling the "bowl" to provide emergency leachate storage should this be required.

[169] We discuss the leachate collection and removal system in section 4.2.3 of this Decision.

[170] Mr Coombe noted that the landfill will be sited at the head of a gully and watershed, meaning there is no upstream catchment water of any significance to convey past or though the landfill. The landform on site is a natural amphitheatre shape, but earthworks will be required to develop the site as a landfill. The loess layer and any underlying weak soils will be removed from the entire landfill liner footprint, the facilities area will be cut out and the toe embankment filled. Topsoil will be stockpiled to apply to be used in the final capping layer. The excess cut materials will be stockpiled for daily cover and the loess will be stockpiled for use in the liner and capping layer.[129] As discussed below, there will be some need to stabilise the dispersivity of the loess material for liner use.

[171] The proposed construction of the landfill has a 10m toe bund across the mouth of the valley, with side slopes cut to 1V:4 H (25%) with 10m high benches at 10m height interval (first bench) and up to 10m between the first bench and the landfill perimeter. Floor grades will be generally formed at 4% grade. Mr Bryce considered these design details to be appropriate for landfill stability but noted the overall stability of the landfill at all stages of the landfill development would need to be demonstrated during detailed design, with emphasis on a potential translational failure plane at the liner interface level.[130]

[172] A liner system will be installed on the upstream face. Mr Coombe noted that once the waste is filled to that level, the perimeter swale drain, including the first bench in the landfill liner, will be installed to manage surface water from up slope areas. The landfill liner will be installed at the commencement of waste placement, sufficient to provide for two years waste volume, in order to reduce the extent of liner that will

[127] Technical Guidelines for Disposal to Land, Waste Management Institute of New Zealand (WasteMINZ) 2018
[128] EIC Richard Coombe, paragraph 35.
[129] EIC Richard Coombe, paragraphs 20 and 22.
[130] Tonkin and Taylor s.95 report, 2 September 2021, paragraph 12.

catch rainfall and produce leachate; to allow undeveloped areas to drain to the stormwater system; and to avoid the landfill liner being exposed to the elements any longer than necessary.[131]

[173] A series of subsoil drains will be installed beneath the liner to control potential groundwater pressures beneath the liner system. Mr Bryce noted that without those drains, groundwater pressures have the potential to cause damage to the liner system before sufficient weight has been placed above the liner as a result of waste filling. The layout and extent of the subsoil drains will be determined during detailed design based on detailed site investigations and will be modified as necessary during construction to intercept any observed seeps. Mr Bryce also noted the point of discharge from the groundwater drainage system underlying the liner would be monitored to indicate the presence of leachate leakage though the liner system and that would enable remedial action to be taken as appropriate.[132]

Liner design

[174] The WasteMINZ guidelines already referred to discuss liner types. Types 1 and 2 are proposed for Smooth Hill. A Type 1 liner comprises, as a minimum (from top to bottom), 300mm layer of leachate drainage material, protection geotextile, a 1.5mm high-density polyethylene (HDPE) membrane and 600 mm of compacted clay with permeability of less than 1×10^{-9} m/s. A Type 2 liner comprises (top to bottom), 300mm layer of leachate drainage material, protection geotextile, a 1.5mm HDPE membrane, a geosynthetic clay liner (GCL) and 600mm of compacted clay with permeability less than 1×10^{-8} m/s. GCL is a 5mm thickness of swelling clay laid between two geotextiles and was suggested for the base liner to assist with leachate management and, recognising that the landfill based was relatively small and would be filled quite quickly, providing confining pressure.[133]

[175] The application documents noted both the base and sides of the landfill would comprise a Type 2 liner, but Mr Coombe advised in his evidence and in response to our questions that he recommended a Type 1 liner for the side slopes of the landfill because GCLs have limitations where confining pressures are required to control swelling, and this was harder to achieve on the side slopes. Additionally, the GCL's internal shear strength was limited to cross threading of the geotextile fibres. If during detailed design a GCL was selected for the inclined liner batter slopes, the design would "*carefully assess and test interface shear strength between the individual and composite liner layers to prove internal stability in shear*."[134] The conditions forming part of the applicant's Reply included both Type 1 and 2 liners for the side slopes of the landfill. The landfill base was proposed to be similar to a Type 2 liner but would include a permeability for compacted soil of 1×10^{-9} m/s. The ORC sought one change to the liner conditions, which was accepted by the applicant.

[176] The liner life expectancy and suitability were queried by Mr Rumsby and Mr Ife for the submitter group represented by Ms Irving, and by other submitters. Mr Coombe provided detailed responses to those comments and to points raised by Mr Bryce's technical review. He acknowledged that HDPE liners are susceptible to degradation through sunlight and temperature variations. The one to two years of liner placement at the outset was intended to manage that risk, along with covering the liner with waste or other materials as quickly as possible. He noted that bulk earthworks to advance the liner subgrade would be completed on a larger scale than needed at the time to allow flexibility in the landfill liner development.[135] Regarding Mr Rumsby's concerns, Mr Coombe confirmed that a HDPE liner was appropriate. He acknowledged that its design life can be affected by factors such as heat generated by the decomposing waste, noting that the heat tends to build up in the centre of the landfill where the greatest mass of waste is, but is less of an issue on the edges of the landfill. Removal of putrescible waste reduces the heat generation potential in the landfill centre. The temperatures in a landfill can reach 35-45 degrees Celsius, but were expected to be less at Smooth Hill due to the applicant's intention to remove (as far as is practicable) putrescible waste from the waste stream being discharged at the landfill. We discuss that

[131] EIC Richard Coombe, paragraph 21.
[132] Tonkin and Taylor s 95 report, 2 September 2021, paragraph 13.
[133] EIC Richard Coombe, paragraphs 25-28
[134] EIC Richard Coombe, paragraph 29
[135] EIC Richard Coombe, paragraph 31

aspect further in section 4.2.13 of this Decision where we discuss the issue of bird strike. Mr Coombe stated that the life of the liner depends on it being in "*its best state*" early on as this lessens leakage.

[177] Mr Coombe noted that wrinkles in the liner can be caused by placement over a day when there are varying levels of sunlight and resultant variations in the expansion of the HDPE membrane during welding and before placement of heavy cover materials such as drainage aggregate. Differences in thermal expansion can be achieved by using white HDPE liner rather than black. He also noted the importance of placing drainage cover over the liner as soon as possible, but was careful to point out that this was subject to all quality assurance testing and sign off being completed before covering any of the multiple liner layers. Part of the quality assurance includes observation for wrinkles.[136]

[178] Mr Coombe did not accept that the difficulties encountered at the Greenmount and Rosedale landfills in Auckland that were raised by Mr Rumsby were relevant, noting that those landfills were much older and had been designed and constructed using different design techniques.

[179] As part of the ORC end of hearing report to us, and responding to the points made by Mr Rumsby, Mr Bryce confirmed that for the Auckland Regional Landfill recently consented at Dome Valley north of Auckland, Tonkin and Taylor had prepared a technical paper on landfill liner life and had it peer reviewed by an expert in the United States who was recognised as a world leading expert in his field. That paper concluded that the expected liner life was between 400 and 700 years, using actual measured waste temperatures from two NZ landfills as part of the assessment. Mr Bryce was comfortable that the liner proposed for Smooth Hill and explained by Mr Coombe was consistent with good practice.[137]

[180] Mr Ife's verbal comments during the hearing addressed a suitable liner system. We note those comments were generally derived from the Victoria BPEM, which is a more stringent standard than the WasteMINZ standard for a Type 1 landfill.[138] On that basis we have given more weight to the evidence of Mr Coombe and Mr Bryce.

Use of materials on site for landfill and liner construction

[181] Evidence for the applicant provided by Samantha Webb[139] addressed in detail the suitability of Henley Breccia and loess as construction materials for the landfill. She advised that laboratory testing had confirmed the suitability of re-use of the weathered Henley Breccia as engineered fill in the construction of the slopes and toe bund. Loess was encountered across the site and typically comprised non-plastic to low-plastic silt, with varying amounts of clay, sand and fine gravel. Investigations were undertaken to establish if the loess on site was suitable for use as landfill liner or capping material. Ms Webb advised that the loess had relatively low levels of permeability (at $1x10^{-8}$ m/s), meaning it was suitable for use in the liner or the capping layer. However, it was also potentially dispersive, which was undesirable as that could affect the long-term integrity of the liner. Loess materials can be made non-dispersive through the addition of lime or bentonite. Ms Webb stated that stabilisation of the loess could be achieved with the addition of lime, but the testing was inconclusive on whether the addition of lime changed the deformation characteristics of the soil. She concluded that if loess was to be used in the final liner system, its dispersive nature would need further consideration.[140]

[182] Mr Ife for the submitter group represented by Ms Irving challenged this evidence. He noted that the testing Ms Webb referred to suggested a range of permeabilities. He accepted her evidence that the loess could be treated with lime and bentonite. However, he noted the issue was the degree of plasticity and Ms Webb's evidence had not been definitive on that. This was an important factor and relevant to differential settlement and seismic assessment. Mr Ife considered more testing was required to meet the required standard. In response to our questions, he accepted that if consent was to be granted, the conditions could specify the

[136] EIC Richard Coombe, paragraphs 71 and 72
[137] Statement of Reply of Hilary Lennox dated 24 May 2022, paragraphs 22.1 and 22.2
[138] David Ife Notes of Comments to Panel dated 24 May 2022, paragraphs 14-23
[139] Engineering Geologist now with Davis Ogilvie & Partners Ltd but formerly part of the GHD technical team.
[140] EIC Samantha Webb, paragraphs 9 and 10

level of permeability that must be achieved by the landfill liner and the liner design could also be subject to the Peer Review Panel process. We asked Mr Ife to provide some condition wording for our consideration, which he did. [141]

[183] In response to Mr Ife, Ms Webb accepted the testing of loess completed to date did not provide all of the answers and further testing would be required, focusing on different stabilisation materials (lime and/ or bentonite) and testing stabilised materials for plasticity and permeability.[142] Ms Webb told us she would prefer that conditions of consent retain a level of flexibility for the addition of lime or bentonite to loess and also wished to retain some flexibility around treatments proposed to address the dispersivity of the loess.

[184] While accepting the need for further testing, we were concerned that a 'trigger point' should be established against which the testing result would be assessed. If the 'trigger point' was not met then the use of loess should be precluded. We asked Ms Webb about that and she agreed that would be prudent. She has recommended conditions that require testing for dispersivity, Atterberg limits and saturated hydraulic conductivity. Importantly, the 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. We find that to be appropriate.

[185] The ORC technical reviewer Andrew Stiles[143] confirmed that the use of loess for a liner would be acceptable subject to more review and confirmation during detailed design, with overview of the Peer Review Panel. Mr Bryce was also satisfied that loess should be suitable for use in the liner provided it can achieve the required permeability. He noted that loess is similar to other soils that have been used for liners in other landfills in New Zealand and that the key parameters to specify in a consent condition are permeability and thickness. He cautioned against being overly prescriptive in conditions establishing liner parameters.[144]

[186] Overall, the ORC technical reviewers were satisfied that the applicant's proposed liner system was robust and contained appropriate redundancy, noting that if the HDPE geomembrane developed defects, the underlying GCL and/ or clay would in the first instance limit leakage to the permeability of those components and would also provide an additional barrier and capacity to absorb contaminants. The risk of significant leachate leakage through the liner system would be very low, provided it was constructed with an adequate level of Construction Quality Assurance (CQA).[145]

[187] Having considered the evidence we find that consent conditions should contain a reasonable degree of specificity regarding the intended liner type and design characteristics. We were not persuaded by Mr Coombe's evidence seeking to retain flexibility in that regard, although we acknowledge that he appeared to be open to the conditions including both Type 1 and Type 2 liner descriptions.

[188] As part of the ORC's end of hearing report to us, Mr Bryce provided suggested condition wording referring to both Type 1 and 2 liners and the level of permeability required for each, which he noted to be consistent with the WasteMINZ guidelines. We find those conditions to be appropriate and note our preference for adherence to the WasteMINZ guidelines rather than the Australian standard pointed to by Mr Ife. The liner conditions also make it clear that lime stabilised loess must not be used for the base of the landfill. If stabilised loess is used as a component of the liner system for the side slopes of the landfill, it must be batch processed by weight prior to placement. The conditions also include the CQA requirement recommended by Mr Bryce.

4.2.3 Leachate management system

[189] The applicant has sought consent to discharge leachate onto land and to discharge water and contaminants from an Attenuation Basin to water. Many submitters expressed concern in relation to the possible risk of

[141] EIC David Ife, paragraphs 20-23; David Ife Notes of Comments to Panel dated 24 May 2022, paragraphs 10-13
[142] Additional evidence of Samantha Webb 17 May 2022
[143] Tonkin and Taylor Geotechnical Consultant.
[144] Lennox Statement of Reply, paragraphs 23.1 and 23.2.
[145] Tonkin and Taylor section 95 report dated 2 September 2021, paragraph 14.

landfill leachate affecting wetland habitat and the Ōtokia Creek, including in areas as far downstream as the coast at Brighton.

[190] Assessment matter 7.6.1.2(e) in the RP: Waste requires us to have regard *to "The characteristics, composition and volume of substances being discharged and of any likely by-products occurring from the degradation of these substances*." Assessment matter 7.6.1.2(f) requires us to have regard to "*Potential contamination of soil or water*." Assessment matter 7.6.1.2(i) requires us to have regard to "*The extent to which the landfill proposal reflects the industry standard for landfills, as represented in the Waste Management Institute New Zealand's Technical Guidelines for Disposal to Land (August 2018)*." In our view these assessment matters are relevant to our consideration of the applicant's proposed leachate management regime.

[191] Leachate is produced through decomposition of waste and where rainfall percolates through waste. Higher rates of leachate are generated where waste is being placed in the landfill. This can be mitigated though managing the area of the active landfill face. The rainfall and leachate flow rates through the waste (including areas with daily cover) can be further mitigated through absorption and evaporation. Leachate flows are attenuated on completion of the landfill and application of low permeability capping.[146]

[192] Importantly, the applicant proposes that the leachate generated at the Smooth Hill landfill will be collected and conveyed to leachate storage tanks for removal and disposal off-site, which at this stage is intended to be the Green Island wastewater treatment plant.

[193] Contaminant concentrations in leachate are highest when waste is exposed during landfill operation and decrease with closure and as the landfill ages. Other relevant factors are the decomposition of putrescible material and the transition of waste over time from an aerobic to an anaerobic state, along with the generation of organic acids.[147] Leachate quality is addressed in detail in our discussion of groundwater effects in section 4.2.6 of this Decision.

[194] The application included modelling of the quantum of leachate expected to be generated annually.[148] The largest leachate volumes are expected to occur during Stage 4, with a total predicted leachate volume of approximately 46,310 m^3/year. After landfill closure, the total leachate predicted to be collected is approximately 38,584 m^3/year. The application also calculated predicted leachate leakage through the landfill liner during operation and stage closure, stating that the maximum leachate leakage is likely to occur during Stage 4 operations and after landfill closure.[149] Mr Kirk's evidence stated the rate of leachate leakage through the liner system as being up to 1.4 m^3/year.[150] Mr Ife for the submitter group represented by Ms Irving noted the predicted seepage rate of up to 1.4 m^3/year to be minor and to have a negligible impact on the salinity of groundwater beneath the site.[151]

[195] The application noted that during Stage 1 landfilling, separation between the leachate management system and surface water systems collecting runoff from as yet undeveloped areas of the landfill footprint will be maintained for the longest practicable duration. It stated that when the development of Stage 1 of the landfill has been completed such that the landfill liner has extended to the level of the Stage 1 bench and top of the landfill toe embankment, the risk of leachate loss to surface water is then practically eliminated as the leachate would need to saturate the waste for a depth of 10m before being able to top the bund. This was considered unlikely.[152]

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[146] Application, Appendix 3, section 5.1
[147] Application, Appendix 8, section 4.2.4
[148] Application, Appendix 8
[149] Application, Appendix 8, section 4.2.3 and Figures 10 and 11
[150] EIC Anthony Kirk, paragraphs 7 and 28. Paragraph 26 of Mr Kirk's evidence recorded that the modelling of landfill performance had been updated since his groundwater report dated May 2021 had been prepared to reflect the most up to date liner design set out in the evidence of Mr Coombe. The overall leakage rates during Stage 4 and after closure did not change.
[151] EIC David Ife, paragraph 82. We note that one of Mr Ife's concerns was the impact of Persistent Organic Pollutants (POPs) which we discuss in other sections of our decision.
[152] Application, Appendix 3, section 5.1

[196] The application detailed the leachate management system design requirements as:[153]

- Under normal operating conditions the leachate head within the base of the landfill will not exceed 300mm;
- The perforated leachate pipework will convey the predicted leachate flow from a nominal 10% Annual Exceedance Probability (AEP) rainfall event onto finished surfaces of Stage 1 (that will be predominantly finished with intermediate cover) and a partially completed landfill cell including varying proportions of open liner, uncovered waste and waste beneath daily cover. The flow will be accommodated in the voids within the leachate sump and drainage blanket at the base of the landfill cell;
- Four leachate inclined pumps will be installed into the leachate sump;
- Leachate storage will comprise 48-hour storage capacity plus additional spill-containment storage in the leachate storage tank bund for emergencies;
- Leachate tanks will be above ground and subject to inspection and maintenance;
- Leachate storage tanks will be housed in a spill containment bund capable of containing the capacity of one leachate tank (should the tank fail); and
- Leachate conveyance system will be constructed in polyethylene pipe with welded joint system.

[197] The proposed leachate collection and removal system will comprise:

- 300mm thickness of drainage media overlying the landfill liner;
- 200mm perforated pipework near the base of the drainage media to effectively drain leachate into the drainage sump at the lowest point of the landfill liner, upstream of the toe bund of the landfill;
- Leachate pumps and riser pumps to pump the leachate from the landfill, avoiding the need for penetrations through the lining system for leachate pipes;
- Emergency power supply via a generator to power the leachate pump system in the event of the loss of network supply;
- Three leachate storage tanks to provide 48-hour storage capacity, contained within a bunded area; and
- A load out bay to fill leachate trucks to transport the leachate to the DCC's wastewater treatment plant.

[198] The leachate will be tankered off site until a gravity pipeline is constructed to move the leachate to the Council sewerage system connection in Brighton. Based on assumed filling rates, this will be approximately in the ninth year of landfill operation. Consents for the pipeline are not being sought as part of the current applications.

[199] Down gradient groundwater monitoring wells will be installed between the landfill toe embankment and northern site boundary to provide advance warning of any leachate leakage that may affect the downstream receiving environment.

[200] The AEE noted the volume of leachate generated will be managed by the following measures:[154]

- Preventing clean upslope surface water from entering the placed waste mass and leachate collection system;
- Minimising the size of the active waste tipping area where waste is exposed to rainfall; and
- Covering areas with intermediate cover or final capping as soon as practicable so that as much water as possible is diverted into the stormwater collection systems and to prevent water ingress to placed waste.

[153] Application Appendix 3, section 3.12
[154] AEE section 5.5.

[201] In his review of the leachate collection system as part of the ORC Section 95 Reporting process[155], Tony Bryce[156] noted the adequacy of leachate storage capacity will need to be reviewed in detailed design and determined on the basis of the reliability of the transport system for leachate from the landfill and whether it will be operated 7 days a week. In response, Mr Coombe accepted this, stating that three storage tanks will accommodate a 10-year rainfall event and the tanks plus the bunded area will accommodate flows from a 100-year event with no tankering off site for two days.[157] The applicant's recommended consent conditions require leachate storage and management facilities to 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. As set out above, it is expected that the volume of storage will increase as the extent of the landfill increases.

[202] It is intended that the leachate collection system will also be finalised during detailed design. Mr Bryce considered that the drainage grades on the floor of the landfill were appropriate for effective removal of leachate, noting that calculations will need to be provided with the detailed design to show that a leachate head not exceeding 300 mm can be achieved for the aggregate to be used, the drainage slope and the collector pipe spacing. Noting that the maximum leachate drainage path on the floor of the landfill would be in the order of 150m in distance, Mr Bryce considered it would be difficult to achieve a 300mm leachate head at that distance unless additional lateral pipes were provided, or a very coarse drainage aggregate was used. Mr Bryce suggested the design may need to consider the use of a filter geotextile above the drainage aggregate to protect the drainage capacity of the stone from clogging.[158] Mr Bryce was also concerned that the design showed no leachate collection pipes on the intermediate benches of the landfill. That would result in relatively large volumes of leachate from the side slopes crossing the benches and accumulating on the landfill floor. He suggested that each bench on the liner side batters could accommodate an additional leachate drain to reduce the loads on the drainage pipes at the base of the landfill.[159]

[203] Despite Mr Bryce's comments, Mr Coombe considered the design he proposed to be adequate. For the leachate drainage pipework, he had chosen two 200mm diameter perforated HDPE pipes. In his opinion, these were more resistant to crushing for a given pipe wall thickness than one larger pipe. The two pipe system would also reduce build-up of leachate on the landfill liner should one pipe block. Overall, the pipe network was designed to cope with extra leachate and associated pressure, and extra leachate and blockage. On the issue of placing leachate pipes on the inclined liner benches, Mr Coombe noted these have a 2% longitudinal gradient, however the detail to return the pipes with multiple bends across the 10m wide bench leading to the leachate sump at the base of the landfill, while still allowing for "water jetting", was complicated. He considered the proposed system with pipes at the bottom of the landfill batter to be simpler and more appropriate.[160]

[204] Mr Ife was of the opinion that the leachate collection system should be 300mm thick and comprise granular material (coarse gravel or aggregate) with fines content less than 1% and comprising no calcareous (limestone fragments). He considered the leachate collection pipes should be sloped at no more than 1% towards the leachate sump and should be made accessible for inspection and cleaning periodically or when required.[161]

[205] Mr Rumsby raised concerns about the clogging of the leachate collection system with coal ash, however Mr Coombe advised that it was not proposed to accept coal ash at the landfill.[162] Mr Bryce also suggested that some provision be made to clean the leachate pipes, noting this could be readily achieved with a pipe laid up the slope of the toe bund to clean-out ports located at the surface of the landfill. Mr Coombe

[155] Review Report of Landfill Concept Design dated 2 September 2021.
[156] Project Director, Tonkin and Taylor [Technical Director – Environmental Engineering].
[157] EIC Richard Coombe, paragraph 46.
[158] Tonkin and Taylor s95 report, 2 September 2021, paragraph 15.
[159] Tonkin and Taylor s95 report, 2 September 2021, paragraph 15.
[160] EIC Richard Coombe, paragraphs 37-45.
[161] David Ife Notes of Comment to Panel dated 24 May 2022, paragraphs 19-21.
[162] Additional evidence Richard Coombe 17 May 2022.

accepted provision should be made for cleaning, noting that the life of the leachate collection system is related to how it is maintained. We have included this requirement in the attached conditions, including those specifying the contents of the LMP.

[206] As part of the ORC's end of hearing report to us, we asked Mr Bryce to confirm his final opinion of the leachate collection system. He stated that he would prefer more pipes where the leachate can accumulate, particularly on the landfill benches. He otherwise accepted the system as proposed by the applicant. Given this is a matter of detailed design and will need to be considered and certified by the ORC (acting on the advice of the Peer Review Panel) as set out in the conditions, we need take this matter no further.

[207] Finally on this topic, we note that a number of submitters raised concerns about leachate leakage and flow on effects on the environment. Mr Coombe responded to much of this in his evidence[163] and we have addressed related concerns in other parts of our Decision. We are satisfied on the basis of the expert evidence before us that leachate can be properly managed through consent conditions and will be the subject of further expert review in the detailed design stage.

4.2.4 Tip face size limit

[208] Evidence presented by the applicant to address fire risk included a recommendation from Anthony Dixon that the size of the active tip face be no more than 300m^2 in hot and dry conditions.[164] However, the size of the tip face is also relevant to the management of bird strike, odour and leachate.

[209] We explored with several experts the appropriate size for the tip face to address all of these effects. In response to our questions Mr Coombe advised that an area of 300m^2 was appropriate and that such a limit could serve other purposes in addition to managing the fire risk. Mr Ife also considered an area of 300 m^2 was appropriate.[165] Mr Bryce noted that it was common to have a condition that restricts the active landfilling area as this controls a number of potential effects. Recent consents he had been involved with restricted the active working face to 1200 m^2 and 6400 m^2 respectively. Mr Bryce noted that the amount of exposed area that is practicable depends on how the tip face is managed and how trucks access the tip face and place waste on site. He considered a limit of 1000m^2 to be reasonable, noting that 300m^2 would become unworkable and would be regularly exceeded.[166]

[210] The draft conditions attached to Mr Dale's Reply evidence volunteered two separate limits:[167]

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

[211] The applicant's draft conditions also included a requirement that the full extent of the 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-minute intervals.[168]

[212] In light of the applicant's position, we have imposed both volunteered limits on the size of the tip face. While we acknowledge Mr Bryce's point on the workability of the smaller tip face, this smaller 300m^2 limit would only apply in significant fire conditions. We consider that to be appropriate. We have also included the requirement for the monitoring of the landfill area by a camera system.

4.2.5 Earthworks, stormwater, erosion and sediment control

[213] As we have noted earlier in this Decision, within the D659 footprint neither earthworks nor vegetation clearance consents are required from the ORC. However, the earthworks that will be undertaken are

[163] EIC Richard Coombe, paragraphs 48-59.
[164] EIC Anthony Dixon, paragraph 45(b)(i).
[165] David Ife Notes of Comments to Panel, paragraph 21
[166] Lennox Statement of Reply paragraphs 15.1-15.4
[167] Applicant Reply, draft general conditions 29 and 30
[168] Applicant Reply draft general condition 31

important in terms of creating a stable platform upon which the waste will be deposited (and the discharge to waste to land does require consent from the ORC). For that reason, we briefly address earthworks matters here.

[214] Earthworks are expected to include cut and fill to create required landfill base slopes and storage volume (including the removal of all loess and unsuitable soils); construction of a toe bund to form a buttress at the low point of the landfill and containment of leachate; cut and fill for internal roads and site facilities; liner construction; landfill capping and landscaping on completed cells.

[215] Construction of the landfill will involve vegetation clearance, followed by bulk earthworks. Bulk earthworks to construct the landfill base grade of each stage are expected to typically involve cuts of 5m depth but will be deeper on some ridges. Excavated topsoil, loess and some underlying weathered and unweathered breccia will be progressively stripped, separated and stockpiled for reuse during landfill development. The expected use of the materials is as follows:

- Topsoil – stockpiled for placing on the final cap of each stage for establishment of vegetation;
- Alluvial deposits – stockpiled for use as a growing layer on the final cap or for disposal as daily cover;
- Loess – stockpiled and used in establishment of the low permeability liner, final cap and as intermediate cover material;[169]
- Underlying weathered breccia – stockpiled and used as construction fill.

[216] The AEE set out the location of the stockpiles and their expected heights, along with approximate volumes.[170] It also set out the indicative earthwork volumes, noting that the net material deficit is estimated as 187,000m^3 of construction fill or cover soils. This could be offset by the use of site-won materials, the potential for waste soils to be used as daily cover and site-won material arising from the construction of the site facility and stockpile platforms beyond the immediate landfill footprint as well as surplus material from road upgrades outside of the site.[171]

[217] The applicant has however sought consent from the ORC to discharge water and contaminants from an Attenuation Basin and sediment retention ponds to water. Assessment matter 7.6.1.2(e) in the RP: Waste requires us to have regard to "*The location of the landfill relative to any water body, areas prone to erosion, inundation or subsidence, and areas of cultural, conservation or historic significance*." In our view that assessment matter is relevant to our consideration of the applicant's proposed erosion and sediment control measures.

[218] Stormwater and surface water runoff management and control will be required across landfill construction, operation and aftercare phases. Permanent systems will be designed to accommodate a 1% AEP storm event and temporary systems will be designed to accommodate a 10% AEP storm event. These systems will divert and enable separation of all surface runoff from the areas where waste is placed. Additionally, they will enable monitoring of runoff from areas of intermediate or final cover and will provide the ability to redirect contaminated runoff to the leachate system.

[219] Appendix 9 to the application comprehensively addressed stormwater control. It noted that stormwater systems were required to ensure that:[172]

- Stormwater is diverted and separated from waste to avoid contamination;
- To the extent practicable, erosion and transport of sediment from earthworks will be minimised through minimising exposed soil surfaces, installing cut-off drains to minimise flow over exposed earth surfaces, installing temporary measures where practicable to minimise the transport of sediment from earthworks areas and stabilising these areas with vegetation or by other means as soon as practicable;

[169] We discuss the possible re-use of loess in Section 4.2.2 of this Decision.
[170] AEE page 59.
[171] AEE page 60.
[172] Application, Appendix 9, section 4.1.

- Suitable conveyance systems are in place to carry the stormwater to treatment devices to remove any sediment carried with the stormwater; and
- Adequate treatment systems are in place to remove sediment from stormwater at all stages of development and operation of the landfill.

[220] Appendix 9 to Ms Lennox's Section 95 Notification Recommendation Report described the key features of the proposed stormwater and surface water runoff management systems,[173] which we summarise as follows:

- Outlet pipes through the toe bund for the discharge of surface water directly to the downstream tributary (Stage 1 only);
- A permanent perimeter swale drain constructed progressively as the landfill stages to intercept upslope flows and divert them around the landfill to the Attenuation Basin to the west of the landfill;
- A permanent Attenuation Basin, receiving stormwater and surface water runoff from the landfill site including gullies, the perimeter swale drain, pre-construction areas, construction areas, landfill operational areas not subject to waste contamination, the upper facilities area and the final cap;
- Sediment retention ponds (SRPs) to collect and provide primary treatment of stormwater and surface water runoff from the two stockpile areas and lower facilities area prior to discharge. SRPs will also be constructed at the immediate base of the excavation for each stage of the landfill. Stormwater and surface water runoff from the SRPs will be discharged either to the Attenuation Basin or downstream watercourses;
- Temporary drains and grades on the landfill operational surfaces to divert all surface water runoff to the landfill perimeter drain (excluding runoff that has come into contact with waste, which will instead be diverted to the leachate collection system);
- Grading of the final cap to flow to the perimeter swale drain; and
- As discussed in section 3.2.9 of this Decision, stormwater generated by the upgraded roads outside the designated site will discharge either via roadside swales or directly to watercourses and wetlands as currently occurs.

[221] In his evidence for the applicant, Allen Ingles[174] confirmed the landfill design features. He noted that the construction of the landfill would result in a net loss in stormwater runoff from the site, but that, in his opinion, the reduction was less than would be expected to occur due to annual climatic variation and less than would occur as a result of afforestation of the area.[175] We discuss this further in section 4.2.7 of this Decision addressing surface water effects.

[222] Mr Ingles noted that the earthworks associated with the construction, operation and closure of the landfill will result in significant land disturbance and, if not managed, the potential for generation of elevated sediment concentrations in runoff from the site. Stormwater Management Procedures and controls had been included in the draft LMP and would be developed further in the detailed design stage.[176]

[223] On the evidence we are satisfied that the design and implementation of sediment control measures will take into account site specific conditions and be in accordance with best practice guidelines, including the commonly used Auckland Council Publication GD05 – *Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region – June 2016* for the sizing of ponds and Environment Canterbury's *Erosion and Sediment Control Toolbox*. The applicant's recommended conditions included a number of matters addressing earthworks, stormwater and erosion and sediment control. Having reviewed those conditions, and having amended them as discussed in section 4.12 of this Decision, we find that compliance with those conditions will satisfactorily avoid, remedy or mitigate effects.

[173] Application Appendix 9, section 4.2 and Lennox Section 95 Report, pages 7-9.
[174] GHD Ltd Technical Director for the Water Sector
[175] EIC Allen Ingles, paragraph 8.
[176] EIC Allen Ingles, paragraph 50.

4.2.6 Groundwater quantity and quality

[224] Many submitters were concerned about the potential for leachate from the proposed landfill to contaminate the underlying groundwater. Relevantly in that regard, assessment matter 7.6.1.2(f) in the RP: Waste requires us to have regard to "*Potential contamination of soil or water*".

[225] Appendix 8 to the applicant's AEE addressed groundwater effects. Evidence was presented for the applicant by Anthony Kirk.[177] The groundwater report and Mr Kirk's evidence was reviewed for the ORC by Sally Lochhead.[178] Mr Ife and Mr Rumsby also gave evidence on groundwater effects for the submitter group represented by Ms Irving.

[226] The construction of the proposed landfill will intercept shallow groundwater beneath the site. A network of subsoil drains will be constructed beneath the landfill liner system. Drainage will be taken to an access manhole before being discharged to the Ōtokia Creek catchment. A groundwater discharge rate of 87 m^3/d is predicted from the sub-surface drains. The applicant's groundwater report[179] identified leachate as being a key discharge from the proposed landfill, which may result in contaminants entering groundwater. We addressed the landfill liner and the estimated leachate leakage in section 4.2.3 of this Decision.

[227] The applicant undertook site investigations to identify the underlying geological and hydrogeological conditions. Most of the site and upper reaches of the valleys therein are reported to be dry with ephemeral stream flows. The proposed landfill footprint and associated infrastructure is located within the upper reaches of the Ōtokia Creek catchment which sits within the McColl Creek surface catchment. The groundwater report identified the area of the proposed landfill footprint to be in an area of limited groundwater resource, reflecting both the limited recharge area and the low annual rainfall in the catchment in which the landfill is proposed to be located, as confirmed by the rainfall records from the on-site metrological station established in 2020.[180]

[228] The applicant identified both shallow and deep groundwater systems at the site. The shallow groundwater system was stated to be limited to the valley setting and not overlying the deeper groundwater system. The shallow groundwater system was considered to be the predominant receiving environment for potential leachate leakage. Mr Kirk predicted that as a result of reduced rainfall infiltration within the landfill footprint, shallow groundwater flow within the Ōtokia Creek sub catchment within that footprint would reduce from approximately 3,000 m^3/year to 2,200 m^3/year, with a commensurate reduction in shallow groundwater levels of less than 1m immediately downgradient of the landfill. Assuming no soakage of stormwater to ground, he predicted that would result in a reduced groundwater discharge to Ōtokia Creek. Mr Kirk also predicted recharge to the deep groundwater system would be reduced from approximately 3,000 m^3/year to 2,200 m^3/year following placement of the landfill. He did not consider that reduction in recharge, and associated reduction in groundwater levels, would result in an adverse effect as it was his assessment that the deep groundwater does not currently support any registered groundwater takes and was unlikely to provide baseflows to any streams, instead flowing southeast and discharging to the Pacific Ocean.[181]

[229] Through the ORC's Section 92 request for further information and in various discussions that followed between the experts, Ms Lochhead queried the applicant's conceptual groundwater model. Those discussions appeared to clarify the nature of the deeper low permeability and unweathered Henley Breccia underlying the landfill site, the absence of fractures and defects within the cored boreholes at depth, and why groundwater flows would be low and slow within that deeper groundwater system. As a result of Ms Lochhead's review, it was agreed that a further borehole[182] would be drilled between two existing bores to further inform the geotechnical investigation. It was anticipated that this would also assist to better understand the groundwater conditions at the site. In her report that formed part of the ORC Section 42A

[177] Environmental scientist with GHD specialising in hydrogeology, groundwater-surface water interactions and water quality.
[178] Senior hydrogeologist with Tonkin and Taylor.
[179] Dunedin City Council, Waste Futures Phase 2 - Work Stream 3. Smooth Hill Landfill, Assessment of Effects to Groundwater, GHD, August 2020 (Updated May 2021).
[180] EIC Anthony Kirk, paragraph 13 and Tonkin and Taylor section 95 report dated 2 September 2021, paragraph 21.
[181] EIC Anthony Kirk, paragraphs 8 and 9.
[182] BH301.

report, Ms Lochhead noted that more recent information provided in March 2022 provided groundwater level records obtained from two nesting piezometers. These showed consistent groundwater levels recorded on two monitoring occasions.[183] The groundwater levels recorded in BH301 at both piezometers were for the deeper groundwater system.

[230] In the same report, Ms Lochhead stated that she could not conclude if potential effects on groundwater quality in the shallow groundwater system (either by itself or following the implementation of the proposed mitigation measures as they stood at that time) would be minor or less than minor because the presence and depth to shallow groundwater across the wider landfill footprint was not well known. The monitoring bore piezometers at BH301 did not include monitoring of the shallow groundwater system, which meant that all data for the shallow groundwater was limited to predominantly the north-western periphery of the landfill footprint.[184]

[231] Ms Lochhead considered that a more detailed quantification of recharge to the deep groundwater system was required and suggested that could be addressed through a consent condition requiring monitoring of the deeper groundwater at the toe of the landfill. She also disagreed with the applicant's suggestion that detailed quantification of recharge to the deep groundwater system was not required and repeated her recommendation for a consent condition to address this point. [185]

[232] In response Mr Kirk opined that the current understanding of groundwater and surface water at the proposed landfill site was that a localised shallow groundwater system was present as a function of the distribution of permeable alluvium and weathered Henley Breccia within the topographical lows of the valleys. That shallow system supported groundwater levels near the surface in the valley floor. Mr Kirk did not agree with Ms Lochhead's recommendation that the extent and water balance of the shallow aquifer should be further assessed and set out his reasons for that. Nevertheless, he recommended that a transect of four additional boreholes and shallow groundwater monitoring wells be installed within the landfill footprint and extending downgradient to the edge of the wetland. These would provide further information on the shallow groundwater system and the dynamic relationship between groundwater and the 'swamp wetland' located adjacent to the proposed toe of the landfill. Mr Kirk noted that, where possible, these additional bores would be aligned with existing or proposed locations for longer term monitoring to make best use of available information and the additional bores would also be monitored during the baseline period.[186] We agree that is a prudent approach.

[233] In her review, Ms Lochhead recommended additional monitoring wells. These were included in the applicant's draft conditions attached to the evidence of Maurice Dale as GW1, GW5 and GW7 and shown on drawing C309. Ms Lochhead also recommended the additional specification of units of measures and the analyte fraction of groundwater samples for analysis. Mr Kirk accepted that it would be appropriate to monitor Kjeldahl nitrogen[187] and organic carbon, however while he agreed that total phosphorous should be included in the suite of surface water parameters, he did not agree it should be added to the groundwater monitoring requirements due to the potential for sediment in monitoring wells to limit the reliability of any results. Mr Kirk recommended instead that dissolved reactive phosphorous (DRP)[188] should be monitored as an indicator of leachate discharges.[189] That seems appropriate to us.

[234] As part of the ORC end of hearing report to us, Ms Lochhead acknowledged that the applicant had provided further clarification regarding the extent of the low permeability stratum that separated the shallow and deeper groundwater systems, but noted that, in her opinion, uncertainty remained with the hydrogeological

[183] Tonkin and Taylor Section 42A Report on groundwater effects, paragraph 35. Monitoring was undertaken in February and March 2022.
[184] Tonkin and Taylor section 42A report on groundwater effects, paragraph 65.
[185] Tonkin and Taylor section 95 report dated 2 September 2021, paragraphs 38-45 and Tonkin and Taylor section 42A report on groundwater effects, paragraph 47.
[186] EIC Anthony Kirk, paragraphs 66-67.
[187] Total Kjeldahl Nitrogen (TKN) is a laboratory test that is made up of both organic nitrogen (nitrogen in amino acids and proteins, plant tissue and detritus) and ammonia.
[188] DRP is the portion which is dissolved and can immediately support plant and algae growth.
[189] EIC Anthony Kirk, paragraphs 68-69.

model. She noted the applicant had proposed improvements to groundwater monitoring, with additional monitoring locations at the landfill toe/wetland and 36 months of quarterly groundwater baseline monitoring prior to construction. Ms Lochhead was of the opinion that monitoring should be undertaken monthly rather than quarterly. She considered monitoring for a 36-month period to be satisfactory.[190] We agree with Ms Lochhead that for the baseline period, monthly monitoring is appropriate.

[235] As noted earlier we also heard from two experts called by the submitter group represented by Ms Irving. Mr Ife suggested that a landfill should not be sited where groundwater met drinking water standards.[191] We note that Ms Lochhead agreed that the WasteMINZ guidelines considered that to be a constraint on landfill siting, but that the presence of potable groundwater did not mean the site should not be developed for a landfill. She noted the applicant had shown there was limited groundwater resource at the site and the groundwater systems have low flows and low yields with the closest active groundwater consent located over 5km from the site. She did not consider this to be of concern [192] and nor do we.

[236] Mr Rumsby stated that "*PFAS compounds make ideal warning compounds of potential leachate impacts*…"[193]. In response, Ms Lochhead noted there were other more easily monitored indicators (such as ammoniacal nitrogen[194], conductivity and chloride) that were mobile in groundwater and would help to determine the presence of leachate in groundwater. [195] We agree and note that those parameters are included in the recommended groundwater monitoring suite.

[237] From the technical evidence before us, and assisted by Ms Lennox's synthesis of it, we consider that some small degree of uncertainty remains regarding the risk of contamination of the shallow groundwater system. However, in that regard we note several mitigating factors:

- firstly, any groundwater contamination would need to arise from a breach of the landfill liner and we have already found that the applicant's proposed liner system is fit for purpose;
- a subsoil drain network beneath the landfill liner and at the toe of the landfill will provide groundwater dewatering during landfill construction and in the long term;
- if leachate leakage through the liner did occur and circumvent the subsoil drain network, it would take a long time to infiltrate through the underlying soil and thereafter enter the shallow groundwater before making its way to the adjacent surface water in the 'swamp wetland'. It is likely that the now extensive intended shallow groundwater monitoring will identify any such contamination and enable the consent holder to undertake remediation measures;
- there is currently no extractive or consumptive use made of either the shallow or deeper groundwater beneath the site and indeed it was uncontested that the deeper groundwater flows towards the coast; and
- in our view any residual concerns regarding the efficacy of the 'conceptual groundwater model' will be alleviated by 36 months of baseline groundwater quality and level monitoring and the continuation of such monitoring for the durations of consent.

[238] Importantly, Ms Lennox's end of hearing report to us did not recommend that consent be refused based solely on groundwater effects.[196] While we acknowledge Ms Lochhead's disappointment that the applicant did not undertake fulsome groundwater assessments prior to lodging the application, having reviewed the evidence that is now available (and in light of the bullet points we set out above) we are satisfied that potential adverse effects of the proposed landfill on groundwater do not of themselves weigh against a grant of consent. In saying that we note that 36 months of baseline groundwater monitoring will enable the setting of fixed 'baseline groundwater quality trigger values' against which potential groundwater contamination

[190] Lennox Statement of Reply, paragraph 34.1.
[191] EIC David Ife, paragraphs 32-35.
[192] Lennox Statement of Reply paragraphs 35.1-35.2.
[193] EIC Andrew Rumsby, paragraph 31.
[194] Ammoniacal nitrogen (NH_4-N), also often called 'ammonium', is the concentration of nitrogen present as either ammonia (NH_3) or ammonium (NH_4). It is toxic to aquatic life at high concentrations.
[195] Lennox Statement of Reply paragraph 35.3.
[196] Lennox Statement of Reply paragraphs 34, 35 and 99-101.

can be assessed throughout the life of the landfill. If those trigger values are breached then potentially difficult and costly remedial measures will need to be undertaken by the then consent holder to either arrest the source of contamination or divert the contaminated water to the leachate storage tanks. That appears to be a risk that the applicant is willing to take.

[239] For completeness, we note that the QHRRA produced by the applicant and the Reply Evidence of Mr Kirk addressed both surface water and groundwater risks. These documents are discussed more fully in section 4.2.7 of this Decision.

4.2.7 Surface water quantity and quality

[240] Numerous submitters, including representatives of the Ōtokia Creek and Marsh Habitat Trust and residents from Brighton, were concerned about the potential effect of 'escaped' landfill leachate on water quality in the lower estuarine reach[197] of Ōtokia Creek (especially during periods of low flow) and the ocean at Brighton Beach. Those submitters described the recreational use of the Ōtokia Creek that occurred in the Brighton area and the extensive community-based habitat restoration efforts (primarily planting indigenous plants) undertaken by volunteers in the estuarine portion of Ōtokia Creek (including the Ōtokia Marsh).

[241] Relevantly, assessment matter 7.6.1.2(f) in the RP: Waste requires us to have regard to "*Potential contamination of soil or water*."

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[242] The proposed landfill is within the Ōtokia Creek catchment. An amphitheatre series of ephemeral gullies[198] run through the site in a south to north direction, merging at the northern edge of the site where standing water forms a 'swamp wetland'. The 'swamp wetland' is connected to Ōtokia Creek by an unnamed tributary. Matthew York[199] advised (based on flow monitoring he has undertaken since October 2013) that the Ōtokia Creek catchment above McLaren Gully Road can be dry for up to four months of the year, usually from January to the end of April / mid-May and that "…*the flow over most of the year is a bit above a trickle*."[200]

[243] The unnamed tributary forms part of a valley floor marsh wetland system. Around 200m downstream of McLaren Gully Road it joins the main stem of the Ōtokia Creek[201] which flows to the coast at Brighton, approximately 12.9 km downstream of the landfill site.[202] Perennial flows in Ōtokia Creek reportedly occur approximately 1,000 m downstream of the toe of the proposed landfill.

Surface water quantity

[244] Surface water in the 'swamp wetland' and the unnamed tributary leading from it is currently sourced from both overland flow (stormwater) from the landfill site and from shallow groundwater beneath the site. The landfill will reduce surface water infiltration and subsequent recharge of the shallow groundwater system that feeds the unnamed tributary, particularly during Stage 4 when the 18.6 ha landfill footprint is fully developed. The construction of the landfill will also result in a net loss in overland flow from the site.

[245] The applicant considers that:

- construction of the landfill will result in a reduction in shallow groundwater flow to the 'swamp wetland' (and subsequently to the unnamed tributary and Ōtokia Creek) of around 800 m^3/year;[203] and

[197] Commencing around 3 km from Brighton Beach.

[198] It was common ground between Ms Lennox and Mr Dale that these gullies are not 'rivers' in RMA terms.

[199] A witness for the submitter Ōtokia Creek and Marsh Habitat Trust.

[200] EIC Matthew York, paragraphs 15 and 17.

[201] The Creek is itself a wide linear-wetland system for approximately 3 km downstream of McLaren Gully Road, moving between areas with defined channel with intermittent flows, and areas of diffuse flow and wider wetland habitat. EIC Tanya Blakely, paragraph 59.

[202] ORC Notification Report, section 4.4.

[203] Shallow groundwater flow within the Ōtokia Creek sub catchment within the landfill designation will reduce from approximately 3,000 m^3/year to 2,200 m^3//year (equivalent to 0.025 L/s), with a reduction in shallow groundwater levels by less than 1m immediately down gradient of the landfill. EIC Anthony Kirk, paragraphs 8 and 32.

- surface runoff to that wetland will reduce by approximately 20% during construction of the landfill, reducing to 19% following completion of filling due to the change in surface cover.[204]

[246] Regarding the loss of groundwater recharge to the 'swamp wetland' Mr Kirk advised[205] "*However, given the low rate of groundwater recharge, and its minimal contribution to the wetland water balance, I do not consider that loss of flow to the wetland estimated to be 800 m^3/year, will have a meaningful influence on the wetland hydrology. This reduction in flow will however, be mitigated through gradual release of water stored in the attenuation basin following rain events. This will provide the means of prolonging saturation of the wetland following run-off events and is also predicted to greatly mitigate the influence on wetland saturation which may result from reduced run-off due to the landfill development*."

[247] Regarding the reduction in overland flow to the 'swamp wetland', Allen Ingles[206] advised that the reduction was less than would be expected to occur due to annual climatic variation and less than would occur as a result of the reafforestation of the area. He did not consider that hydrological changes would lead to loss of wetland extent at the site.

[248] The applicant initially considered that the point where the unnamed tributary draining the 'swamp wetland' transitions from ephemeral to perennial (downstream of McLaren Gully culvert) could move downstream by up to 45m as a result of the above factors. However, Mr Ingles' evidence was that no discernible change to the flow regime within the valley floor marsh wetland was anticipated.

[249] Turning to Ōtokia Creek, Mr Ingles considered that low flow volumes from the landfill area provided a very minor contribution the Creek's low flows, being in the order of only 1 - 2%. He suggested that was significantly lower than variations that would occur annually as a result of climatic variation and changes that would occur during the forestry cycle and accordingly there would be no discernible change in the Ōtokia Creek flows.[207]

[250] As noted by Ms Lennox and set out in Attachment 7 to the ORC Section 42A Report, based on the applicant's AEE and its response to Section 92 requests for further information, the ORC technical reviewer Peter Cochrane[208] considered that there while there were some uncertainties regarding effects on surface water hydrology, those effects were, from a hydrological perspective, likely to be minor affecting only a small reach of the unnamed tributary downstream of the landfill site.

[251] NPSFM Policy 7 is that "*The loss of river extent and values is avoided to the extent practicable*." In light of the above evidence, we are satisfied that has been achieved in this case and furthermore that potential adverse effects on surface water hydrology are no more than minor.

[252] We discuss effects on the wetland in section 4.2.8 of this Decision.

Surface Water Quality

[253] In terms of the existing environment, limited surface water quality monitoring undertaken to date indicates that Ōtokia Creek downstream of the landfill site complies with ANZ Guidelines (ANZG)[209] water quality criteria, with the exception of cadmium, copper, chromium, arsenic, lead, nickel, manganese and zinc.[210] Surface water samples have also exceeded the RP: Water receiving water limit for achieving good water quality[211] for nitrate, reflecting existing and historical forestry and other land use operations.

[204] EIC Allen Ingles, paragraphs 32 and 33.
[205] EIC Anthony Kirk, paragraph 55.
[206] GHD Ltd Technical Director.
[207] EIC Allen Ingles, paragraph 42.
[208] Tonkin and Taylor Principal Water Quality Scientist.
[209] Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018
[210] EIC Anthony Kirk, paragraphs 6 and 24.
[211] Schedule 15 Receiving Water Group 2.

[254] The construction, operation, and aftercare of the landfill will result in the generation of leachate, stormwater containing sediment and other contaminant runoff which has the potential to enter the shallow groundwater, the downstream unnamed tributary and thereafter Ōtokia Creek. However, the risk of that occurring is minimised by the proposed erosion and sediment runoff controls described in section 4.2.5 of this Decision and the leachate collection and treatment system described in section 4.2.3.

[255] Mr Kirk predicted that the parameters that are expected to increase in the shallow groundwater system following landfill development included: iron, lead, DRP[212], ammoniacal nitrogen, chromium and Total Kjeldahl Nitrogen[213] (TKN). He considered that concentrations of lead and chromium were not anticipated to exceed the ANZG water quality criteria for 95% freshwater species protection. He suggested that iron and TKN were not of concern given concentrations greater than those predicted after the landfill is developed have been recorded in the existing shallow groundwater system. DRP would not exceed the RP: Water Schedule 16A discharge threshold or the Schedule 15 receiving water limit.[214]

[256] The discharge of total inorganic nitrogen is predicted to reduce within the shallow groundwater system following development of the landfill when compared to existing conditions, with a corresponding reduction also being expected within Ōtokia Creek.[215] We note that to be a water quality improvement. Mr Kirk concluded that that the impact of the landfill on surface water quality would be negligible.

[257] The lower Ōtokia Creek is a low energy water body affected by tidal events and it is occasionally blocked from reaching the sea. Mr Ingles considered that any water quality impacts that did occur in the unnamed tributary would further decrease as one progressed downstream and consequently any effect in the lower reaches of Ōtokia Creek and at Brighton[216] would be undetectable.[217] .

[258] Nevertheless, the applicant has proposed surface water quality monitoring and the establishment of trigger levels to respond to changes in water quality and take action if necessary, suggesting some metrics (95th percentile) as being appropriate. Mr Kirk advised[218] that "*a detailed programme of [quarterly] baseline water quality monitoring will be undertaken over a period of 36 months prior to landfill development … The information from this to be used to develop water quality trigger levels protective of the environment and determine the long-term monitoring requirement*s." Mr Ingles noted that the refinement of trigger levels during the early stages of operation would assist with avoiding frequent false alarms.[219]

[259] Mr Kirk also advised:[220]

> *"The proposed approach for water quality trigger levels, which comprises trend analysis, does not provide a single threshold for water quality. Instead, it compares values and trends over time, which allows improvements in conditions over the long term to be accommodated. Such trend-based trigger levels are a more reliable means of identifying changing conditions than fixed value limits."*

[260] We consider that approach to be rather novel and note that other experts, including David Ife[221], shared our concern regarding Mr Kirk's proposed methodology. In our experience it is more common for either:

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[212] Dissolved reactive phosphorous.
[213] TKN is sum of Ammonium, Organic and Reduced Nitrogen. Total Nitrogen is sum of Total Kjeldahl Nitrogen (TKN), Nitrite and Nitrate.
[214] EIC Anthony Kirk, paragraphs 42 to 45.
[215] EIC Anthony Kirk, paragraph 46.
[216] This was an issue of concern to the numerous submitters we heard from including Brighton Surf Lifesaving Club, R Aburn, Big Stone Forest Ltd, S & A Ramse, A Hutchison, Saddle Hill Community Board, South Coast Neighbourhood Society Inc (SCNS), and Scott Weatherell.
[217] EIC Allen Ingles, paragraph 71.
[218] EIC Anthony Kirk, paragraph 50.
[219] EIC Allen Ingles, paragraph 63.
[220] EIC Anthony Kirk, paragraph 70.
[221] Senior Principal Hydrogeologist with EHS Support Pty Ltd called as a witness by Big Stone Forest Limited, A Ramsey, and Ōtokia Creek and Marsh Habitat Trust and South Coast Neighbourhood Society Incorporated.

- discharge (or end of pipe) standards to be set in consent conditions for point source discharges to ensure receiving water guideline standards are met after reasonable mixing; or
- numerical receiving water quality standards (to be met after reasonable mixing) to be set in consent conditions for either point source or diffuse discharges, based on appropriate water quality guidelines. Where background (or existing) water quality already exceeds those guidelines then receiving water quality standards can be based on the existing water quality, which in this case will be determined by the proposed 36 months of baseline monitoring.

[261] The first option is not suitable for diffuse discharges (such as where groundwater seeps into surface water) as is the case here for potential leachate leakage resulting from liner breaches. It may however be appropriate for discharges from the Attenuation Basin. In that regard the applicant proposes continuous monitoring of water quality in the sediment retention pond and the Attenuation Basin. If monitoring reveals that water in either pond it is not suitable to be released (namely it exceeds the trigger levels), portable pumps will discharge the pond water to the leachate management system and ultimately to the Dunedin wastewater treatment system.[222] In our view this represents a suitable precautionary approach, provided the 'trigger levels' are set appropriately as outlined above.

[262] In response to our concern, as part of the evidence lodged in support of the applicant's Reply submissions Mr Kirk[223] advised:

> *"To provide a specific concentration limit for groundwater and surface water quality I have subsequently proposed use of a more simplistic upper concentration limit trigger level, derived as mean plus three standard deviations of a baseline dataset. These are to be updated every 5 years to accommodate the long-term improvements in catchment water quality that may result due to landfill development and/or change in forestry … The upper concentration trigger level method proposed allows detection of long-term change in water quality, where that change results in parameter concentrations greater than previously measured at the site. This effectively constrains any changes in water quality to within the range experienced at the site over the preceding 5 years or the baseline condition if catchment improvements do not occur. … Table 3 of the proposed conditions of consent outlines actions in response to trigger level exceedance, with this including statistical analysis of water quality".*

[263] We find Mr Kirk's revised approach to the setting of water quality trigger levels to be appropriate.

Risks to Human Health

[264] Big Stone Forest Limited, A Ramsey and the Ōtokia Creek and Marsh Habitat Trust and South Coast Neighbourhood Society Incorporated amongst others expressed concerns regarding the potential risk associated with Persistent Organic Pollutants (POPs) that might be contained in landfill leachate. This was also addressed in the evidence of Mr Ife who considered that although the estimated leachate seepage rate was minor and would have a negligible impact on the salinity of groundwater beneath the site, the impact of POPs on groundwater quality would be significant.[224]

[265] In response Mr Kirk advised that with the very small volume of leachate predicted to leak from the landfill (the maximum leachate leakage rate at landfill closure is 1.4 m^3/year) and the predominantly limited mobility of POPs,[225] he considered it very unlikely that POPs would influence water quality downgradient of the landfill.[226] However, Mr Kirk went on to state that of the group of known POPs, Perfluorooctanesulfonic acid (PFOS) and similar salts demonstrated notably different properties, being mobile in the environment. The occurrence of PFOS was widespread and known to occur in municipal landfill leachate at modest

[222] EIC Coombe, paragraph 52.
[223] Reply Evidence, Anthony Kirk, paragraphs 57 and 58.
[224] EIC David Ife, paragraph 82.
[225] These contaminants predominantly have a very high affinity to bind to soils and so demonstrate very low mobility in the environment.
[226] EIC Anthony Kirk, paragraphs 88 to 92.

concentrations. He recommended that analysis of leachate and surface water for this group of POPs be included in the landfill monitoring programme as a cautionary measure.

[266] We were not persuaded that simply monitoring for POPs after the landfill is established was a suitable approach, given the potential adverse effects on human health should those contaminants find their way into the Ōtokia Creek. Accordingly, we asked the applicant to consider preparing what we termed a 'Quantitative Public Health Risk Assessment' that would assess the potential contamination of the Ōtokia Creek from the discharges of contaminants to land and water for which consents have been sought from the ORC. We advised that would assist us with considering the matters raised by submitters who undertake recreational activities in and along the Ōtokia Creek and in the waters at Brighton Beach.

[267] We received the QHHRA (which included an Extended Water Quality Assessment (EWQA)) on 22 June 2022 and comments from Andrew Rumsby on behalf of the submitters Ōtokia Creek and Marsh Habitat Trust on 29 June 2022 and from Tonkin and Taylor[227] on behalf of the ORC reporting officers on 7 July 2022. Unsurprisingly the comments from the submitters and the ORC identified what the respective reviewers considered to be shortcomings in the QHHRA. A comprehensive response to the reviewers' comments was provided in a further brief of evidence from Mr Kirk that was included as part of the DCC's Reply submissions. We note that Mr Kirk's Reply evidence was prepared with the assistance of Kylie Dodd.[228]

[268] The QHHRA and the two reviews contained a wealth of highly detailed technical information. We deliberately keep our following findings at a higher level so that our overall assessment will not be lost in a myriad of detail:

- The EWQA extended the water quality assessments discussed above to the potential effects of a total failure of the landfill's entire HDPE liner over a period of only 50 years, with a delay of five years to implement any mitigation measures. That equates to the removal of 3,700m^2 of liner per year following landfill closure. We find that to a conservative approach;
- The EWQA predicted the leachate discharges that would result from the liner failure and the impact of that leachate on groundwater and water quality outcomes within the landfill designation and downstream within the Ōtokia Creek extending to Brighton. That information then underpinned the QHHRA;
- Landfill leachate quality was conservatively assumed to have high contaminant concentrations, derived from landfill leachate measured at other municipal solids waste landfills in New Zealand and Australia;
- Leachate was assumed to mix immediately with the volume of groundwater flowing to the adjacent wetland, with no allowance for contaminant transport, chemical and physical attenuation processes, time to travel or distribution of contaminants throughout the sub-surface. We find that to a conservative approach;
- The groundwater volume was assumed to immediately mix with average surface water flow within the designation. No allowance was made for longer downstream groundwater flow (within the wetland sediments), dry periods or separation of groundwater and surface water within the swamp wetland that would limit contaminant mobility. We find that to be a conservative approach;
- The assessment was based on PFAS but also included a range of contaminants including organic contaminants not typically measured or reported in landfill leachate;
- Contaminant concentrations in the surface water were assumed to be available for assimilation and uptake by biota. The water quality "effects" criteria assume protection of 95% to 99% of freshwater species which is appropriate for slightly to moderately disturbed ecosystems such as that which occurs in Ōtokia Creek;
- The QHHRA considered the risks associated with ingesting PFAS compounds through a variety of concurrent exposure pathways, namely recreational use of Ōtokia Creek, gathering and consumption of food from Ōtokia Creek (such as eels and watercress) and the consumption of home-grown produce (such as fruit and vegetables) or livestock products (eggs, milk and meat) watered from Ōtokia Creek. We find that to be a conservative approach;

[227] Dr Lyn Denison Technical lead Environmental – Human Health Risk Assessment.
[228] GHD Technical Director – Risk Assessment, based in New South Wales, Australia and co-author of QHHRA.

- The rates of ingestion for each pathway are very conservative and reflect high rates of exposure much above those of the average person; and
- Based on all of the above conservative assumptions the QHHRA determined that near to Brighton (in our view that being the most likely point of public exposure to the water in Ōtokia Creek) the Hazard Index (HI)[229] was 0.05 for PFOS + PFHxS and 0.0002 for PFOA compounds compared to an acceptable HI threshold of 1.0.

[269] As with any study such as that undertaken by the applicant as outlined above, improvements and refinements could be made. However, we are satisfied that the EWQA and QHHRA assumptions are all conservative and the predicted HI's are so far below the acceptable threshold that there is no need for us to forensically address what appear to be some valid shortcomings identified by the submitter and ORC reviewers.

[270] That would be the case even if the acceptable HI threshold was halved to 0.5 instead of 1.0, as was recommended by Mr Rumsby.

[271] In light of our findings we accept Mr Kirk's evidence that:

- *"Given the significant overexpression of risk in the landfill liner failure scenario, I have a high degree of confidence in the overall conclusion of the risk assessment: that the risks of adverse effects to ecosystems and the public from landfill discharges to Ōtokia Creek are negligible";* and
- *"Even with considering the changes proposed by Mr Rumsby and Otago Regional Council's technical reviewer, I do not believe the outcomes of the liner failure risk assessment will materially change."*[230]

[272] We find that unacceptable adverse effects on human health are unlikely to result even if the extremely conservative liner degradation scenario assumed in the EWQA and QHHRA eventuates. That being the case a more realistic partial liner failure scenario would poses an even lower risk to human health. We consequently find that a consideration of the potential adverse effects of leachate leakage on human health does not weigh against a grant of consent.

4.2.8 Wetland hydrology

[273] As we discussed earlier, the DCC has amended the application to realign the proposed road carriageway to avoid any direct impact on roadside wetlands located alongside McLaren Gully Road. There will, therefore, no longer be any direct impact on these wetlands as a result of the proposed road realignment.

[274] However, many submitters were concerned about potential adverse effects on wetlands below the landfill footprint, given the loss of wetlands nationally. There is a small (c.0.5 ha) 'swamp wetland' situated around 10m below the location of the proposed landfill toe. It contains harakeke flax, tall gorse, purei and rautahi / cutty grass and scattered sedgelands. Downstream of this 'swamp wetland' defined channels containing small areas of open surface water start to form and connect to a valley floor marsh wetland, which commences at about the D659 boundary and continues for approximately 1.2 km to a culvert beneath McLaren Gully Road.[231]

[275] NPSFM 2020 Policy 6 is that "*There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted*."

[276] As noted by Ms Lennox and documented in Attachment 7 to the ORC Section 42A Report, based on the applicant's AEE and its response to Section 92 requests for further information, the ORC technical reviewer

[229] Chronic health risks for threshold toxicants are assessed by comparing the estimated intake doses with toxicity reference values (TRVs). TRVs are a measure of tolerable daily exposure and include values that are referenced by different agencies using a range of terms, including acceptable daily intake (ADI), tolerable daily intake (TDI), reference dose (RfD) or minimal risk level (MRL). The ratio of the estimated intake to the TRV for each exposure pathway is termed a Hazard Quotient (HQ) and all the HQs are summed to derive an overall Hazard Index (HI).

[230] Reply Evidence. Paragraphs 22 and 23.

[231] EIC Tanya Blakely, paragraph 13.

Peter Cochrane was unable to conclude whether potential adverse effects on wetland hydrology would be minor or less than minor.

[277] We discussed the reduction of overland flow (stormwater) from the site and Mr Ingles' evidence on that matter in the preceding section of this Decision. Regarding the 'swamp wetland' and the valley floor marsh wetland, Mr Ingles considered that while construction and operation of the landfill had the potential to decrease flows in those intermittent water courses, the effects of the flow reduction would be mitigated to a significant extent by the attenuation effect of the wetland systems. Furthermore, the Attenuation Basin constructed as part of the landfill works would assist by retaining stormwater and releasing surface flows to those wetlands over a longer period.[232]

[278] Regarding the reduction in shallow groundwater recharge to the 'swamp wetland', and expanding on our discussion in the preceding section of this Decision, Mr Kirk advised:[233]

> *"To provide context for the predicted rates of reduction in flow to the wetland, the predicted reduction in groundwater flow is estimated to be in the order of 2-3 m^3/day or 0.3% of the calculated average water flow to the wetland. I consider that such a decrease in inflow and wetland saturation would most likely be unmeasurable in the context of the natural variability"*
>
> *"Saturation of the wetland from the surrounding catchment will continue to occur …. Mitigation of effects, if any, of reduced inflow to the wetland from the landfill area is proposed to be provided by the attenuation basin, which I understand will have a minimum useable volume for wetland water supplement of 500 m^3".*

[279] Mr Kirk went on to state[234] that "… *in the order of 25 m^3/day, or three times total estimated groundwater inflow [will be available from the attenuation basin which], will more than offset any loss of groundwater flow to the wetland*."

[280] We accept Mr Kirk's evidence and find that adverse effects on the 'swamp wetland' will be no more than minor and consequently its values will be protected. Having made that finding, it is axiomatic that adverse effects on the valley floor marsh wetland will also be no more than minor.

[281] Finally, the Lower Ōtokia Creek Marsh is located towards the bottom of the catchment. At that location the contribution to surface flows from the landfill site is very small, and any adverse effect associated with Creek hydrology at this location will be no more than minor.[235]

[282] We are satisfied that NPSFM Policy 6 is met for the natural wetlands affected by the landfill proposal, noting that we discuss wetland restoration and the applicant's proposed Vegetation Restoration Management Plan in section 4.2.12 of this Decision. Having said that, we note that for the applicant Dr Jazz Morris observed that the 'swamp wetland' is proposed to be substantially enhanced, and with the mitigation measures from a Vegetation Restoration Management Plan (VRMP) in place, he considered that the outcome for the 'swamp wetland' would be a net gain. We agree.

4.2.9 Aquatic biodiversity

[283] In terms of the existing environment, the ephemeral gullies traversing the landfill only contain flowing water only after persistent rainfall. Those watercourses have no clearly defined bed and a general absence of natural bed substrates, and do not provide any habitat for freshwater macroinvertebrate or fish fauna. The 'swamp wetland' and the macrophyte-dominated unnamed tributary of Ōtokia Creek to the north of the site may contain some surface water throughout the year. However, it is unlikely that they support indigenous

[232] EIC Allen Ingles, paragraph 40.
[233] EIC Anthony Kirk, paragraphs 72 and 75.
[234] EIC Anthony Kirk, paragraph 76.
[235] ORC Notification Report, section 7.6.

fish populations other than migratory longfin and shortfin eels.[236] Having said that, it is likely that further downstream the Ōtokia Creek supports a wider range of indigenous fish species.[237]

[284] The above waterbodies support a suite of macroinvertebrate taxa[238] that are commonly found in soft-bottomed and slow-flowing / standing water freshwater systems.[239] That macroinvertebrate community, which provides a good indication of stream or ecosystem health, is dominated by "soft-bottom taxa". The macroinvertebrate community index (MCI), and its variant (SQMCI), indicate that the unnamed tributary has "poor" stream health and water quality.[240]

[285] As noted by Ms Lennox and as documented in Attachment 9 to the ORC Section 42A Report, based on the applicant's AEE and its response to Section 92 requests for further information, the ORC technical reviewer Mike Lake[241] was in general agreement with the applicant that the potential adverse effects on freshwater ecological matters would in all likelihood be low (which we take to mean minor) provided all mitigation actions proposed by the applicant were implemented. Notwithstanding that level of agreement, for completeness and in acknowledgement of submitter concerns we nevertheless discuss freshwater ecological matters below.

[286] Ms Blakely concluded that because there was expected to be no discernible change to the flow regime in the open channels in the valley floor marsh wetland, she did not expect there to be any change to that freshwater habitat or existing fish passage opportunities.[242]

[287] On the evidence we find that the existing freshwater ecology (as described above) that may potentially be impacted by landfill runoff, leachate or reduced flows is relatively unremarkable. NPSFM Policy 9 is that "*The habitats of indigenous freshwater species are protected*." We are satisfied that will be the case here given the paucity of such species in the potentially affected waterbodies and we accept Ms Blakely's conclusion that the activities for which consent is sought form the ORC will have a very low (less than minor) level of effect on the moderate freshwater ecology values that are present.[243]

[288] Turing to aquatic vegetation, for the applicant Dr Jazz Morris considered that any reduction in water levels may at worst slightly alter habitat suitability for largely exotic species that occupy a currently wetted channel in the 'swamp wetland', but would not alter its extent or indigenous plant values. Those values are unremarkable as the indigenous species present within the wetland are widespread and common, and also typical of the many larger, more intact, and / or more diverse flaxland / sedgeland wetland features located elsewhere within the wider area.[244]

[289] Regarding the valley floor marsh wetland area, Dr Morris did not expect any net loss of its habitat, nor any change to its extent or condition. That wetland contains scattered indigenous rushes and sedges and rautahi forms a sward in places. The indigenous vegetation is modified with a substantial cover of exotic species and contains similar weeds to those found in the 'swamp wetland'. He considered that the valley floor marsh wetland appeared well buffered against even a more substantive hydrological change than that predicted by Mr Kirk and Mr Ingles.[245]

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[236] During freshwater surveys, one longfin eel (*Anguilla dieffenbachii*) and two shortfin eel (*Anguilla australis*) were captured in a large manmade pond created in the 1970's located around 300m downstream of the site. EIC, Tanya Blakely and Dr Jazz Morris.

[237] EIC Matthew York, paragraph 28. An April 2021 eDNA sample also suggested the presence of Giant and Banded kokopu, mudfish and redfin and Cran's bully.

[238] Including seed shrimps (Ostracoda) and other freshwater crustaceans (Cladocera and Copepoda), freshwater clams (Sphaeriidae), the ubiquitous native mud snail Potamopyrgus, aquatic worms, springtails and other freshwater snails, low numbers of damselfly nymphs, freshwater beetles and true fly larvae. EIC Tanya Blakely, paragraph 43.

[239] EIC Dr Tanya Blakely, paragraph 15.

[240] ORC Notification Report, section 4.10.

[241] Tonkin and Taylor Senior Freshwater Ecologist

[242] EIC Dr Tanya Blakely, paragraph 54.

[243] EIC Dr Tanya Blakely, paragraph 65.

[244] EIC Dr Jazz Morris, paragraph 26.

[245] EIC Dr Jazz Morris, paragraphs 30, 94 and 95.

[290] For Ms Irving's submitter group, Kelvin Lloyd considered that the applicant's assessments did not take into account dryland species[246] increasing in cover within the wetland if water supply to it decreased.[247] In that regard we note Dr Morris' advice that restoration actions are proposed in a Vegetation Restoration Management Plan, including pre-construction baseline monitoring of wetland extent and water levels, implementation of a vegetation restoration plan that would see weed control, indigenous planting, and planting of a buffer of indigenous dryland species around the existing 'swamp wetland'. The 'swamp wetland' is to be supported by further restoration work in the upstream connected flax land and kanuka forest in West Gully. Dr Morris was of the opinion that the proposed restoration works would improve their condition relative to current state (a net gain) and increase their resilience to any water level changes that may occur[248]. We agree and in our view that will provide more than adequate mitigation of any increase in dryland species that was of concern to Mr Lloyd.

[291] Dr Morris concluded[249] that the adverse ecological effects of the activities for which consent is sought on wetland habitats would be either inconsequential or undetectable in most areas. We accept his evidence and in overall terms we find that potential adverse effects on aquatic biodiversity will be no more than minor.

[292] Regarding the impact of persistent organic pollutants on aquatic ecology, for the liner failure leachate discharge scenario that we described in section 4.2.7 of this Decision, the EWQA determined that all downstream concentrations of PFOS in the Ōtokia Creek would be well below the 95% freshwater species protection value. However, a number of locations in the upper reaches of the Ōtokia Creek concentrations of PFOS could exceed the 99% freshwater species protection value. In those reaches the aquatic fauna is sparse (as we outlined earlier) and so secondary poisoning of higher trophic level organisms is unlikely to occur. We find that a consideration of the potential for bioaccumulation of leachate contaminants, including persistent organic pollutants, does not weigh against a grant of consent.

4.2.10 Terrestrial biodiversity

[293] Earthworks and vegetation removal within the designated site are authorised by that designation. The applicant has not sought earthworks consents or vegetation clearance consents from the ORC and we confirmed with Ms Lennox that no such consents are required. Consequently, the scope of our consideration of terrestrial biodiversity (as opposed to aquatic biodiversity) is limited to riparian vegetation adjoining the 'swamp wetland' and the Ōtokia Creek. On the evidence received we do not consider that the proposal will have any adverse effects on that riparian vegetation. In making that finding we note the verbal advice of Mr Markham that the endangered Eastern Falcon would not nest in the swamp wetland or the low vegetation on its margin.

4.2.11 Operating hours

[294] The operating hours the applicant originally proposed[250] were:

- Monday to Sunday 7.00am to 7.00pm; and

[295] The landfill would be closed on:

- Christmas Day;
- Easter Friday;
- New Year's Day; and
- the morning of Anzac Day (until 1pm).

[296] It was also proposed that the landfill operator would be allowed to commence operations one hour before and up to 1.5 hours after the opening hours to prepare for waste delivery in the morning and to close off the

[246] Including gorse and trees such as makomako, tarata, and radiata pine.
[247] EIC Kelvin Lloyd, paragraph 26.
[248] EIC Dr Jazz Morris, paragraph 16.
[249] EIC Dr Jazz Morris, paragraph 97.
[250] EIC Chris Henderson, paragraph 64.

works at the end of the day. Staff or contractors might be on-site outside these hours for required work, monitoring or maintenance.

[297] A number of submitters were concerned about the disruption that the landfill operation would cause to existing recreational activities around the site, particularly on Big Stone Road. Several submitters suggested that the landfill should not be allowed to operate on weekends or at least on Sunday. In response to the submissions of Big Stone Forest Limited and A & M Granger, the DCC offered to amend the Smooth Hill operating hours to 8am to 6pm seven days a week, noting that the Smooth Hill landfill will be required to operate seven days a week to receive bulk waste transferred from the Green Island Transfer Station.[251] We consider the applicant's offer did little to appease the concern of submitters.

[298] In Minute 4 we asked the applicant to consider reduced operating hours, including precluding the receipt of waste on Saturday afternoons and Sundays. In Reply the applicant did not offer to amend the proposed operating hours. We found this response disappointing. Based on the evidence available to us we were not persuaded there is a critical need for the Smooth Hill landfill to receive bulk waste transferred from the Green Island Transfer Station seven days a week. We have revised the conditions to preclude the delivery of waste on Sundays. That will provide a clear window of time during weekend periods when recreational use of Big Stone Road can occur in an unimpeded manner. We have also reduced the operating hours on Saturdays to 9.00am - 5.00pm.[252] We consider those alterations to the operating hours to be an appropriate acknowledgement of, and response to, the concerns expressed to us by submitters.

4.2.12 Biodiversity offsets

[299] The applicant has proposed to implement a Vegetation Restoration Management Plan that would involve:[253]

- a 'Smooth Hill Reserve' that includes the swamp wetland, and the upstream connected flax land and kanuka forest in West Gully 3. Within the swamp wetland potential changes in vegetation composition in the 'swamp wetland' will be mitigated by weeding, planting, monitoring and ongoing protection; and
- a wetland offset area of 0.49 ha that sits within the landfill site upstream of and connected to the swamp wetland (it is generally located below West Gully 4).

[300] That restoration will improve the condition of those wetlands relative to current state (a net gain) and increase their resilience to any water level changes that may occur.[254] As we noted elsewhere in this Decision, that proposal is supported by Te Rūnanga o Ōtākou.

[301] As a result of the existing designation and avoidance of roadside wetlands, the biodiversity enhancement works referred to above are not directly triggered by any of the consents required for the landfill proposal. Notwithstanding this, the applicant remains committed to enhancing the 0.49 ha West Gully 4 wetland area and offered an '*Augier'* condition of consent relating to those restoration activities.

[302] We understand an *'Augier'* condition of consent to be a condition volunteered and agreed to by an applicant for a resource consent under RMA section 108AA(1)(a)[255]. We asked for legal advice during the hearing on the scope of conditions that can be imposed on an '*Augier'* basis. ORC's legal counsel, Ms Mehlhopt, advised us that such a condition needs to meet criteria as established through Environment Court case law[256] and does not necessarily need to relate to the activity for which consent is sought.

[303] We are satisfied that the proposed condition to enhance the 0.49ha West Gully wetland area represents a biodiversity offset and we agree it can be included as a condition of consent on an '*Augier*' basis under s108AA(1)(a).

[251] EIC Chris Henderson, paragraph 61 to 66.
[252] Condition 41 of the Discharge Waste and Leachate to Land consent.
[253] Opening submissions, paragraph 89.
[254] Additional evidence 17 May 2022 Dr Jazz Morris, paragraph 16.
[255] ORC Final Legal Submissions, paragraph 6.
[256] ORC Final Legal Submissions, paragraphs 2-10.

[304] An issue traversed at the hearing was whether the applicant had put forward appropriate ecological offsetting methodologies to ensure any residual effects are offset and compensated so that there is no nett loss in ecological values. We note the applicant's opening legal submissions which state:

> *"Despite the likelihood of residual effects being extremely low, draft consent condition 65 has also now been updated so that any offset or compensation required to address residual adverse effects remaining after implementation of the EFMP, LiMP and the FWMMP must use methodologies that are transparent, logical, and use accepted ecological principles to derive the related offset/compensation type, and quantum".*[257]

[305] The ORC End of Hearing report[258] set out the following response from Mr Markham:

> *"There is still some uncertainty regarding how the hydrology of the wetlands will be affected, and there still isn't enough specific information on the tolerance of these wetlands to make a conclusion regarding the quantum of ecological effects. It is, however, possible that monitoring of these wetlands and the use of offset and compensation tools could appropriately address residual adverse effects.*
>
> *There is still disagreement regarding the level of detail required in terms of effects on lizards, avifauna, wetlands, and vegetation. However, the overall level of ecological effects should still be manageable and able to be offset or compensated for. It is, therefore, possible that agreement could be reached on appropriate conditions that require the use of offset and compensation tools to appropriately address residual adverse effects".*

[306] We do not share Mr Markham's concerns regarding lizards, avifauna and vegetation; primarily because as we have noted previously, there is no consent required under the ORC regional plans for vegetation clearance or earthworks within the designated site D659 (thereby limiting our scope to consider the effects of such activities). Regarding the potentially affected wetlands, in section 4.2.8 of this Decision we concluded that with the mitigation measures set out in the applicant's Vegetation Restoration Management Plan (VRMP) in place, the biodiversity outcome for the 'swamp wetland' would be a net gain.

[307] Furthermore, we have already addressed the effects of the proposed road widening and realignment works (for which consent is required from DCC – Regulatory) in section 3.2.5 of this Decision and have imposed land use consent conditions in response to potential effects of those activities on terrestrial biodiversity.

[308] We find that the applicant's offered biodiversity offset works as specified in the Vegetation Restoration Management Plan are more than adequate having regard to the actual and potential effects on biodiversity arising from the consents required from the ORC.

4.2.13 Bird strike

[309] As submitted by counsel[259] for the applicant in Reply, Plan Change 1 (Dust suppressants and landfills) to the Regional Plan: Waste for Otago became operative on 9 July 2022 and it introduced a requirement that discharges from landfills within 13 kilometres of airports that are used for regular air transport services by aeroplanes capable of carrying more than 30 passengers are to be assessed in order to prevent increasing the existing risk of bird strike. This section of our Decision addresses that requirement.

[310] From the evidence of Phillip Shaw,[260] a witness for the applicant, we note there are three main ways that putrescible waste[261] landfills near airports can affect bird strike risk:

- Site Risk: Aircraft overfly the landfill and birds soaring above can conflict with aircraft;
- Flight Path Risk: Birds traverse aircraft flight paths to and from the landfill; and

[257] Opening submissions, paragraph 67.
[258] ORC, End of Hearing Report, pages 14-17
[259] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraphs 54 and 58.
[260] Founder and Managing Director of two Australian consulting firms, Ecosure Pty Ltd and Avisure Pty Ltd and President of a Vancouver-based Canadian company, Avisure Services Limited.
[261] Putrescible waste is attractive as a food resource to several bird species, as it is generally abundant, easily obtained, and is nutritionally adequate for many species. Putrescible waste includes organic material that is subject to decay, and includes household and commercial food wastes. EIC Phillip Shaw, paragraph 32.

- Spill Over Risk: Significant population growth of species receiving abundant food results in 'spill over' onto areas around or on the airport. This can be highly influenced by certain events, such as heavy rainfall, calving season, or ploughing activity.

[311] In this case we understand the primary risks of concern to be 'site risk' and 'flight path risk'.

[312] Mr Shaw helpfully described the nature of the bird strike risk:[262]

> *"The main factors determining the consequences of a strike are the number and size (total mass) of wildlife struck, the phase of flight when struck and the part of the aircraft hit. Generally, the larger the bird or animal, the greater the damage. Large birds and bats can destroy engines and windshields and cause significant damage to airframe components and leading-edge devices. Strikes involving more than one bird (multiple strikes) can be serious, even with relatively small birds, potentially disabling engines and/or resulting in major accidents. Engine ingestions on take-off and initial climb when power settings are high are normally more damaging and potentially more threatening to continued flight than those on approach. En-route strikes are less common as en-route flight normally occurs above the threat layer, but they are potentially more disabling to the aircraft because collision speed is normally high during this phase of flight."*

[313] Mr Shaw advised that in the USA (where the largest dataset exists), 82% of strikes to commercial aircraft were reported to have occurred at or below 1500 feet (457m) above ground level. As birds mostly fly at lower altitudes conflict with aircraft is most likely during take-off and landing.[263] In that regard DIAL's General Manager Operations and Infrastructure, Danial De Bono, advised that if an aircraft was flying at an altitude of 2,000 feet (609m) as it crossed the Smooth Hill site on descent or take-off, it would be 1,640 feet (500m) above ground level (AGL) as it tracked over the site. Consequently, there is a potential 'site risk' associated with the proposed landfill.

[314] The consequences of bird strike on aircraft can be very serious. As noted by Mr Shaw, even minor strikes that result in no damage can reduce aeroplane engine performance, cause concern among aircrew and add to airline operating costs through aborted procedures and/or delay and/or unscheduled maintenance checks. We understand that the worst-case potential adverse effect is the downing of the aircraft and the significant loss of life. We agree with Matthew Bonis[264] (DIAL's planning witness) that would fall within the RMA section 3(f) meaning of effect, namely "*any potential effect of low probability which has a high potential impact*" and we note that counsel for the applicant also agreed.[265]

[315] DIAL CEO Richard Roberts advised that the draft conditions appended to Mr Dale's evidence went a long way to meeting DIAL's concerns, but two matters remained outstanding:[266]

> *"The ability to receive "highly odorous waste"- condition 43. DIAL accepts that receiving wastewater treatment biosolids and screenings can be managed and form a vital part of the DCC's functions as a Council. However, receiving commercial loads of animal remains, waste from meet [sic] processes, wool scour, tannery, and fellmongery waste, and fish waste are all products that must be taken elsewhere to other commercial waste disposal operators. It is hard to imagine a waste stream more attractive to black back gulls.*
>
> *Condition 75 and Attachment 3. Attachment 3 has been included because a defined and enforceable percentage of contaminated waste could not be agreed. However, the problem with attachment 3 is that after sorting general waste at the Bulk Transfer Waste Station, the contaminated waste is still taken to Smooth Hill, rather than diverted to alternative sites along with the organic waste. That is unacceptable. From DIAL's point of view, the whole point of separating out the contaminated waste was to divert it elsewhere."*

[316] We have borne those two matters in mind when undertaking our assessment.

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[262] EIC Phillip Shaw, paragraph 26.
[263] EIC Phillip Shaw, paragraph 27.
[264] Associate at Planz Consultants in Christchurch.
[265] Opening submissions, paragraph 70.
[266] EIC Richard Roberts, paragraph 20

Policy Guidance

[317] The assessment of bird strike risk is guided by the statutory instruments.

[318] DIAL is 'nationally and regionally significant infrastructure' as defined by the Partially Operative Otago Regional Policy Statement (PORPS). Dunedin International Airport is also defined as Nationally Significant Infrastructure under the Proposed Otago Regional Policy Statement 2021 (PRPS).[267] Ms Lennox considered that with regard to DIAL, the landfill proposal was contrary to Policies 4.3.3, 4.3.5(a) and (b), and 4.6.8(b) of the PORPS. We note the directive nature of Policies 4.3.3 and 4.3.5(b)[268] in particular and those provisions read respectively (our emphasis):

> *Provide for the functional needs of infrastructure that has regional or national significance, <u>including safety</u>.*
>
> *Protect infrastructure with national or regional significance, by all of the following:*
> *…*
> *b) <u>Avoiding</u> significant adverse effects on the functional needs of such infrastructure;*
> *…*

[319] In 2018 Mr Shaw completed a Wildlife Hazard Assessment for DIAL which determined that the existing bird strike risk at the airport was high. That risk arose from the Waihola-Waipori-Sinclair Wetland Complex located 6 km to the southwest of the airport and also from surrounding agricultural land uses, including a DIAL owned dairy farm located adjacent to the airport.

[320] Mr Shaw advised that the implication for the proposed Smooth Hill landfill in risk management terms was that it should not increase DIAL's existing bird strike risk any further.[269] In evidence he stated[270] "… *without mitigation the Smooth Hill Landfill would present an unacceptable risk to aviation*" and "*The bird strike risk in the Dunedin airspace is already high and additional risk should not be created*."

[321] Unsurprisingly then, it appeared to be common ground amongst the parties that the Smooth Hill landfill (in this case specifically the discharge of waste to land for which consent is required from the ORC) must avoid exacerbating the existing bird strike risk at DIAL and that such an outcome must be achieved with certainty.

[322] Consequently, the task we faced was to assess whether or not the above outcome can be achieved. From the evidence it appeared to us that there are three aspects to that assessment:

- The type of waste that should be allowed to be deposited in the landfill;
- The management of birds at the landfill; and
- The wider management of bird numbers and colonies.

[323] We now discuss those three aspects.

Allowable Waste Types

[324] Mr Shaw unsurprisingly advised that putrescible waste attracts birds to a landfill and he noted that the existing Green Island landfill that accepts mixed wastes supports thousands of Southern black-backed gulls (SBBG) and other bird species.[271]

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[267] EIC Matt Bonis, paragraphs 15 and 17.

[268] We note there was debate at the hearing regarding the applicability of Policy 4.3.5(a) relating to 'reverse sensitivity' We are not persuaded that is relevant here given the commonly understood application of 'reverse sensitivity' relates to sensitive activities (which the Smooth Hill landfill is not) encroaching on existing activities resulting in complaints (typically noise or odour) from the encroaching sensitive activities leading to additional restrictions being placed on the existing activity.

[269] EIC Phillip Shaw, paragraph 43.

[270] EIC Phillip Shaw, paragraphs 62 and 90.

[271] Other species attracted to landfills include red-billed gull (Larus novaehollandiae), feral pigeon (Columba livia), common starling (Sturnus vulgaris), house sparrow (Passer domesticus), various finch species, ducks and shags.

[325] As we noted in section 1.5 of this Decision, the DCC has resolved to move to a 'four bins plus' kerbside collection. That means "…*food waste will be separated at the kerbside and subsequently processed for beneficial reuse. The processing facility for food waste (and garden waste) will also accept commercial drop-off. General waste will be consolidated at Green Island Transfer Station prior to transport to Smooth Hill*."[272] We understand that the food and garden waste will go to an Organics Processing Facility (OPF) run by the DCC.

[326] Mr Shaw recommended that it would be appropriate to classify the Smooth Hill landfill as a non-putrescible facility.[273] However, we note that the applicant's Draft Smooth Hill Bird Management Plan (SHBMP) states:[274]

> *"Even with kerbside collections including a "food waste bin" and an optional "garden waste bin", it is anticipated that some organic waste will still enter the general waste stream. It is critical that this is minimised as much as is reasonably possible. The landfill will also receive "special wastes" that have a high putrescible content (e.g. waste from food manufacturing or as part of clean up during emergency response)."*

[327] Counsel for the applicant submitted[275] that after careful consideration the DCC had decided that it could not exclude residual putrescible material from the landfill "*The reason being that DCC considers that it is in best interests of the Dunedin community and local businesses to have the ability for a disposal facility for municipal waste material in the district, rather than having to truck it out of the district on all occasions to another class 1 landfill.*" We acknowledge the DCC's position regarding the trucking of waste out of the district aligns with the wishes of Te Rūnanga o Ōtākou.

[328] Regarding the 'residual putrescible material', we understand from the evidence of Mr Dale[276] that general waste from all sources (DCC collections, commercial and the general public) will be deposited at a Bulk Waste Transfer Station (BWTS) prior to consolidation and transfer to Smooth Hill. At the BWTS the general waste will be deposited on a 'tipping floor' prior to consolidation and transfer into bulk transfer containers by mechanical handlers. Staff monitoring the tipping floor will identify any highly contaminated (with putrescible material) waste prior to consolidation, remove that contamination and divert it to an Organics Processing Facility (OPF). If the contamination cannot be removed, the waste will be quarantined for separate disposal at Smooth Hill in accordance with a Special Disposal Procedure.

[329] Additionally, organic material entering the OPF may be contaminated with general waste and recycling material entering a proposed Material Recovery facility (MRF) could also be contaminated with organic material. In both cases the contaminated waste will also be quarantined for disposal in accordance with a Special Disposal Procedure.

[330] That Special Disposal Procedure involves the 'quarantined waste' being transported in sealed truck and trailer units or bins to Smooth Hill. Deliveries of the 'quarantined waste' will be pre-booked to ensure preparations are made at the landfill, including ensuring cover material is available at the tip face disposal location and once deposited in the landfill the 'quarantined waste' will be covered immediately and prioritised for disposal ahead of more general waste loads.

[331] Through the applicant's Reply, Mr Dale advised[277] that conditions on the 'discharge of solid waste to land' consent set out the proposed waste separation process (previously included as Attachment 3 to the consents). The 10% of residual putrescible waste going to Smooth Hill was intended to be a target rather than a limit. A limit implies that compliance must be achieved at all times and it would be impracticable to measure organic contamination by weight in each and every load to determine compliance with a limit,

[272] EIC Phillip Shaw, paragraph 67.
[273] EIC Phillip Shaw, paragraph 68.
[274] Section 2.1
[275] Opening submissions, paragraph 81.
[276] EIC Maurice Dale, Attachment Three to his recommended conditions.
[277] Reply Evidence, Maurice Dale, paragraph 13(f).

especially as separating all organic contamination from a load of general waste would be practically impossible.

[332] We accept Mr Dale's evidence in that regard.

[333] We are satisfied that the above process for general waste containing 'residual putrescible material' is a sufficiently robust and appropriate means of avoiding both the general waste and 'quarantined waste' becoming an attractive food source for foraging birds at the landfill.

[334] That addresses the second residual concern expressed by the DIAL CEO Mr Roberts.

[335] Turning to Mr Robert's first residual concern, the applicant intends that Smooth Hill will receive "highly odorous wastes". Those wastes include, but are not limited to:[278]

- Wastewater treatment sludges, biosolids, and screenings;
- Wastewater pump station screenings and grits;
- Animal remains;
- Waste from meat processes;
- Wool scour, tannery, and fellmongery waste; and
- Fish waste

[336] These types of waste will be attractive to birds. The applicant proposed consent conditions requiring that "highly odorous wastes" would be covered as soon as practicable and in any event not later than 30 minutes following their placement at the landfill. On the evidence provided to date we cannot be absolutely certain that will avoid attracting birds to the site over the intended 40-year life of the landfill. Coincidently, the "highly odorous waste" was also of concern to other submitters regarding its odour generating potential.[279]

[337] We share the submitter's concerns regarding the intended discharge to land of "highly odorous waste" at the Smooth Hill site and note that doing so would in our assessment be arguably inconsistent with Mr Shaw's recommendation to effectively classify the proposed landfill as a non-putrescible facility.

[338] We note that the applicant has now proposed that a full bird strike risk assessment must be completed by a suitably qualified expert at least six months prior to construction of the landfill commencing for the purpose of confirming the landfill will not increase the existing level of bird strike risk at Dunedin International Airport. That further risk assessment will be based on comprehensive monthly baseline bird monitoring by a suitably qualified ornithologist over a 12-month period. Accordingly, we consider that "highly odorous waste" as defined above should not be allowed to be discharged to land at the Smooth Hill site unless the full bird strike risk assessment confirms that the deposition of "highly odorous waste" will not increase the existing level of bird strike risk at DIAL. We have inserted a 'condition precedent' to that effect into the Discharge Waste and Leachate resource consent (condition 35).

[339] We note that to be consistent with a 'precautionary approach', as recommended to us by Ms Irving[280] when she referred to Policy 5.4.3 of the PORPS 2019 which states (our emphasis):

> *Apply a precautionary approach to activities where adverse effects may be uncertain, not able to be determined, or poorly understood but are potentially significant or irreversible.*

Managing birds at the Smooth Hill landfill

[278] EIC Maurice Dale, recommended Condition 43.

[279] Counsel for Big Stone Forests Limited, Ōtokia Creek and Marsh Habitat Trust, South Coast Neighbourhood Soc Inc, Brighton Surf Lifesaving Club Inc and David Grant submitted that we should prohibit the receipt of Highly Odorous Wastes at Smooth Hill. Submissions of Bridget Irving, paragraph 38(a).

[280] Submissions of Bridget Irving, paragraph 21.

[340] While prohibiting the discharge of "highly odorous waste" at the landfill site will reduce the attractiveness of the site to foraging birds, it is nevertheless necessary to address the management of birds that may still be attracted there, given that there will still be some putrescible matter in the general and quarantined waste stream.

[341] It was common ground that Southern Black Backed Gulls (SBBG) comprise the main bird strike risk. They fly individually or in flocks, often at heights of between 50 – 1200 feet (15m to 360m), and they undertake daily, long distance movements across the landscape searching for feeding sites. However, we agree with Mr Markham (as reported by Ms Lennox) that all birds (not just SBBG) with a body weight exceeding 50 grams must be controlled. Mr Shaw advised that "*This is precisely what is provided in the Smooth Hill Bird Management Plan* [SHBMP]".

[342] We note that the SHBMP is now called the Landfill Operational Bird Management Plan.

[343] The applicant intends managing birds exceeding 50 grams in weight to zero densities daily.[281] The SHBMP and recommended conditions of consent outlined escalating bird management mitigations based on a bird number threshold which we understand to be "*if at any time more than 20 individuals from a species greater than 50 g, or combined numbers of these species exceeds 100 individuals*".

[344] The escalating mitigations are:

- Deterrence involving dispersing birds from the active tip face and placing anti-roosting strips on structures;
- Lethal methods involving shooting, poisoning and colony control (at locations identified during an off-airport bird monitoring regime);
- Installation of wires above the landfill (although this is unproven in New Zealand);
- Baling waste in a bird-proofed building; and
- Installation of a net over the landfill if more than 12 breaches of the bird threshold occurred in a 12-month period.

[345] Mr Shaw observed that nets have been successfully used for putrescible waste landfills in several jurisdictions and gave examples of their successful use.[282] He also advised[283] that the escalation threshold had been set at a level such that even if it was breached, the impact on bird strike risk would be insignificant.

[346] DIAL's General Manager Operations and Infrastructure, Danial De Bono, was concerned about the escalation approach advocated by Mr Shaw. He considered that the escalation of management responses would always be days, weeks, or months behind the arrival of a bird problem at Smooth Hill, leaving a significant risk to aircraft movement and public safety in the meantime.[284]

[347] We initially shared those concerns. However, in response to our questions Mr Shaw expressed confidence that the proposed escalation measures would be sufficient to deter SBBG and other troublesome birds. He was of the view that the 20-bird threshold (which he conceded was an arbitrary number based on his professional judgement and experience) was very conservative in light of the fact that the landfill site was 4.5 km distant from Dunedin International Airport. To put the 20-bird threshold number in context he advised that five out of twelve bird surveys undertaken at Dunedin International Airport over the previous three months had recorded less than 20 birds at that location. Mr Shaw also considered that deterrence methods alone would suffice and there would be no need to escalate to lethal methods and beyond, although those methods would be pursued if required.

[281] Opening submissions, paragraph 73.
[282] EIC Phillip Shaw, paragraph 69.
[283] EIC Phillip Shaw, paragraphs 100 and 101.
[284] EIC Daniel De Bono, paragraph 31.

[348] We note that the applicant's recommended Reply conditions require DIAL to be advised of any breach of the 20-bird threshold and any escalation of bird mitigation measures within one hour of occurrence and not 24 hours as was initially recommended by Mr Dale.

[349] Regarding onsite deterrence methods, we note that the draft Landfill Management Plan produced by the applicant states that the consent holder will employ a full-time "bird control officer' at the site. That important measure will be required by conditions of consent.

[350] Mr Shaw was the only qualified bird strike expert we heard from. Notably we are aware that he has in the past advised both DIAL and Christchurch International Airport on bird strike matters and is recognised for his expertise. We therefore accept his uncontested expert evidence and record that our confidence in his opinions is bolstered by our intended prohibition of the discharge to land of "highly odorous waste" at the Smooth Hill site.

[351] For completeness we note that the ORC technical reviewer Josh Markham[285] initially concluded that the SHBMP provided a good baseline, but he considered it did not provide confidence that bird density and bird populations would be sufficiently controlled. Mr Markham recommended an approach whereby adverse effects would be effectively avoided by requiring 50 gram birds being managed to zero densities daily, where non-compliance over a consecutive 3 days period would result in the landfill ceasing operations and material being covered (including by netting) until zero densities of birds were reached for five consecutive days.

[352] Counsel for the applicant submitted that the ORC recommendation could result in the landfill operation being be shut with one day's notice (on the fourth day after three days of more than zero birds). The landfill would be required to remain shut for at least five further days and in the meantime Dunedin's waste would still continue to be collected and would need to be stored elsewhere or diverted to alternative Class 1 landfill facilities. Counsel submitted that the DCC opposed the ORC recommendation.[286] We agree that Mr Markham's recommendation would be unduly onerous in light of the applicant's approach to general waste outlined above, the onsite bird deterrence mitigation offered by it and our finding to prohibit the discharge of "highly odorous waste".

[353] Importantly in our view, for DIAL Mr Bonis also did not favour the ORC approach as he considered it *"… sets the landfill up to fail*" and his evidence was that:[287]

> *"…subject to [condition] drafting amendments, greater certainty as to the extent of putrescible waste, avoidance of acceptance of 'highly odorous wastes', and a recommended s128 Condition, and based on the expert evidence of Mr Shaw, I accept his views that residual risk could be managed to the extent that there is no increase in bird hazard compared to the status quo."*

[354] We agree with Mr Bonis and observe that the approach he recommends is the one we have adopted.

[355] Having addressed the discharge of waste to land, we note that open water (or ponds) can also attract birds. For the applicant Mr Ingles advised that the proposed sediment retention ponds were designed to drain following rainfall events, however there would be some prolonged ponding of water in the base of the ponds, particularly during winter. The attenuation basin would be designed to detain water following rainfall events allowing slow discharge to the 'swamp wetland' and as such would contain water for the majority of the year. To avoid these ponds becoming an attraction to birds, remedial measures such as netting were proposed to be proactively implemented.[288] Mr Dale recommended a condition requiring the attenuation basin to be covered with a net or an array of closely spaced wires. We find that to be appropriate.

[285] Senior Terrestrial Ecologist, Tonkin and Taylor
[286] Opening submissions, paragraph 76.
[287] EIC Matt Bonis, paragraph 28.
[288] EIC Allen Ingles, paragraph 75.

Civil Aviation Agency (CAA) concerns

[356] Civil Aviation Authority 'Guidance Material for land use at or near airports' (2008) notes that the International Civil Aviation Organisation (ICAO) Bird Control and Reduction Manual recommends that [municipal solid waste landfill] sites be located no closer than 13 km from an airport property.[289] For the CAA, Manager of the Aeronautical Services Unit Sean Rogers advised that the ICAO document stated in a footnote:[290]

> *"The 13-km circle was based on a statistic that 95% of bird strikes occur below 2 000 ft, and that an aircraft on a normal approach would descend into this zone at approximately 13 km from the runway. An assumption was made that birds would remain overhead the attraction (at up to 2 000 ft) and that overflying aircraft would be at risk."*

[357] In this case the Smooth Hill landfill is located only approximately 4.5 km to the southeast of Dunedin International Airport[291] or only around one third of the distance specified in the ICAO Manual.

[358] In his evidence DIAL CEO Richard Roberts explained that any increased risk of bird strike could jeopardise DIAL's ability to retain its Civil Aviation Act 1990 Part 139 safety and security certification. Mr Rogers advised that the CAA would expect a Part 139 certificated airport operator such as DIAL to take all reasonable and practicable steps to mitigate current and potential threats to aviation safety including from wildlife (bird strike) hazards.[292]

[359] Mr Rogers noted that while Dunedin International Airport had a low bird strike incident rate (less than 5 bird strikes per 10,000 aircraft movements or one bird strike per month) it was trending upwards and was relatively high compared to other NZ international airports. He added that the establishment of the Smooth Hill landfill would require DIAL to amend its wildlife management processes to accommodate any impact on the risk of aircraft damage or loss due to bird strike. If the risk became unacceptable CAA could require DIAL to limit or reduce its aviation activities.[293]

[360] Mr Rogers told us that he was concerned that the draft SHBMP relied on a 'preliminary' assessment of wildlife hazards and it was not based on a longitudinal study of bird behaviour. We understand from Mr Shaw's verbal evidence to us that such a study involving monthly bird number surveys is underway but not yet complete. We consequently asked counsel for the applicant to develop a 'condition precedent' outlining a process whereby documentation would be developed that would address Mr Rogers' (and CAA's) concerns, with such documentation to be developed prior to the commencement of the discharge of waste to land at the Smooth Hill site. The purpose of that being to avoid CAA having to require DIAL to limit or reduce its aviation activities.

[361] In his evidence[294] that formed part of the DCC's Reply submissions Mr Dale advised:

> *"The revised conditions have also been provided to Dunedin International Airport Limited's (DIAL) planner Mr Matt Bonis who has engaged with Mr Sean Rogers from the Civil Aviation Authority (CAA) with regard to whether the conditions negate the need for the CAA to impose operational restrictions on DIAL as a consequence of the operation of the landfill. In response, the CAA has advised that it does not wish to be directly involved in any RMA consultation, as any decisions made by CAA in the interests of aviation safety, will be independent of those made by ORC."*

[362] We consider CAA's response to be disappointing.

[363] However, we note that the applicant is now proposing that a full bird strike risk assessment is completed by a suitably qualified expert at least 6 months prior to construction of the landfill commencing for the purposes

[289] ORC Section 42A Report, Attachment 13, page 12.
[290] EIC Sean Rogers, paragraph 21.
[291] AEE section 4.11.3.
[292] EIC Sean Rogers, paragraph 16.
[293] EIC Sean Rogers, paragraph 30 to 33.
[294] Paragraph 11.

of confirming the landfill will not increase the existing level of bird strike risk at Dunedin International Airport. That risk assessment is to take into account the results of bird monitoring bird monitoring by a suitably qualified ornithologist over at least a 12-month period. The results of that risk assessment will inform the Landfill Operational Bird Management Plan. The objective of that Plan is to ensure that the management of birds at the landfill and any associated wetland restoration sites will not increase the existing level of bird strike risk to aviation at DIAL. We find that to be a suitably precautionary response to CAA's concerns.

Other bird management initiatives

[364] Counsel for the applicant submitted that treating the risk of bird strike was an area-wide issue.[295] It was therefore proposed to establish a Bird Management Operational Group comprising the consent holder, DIAL and the landfill operator (if any) which would meet twice during the first year of landfill operation, and annually thereafter, to review the effectiveness of the SHBMP for the purpose of considering whether there was a need to escalate the onsite bird management actions (which we outlined above) sooner than required by Mr Shaw's proposed trigger levels. Counsel for DIAL submitted that they strongly supported the establishment of such a Group and so we have imposed conditions relating to it as were recommended to us by Mr Dale.

[365] On the topic of area-wide controls, Mr Shaw advised that it was important to 'cull' or reduce bird numbers at the existing Green Island landfill prior to its pending closure and to also undertake bird reduction actions at SBBG breeding colonies.[296] We could see the sense in those actions as they would reduce the number of troublesome birds that could potentially flock to the Smooth Hill site once it commenced operation. In that regard our questions to Christopher Henderson, Group Manager of the Waste and Environmental Solutions Group at DCC, revealed that with the Green Island consents expiring in 2023, the DCC intended applying to extend those consents for a period of up to five or six years while the Smooth Hill site was being commissioned.

[366] We observed that we could not impose conditions relating to land not owned by the consent holder (breeding colonies) and nor could we arguably impose conditions relating to another site (Green Island landfill) even if it was owned by the applicant. However, we suggested that should the applicant offer an *Augier* condition relating to bird culling at Green Island then in our view that condition would be both appropriate and enforceable. Mr Page agreed with that proposition. We consequently asked counsel for the applicant to develop appropriate condition wording.

[367] In Reply, counsel submitted[297] that the DCC was offering a condition, based on the expert evidence of Mr Shaw, requiring that a SBBG Management Plan be prepared by a suitably qualified person to manage landfill food availability at the Green Island landfill and the breeding success of the existing SBBG population at Dunedin breeding sites. Counsel advised that the Management Plan was intended to manage down the SBBG population in order to reduce the overall risk of bird strike in the area of the Green Island landfill, and reduces the risk of SBBG's relocating away from Green Island, we presume to Smooth Hill. We find the preparation of such a Plan to be appropriate.

4.2.14 Fire risk

[368] A number of submitters[298] were concerned about the risk of fire given that the landfill is close to forestry and residential properties. That is understandable as the landfill site is surrounded by pine plantation forest which is combustible. While the risk of fire principally arises from the operation of the landfill site which is authorised by the land use designation (and therefore not open to us to revisit), we nevertheless discuss it

[295] Reducing the numbers of black back gulls currently feeding at the Green Island landfill and at DIAL and preventing them from establishing at Smooth Hill.

[296] Mr Shaw could not advise where those colonies were.

[297] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraphs 70 and 71.

[298] Including Saddle Hill Community Board, South Coast Neighbourhood Society Inc, M Sydor, E J Munro, GJ Bennett Scott, J, T & G Weatherall, S W Bennett, A & M Granger, Big Stone Forest Ltd, S & A Ramsey, E Velenski, S & B Judd, A & K Lucking, GL & EG McLeod Family Trust, JAR McLeod, PA McLeod, RJ King, S & B Judd,J Hancock, Vianney Santagati, P & W Early and S Hart.

here as it is relevant to the discharge of waste to land and there was a high level of submitter concern about possible landfill fires.

[369] For the applicant Anthony Dixon advised that the primary means of reducing the risk of a surface fire was to have a small active tipping area that was under observation, with plant and equipment available for use by suitably trained staff to quickly extinguish surface fires. He considered that all other areas should be covered with inert cover materials. In his view the risk of subsurface fires could be significantly reduced by ensuring any surface fires were fully extinguished before placing more waste (or cover) over the fire impacted area.[299] We addressed the tip face size limit in section 4.2.4 of this Decision.

[370] Paul de Mar addressed the risk of fires leaving the site and impacting nearby residents. He advised that in response to the submitter concerns additional mitigation measures have been proposed including:

- Fire services emergency access points at each end of the south east boundary of the landfill to provide access for fire response equipment and FENZ appliances to gain access for fire control operations along the south-eastern boundary;
- A 10m wide firebreak surrounding the landfilling areas that can be accessed by a tracked water cart, and tracked earthmoving machinery at all times;
- Amended screening vegetation to reduce the fire risks along the south-eastern boundary; and
- Clearing all woody vegetation from the landfill footprint from the commencement date of the project.[300]

[371] Mr Coombe advised[301] that in response to the submitter concerns and the advice of Mr Dixon and Mr de Mar, additional fire prevention and management procedures would be adopted including: additional storage of fire water supplies, access tracks to the perimeter of the landfill and all terrain water tankers to use that access and emergency fire truck access to the southern end of the site abutting Big Stone Road. We find that to be appropriate.

[372] Some submitters[302] expressed concern that the fire prevention and response measures proposed by the applicant were inadequate or that the Smooth Hill site was inappropriately remote from FENZ services. We are not persuaded that is the case and note that the detail of fire prevention and response measures can be dealt with in the applicant's proposed Landfill Management Plan.

[373] Having said that we note that a number of submitters were understandably concerned about the risk of a landfill fire spreading to adjoining forestry areas. Addressing that concern, Mr de Mar advised that the mechanism for that to occur would be by way of windblown embers. However, subterranean fires within the landfill waste (should they occur) would not generate enough convection to spread embers and any surface fires would be quickly extinguished. We accept that evidence.

[374] In Reply, counsel for the applicant submitted[303] that additions to the previously drafted fire management conditions had been made in response to the questions about ceasing operations on peak fire days. The revised approach required that the active landfilling area must not exceed 300m^2 at any time when the daily fire danger rating for the site was very high, extreme, or very extreme for forestry, as reported by the New Zealand Fire Weather System. DCC had not gone so far as offering to shut down disposal to land on such days because that would require waste to be stockpiled at either the Bulk Waste Transfer Station, or retained in trucks, pending burial at Smooth Hill. DCC considered the preferable overall approach to manage fire risk from waste was to bury it at a small operating face at Smooth Hill, under close supervision.

[375] We find that the risk of fire within the landfill and the spreading of fire to adjacent land can be appropriately mitigated by the comprehensive suite of conditions that were proposed as part of the applicant's Reply submissions. For completeness however, we note that Mr Dixon considered that air ingress to the waste

[299] EIC Anthony Dixon, paragraph 73.
[300] EIC Paul de Mar, paragraph 19.
[301] EIC Richard Coombe, paragraph 85.
[302] Including Blair Judd
[303] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraph 73(d).

as a result of active gas extraction system was a major source of landfill fires. We discuss that in section 4.2.16 of this Decision.

4.2.15 Landscape, natural character and visual amenity

[376] As we have noted, activities (including earthworks and landscape screen planting) within the designated site are already authorised under the District Plan and no consents are required from the ORC for earthworks or vegetation clearance within that site. However, the discharge of waste to land (for which consent is required from ORC) will result in an alteration of the existing landform and so we briefly discuss that matter here.

[377] As we have also noted earlier, land use activities (including earthworks and landscape screen planting) within the boundary of the designated site D659 are already authorised under the District Plan, and no consents are required from the ORC for earthworks or vegetation clearance within that site. However, the discharge of waste to land (for which consent is required from the ORC) will eventually result in a significant alteration of the existing landform and some submitters were concerned about adverse effects on landscape and amenity values.

[378] Appendix 12 to the applicant's AEE addressed landscape, natural character and amenity effects. The landscape methodology was set out in full in Appendix 1 of the landscape assessment. The landscape assessment included a comprehensive graphic supplement, which provided various views of the site as it exists now, views of the site as it will look once planting mitigation is established and an assessment of sightlines from the most impacted properties on Big Stone Road. Evidence for the applicant was presented by Rhys Girvan.[304] The landscape assessment was reviewed for the ORC by Ben Espie.[305]

[379] The landscape assessment noted the area in which the proposed landfill site sits is rolling to steep hill country, with the site being contained within folding gullies and ridges and largely concealed from wider public views. The hills in the vicinity of the site generally comprise forestry operations and pasture, with pockets of indigenous vegetation. The site and its general location are not identified in the coastal environment, nor is it part of any outstanding natural feature or landscape or highly valued landscape. The nearest highly valued landscape is Saddle Hill Significant Natural Landscape, located approximately 2km to the north of the site.[306]

[380] Mr Girvan's evidence noted that much of the existing landcover within the site is associated with production forestry which has been recently felled and replaced. Colonising plants such as gorse, broom and the native shrub poroporo area also scattered throughout the site, especially in the lowest points in the wetland.[307]

[381] The potential to see into the site is primarily limited to adjoining areas along Big Stone Road and part of McLaren Gully Road. There are also potential longer distance private views from elevated areas within the surrounding hill country, including in the vicinity of 513, 689 and 731 Big Stone Road. It was Mr Girvan's opinion that potential views from these private areas would be typically concealed beyond intervening planation forestry in the surrounding landscape.[308] We discussed the proposed upgrades to McLaren Gully Road in section 3.2.6 of this Decision and do not repeat those matters here.

[382] Mr Girvan noted that the landfill will extend to a maximum height of approximately 40 metres above the existing ground level. This is equivalent to about 5 vertical metres above adjoining areas of Big Stone Road, resembling a smoothed ridgetop form.[309] He noted that this height would be arrived at over many years of landfill operation and would coincide with the establishment of perimeter landscape mitigation and surrounding plantation forestry. As noted elsewhere in this Decision, the landfill will be developed over four stages and daily and intermediate cover will be placed over waste in the landfill. Mr Girvan noted the landfill

[304] Senior Principal and landscape planner, Boffa Miskell.
[305] Landscape Planner, Vivian and Espie.
[306] Appendix 12 to AEE, section 3.0.
[307] EIC Rhys Girvan, paragraph 19.
[308] EIC Rhys Girvan, paragraphs 21 and 22.
[309] EIC Rhys Girvan, paragraph 28.

has been located within the designation area to become integrated within the existing topography and surrounding vegetation to the extent possible, thereby limiting landscape effects.

[383] During enabling works, boundary planting will be established along Big Stone Road along the length of the site. This will comprise a minimum 10m wide planted strip include a mix of native vegetation and fast-growing planation species which will replace areas of recently cleared plantation forestry. As the proposed planting becomes established, views into the site will be less open, such that potential landscape effects will be largely internalised. In light of the assessed fire risk described by Mr de Mar in his evidence for the applicant, planting adjoining the uphill south-east perimeter of the landfill adjoining Big Stone Road will include lower flammability indigenous species between the landfill footprint and pine trees proposed along the site boundary and the inclusion of an emergency access point at the south-east corner of the landfill footprint. This planting will provide an effective visual screen from adjoining areas during the lifetime of the landfill operations.[310]

[384] Landfill works will avoid all streams and wetlands that form tributaries to Ōtokia Creek identified within the designation. Mr Girvan's evidence was that any indirect impacts on downstream 'swamp wetland' will remain localised and appear broadly consistent with a range of species already present.[311]

[385] Mr Girvan's evidence was that landscape character effects during the landfill operation will not appear prominent within views or uncharacteristic within the receiving landscape and would be moderate-low in scale. Once the proposed landfill works are completed, the site will be reinstated with grass and form part of a wider productive landscape not dissimilar to that which currently exists. The project is expected to result in little material loss of, or modification in terms of, landscape character and will, at completion, generate low adverse effects.[312]

[386] Mr Girvan's evidence addressed the potential viewing audience. He noted that some observers travelling on Big Stone Road and McLaren Gully Road may see some landfill infrastructure, including operational plant and vehicles within or accessing the landfill operation. Some bare ground may also be visible across the site. This would be typically associated with preparation of the landfill footprint or the creation of stockpiles prior to vegetation within the site becoming established. We note that all of those activities are authorised under D659 and are not open to our consideration.

[387] The neighbour at 689 Big Stone Road, when accessing Big Stone Road from their property, would have the benefit of the visual screen resulting from the fast-growing pine shelter belt forming part of the proposed mitigation.[313] The properties at 513, 689 and 731 Big Stone Road would potentially see elevated parts of the site in long distance views beyond approximately 600 metres, including the highest finished elevation of the landfill and part of the administration building constructed along the upper central ridgeline. It was not expected that the workshop and landfill activity would be visible from these dwellings in stages 1 and 2. Any views of the site would be seen through plantation forestry. These views would result in low adverse effects once mitigation was established.[314]

[388] Mr Girvan attached to his evidence a Landscape Mitigation Plan dated 29 April 2022.

[389] The ORC's peer reviewer, Mr Espie, visited the site with Mr Girvan in March 2022. The ORC Section 42A report recorded Mr Espie's agreement to the following points:[315]

- The contained visual context of the site means the potential for adverse effects are limited to adjacent areas. Once planting reaches approximately 2-3 m high, this will screen direct views into the site from adjoining areas. Once existing planation trees reach 10m high (within the first 10 years of landfill operation), additional screening of facilities on the ridge will be achieved.

[310] EIC Rhys Girvan, paragraphs 24 and 25.
[311] EIC Rhys Girvan, paragraph 26.
[312] EIC Rhys Girvan, paragraphs 31-33.
[313] EIC Rhys Girvan, paragraphs 34 and 35.
[314] Appendix 12 to AEE, Landscape and Visual Assessment Report, page 25.
[315] Section 42A report section 6.1.10.

- When approaching the site from the east along McLaren Gully Road, the initial stages of the operation will predominantly be screened by the intervening spur that contains the site access and associated support infrastructure. Once mitigation planting is established in approximately 10 years' time, most of that infrastructure will be screened from view.
- When approaching the site from the west, the landfill will be visible from Big Stone Road prior to mitigation becoming established. During the initial stage of the landfill, intervening planation forestry and boundary planting will increasingly become established and screen the western stockpile area and much of the lower lying internal operation. Once mitigation is established, the combination of planation forestry and enduring native vegetation along the boundary will provide long term visual screening of the stockpile and roading.
- Visual effects experienced from McLaren Gully Road and Big Stone Road will be moderate in the short term, reducing to a low level of effect once mitigation is established. Key to this assessment is the existing amenity resulting from ongoing extensive forestry including harvesting and associated vehicle movements.

[390] Mr Espie noted that the sightlines for the properties at 513, 689 and 731 Big Stone Road were included within the graphic supplement forming part of the landscape assessment and that these properties are between 15 and 30 hectares in area and are very largely covered in plantation forestry. They each have a dwelling on them. Assuming the contour and cross-information provided in the landscape assessment was correct, Mr Espie's opinion was that there be "very minimal visibility" to any of the proposed activities from any of the dwellings on these three properties, even in the event all of the forestry trees were removed. The dwellings were all located and orientated to take advantage of the broad views to the east, out over the coast. In light of the existing designation D659, the strong screening provided by the forestry trees and general working forestry character of the area adjacent to, and north of, Big Stone Road, Mr Espie considered the adverse effects on the visual amenity of these three properties to be of a low degree.[316]

[391] Mr Espie also stated that the occupiers of those properties would experience more pronounced visual effects when they exited their properties given the forestry on the landfill site has now been cleared and these residents can see directly into the site. However, in the medium to long term native vegetation along the site frontage will screen that visibility.[317]

[392] Mr Espie considered the proposed mitigation to be provided by vegetation management and planting to be appropriate and recommended that this be enforced through consent conditions.

[393] Sarah Ramsay gave evidence as part of the submitter group represented by Ms Irving. She noted her property was directly opposite the landfill site and stated that she and her family would be able to see the landfill from their driveway. Other submitters told us of their use and enjoyment of the forest areas near the site for horse riding, walking and cycling and their desire to retain that amenity.

[394] In her Section 42A Report, Ms Lennox stated that provided the applicant adopted a consent condition specifically stipulating the proposed mitigation measures for landscape and visual effects described in the application, she was satisfied that potential adverse landscape effects arising from the deposition (discharge to land) of waste within the landfill, for which consent is required from the ORC, could be managed appropriately.

[395] The applicant included two consent conditions specifically addressing landscape and visual effects in the conditions attached to Mr Dale's evidence. These include the requirement for planting to be undertaken in accordance with the Landscape Mitigation Plan dated 29 April 2022. No further changes were made to this condition through the applicant's Reply. We accept the conditions are appropriate. On the basis of the conditions and mitigation being implemented in accordance with the Landscape Mitigation Plan, we find that landscape and visual amenity effects arising from the deposition of waste (discharge to land) within the

[316] Landscape and Visual Effects Assessment – Peer review dated 29 March 2022 forming part of Section 42A Report, paragraphs 39-40.
[317] Ibid, paragraph 41.

landfill will be minor. In making that finding, we acknowledge that some residents will experience short term visual effects until the mitigation planting has achieved a level that provides visual screening of the site, expected to be within 2-3 years of planting. However, we find that those short-term effects do not weigh against a grant of consent.

4.2.16 Odour, dust and landfill gas

[396] Many submitters raised concerns about air quality effects associated with the construction and operation of the landfill, including highly odorous waste, odour (and dust) beyond the boundary of the site, and the discharge of LFG.

[397] The written evidence of Mr Stacey[318] for the applicant considered the disposing of highly odorous waste to have the greatest potential to cause odour nuisance. Some submitters[319] expressed concern that the proposed activities will result in offensive and/or objectionable odours that will be detectable not only in the immediate vicinity, but also at locations as far away as Brighton and Ocean View.

[398] Having visited the site and surrounding environment, we agree with the evidence of Mr Stacey that the landfill is relatively well-sited from the perspective that there are a limited number of receptors located close to the site. We accept Mr Stacey's evidence where he identifies that of the sensitive receptors located within 3.5km of the site, only three submissions[320] were received in relation to air quality.

[399] Section 4.2.13 of this Decision addresses allowable waste types and the resultant risk of bird strike. We noted in that section that we share the submitter's concerns regarding the intended discharge to land of highly odorous waste at the Smooth Hill site and that doing so would in our assessment be inconsistent with Mr Shaw's recommendation to effectively classify the proposed landfill as a non-putrescible facility. We arrived at the view that "highly odorous waste" should not be allowed to be discharged to land at the Smooth Hill site unless the full bird strike risk assessment confirms that the deposition of 'highly odorous waste' will not increase the existing level of bird strike risk at DIAL. We have included a 'condition precedent' to that effect into the Discharge Waste and Leachate resource consent.

[400] This means that in the event that the full bird strike risk assessment confirms that the deposition of 'highly odorous waste' will increase the existing level of bird strike at DIAL then the deposition of 'highly odorous waste' would be prohibited and there would be no possibility of offensive and/or objectionable odours being generated by highly odorous waste types. Conversely, if the full bird strike risk assessment confirms that the deposition of 'highly odorous waste' will not increase the existing level of bird strike at DIAL then the deposition of 'highly odorous waste' would occur as proposed and specific mitigation measures[321] developed by the applicant to reduce the potential for off-site odour nuisance effects from highly odorous waste types would be implemented.

[401] We note that the Applicant's submissions in Reply[322] confirmed that any delivery loads of highly odorous waste would be received from 9.30am to enable on-site preparations for immediate burial to be made. We agree with this measure and find that the requirements set out in conditions in the Discharge of Landfill Odour and Dust and Landfill Gas and Flare Emissions to Air resource consent are appropriate.

[402] Some submitters also raised concerns about general landfill odour, including the potential of general waste containing 'residual putrescible material' to generate odour. Mr Stacey noted in his evidence that a range of measures would be implemented to reduce the risk of causing off-site odour nuisance, including:

- Having stringent controls regarding the acceptance and placement of waste;

[318] Additional evidence 17 May 2022 Peter Stacey, paragraph 58

[319] Counsel Big Stone Forests Limited, Ōtokia Creek and Marsh Habitat Trust, South Coast Neighbourhood Soc Inc, Brighton Surf Lifesaving Club Inc and David Grant submitted that we should prohibit the receipt of Highly Odorous Wastes at Smooth Hill. Bridget Irving, paragraph 38(a).

[320] R11 (Big Stone Forest Limited – S & A Ramsay located at 691 Big Stone Road, Dunedin), R12 (S & C Rampe located at 513 Big Stone Road, Dunedin), and R16 (S & B Judd located at 389 Big Stone Road).

[321] Additional evidence 17 May 2022 paragraph 58 Peter Stacey and Section 5.1.4 of Mr Stacey's Air Assessment Report (2021)

[322] Applicant's submissions in reply, paragraph 73(f).

- Designing and installing an appropriate system to collect and destroy landfill gas (LFG);
- Storing leachate in enclosed tanks; and
- Implementing a range of industry best practice operational odour mitigation measures to minimise the frequency and intensity of odour discharges.

[403] We note that in response to Mr Chilton's peer review for the ORC, Mr Stacey incorporated additional odour mitigation measures and consent conditions, including amendments to better align with the Ministry for the Environment's Good Practice Guide for assessing and managing odour, and he also updated the draft LMP accordingly.

[404] We heard from Ms Irving, counsel for the submitter group[323], that the condition put forward by the applicant to manage odour created a high degree of uncertainty for surrounding residents and people who utilise the area. In particular, Ms Irving submitted that the condition effectively allows the discharge of offensive and objectionable odour and then requires an evaluation in each circumstance of whether it has given rise to adverse effects. Ms Irving promoted permitted activity Standard 16.3.7.1[324] from the Otago Regional Plan: Air as providing a clearer threshold by requiring that the odour is not noxious, offensive, or objectionable beyond the boundary, without the additional requirement to prove that the odour is an adverse effect. In the submission of counsel, that approach and threshold would be consistent with the Ministry for the Environment Guide to Landfill Consent Conditions.

[405] We were provided with recommended wording for a routine 'no odour and dust beyond the boundary' condition by both Ms Lennox[325] and Mr Dale.[326] Mr Dale's Reply evidence also suggested an advice note that helpfully referred to the Ministry for the Environment's Good Practice Guide for Assessing and Managing Odour (2016) and Good Practice Guide for Assessing Dust (2016).

[406] We prefer the condition wording recommended by Ms Lennox (noting that we consider it appropriate to refer to 'site' instead of 'property boundary' as the word 'site' is a defined term in the advice notes that form part of the Schedule of general conditions) together with the advice note suggested by Mr Dale. We are hopeful that will provide a greater level of assurance, particularly to submitters who are located within 3.5km of the site, that general landfill odours will be appropriately controlled.

[407] Ms Irving submitted[327] that it would be appropriate to impose conditions relating to

> *"(a) Prohibit the receipt of Highly Odorous Wastes at Smooth Hill (Mr Dale's condition 43).*
> *(b) A limit on the amount of waste that can be disposed of annually. This will also help ensure that effects are in line with what has been assessed in the AEE, including the likes of leachate generation rates, odour, noise, traffic etc.*
> *(c) A control on the size of the tip face – throughout the application assessments relied on an active tipping face of 300m^2. The tipping face is one of the main risk areas for odour generation, litter, fire risk etc."*

[408] As discussed in section 4.2.11 of this Decision, we have actioned items (a) and (c) in response to the risk of bird strike. We were not persuaded that item (b) was necessary.

[409] We heard from Mr Welsh[328] for the applicant on the potential effects of landfill gas if not appropriately managed. In his evidence Mr Welsh stated that the management measures proposed, including a landfill

[323] Big Stone Forests Limited, Ōtokia Creek and Marsh Habitat Trust, South Coast Neighbourhood Soc Inc, Brighton Surf Lifesaving Club Inc and David Grant
[324] Discharges from the storage, transfer, treatment and disposal of liquid borne municipal, industrial or trade waste
[325] ORC End of Hearing Report, paragraph.17
[326] Applicant Reply draft consent C general condition 3
[327] Opening submissions of counsel for the submitter group, 17 May 2022, Big Stone Forests Limited, Ōtokia Creek and Marsh Habitat Trust, South Coast Neighbourhood Soc Inc, Brighton Surf Lifesaving Club Inc and David Grant
[328] Further evidence 17 May 2022 Matthew Welsh, paragraphs 11-12

gas collection and destruction system and a perimeter landfill gas monitoring bore network, were the key measures to reduce the risk of landfill gas causing offsite odour nuisance[329]. We agree.

[410] Ms Irving submitted that there was no specific odour monitoring proposed (as a condition of consent) and it was now common for hydrogen sulphide monitors to be utilised to help monitor and control odour emissions associated with landfills and landfill gas. We were referred to the Ministry for the Environment's Guide to Landfill Conditions that state *"while there is normally a limit condition with respect to objectionable or offensive odours, odour has a very subjective effect to which people have differing sensitivity. Therefore, this type of condition does not ensure that site neighbours will not be affected by emissions from these devices".* Ms Irving submitted that a monitoring condition should be included in any consent granted in terms of identifying when landfill gas odour might be about to become an issue, but also picking up potential landfill gas escape through the landfill cap.

[411] We generally agree and note that the applicant's Reply submissions[330] included conditions requiring that the concentration of oxygen in the landfill gas measured at the inlet to flare must not exceed 5% v/v oxygen. The conditions also set out the matters proposed to be addressed in the Landfill Management Plan for the management of landfill gas, including the obligation to ensure that escape of fugitive landfill gas, exposure of people to landfill gas and landfill gas related odour are minimised. We find those conditions to be appropriate and consider that they adequately address the concerns expressed by Ms Irving.

[412] In that regard, we accept Mr Stacey's evidence that the efficiency of the landfill gas collection system proposed to be installed at the site (including a primary and a backup flare to allow for gas to be continuously collected and flared) means that any off-site landfill gas odour is unlikely to be problematic. Consent conditions will govern the operation and maintenance of the landfill gas flare and impose a monitoring and maintenance programme for the landfill gas collection system.

[413] Mr Stacey explained that dust emissions from the site were expected to predominantly consist of coarse particles, which typically resulted in concerns related to impacts on amenity, visibility and effects on structures (nuisance). The likely sources of dust from the site would include construction dust (from earthworks, vehicle movements and stockpiling), operational dust (from disturbance of dry soils, earthworks, working with dry materials in windy conditions and vehicle movements). The applicant has put forward a range of control measures to control dust emissions and we find these to be acceptable and, on that basis, we consider that it is unlikely that off-site receptors will experience adverse effects in relation to dust.

[414] In overall terms we conclude that potential adverse effects on air quality have been adequately addressed and can be managed through conditions of consent.

4.2.17 Archaeological values

[415] The applicant has not sought earthworks consents or vegetation clearance consents from the ORC other than those required under the NES-FM and we confirmed with Ms Lennox that no such consents are required. That being the case, and given that the earthworks within the designated site are already authorised under the District Plan, there is no need for us to discuss archaeological matters further in relation to the consent required from the ORC.

4.2.18 Tangata whenua values and interests

[416] We discussed tangata whenua interest and values in section 3.2.8 of this Decision in relation to the land use consents required from DCC – Regulatory. That discussion is relevant to the consideration of the consents required from the ORC and we adopt it here without repeating it for the sake of brevity. However, we note the following additional salient points from the evidence of Edward Ellison and Yvonne Takau. Mr Ellison[331] advised:

[329] Further evidence 17 May 2022 Matthew Welsh, paragraph 47
[330] Applicant Reply draft consent C condition 23
[331] EIC Edward Ellison, paragraphs 39, 50 and 48.

"It is important to Kai Tahu that the connections between land, wetlands, surface waterbodies and groundwater are recognised and managed through the construction and operation of a landfill at Smooth Hill to avoid degrading Otokia Creek and reducing the extent of wetlands within the catchment.

Restoration of downstream freshwater and wetland habitats is a practical way of balancing the impact on te taiao from the construction of a landfill at Smooth Hill.

The conditions proposed by the applicant recognise and provide for the exercise of rakatirataka and kaitiakitaka by Te Rūnanga through engagement in the development of the Landfill Management Plan and through engagement in the development of specific management plans for taoka species, habitat restoration and freshwater and wetland monitoring."

[417] Ms Takau[332] advised:

"In my opinion, the mitigation measures proposed by the Council, particularly, those which deal with the prevention of leachate and contaminant discharges to groundwater and surface water, provide for the protection of wai maori, wetlands and taoka species. This is further strengthened by the landfill design which proposes that the landfill will largely be built into the natural topography of the site, allowing the use of the natural gully system and the natural containment of contaminants.

The Council has also proposed the development of freshwater and wetland, monitoring management plans and the enhancement of wetland and riparian habitat, to protect the health and well-being of wetlands and of Ōtokia Creek and its tributaries. In my opinion, these proposed conditions are appropriate to provide for the matters identified in the CIA and discussed by Mr Ellison. "

[418] It is evident that the Aukaha CIA and the submission and evidence of Te Rūnanga o Ōtākou was made in full cognisance[333] of the Kai Tahu ki Otago Natural Resources Management Plan 2005 (NRMP) and given the accepted principle that the identification of issues of concern to iwi are best identified by iwi we do not find it necessary to assess the NRMP any further.

[419] We find that a consideration of tangata whenua values and interests does not weigh against a grant of consent.

4.2.19 Closure and aftercare

[420] Policy 7.4.4 of the RP: Waste is "*To monitor discharges to land, water, and air from new, operating and closed landfills, and from silage production and composting"* (our emphasis). Policy 7.4.6 of that Plan is "*To require that all new, operating, and closed landfills are managed in compliance with approved management and post-closure procedures* (our emphasis).

[421] The applicant advised that landfill closure activities would include placing the final capping layer on completion of each stage, establishing any final landscaping, removing any infrastructure that is not required during the aftercare period, or modifying such infrastructure for the aftercare period. Specifically, the proposed aftercare activities include[334]:

- Ongoing operation and maintenance of the LFG collection and destruction (or future electricity generation) systems;
- Ongoing operation and maintenance of the leachate collection, treatment and disposal system;
- Maintenance of the permanent site stormwater systems, including the perimeter swale drain and attenuation basin;
- Maintenance of the landfill caping layer, including filling any areas that may have been subject to differential settlement, repair of any surface erosion, and maintenance of vegetation as required;

[332] EIC Yvonne Takau, paragraphs 38 and 39.
[333] EIC Yvonne Takau, paragraphs 12 and 32.
[334] Application, Assessment of Environmental Effects for Updated Design May 2021, Section 5.14 Landfill Closure and Aftercare, page 63

- Maintenance of any remaining site infrastructure, including fences, and buildings not removed following closure; and
- Ongoing environmental monitoring, reporting, and event response, as required by resource consent conditions and the Landfill Management Plan.

[422] Mr Coombe described the landfill design for the physical aspects of the proposed landfill, including capping details. He explained that intermediate capping would be installed where areas of waste will not be overlaid with fresh waste for more than three months, followed by the progressive completion of final capping as waste is placed to the intended finished level[335].

[423] In response to a submitter concern about the risk of leachate runoff contaminating downstream surface water[336], Mr Coombe noted that possible leachate spills that would flow to the attenuation basis could arise from leachate breakout at the landfill capping[337]. He further noted that any potential spillage of leachate to surface areas would be captured in the proposed drainage flowing to the attenuation basin[338]. We address leachate management more fully in Section 4.2.3 of this Decision where we concluded that leachate can be properly managed through consent conditions and will be the subject of further expert review in the detailed design.

[424] The applicant advised that following closure of the landfill, all site facilities not required during the landfill aftercare period would be removed. That included recontouring the soil stockpile area to conform to the surrounding topography, revegetation of bare areas and disestablishing any temporary stormwater systems[339].

[425] In our experience Landfill Management Plans routinely cover all aspects of a landfill operation, including the closure and aftercare of completed cells and the whole landfill. The draft Landfill Management Plan submitted by the applicant included a section on Landfill Closure and Aftercare and set out procedures for site closure, rehabilitation, and ongoing aftercare, that achieves the LMP objectives, and resource consent conditions[340]. We find that to be appropriate.

[426] As discussed in Section 1.10 of this Decision, the Smooth Hill Landfill Management Plan (LMP) will guide the aftercare of the landfill and it will be appropriately developed in accordance with the WasteMINZ guidelines.[341] We have reviewed the management plan conditions that were recommended to us by both the applicant and the Section 42A Report authors and in the applicant's reply, including those relating to the LMP, and we have amended them as discussed in sections 1.10 and 4.12 of this Decision.

[427] Te Rūnanga o Ōtākou sought that the DCC consider a process of resourced and ongoing engagement with Te Rūnanga o Ōtākou, with particular regard to input into and reporting on landfill closure and rehabilitation. We note the applicant accepted that the draft LMP would need to be further developed prior to the submission of a revised LMP for ORC certification. That further development will be undertaken in collaboration with Te Rūnanga. We endorse their proposed involvement and find it to be consistent with Policy 7.4.1(a) of the RP: Waste which is to provide for "…*for the management and disposal of Otago's wastes in a manner that takes into account Kai Tahu cultural values*."

[335] Additional evidence 17 May 2022 Richard Coombe, paragraph 22
[336] Big Stone Forest Ltd, S & A Ramsey
[337] Additional evidenc 17 May 2022 , Richard Coombe, paragraph 54(d)
[338] Addttional evidence 17 May 2022 , Richard Coombe, paragraph 58
[339] Application Assessment of Environmental Effects for Updated Design May 2021, Section 5.14 Landfill Closure and Aftercare, page 63
[340] Application, Assessment of Environmental Effects for Updated Design May 2021, Section 5.14 Landfill Closure and Aftercare
[341] The ORC Section 95 Notification Recommendation Report advised that clause 7.6.11 of the RP: Waste requires the preparation of a landfill development and management plan in the form prescribed in Appendix 2 of that Plan. Plan Change 1 amended that clause and it now requires a site-specific management plan be prepared in accordance with the WasteMINZ Technical Guidelines for Disposal to Land (August 2018).

[428] A question to arise during the hearing was whether a bond condition would typically be required for a Class 1 landfill facility to ensure any long-term effects of the landfill activities are appropriately managed post closure. We discussed our findings on that matter in Section 4.2.20 of this Decision.

[429] We heard from submitter Tony Granger who presented a post-closure scenario for us to consider that involved the landfill being *"planted out in forestry"*[342]. We advised Mr Granger that based on the applicant's proposal, we understood that only grass or shallow rooted vegetation would be established[343] on site, and trees would not be planted. The reason being that deep rooting vegetation (such as trees) can penetrate the capping layer, allowing the ingress of rainwater and the emission of landfill gas.

[430] Overall, we accept the evidence of the applicant that the landfill design together with construction, operating and post closure monitoring and management measures and associated consent conditions will ensure the landfill will be managed appropriately once it has been closed. As discussed in Section 4.6.3 of this Decision, we are satisfied that the 'landfill aftercare' requirements of the RP: Waste will be met.

4.2.20 The need for a bond

[431] The applicant's April 2022 conditions attached to Mr Dale's evidence did not mention the provision of a bond. We raised this in questioning of the applicant. In our experience bonds are commonly imposed on landfill resource consents throughout New Zealand, albeit in different forms. We note that the Brighton submitter group[344] raised concerns in this regard and we share the concern that without a bond, there would be no financial remedy available to the ORC or the DCC as regulators for any breach of resource consents by the consent holder or a third party, or any abandonment of the site. While it is the applicant's current intent to own the site and remain as its consent holder, it wishes to contract a private party to operate the landfill site. It is also possible that the DCC as consent holder may one day decide to sell the land and the landfill operation to a private company, as has occurred in other parts of New Zealand.

[432] Section 108(2)(a) of the Act states that a condition requiring a bond (and describing the terms of that bond) may be imposed on a resource consent, in accordance with section 108A. Section 108A(1) states that a bond may be required for the performance of any 1 or more conditions the consent authority considers appropriate and may continue after the expiry of the resource consent to secure the ongoing performance of conditions relating to long-term effects, including:

- A condition relating to the alteration or removal of structures;
- A condition relating to remedial, restoration or maintenance work;
- A condition providing for ongoing monitoring of long-term effects.

[433] Section 108A(2) sets out what the condition describing the terms of the bond may cover. In summary, this includes:

- Requiring that the bond be given before the resource consent is exercised or at any other time;
- Requiring that section 109(1) apply to the bond;
- Providing that the liability of the holder of the resource consent is not limited to the amount of the bond;
- Requiring the bond to be given to secure performance of conditions of the consent including conditions relating to any adverse effects on the environment that become apparently during or after the expiry of the consent;
- Requiring the consent holder to provide such security as the consent authority considers fit for the performance of any condition of the bond;
- Requiring the consent holder to provide a guarantor acceptable to the consent authority to bind itself to pay for the carrying out of a condition in the event of a default by the consent holder or the occurrence of an adverse environmental effect requiring remedy; and

[342] Tony Granger speaking notes

[343] Application, Assessment of Environmental Effects for Updated Design Section 5.14 Landfill Closure and Aftercare, Updated May 2021

[344] Opening submissions of counsel for Big Stone Forests Ltd, Ōtokia Creek and Marsh Habitat Trust, South Coast Neighbourhood Society Inc, Brighton Surf Lifesaving Club Inc, David Grant, 17 May 2022.

- Providing that the bond may be varied or cancelled or renewed at any time by agreement between the holder and the consent authority.

[434] In response to our questions at the hearing counsel for the applicant accepted that a bond should be imposed and suggested this could be in a form which was based on the degree of risk being calculated with reference to the tonnage of waste in the landfill, rather than a fixed sum. In his Reply submissions Mr Garbett took a different approach. He submitted that the bond condition proposed was based on the bond condition used in the Kate Valley landfill but "*adapted with minor changes in the context of the Smooth Hill landfill*"[345]. No further explanation was provided of the "minor changes" that had been made. Mr Garbett stated that the amount of the bond proposed would be either the sum of $5,000,000 or would be set according to cost estimates established via a risk assessment prepared by the consent holder and submitted to the ORC prior to the transfer of any consent. In that regard, draft conditions 68 and 69 (as they stood at that time) proposed that the bond only be provided if the DCC transferred the consents to another entity, and would not apply if the DCC remained the consent holder but engaged a contractor to operate the landfill on its behalf. Mr Garbett submitted the specific costs that must be covered by the bond were listed in the bond conditions.[346]

[435] No evidence was provided to support the $5,000,000 sum proposed by the applicant or to explain how this sum would be sufficient to address all of the matters set out in the bond conditions. Mr Dale's Reply Evidence simply referred us to his draft conditions 68-79.[347] Nor did we receive evidence or legal submissions explaining why a bond should only apply if the consents were transferred to another entity.

[436] Our review of the Kate Valley landfill bond condition indicates two important differences to the bond condition proposed by the applicant. First, no specific bond sum was set by the Environment Court in approving the Kate Valley consents. The Court instead imposed the risk assessment approach. This is consistent with most large landfill facilities in New Zealand. The risk assessment approach enables the risk of the liability to be measured against the amount and type of waste in the landfill and a number of other matters and to be revisited on a frequent basis. It is expected the bond sum may increase or decrease depending on the level of risk. Second, the bond condition was applied at Kate Valley regardless of whether the consents would be transferred to another entity. Again, this is consistent with New Zealand practice.

[437] It is important for the bond to provide sufficient identified funds to remedy any problems and/ or non-compliances arising from landfill operations, closure and aftercare. Council ownership of the site does not excuse potential liabilities in this regard. We consider a fixed sum of $5,000,000 does not provide certainty that sufficient funds would be available to remedy any problems, particularly given costs are likely to increase substantially over the landfill's life. We have therefore adopted the risk assessment approach and have made some further amendments to the text of the bond conditions.

[438] ORC did not provide feedback on the draft bond conditions. DIAL did provide feedback, as outlined in Attachment 2 to Mr Dale's Reply evidence. We accept that draft condition 75(c)(viii) (as it then was) would be improved by the additional wording proposed by DIAL on bird management and have amended the condition accordingly.

4.2.21 Monitoring

[439] Numerous submitters raised concerns about the proposed management of the potential adverse effects on the environment that might arise during the construction, operation, maintenance and aftercare phases of the proposed landfill. Responding to those concerns, Mr Dale advised that the proposed Landfill Management Plan (LMP) would document site-specific procedures, including monitoring and contingency actions, to be implemented by the consent holder to ensure the landfill achieved the applicant's operational

[345] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraph 66
[346] Submissions in Reply by counsel for the Applicant, paragraphs 67-68.
[347] Evidence in reply of Maurice Dale, paragraph 13(c).

and environmental objectives and complied with the various conditions of consent[348]. He noted the draft LMP included a section on 'Monitoring, records, and reporting,' with the aim of including details of the monitoring and reporting requirements that will be undertaken.[349]

[440] As previously discussed in section 1.10 of this Decision, the applicant now proposes to omit the requirement for a separate Receiving Waters Environment Management Plan, with the matters that would have otherwise been specified in that Plan now being encapsulated in the LMP. In that regard Mr Dale provided a copy of the revised draft LMP350 and section 6 of that Plan is dedicated to 'Monitoring, Records and Reporting'. It describes the primary areas of focus for the landfill monitoring programme, including proposed monitoring and reporting requirements for the following components:

- Weather
- Groundwater
- Surface water
- Landfill Gas
- Landfill Stability
- Landfill Cap Integrity
- Odour
- Dust
- Noise
- Waste
- Birds
- Falcons
- Lizards
- Terrestrial Vegetation
- Freshwater and wetlands
- Incidents
- Complaints

[441] We note that to be a comprehensive list.

[442] We discussed the management (and by extension any associated monitoring) of indigenous biodiversity including lizards and falcons in section 3.2.5 of this Decision and do not repeat that discussion here. The LMP's proposed monitoring and reporting requirements for the other components listed above are largely addressed within the corresponding sections of this Decision. We focus the remainder of this section on those aspects of the applicant's monitoring proposals that were discussed at length during the hearing with numerous technical witnesses variously representing the applicant, submitters, ORC, and DCC-Regulatory.

[443] A key matter traversed during the hearing was the applicant's proposed groundwater and surface water monitoring regime. Mr Dale[351] noted that the proposed groundwater baseline monitoring period had been extended from 12 to 36 months and that following completion of the baseline monitoring (including comparison of the monitoring results with rainfall data) the conceptual groundwater model for the landfill site would either be confirmed or updated. We find that to be appropriate.

[444] In response to matters raised during the hearing the applicant has incorporated additional requirements for continuous monitoring of the landfill's sub-liner groundwater drainage system, the sediment retention pond for the Stage 1 area, and the attenuation basin during the landfill's operation. Additional parameters will be

[348] Additional Evidence, 18 May 2022, Maurice Dale, paragraph 27.
[349] Additional Evidence, 18 May 2022, Maurice Dale, paragraph 30(f)
[350] Further evidence in response to Section 42A Report and submitters, DRAFT Landfill Management Plan Prepared for Dunedin City Council, 29 April 2022
[351] Further evidence Maurice Dale presented at the hearing, paragraph 69.

monitored in the receiving waters including PFOS[352], Total Organic Carbon, Total Kjeldahl Nitrogen and Total Phosphorus had been added as contaminants to be monitored. We also find that to be appropriate

[445] In section 4.2.6 of this Decision, we set out our finding that both surface water and groundwater should be monitored monthly during the 36-month baseline period and in section 4.2.7 we discussed and accepted Mr Kirk's proposal for the setting of upper allowable concentration limits for surface and groundwater quality. We have reviewed the applicant's proposed conditions of consent relating to groundwater and surface water monitoring and consider them to include an appropriate range of monitoring practices, procedures and actions. We also discussed and accepted the applicant's proposed monitoring of birds that pose a potential threat to aviation safety in section 4.2.13 of this Decision.

[446] During the hearing, we asked Yvonne Takau to draft a condition regarding Te Rūnanga o Ōtākou's involvement in both the baseline and ongoing monitoring activities and she helpfully provided wording for us to consider. As part of the applicant's Reply submissions Mr Dale[353] advised that the applicant had accepted Ms Takau's proposed wording. We also find that wording to be appropriate and note it[354] refers to components of the monitoring programme that Te Rūnanga o Ōtākou will be involved in, together with resourcing and support for that involvement.

[447] Regarding the consent required under the NES-FM (see section 2.2 of this Decision), we accept Tanya Blakely's[355] advice that the construction of any new in-stream structures, or the modification or upgrading of existing in-stream structures, would need to occur in accordance with the design, monitoring and maintenance parameters set out in the NES-FM. We are satisfied that will ensure any existing fish passage is maintained or perhaps even improved.

[448] Overall, we have carefully considered the applicant's proposed and revised monitoring actions and programmes and find them to be robust and comprehensive. We consider them sufficiently detailed to enable the actual effects of the proposed landfill on surface water, groundwater and aquatic ecology to be determined throughout the proposed life of the landfill. That in turn will enable a review of conditions of consent to be undertaken by the ORC should any unanticipated adverse effect on the environment become evident after the consents commence.

[449] For completeness and to assist readers we summarise the full range of monitoring requirements contained in the ORC consents below:

A. Schedule 1 General Conditions Relevant to All Consents

General condition 17(f)	Requirement of LMP - Waste acceptance criteria and monitoring
General condition 17(n)	Requirement of LMP – Monitoring procedures, including locations, parameters, frequency, detection limits and trigger levels
General condition 42	Te Rūnanga o Ōtākou involvement in both baseline monitoring and ongoing monitoring of the effects of the landfill operation.
General condition 43	Weather monitoring
General conditions 44-58	Groundwater and surface water monitoring
General conditions 59-64	Freshwater ecology and wetland ecology monitoring
General conditions 65-66	Complaints monitoring
General condition 67	Annual monitoring reporting requirement
General condition 68-78	Bond for performance of monitoring obligations
General condition 79 (e)	Review of requirements and frequency of monitoring and reporting

Attachment 1 to General conditions - Table 1 Water Quality Monitoring Parameters

[352] Perfluorooctanesulfonic acid.
[353] Reply Evidence Maurice Dale, paragraph 14.
[354] General Conditions – condition 42.
[355] Further evidence, Tanya Blakely, paragraph 56

B. Discharge of Waste and Leachate to Land

Condition 20	Leachate storage and management monitoring
Conditions 49-57	Southern Black Backed Gull monitoring
Condition 67	Landfill fire response procedures and monitoring
Condition 69	Pest and cat monitoring

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

Conditions 11-15	Landfill gas baseline monitoring
Conditions 28-33	Landfill gas perimeter and surface monitoring

Attachment 1 to Discharge to Air Conditions – Table 1 Landfill Gas Monitoring Parameters

D. Discharge of Stormwater and Collected Groundwater to Water

Condition 14	Erosion and sediment controls – inspection and monitoring

4.2.22 Community liaison group

[450] At the commencement of the applicant's case, we suggested the formation of a 'community liaison group' as a means of enabling ongoing dialogue and two-way communication between the consent holder and the affected community. We noted that such arrangements were relatively common for large infrastructural projects, particularly those that had elicited a wide range of community interest, which is the case here.

[451] DCC CEO Sandra Graham indicated a willingness to form such a group and the applicant volunteered conditions accordingly as part of their Reply submissions. We have imposed the requirement for a 'community liaison group' accordingly, noting that it is to be serviced by the consent holder.

4.2.23 Positive effects

[452] Granting the consents sought from the ORC will enable the Smooth Hill landfill to be developed and operated as a replacement for the Green Hill landfill which will shortly reach the end of its operational life. As set out in sections 1.5 and 1.6 of this Decision this will in turn enable the DCC to dispose of its non-divertible solid waste stream in an environmentally sustainable manner.

[453] As submitted by counsel[356] for the applicant, the Smooth Hill landfill will be important piece of infrastructure for the people of Dunedin, enabling them to dispose of waste locally without being dependent on transportation to municipal waste facilities located outside of Dunedin. The proposal will also provide for ecological enhancements (see section 4.2.10 of this Decision).

[454] We also note that the construction and operation of the landfill will generate a nominal $14.6m in net additional Value Add in the Dunedin economy over 35 years (in $2016 terms) and over 813 full time job equivalents across that same time period.[357] In saying that, we record that contrary to the views of some submitters,[358] the wider 'economics' of the proposal are not of concern to us, rather those are matters for the DCC to consider under its Local Government Act responsibilities.

4.2.24 Other submitter issues

[455] Some submitters raised the issue of the effects of the landfill and its operation on property prices. We agree with Ms Lennox[359] that this is not a relevant matter. As set out in various Court decisions, the physical effects of an activity on the environment are the primary consideration, and any effect on property prices is simply a (potentially imperfect and difficult to quantify) reflection of those environmental effects. Furthermore, considering both the physical effects on the environment as well as any indirect effect on property prices would risk "double-weighing" of effects on the environment.

[356] Opening submissions, paragraph 5.
[357] EIC Greg Akehurst, paragraphs 22 and 23.
[358] Including Viktoria Kahui, Maria Sydor and Scott Weatherall.
[359] ORC Section 42A Report, section 6.1.13.

[456] Ms Lennox noted[360] that some submitters raised concerns about landfill fires, vermin and litter and the contamination of roof water supplies for nearby residents by birdlife attracted to the landfill. She considered that those matters could be managed through the implementation of the Landfill Management Plan, which is to be developed in consultation with Te Rūnanga o Ōtākou, reviewed by the Peer Review Panel, certified by the ORC and reviewed annually by the consent holder to ensure that management practices are ensuring compliance with consent conditions. We agree, noting that we discussed the issue of landfill fires and discharges to air in sections 4.2.14 and 4.2.16 of this Decision.

[457] We heard from submitter Andrea McMillan who resides on Big Stone Road. In her presentation she queried why the applicant had not undertaken a social impact assessment as part of the assessment process. She referred us to the guidance provided by New Zealand Association for Impact Assessment (NZAIA) and highlighted the various types of assessments that constitute best practice. Ms McMillan emphasised that such as assessment would cover the impacts of the proposal on 'way of life', 'culture', 'community', 'political and governance systems', 'fears and aspirations' and 'personal and property rights'.[361]

[458] In accordance with the decision-making framework that guides our assessment of the proposal, we have carefully and thoroughly considered the direct effects of the proposal on the environment (including people and communities) throughout this Decision. Having considered the further evidence provided by the Applicant at the hearing (including the QHHRA that we discussed in sections 2.6 and 4.2.7 of this Decision), we find that the applicant has provided comprehensive evidence on all relevant matters within the scope of our jurisdiction. We note that the impact of the proposal on private property rights is not a matter we can consider as already stated above, and similarly the community's perception of risk is addressed in section 1.7 of this Decision.

[459] We heard from Anne-Claire Mauger on behalf of the Ōtokia Creek and Marsh Habitat Trust who presented views from the reported perspective of tangata whenua and the kaiatiaki Ōtokia Whānau relating to the cultural and archaeological significance of the Ōtokia landscape. While we acknowledge that members of the Ōtokia Whānau may have concerns about the proposal, we note that it is Te Rūnanga o Ōtākou that represents the interests of mana whenua for Smooth Hill and the Taiari Plain. As noted in sections 3.2.7 and 4.2.18 of this Decision, Te Rūnanga o Ōtākou do not share the concerns raised by Ms Mauger on behalf of the Ōtokia Whānau.

4.2.25 Overall findings on effects

[460] In overall terms we find that the potential adverse effects of the activities for which consent has been sought from the ORC are either no more than minor, or are able to be adequately avoided, remedied, mitigated or otherwise offset through the imposition of appropriate conditions of consent.

4.3 National environment standards and other regulations

[461] The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 are relevant. We discussed the requirements of those Regulations earlier in this Decision.

[462] The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 and Amendment Regulations 2020 are relevant should the maximum instantaneous rate of groundwater abstraction exceed 5 L/s. We note that the ORC water take permit includes routine water flow monitoring conditions.

[463] The Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES-AQ) are relevant insofar as conditions of consent are required to ensure that the flaring of landfill gas is undertaken in accordance with regulations 25, 26 and 27. We are satisfied that the conditions on the Discharge of Landfill Odour and Dust and Landfill Gas and Flare Emissions to Air consent appropriately refer to those regulations.

[360] ORC Section 42A Report, section 6.1.13.
[361] EIC Andrea McMillan - Smooth Hill Powerpoint Presentation 23 May 2022.

[464] No other national environmental standards of regulation were brought to our attention.

4.4 National policy statements

[465] The primary relevant national policy statement is the National Policy Statement Freshwater Management 2020 (NPSFM). Ms Lennox assessed the applications against the NPSFM policies in Attachment 13 to the ORC Section 42A Report, noting uncertainty regarding whether or not Policy 6 (natural wetlands) was met. We considered relevant NPSFM polices in section 4.2 of this Decision and we found that a consideration of those provisions, including NPSFM Policy 6, did not weigh against a grant of consent.

[466] Importantly, we agree with Mr Dale that, in terms of the hierarchy of obligations in Te Mana o te Wai (and the sole NPSFM Objective 2.1(1)) the health and well-being of water bodies and freshwater ecosystems has been prioritised in by the Smooth Hill proposal.[362] Regarding Te Mana o te Wai, Ms Takau's evidence for Te Rūnanga o Ōtākou was that "…*the health and well-being of the water bodies and freshwater ecosystems have been recognised and provided for through the proposed conditions*" and "… *that mana whenua have been actively engaged throughout the process and that proposed conditions will allow this to continue, by enabling Te Rūnanga o Ōtākou to provide input into the detailed management and monitoring in the Landfill Management Plan and associated ecological management plans*." Ms Takau's evidence was that the Smooth Hill proposal was consistent with NPSFM Policies 1, 2, 3, 6 and 9. We agree.

[467] During the hearing the relevance of the New Zealand Coastal Policy Statement (NZCPS) was raised. As part of the Reply, Mr Dale considered that the provisions that seek to manage the effects of land use activities on a range of values in the coastal environment were relevant. This includes the preamble, and Policies 3, 4, 11, 13, 22 and 23. Mr Dale, drawing on the other technical experts who assess potential effects on water quality, concluded that the proposal was consistent with those policies which are all effects focused. Having considered those provisions ourselves, we concur with Mr Dale on that matter.

4.5 Regional Policy Statements

[468] The Regional Policy Statement for Otago (RPS) 1998 has been revoked and the Partially Operative Regional Policy Statement for Otago (PORPS) was made partially operative on 15 March 2021. The Proposed Regional Policy Statement 2021 (PRPS21) has been the subject of a High Court Declaratory judgement.[363] The Court made declarations that:

a) the Otago Regional Council's determination, that the whole of its proposed regional policy statement was a freshwater planning instrument, was in error;
b) the Otago Regional Council must now reconsider the proposed regional policy statement and decide which parts of it do relate to freshwater in the way the legislation requires for those parts to be subject to the freshwater planning process; and
c) the Otago Regional Council will then have to notify those parts of the proposed regional statement which are to be treated as a freshwater planning instrument and begin again the freshwater planning process as to those parts.

[469] We have therefore given little weight to the PRPS21 provisions, although we note that of relevance to the applications before us, they generally mirror the provisions of the NPSFM and PORPS.

[470] Ms Lennox set out what she considered to be the relevant provisions of the PORPS and PRPS21 in Attachment 13 to the ORC Section 42A Report. Like her, we focus on provisions that might weigh against a grant of consent. In that regard Policy 4.6.8 of the PORPS provides a starting point for our assessment and it is (our emphasis):

> *Manage the storage, recycling, recovery, treatment and disposal of waste materials by undertaking all of the following:*
> a) *Providing for the development of facilities and services for the storage, recycling, recovery, treatment and disposal of waste materials;*

[362] EIC Maurice Dale, paragraph 111.
[363] *Otago Regional Council v Royal Forest and Bird Protection Society of New Zealand Incorporated* [2022] NZHC 1777

b) *Ensuring the health and safety of people;*
c) *Minimising adverse effects on the environment;*
d) *Minimising risk associated with natural hazard events;*
e) *Restricting the location of activities that may result in reverse sensitivity effects near waste management facilities and services.*

[471] Ms Lennox considered that with regard to Dunedin International Airport, the landfill proposal was contrary to Policies 4.3.3, 4.3.5(a) and (b), and 4.6.8(b) of the PORPS. Policies 4.3.3 and 4.3.5(a) and (b) are respectively:

> "*Provide for the functional needs of infrastructure that has regional or national significance, including safety*.
>
> *Protect infrastructure with national or regional significance, by all of the following:*
> *a) Restricting the establishment of activities that may result in reverse sensitivity effects;*
> *b) Avoiding significant adverse effects on the functional needs of such infrastructure; …*

[472] We come to a different conclusion and find that the proposal is not contrary to those provisions because:
- With regard to Policy 4.3.3, while recognising that we need to provide for the functional need of DIAL for safety, on the evidence we have found that subject to adherence with conditions of consent, the Smooth Hill landfill will not exacerbate the already high risk bird strike at DIAL;
- Regarding Policy 4.3.5(a), we agree with counsel[364] for the applicant that reverse sensitivity[365] applies where a sensitive use of land establishes near an existing lawful activity and experiences effects resulting in complaints that may curtail the existing operation. In this case the proposed landfill is not a sensitive use of land and we cannot foresee the owners and operators of the landfill seeking to curtail the operation of DIAL because of adverse effects that it has on the landfill; and
- Regarding Policy 4.3.5(b), as outlined in section 4.2.13 of this Decision, we do not consider that the proposed Smooth Hill landfill poses a 'significant' risk to the functional needs of DIAL.

[473] For the applicant Mr Dale provided a detailed assessment of the relevant provisions and he considered:
- Regarding the management of indigenous biological diversity, and the protection of significant indigenous vegetation and significant habitats of indigenous fauna, the landfill proposal would be consistent with Policy 9 of the NESF and PORPS Policies 3.1.9, 3.2.2, 5.4.6, 5.4.6A; and
- Regarding Ōtokia Creek, the landfill proposal would maintain good water quality and aquatic health, maintain indigenous habitats and species and their migratory patterns, and maintain as far as practicable the natural functioning and amenity and landscape values of rivers and wetlands and it was therefore consistent with PORPS policy 3.1.1.

[474] We agree with Mr Dale on those matters.

[475] We find that having regard to the PORPS does not weigh against a grant of consent.

4.6 Regional plans

[476] There are three regional plans that are relevant to the applications before us. Given the plethora of provisions within the regional plans and the PORPS Policy 4.6.8 starting point outlined in section 4.5 above, we have taken the approach of determining if there are any regional plan provisions that might potentially weigh against a grant of consent.

4.6.1 Regional Plan: Water for Otago (RP: Water)

[477] Ms Lennox set out what she considered to be the relevant provisions Regional Plan: Water for Otago in Attachment 13 to the ORC Section 42A Report.

[364] Submissions in reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraph 15
[365] The partially operative RPS defines 'reverse sensitivity' as " The potential for the operation of an existing lawfully established activity to be constrained or curtailed by the more recent establishment or intensification of other activities which are sensitive to the established activity."

[478] She drew our attention to Policy 7.4.11(a) which is that "*the siting, design, construction, operation and management of new and operating landfills is in accordance with the Waste Minimisation Institute New Zealand's Technical Guidelines for Disposal to Land (August 2018*)." As discussed above, the landfill is to be sited within 13km of the Dunedin International Airport which is contrary to those Guidelines. However, we consider that in light of the bird management initiatives offered by the applicant (see section 4.2.13 of this Decision), having regard to that provision does not weigh against a grant of consent.

[479] Ms Lennox also considered that the proposal was contrary to Policy 5.4.2A which is:

> *"The loss of river extent and values is avoided, unless the council is satisfied:*
> *(a) That there is a functional need for the activity in that location; and*
> *(b) The effects of the activity are managed by applying the effects management hierarchy."*

[480] On the evidence we are satisfied the loss of river extent and values will be avoided, noting those values to be unremarkable given the ephemeral nature of the unnamed tributary that leads from the 'swamp wetland' and eventually merges with the Ōtokia Creek.

[481] Ms Lennox was concerned about Policy 10.4.8[366] which is that "*The loss of natural inland wetlands is avoided, their values are protected, and their restoration is promoted …*" unless certain exceptions apply. However, we are satisfied that in this case the clear 'intent' of Policy 10.4.8(b) applies, because the applications relate to the construction of significant public good infrastructure[367] (clause b(i)) that will provide significant regional benefits (clause b(ii)), there is arguably a functional need for the landfill to be located within the designated site (clause b(iii)), and the effects of the landfill activity will be managed by applying the effects management hierarchy (clause b(iv)).

[482] For the applicant Mr Dale provided a detailed assessment of the relevant regional statutory instruments and he considered that regarding RP: Water Policy 10.4.2, none of the wetlands immediately downstream of the landfill are identified as Regionally Significant Wetlands and there would no adverse effects on wetland values of the regionally significant Lower Ōtokia Creek Marsh at Brighton. We agree.

[483] As mentioned in section 2.2 of this Decision, Plan Change 8 to the RP: Water has amended clause (b) of Policy 10.4.2 to read "*Is nationally or regionally significant ~~important~~ infrastructure, and has specific locational constraints*". That brings the landfill within the definition of "specified infrastructure" in the NES-FM. We understand that Policy 10.4.2 enables the DCC to undertake remediation or mitigation of any adverse the effects of the proposed landfill on "*a Regionally Significant Wetland or a regionally significant wetland value*." That being the case, even if Mr Dale was wrong about the status of the potentially affected wetlands, that would not require adverse effects on those wetlands to be avoided in this case.

[484] We find that having regard to the RP: Water does not weigh against a grant of consent.

4.6.2 Regional Plan: Air for Otago (RP: Air)

[485] Ms Lennox set out what she considered to be the relevant provisions Regional Plan: Air for Otago (RP: Air) in her Section 95 Notification Recommendation Report. She advised that the applicant stated that the following discharges to air will be undertaken in accordance with the relevant permitted activity criteria:

> *Discharge of exhaust gases from the backup diesel electricity generator to power the leachate collection pumps and LFG flare system (RPA - Rule 16.3.4.2).*
>
> *Discharges of dust to air during construction of the upgrade of McLaren Gully Road, Big Stone Road, and State Highway 1 (RPA - Rule 16.3.13.1).*[368]

[366] NPSFM Policies 3.22 and 3.24 and PRPS21 policies LF-FW-P9 and P13 mirror that guidance.
[367] We note that landfills are not defined as 'regionally significant infrastructure' in the PRPS21 and so they are not strictly captured in the definition of 'specified infrastructure' under the NPSFM or the PRPS21.
[368] We note Ms Lennox appeared to incorrectly refer to Rule 16.3.14.1.

[486] Section 8.2 of the RP: Air sets out the general policies for managing discharges of contaminants into the air. Policy 8.2.3 sets out general criteria that we have had regard to. We note that Policy 8.2.8 is particularly relevant in light of the concerns expressed by submitters regarding potential nuisance odours emanating from the landfill site. That Policy reads:

> *To avoid discharges to air being noxious, dangerous, offensive or objectionable on the surrounding local environment.*

[487] The explanation to Policy 8.2.8 states that irrespective of any other control on discharges, a condition will be placed on all relevant permitted activities to prevent, where necessary, any noxious, dangerous, offensive or objectionable effects at or beyond property boundaries. That is also a routine requirement for potentially odorous activities that require discharge consents and the applicant, the ORC's technical expert Mr Chilton, and Ms Lennox all agreed that such a condition was appropriate here. We concur.

[488] We note that the discharge of landfill gas is regulated by the Regional Plan: Waste for Otago and we address that matter below.

[489] We find that having regard to the RP: Air does not weigh against a grant of consent.

4.6.3 Regional Plan: Waste for Otago (RP: Waste)

[490] Ms Lennox set out what she considered to be the relevant provisions Regional Plan: Waste for Otago (RP: Waste) in Attachment 13 to the ORC Section 42A Report.

[491] Policy 7.4.3 is "*To ensure that landfills and discharges from silage production and composting operations are sited at locations and managed in a manner whereby adverse effects on the environment are avoided, remedied, or mitigated*." We are satisfied that is the case here.

[492] Policy 7.4.11 (a) mirrors RP:WFO Policy 7.4.11(a) which we discussed above.

[493] For the applicant Mr Dale concluded[369] that practicable alternative sites and methods had been considered; the minimisation hierarchy had been given effect to; disposing of organic waste would be provided for, and that the landfill would will cater only for those materials that cannot be recycled, recovered, or treated for re-use consistent with PORPS policy 4.6.9 and RP: Waste Policies 4.4.2, 4.4.4, and 7.4.8. We agree.

[494] As outlined in the preceding section of this Decision, landfill gas is dealt with under the RP: Waste and that Plan states that landfills produce methane gas which could pose a hazard if it is unable to dissipate away from the landfill.[370] However, despite recognising landfill gas as an issue, the RP: Waste does not have any policy provisions specifically addressing that matter other than perhaps Policy 7.4.3 which states a general requirement for landfills to be "… *managed in a manner whereby adverse effects on the environment are avoided, remedied, or mitigated*."

[495] It is widely acknowledged that landfills need to be managed and monitored on an ongoing basis (often referred to as 'landfill aftercare') for some time after their closure. The RP: Waste recognises that, stating[371] that "… *it will be necessary to require post closure management plans for landfills*." Policy 7.4.6 address that matter and it reads "*To require that all new, operating, and closed landfills are managed in compliance with approved management and post closure procedures."*

[496] We are satisfied that the 'landfill after care' requirements of the RP: Waste will be met in this case and that appropriate conditions can ensure that happens.

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[369] EIC Maurice Dale, paragraph 136.
[370] Section 7.2.5.
[371] Ibid.

[497] As submitted by counsel[372] for the applicant in reply "*Plan Change 1 (Dust suppressants and landfills) to the Regional Plan: Waste for Otago became operative on 9 July 2022, after the hearing. Under this Plan Change there is a new policy (Policy 7.4.11) that the siting, design, construction, operation and management of new landfills, must be in accordance with the Waste Management Institute New Zealand's Technical Guidelines for Disposal to Land (August 2018); and a site-specific management plan covering leachate management, stormwater capture and control, minimisation of contamination of surrounding environment, and management of hazardous waste, must be prepared and implemented. The design of the landfill and conditions of consent offered by DCC meet these requirements*."

[498] We agree with counsel.

[499] We find that having regard to the RP: Waste does not weigh against a grant of consent.

4.7 Section 104(1)(c) other matters

[500] There are no other matters that were brought to our attention.

4.8 Section 105(1) matters

[501] Section 105(1) of the RMA states that where an application is for a discharge permit to do something that would otherwise contravene Section 15 or Section 15B of the Act we must have regard to certain matters, namely:

a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects;

b) the applicant's reasons for the proposed choice; and

c) any possible alternative methods of discharge, including discharge into any other receiving environment.

[502] We note that section 105(1)(c) of the RMA reflects the wording of clause 6(1)(d)(ii) of Schedule 4, however we do not consider that the requirements of s105 require us to revisit the applicant's selection of the Smooth Hill landfill site as that occurred as part of the designation process. We discussed that matter more fully in section 1.5 of this Decision.

[503] In this case the receiving environment is not particularly sensitive, comprising as it does an unnamed surface water tributary of the Ōtokia Creek and shallow groundwater below the landfill footprint. The reason for the applicant's choice of the receiving environment is that the Smooth Hill site is designated for landfill purposes. Given the applicant's proposed stormwater and leachate management systems we are satisfied alternative methods of discharge would not better achieve the relevant regional policy direction to minimise adverse effects on the environment.

[504] For the applicant Mr Dale did not consider that the landfill proposal would result in any significant adverse effects, such that assessment of alternatives under section 104(1)(c) (and 105(1)(c)) RMA was warranted.[373] We have come to a similar conclusion.

[505] We find that a consideration of s105(1) matters does not weigh against a grant of consent.

4.9 Section 107(1) matters

[506] Section 107(1) of the RMA states that a discharge permit shall not be granted if, after reasonable mixing, the contaminant or water discharged is likely to give rise to certain listed effects. Ms Lennox considered that the setting of trigger levels for suspended sediment that would lead to a conspicuous change in colour and visual clarity and therefore contravene s107.

[372] Submissions in Reply by Counsel for Dunedin City Council as Applicant, 12 August 2022, paragraphs 56 and 57.
[373] EIC Maurice Dale, paragraph 151.

[507] For the applicant Mr Dale stated[374] that in response to Ms Lennox's concern he recommended amending the conditions to require trigger levels for suspended sediments for flood events to be based on visual inspection with the discharge not causing a conspicuous change in colour or visual clarity after reasonable mixing in the downstream receiving waters. We find that to be appropriate.

[508] We find that a consideration of s107(1) matters does not weigh against a grant of consent

4.10 Part 2 matters

[509] We are aware of the case law which outlines that if the lower order statutory instruments appropriately deal with Part 2 matters, then no further assessment of Part 2 matters is required. We find that recourse to Part 2 matters would not add anything to the statutory instrument assessments that we have set out in preceding sections of this Decision.

4.11 Consent duration and lapsing

[510] The applicant has sought a term of 35 years for all consents other than the water permit to take groundwater, for which a 6-year consent term is sought in line with the new policy direction in Chapter 10A of the RP:WFO as (introduced by Plan Change 7). Ms Lennox considered those durations to be appropriate.[375]

[511] We agree that the durations sought are appropriate for a significant 'public good' regionally significant infrastructure project such as the Smooth Hill landfill.

[512] As noted by Ms Lennox,[376] under RMA s125, if a resource consent is not given effect to within five years of the date of the commencement (or any other time as specified) it lapses automatically, unless the ORC grants an extension. However, in this case the applicant has sought lapse period of ten years[377] and we find that to be appropriate, other than for the water permit to take groundwater which we find should have a lapsing date commensurate with its six-year term.

4.12 Consent conditions

[513] Mr Dale recommended a suite of conditions that was based on those contained in the AEE, but included numerous amendments resulting from the recommendations of Ms Lennox, the concerns of submitters and the evidence of the applicant's witnesses. We have used those conditions as a starting point but have amended them in line with this Decision. The more substantial changes that we have made include:

- Inserting administrative details at the start of the general condition;
- Inserting an ORC certification process into the suite of general conditions;
- Restricting the role of the Peer Review Panel to reviewing documentation (as opposed to specifying 'confirmation' or 'acceptance') given we have included a documentation certification role for the ORC;
- Omitting earthworks conditions that relate to the roading upgrade and realignment works as those matters are dealt with under the DCC land use consent;
- Simplifying the Vegetation Restoration Management Plan and Freshwater and Wetland Monitoring and Management Plan requirements in recognition of the relatively unremarkable nature of the potentially affected swamp wetland located at the proposed toe of the landfill and the intermittent watercourse that flows from it to the Ōtokia Stream;
- Avoiding duplicating stormwater management conditions with the permits for the Discharge of Stormwater and Collected Groundwater to Water and the Water Permit for the Diversion and Damming of Surface Water within the Landfill Site;
- Revising the bond conditions;
- Revising the operating hours condition;
- Inserting specific consent expiry dates;

[374] EIC Maurice Dale, paragraph 155.
[375] ORC Section 42A Report, section 11.
[376] Ibid.
[377] EIC Maurice Dale, paragraph 40.

- Clarifying the grammar in many conditions;
- Ensuring condition sub-clauses are clearly conjunctive and deleting all 'Oxford commas', and
- Consolidating 'advice notes' within the Schedule of General Conditions to avoid repetition.

[514] As noted above we have inserted 'administrative provisions' at the start of the suite of 'general conditions' and we have also inserted 'placeholder' consent numbers into the suites of specific conditions that follow. We direct the ORC to review, amend if necessary, and complete those sections prior to issuing the consent documents.

[515] In light of the numerous amendments outlined above, it is conceivable that the conditions may now contain errors. Accordingly, should the applicant or the ORC identify any minor mistakes or defects in the attached conditions, then we are prepared to issue an amended schedule of conditions under s133A of the RMA correcting any such matters. Consequently, any minor mistakes or defects in the amended conditions should be brought to our attention prior to the end of the 20-working day period specified in section 133A of the RMA.

4.13 Determination

[516] We grant the resource consents sought by the Dunedin City Council for the purpose of the construction and operation of a Class 1 landfill as follows:

- Discharge Permit to discharge:
  - waste and leachate onto land;
  - landfill gas, flared exhaust gases, dust and odour to air,
  - water and contaminants from an Attenuation Basin and sediment retention ponds to water;
- Water Permit to take up to 87 m^3/day and 1,600 m^3/year of groundwater and use of up to 50m^3/day of groundwater;
- Water Permit to divert surface water within the Ōtokia Creek catchment;
- Water Permit to dam water within an Attenuation Basin; and
- Various consents under the NES-FM.

[517] Our reasons are detailed in the body of this Decision, but in summary they include:

- Potential adverse effects of the proposal are either minor; minimised to the extent practicable or are otherwise suitably avoided, remedied, mitigated or offset by the imposition of appropriate conditions of consent (including comprehensive monitoring and mitigation of unforeseen adverse effects should they arise); and
- The proposal is generally consistent with the relevant statutory instruments and any inconsistencies are minor and do not weigh against a grant of consent.

Rob van Voorthuysen (Chair)

Jan Caunter

Ros Day-Cleavin
9 September 2022

APPENDIX 1:
SMOOTH HILL DCC CONDITIONS OF CONSENT FOR ROAD UPGRADE AND REALIGNMENT WORKS

General

1. The proposed activity must be undertaken in general accordance with the approved plans attached to this certificate as Appendix One, and the information provided with the updated resource consent application received by the Dunedin City Council on 31 May 2021 and further information received on 5 April 2022 and the information provided at the resource consent hearing held between 17 May 2022 and 25 May 2022, except where modified by the following conditions. In the event of differences or conflict between the measures in the documents and the conditions, the conditions shall prevail.

2. The consent holder:
   a) is responsible for all contracted operations relating to the exercise of this consent; and
   b) must ensure that all personnel (contractors) working on the site are made aware of the conditions of this consent, have access to the contents of consent documents and to all associated erosion and sediment control plans and methodology; and
   c) must ensure compliance with land use consent conditions.

3. Neighbouring property owners adjoining the affected road boundaries of Big Stone Road and McLaren Gully Road must be advised of the proposed works at least seven days prior to the road upgrade works commencing.

Certification Process

4. The consent holder must follow the process set out below for any plans or documents requiring the certification of an officer of the Dunedin City Council:
   a) Plans or documents requiring certification must be submitted to the relevant officer in electronic and hard copy form for certification at least 20 working days prior to the commencement of the works to which the plan or document relates. The certification process must be confined to confirming that the plan or document adequately gives effect to the relevant condition(s).
   b) Subject to (c) and (e) below, works to which the plan or document relates must not commence until the consent holder has received written certification from the relevant officer.
   c) If the consent holder has not received a response from the relevant officer within 10 working days of the date of submission under (a) above, the plan or document must be deemed to be certified.
   d) If the relevant officer's response is that they are not able to certify the plan or document they must provide the consent holder with reasons and recommendations for changes to the plan or document in writing. The consent holder must consider any reasons and recommendations of the relevant officer and resubmit amended plans or documents for certification.
   e) If the consent holder has not received a response from the relevant officer within 5 working days of the date of resubmission under (d) above, the plan or document must be deemed to be certified.
   f) If the relevant officer's response is that that they are still not able to certify the resubmitted plan or document then the consent holder must nevertheless implement the resubmitted plan or document with a notation that certification of them has not occurred.
   g) Certified plans and documents may be amended at the request of the consent holder at any time subject to recertification undertaken in accordance with a) to f) above with references in those clauses to certification to be read as certification.

Engineering

5. All investigations, detailed design, and construction of the road upgrades must be supervised by a suitably experienced Chartered Professional Engineer (CPEng).

Biodiversity

6. If a Lizard Management Plan (or equivalent document) is not produced by the consent holder and submitted to the Department of Conservation as part of an application for a section 53 authority under the Wildlife Act 1953, then prior to commencement of the road upgrade and realignment works a Lizard Management Plan (LMP), based on the Draft Smooth Hill Lizard Management Plan prepared by Boffa Miskell Ltd dated June 2021, must be prepared by a suitably qualified herpetologist. The LMP must be developed in consultation with Te Rūnanga o Ōtākou and the Department of Conservation. The LMP must include (but not be limited to):
   a) Identification of potentially affected lizard habitat as determined by desktop assessment and on-site surveys;
   b) Description of the methodology for lizard survey, salvage, transfer and release including the identification of potential habitats for planned and opportunistic relocations;
   c) Identification of any works necessary to protect relocation sites from predation or disturbance; and
   d) The personnel who will be responsible for implementing the LMP.

7. The LMP prepared under Condition 6 must be submitted to the Resource Consents Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz for certification in accordance with condition 4 that it addresses the requirements of Condition 6.

8. The certified LMP is to be implemented for the duration of any road construction works.

Archaeology

9. The consent holder must engage a qualified archaeologist to provide advice, recording, and reporting on any archaeological material encountered during the construction of the road upgrade and realignment works.

10. The consent holder must clearly identify any standing archaeological remains within the road upgrade area that are to be retained.

11. Prior to the commencement of the road upgrade and realignment work, an archaeological site briefing by a qualified archaeologist must be delivered to all contractors undertaking earthworks associated with the road upgrades that may affect archaeology. The briefing must outline:
   a) The type of archaeological features that might be encountered during earthworks and what they might look like;
   b) What to do if a possible archaeological site is encountered and the archaeologist is not on site; and
   c) The role of the archaeologist referred to in Condition 9.

12. Evidence that the archaeological site briefing has been undertaken must be provided to a warranted DCC officer upon request.

Construction Traffic Management

13. Prior to the commencement of the road upgrade and realignment works, the consent holder must provide evidence to the Resource Consents Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz that the necessary Temporary Traffic Management Plans for both the State Highway 1 and McLaren Gully and Big Stone Roads have been approved by the relevant Roading Control Authority.

Advice Note: *The Temporary Traffic Management Plans must be prepared by a qualified planner under the NZ Code of Practice for Temporary Traffic Management*

Construction of Upgrades to McLaren Gully Road and Big Stone Road

14. Prior to commencement of the road upgrade and realignment works:
    a) The detailed design of the road upgrade and realignment works, including cut and fill slopes, must be informed by geotechnical investigations and be in accordance with the road design standards contained in the Dunedin City Council Code of Subdivision and Development 2010 or alternative land development or traffic engineering standards advised by the Transport Manager, Dunedin City Council;
    b) The detailed design of the road upgrade and realignment works must be provided to the Transport Manager, Dunedin City Council for review and certification in accordance with condition 4 that the detailed design complies with condition 14(a);
    c) A design stage road safety audit in accordance with the NZTA Road Safety Audit Procedures for Projects Guidelines 2013 must be carried out and provided to the Transport Manager, Dunedin City Council. Any recommendations of the Audit must be implemented unless advised otherwise by the Transport Manager, Dunedin City Council.

15. The completed road upgrade and realignment works must be certified by a suitably experienced Chartered Professional Engineer (CPEng) that they have been completed in accordance with the detailed design referred to in Condition 14(b). That certification must be provided to the Transport Manager, Dunedin City Council.

16. Following completion of the upgrades to McLaren Gully Road and Big Stone Road the consent holder must provide to the Transport Manager, Dunedin City Council:
    a) As-built plans detailing full asset data; and
    b) A post construction stage road safety audit in accordance with the NZTA Road Safety Audit Procedures for Projects Guidelines 2013 along with evidence that any recommendations of the audit have been implemented unless the Transport Manager, Dunedin City Council has advised in writing that those recommendations are not required to be implemented.

Upgrades to State Highway 1 Intersection with McLaren Gully Road

17. Prior to construction of the State Highway 1 intersection works commencing, the consent holder must submit the detailed design of the State Highway 1 intersection works to Waka Kotahi NZ Transport Agency for its approval.

18. Prior to the State Highway 1 intersection works commencing, the consent holder must submit to the Resource Consents Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz a copy of Waka Kotahi NZ Transport Agency's approval to undertake works on the State Highway (as detailed in the advice notes below).

19. As part of the road widening and realignment works authorised by this consent, and prior to waste being accepted at the landfill, the consent holder must construct a right turn bay, auxiliary left turn lane, localised shoulder widening for left turn out movement and flag lighting (the 'State Highway 1 Intersection works') at the intersection of State Highway 1 and McLaren Gully Road.

20. The completed State Highway 1 intersection works must be certified by a suitably experienced Chartered Professional Engineer (CPEng) that they have been completed in accordance with the detailed design approved by Waka Kotahi NZ Transport Agency. The consent holder must provide that certification to Waka Kotahi NZ Transport Agency.

21. Prior to waste being accepted at the landfill, the consent holder must provide to the Resource Consents Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz correspondence from Waka Kotahi NZ Transport Agency confirming that the works to the State Highway 1 intersection with McLaren Gully Road have been constructed to Waka Kotahi NZ Transport Agency standards.

Advice Notes:

a) It is a requirement of the Government Roading Powers Act 1989 that any person wanting to carry out works on a state highway first gain the approval of Waka Kotahi New Zealand Transport Agency for the works and that a Corridor Access Request (CAR) is applied for and subsequently a Work Access Permit issued (WAP) before any works commence. A CAR will be required for the State Highway 1 Intersection works.

b) Detailed design approval from Waka Kotahi NZ Transport Agency shall be gained by the consent holder prior to applying for a CAR. The detailed design shall be prepared by a suitably qualified professional who has been certified by Waka Kotahi. In developing the detailed design, the consent holder will need to consult with the Waka Kotahi appointed state highway maintenance contractor for Coastal Otago (Highway Highlanders; coastalotago@downer.co.nz) and a Waka Kotahi Safety Engineer.

c) A Corridor Access Request is made online via www.submitica.co.nz. The CAR needs to be submitted at least 21 working days before the planned start of works. A copy should also be sent to the Waka Kotahi NZ Transport Agency System Design and Delivery Planning Team at EnvironmentalPlanning@nzta.govt.nz . The Corridor Access Request will need to include:

i. The detailed final design for the right turn bay, auxiliary left turn lane, localised shoulder widening, flag lighting and stormwater management;

ii. A Construction Traffic Management Plan that has attained approval from the Waka Kotahi NZ Transport Agency appointed state highway maintenance contractor for Coastal Otago (Highway Highlanders).

iii. If requested by Waka Kotahi, a design safety audit which has been prepared, processed and approved in accordance with Waka Kotahi guidelines for Road Safety Audit Procedures for Projects at:

https://www.nzta.govt.nz/assets/resources/road-safety-audit-procedures/docs/road-safety-audit-procedures-tfm9.pdf.

Vehicle Access

22. The consent holder must ensure all existing (or relocated) driveways adjoining the upgraded (sealed) McLaren Gully Road and/or Big Stone Road are hard surfaced from the edge of the respective road carriageways towards the respective property boundaries for a distance of not less than 5.0m.

23. The consent holder must require all heavy vehicle contractors associated with the landfill construction and operation to use the route described within the application (SH1 – McLaren Gully Road – Big Stone Road) unless a hazard is present on this route which renders it impassable.

Construction Noise

24. The consent holder must only undertake the road upgrade and realignment works between 7.30am – 6pm Monday to Saturday (inclusive). No works are permitted to occur outside of these times, on Sundays, or public holidays, except where emergency works, such as responses to extreme weather events, are required to protect public health and safety.

25. Within 24 hours of any emergency works occurring outside of the authorised hours, the consent holder must inform the Resource Consent Manager, Dunedin City Council in writing at rcmonitoring@dcc.govt.nz of the following:

a) The nature of the emergency event; and

b) The nature, location and duration of the emergency works required to protect public health and safety.

26. Noise from the road upgrade works must comply with the noise limits outlined in rule 4.5.4.1 Construction of the Dunedin City Council's 2nd Generation District Plan (2GP).

27. The consent holder must have a Construction Noise Management Plan (CNMP) prepared by an acoustic specialist which addresses the requirements of Appendix E of NZS6803: 1999 Acoustics –Construction Noise and which includes (but is not limited to) measures to mitigate noise transmission from construction activity to the existing residential dwellings.

28. The CNMP must be submitted to the Resource Consent Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz for certification in accordance with condition 4 that it meets the above requirements.

29. The road upgrade works must be undertaken in accordance with the certified CNMP.

Earthworks

30. Prior to commencement of road upgrade and realignment works, the consent holder must have an Erosion and Sediment Management Plan (ESMP) prepared by a suitably qualified and experienced person which includes methods to ensure the 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 site;
    d) protect any existing drainage infrastructure sumps and drains from sediment run-off; and
    e) manage dust, including but not limited to having water trucks on site to dampen down dust and stopping work when wind speeds exceed a level that generates nuisance dust clouds.

31. The ESMP must be submitted to the Resource Consent Manager, Dunedin City Council at rcmonitoring@dcc.govt.nz for certification in accordance with condition 4.

32. The earthworks for the road upgrade and realignment works must be undertaken in accordance with the certified ESMP.

33. Any change in ground levels must not cause a ponding or drainage nuisance to neighbouring properties adjoining the road upgrade and realignment works.

34. Any introduced fill material must comprise clean fill only; being natural material such as clay, soil, and rock, and such other materials as concrete, brick or demolition products that are free of combustible or organic materials.

35. Earthworks slopes must not be cut steeper than 1:1 (45°) or two metres high without specific engineering design and confirmation by the Transport Manager, Dunedin City Council in accordance with condition 14.

36. Earthworks slopes must not be filled steeper than 2h:1v (27°) or two metres high without specific engineering design and confirmation by the Transport Manager, Dunedin City Council in accordance with condition 14.

37. The consent holder must have all completed slopes inspected and certified by a suitably experienced Chartered Professional Engineer (CPEng) in accordance with condition 15.

36. The consent holder must have a suitably experienced Chartered Professional Engineer (CPEng) design any temporary shoring requirements at the site during earthworks construction and the consent holder must install any temporary shoring recommended by that Engineer.

37. Surplus earthworks material is to be removed and transported to either the landfill site for reuse or to another Dunedin City Council approved destination.

38. 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 from the work site and must thereafter maintain those measures for so long as necessary to prevent sediment discharge or dust emission from the work site. All such measures must be of a type and to a standard which are to the satisfaction of the Resource Consent Manager, Dunedin City Council.

39. The consent holder must ensure that at the completion of the road upgrade and realignment earthworks (or earlier, if physical conditions allow) all slope and batters are adequately top-soiled and vegetated (e.g. hydro-seeded) as soon as possible to limit sediment mobilisation.

Advice Notes:

Transport

1. *In the event of future development on the site, Dunedin City Council will assess provision for access, parking and manoeuvring upon receipt of an Outline Plan of Works application.*

Heritage

2. *Modification or destruction of an archaeological site is managed through the archaeological authority process under the Heritage New Zealand Pouhere Taonga Act 2014.*

APPENDIX 2:
SMOOTH HILL LANDFILL ORC CONDITIONS OF CONSENT

Our reference: [*insert*]

Discharge Permit RM20.280.[*insert consent number*] to discharge waste and leachate onto land, to discharge landfill gas, flared exhaust gases, dust and odour to air, and to discharge water and contaminants from an Attenuation Basin and sediment retention ponds to water, for the purpose of the construction and operation of a Class 1 landfill.

Water Permit RM20.280.[*insert consent number*] to take up to 87 m^3/day and 1,600 m^3/yr of groundwater, and use of up to 50 m^3/day of groundwater, for the purpose of managing groundwater collected beneath a Class 1 landfill.

Water Permit RM20.280.[*insert consent number*] to divert surface water within the Ōtokia Creek catchment for the purpose of the construction and operation of a Class 1 landfill.

Water Permit RM20.280.[*insert consent number*] to dam water within an Attenuation Basin for the purpose of the construction and operation of a Class 1 landfill.

Under regulations 45 and 47 of the Resource Management (National Environmental Standards for Freshwater) Regulation 2020 consents RM20.280.[*insert consent numbers*] for the construction of specified infrastructure within 10m of a natural wetland for earthworks and vegetation clearance; for the taking, use, damming, diversion, or discharge of water within, or within a 100m setback from a natural wetland; and for maintaining and operating a Class 1 landfill.

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants the above listed consents to:

Name: Dunedin City Council

Address: : *[insert details]*.

Location of activity: *[insert details]*.

Legal description of land: *[insert details]*.

Map Reference: : *[insert details]*.

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) 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 contents of 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 and evidence provided as part of the consent holder's Reply submissions to the hearing dated 12 August 2022.

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 25 to the Independent Peer Review Panel for review and is thereafter provided to the Otago Regional Council in accordance with the process specified in general conditions 19 and 20 and certification is obtained from the Otago Regional Council; or

c. The alternative design or methodology has been incorporated into the Landfill Management Plan required under general condition 15 and provided to the Independent Peer Review Panel for review and is thereafter provided to the Otago Regional Council in accordance with the process in general conditions 19 and 20 and certification is obtained from the Otago Regional Council.

Certification Process

3. The consent holder must follow the process set out below for any plans, documents, designs or specifications (hereafter referred to as 'documents') requiring the certification of an officer of the Otago Regional Council:

a. Documents requiring certification must be submitted to the relevant officer in electronic and hard copy form for certification at least 20 working days prior to the commencement of the works to which the documents relate. The certification process must be confined to confirming that the documents adequately give effect to the relevant condition(s).

b. Subject to (c) and (e) below, works to which the documents relate must not commence until the consent holder has received written certification from the relevant officer.

c. If the consent holder has not received a response from the relevant officer within 10 working days of the date of submission under (a) above, the documents must be deemed to be certified.

d. If the relevant officer's response is that that they are not able to certify the documents they must provide the consent holder with reasons and recommendations for changes to the documents in writing. The consent holder must consider any reasons and recommendations of the relevant officer and resubmit amended documents for certification.

e. If the consent holder has not received a response from the relevant officer within 5 working days of the date of resubmission under (d) above, the documents must be deemed to be certified.

f. If the relevant officer's response is that that they are still not able to certify the resubmitted documents then the consent holder must nevertheless implement the resubmitted documents with a notation that certification of them has not occurred.

g. Certified documents may be amended at the request of the consent holder at any time subject to recertification undertaken in accordance with Condition 3(a) to (f) with references in those clauses to certification to be read as recertification.

Community Liaison Group (CLG)

4. 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 5 to 10.

5. The consent holder must invite the Ōtokia Creek Habitat and Marsh Habitat Trust and all residents who own property within 2 km of the landfill site to the first meeting of the CLG. Persons who live more than 2 km 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 be invited to nominate up to 5 persons to attend future meetings, as representatives of the community.

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

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

    b. A member of the Independent Peer Review Panel; and

    c. Two representatives of the consent holder or landfill operator.

7. The consent holder must offer to provide (at the consent holder's expense) members of the CLG the opportunity of a quarterly site inspection and a quarterly meeting for the first 5 years following the commencement of landfill construction activities, and both annually thereafter. The consent holder must also offer to provide to members of the CLG any information to which the Dunedin City Council (in its regulatory capacity) and the Otago Regional Council are entitled by virtue of the conditions of the resource consents for the landfill. 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.

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

9. The purpose of the quarterly meetings of the CLG will be for the consent holder to:

    a. 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; and

    c. Hear any community issues or concerns with the landfill construction and operation and discuss and consider 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.

10. In the event that a member of the CLG nominated under general condition 5 no longer wishes to be part of the CLG, the consent holder must invite a replacement member in accordance with general condition 5.

    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.

Independent Peer Review Panel

11. 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 these consents, 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 these consents.

12. The Independent Peer Review Panel must comprise at least four persons who together must be:

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

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

c. Qualified and experienced in geotechnical, groundwater and surface water quality and quantity matters;

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

e. Qualified and experienced in the assessment of the risk of aviation bird strikes.

13. The consent holder must not request the Independent Peer Review Panel to commence any work until the Otago Regional Council confirms to the consent holder in writing that it is satisfied that the composition of the Independent Peer Review Panel meets the requirements of condition 12. The members of the Independent Peer Review Panel may be changed at any time, subject to the prior written agreement of the Otago Regional Council.

14. 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 these resource consents:

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.

The Independent Peer Review Panel's annual 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 as required by general conditions 15, 18, 22 and 28.

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 Independent Peer Review Panel's annual 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 with the Otago Regional Council. The consent holder must make the report publicly available on the Dunedin City Council website.

Landfill Management Plan

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

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

17. The Landfill Management Plan must address how the following matters will meet any requirements, limits, or restrictions set out by the conditions of these resource consents:

    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 aftercare.

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

    a. Landfill Operational Bird Management Plan – refer to condition 57 of Discharge Permit RM20.280.[*insert consent number*].

b. Vegetation Restoration Management Plan – refer to general condition 61.

c. Freshwater and Wetland Monitoring and Management Plan – refer to general condition 64.

Management Plan and Design Certification

19. The management plans required by general conditions 15 and 18 and the detailed design details required by condition 25 must be submitted by the consent holder to the Independent Peer Review Panel for a review to assess that they have been prepared by appropriately qualified personnel in accordance with the conditions of 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.

20. The management plan or detailed design and the Independent Peer Review Panel feedback must be provided to the Otago Regional Council for certification in accordance with general condition 3.

    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.

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

Management Plan Review and Amendment

22. 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 15 and18 to ensure that the management practices contained within them remain adequate to ensure compliance with the conditions of these consents. If amendments are made to a management plan, the amended plan must be submitted to the Independent Peer Review Panel for review and thereafter to the Otago Regional Council for recertification in accordance with general condition 3.

23. The consent holder may make amendments to any certified management plan required by general conditions 15 and18 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 thereafter to the Otago Regional Council for recertification in accordance with general condition 3.

Design and Construction

24. 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.

25. 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 thereafter to the Otago Regional Council for certification in accordance with general condition 3.

26. 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 these resource consents and any certified document will be complied with during construction.

27. 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 these resource consents and any certified document that must be complied with during construction.

28. When completed, the works specified in general condition 25 must be confirmed by a 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 specified in general condition 25.

Landfill Operation

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

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

31. The active landfilling area must not exceed 300 m^2 at any time when the daily fire danger rating for the landfill 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.

32. 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 minute intervals.

33. Except where required by condition 34, all waste must be 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.

34. All special waste, highly odorous waste, medical waste, and commercial or industrial waste containing putrescible material must be covered no more than 30 minutes following its 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.

    Advice Notes: The discharge of highly odorous waste is restricted by condition 35 of Discharge Permit RM20.280.[insert consent number] for the Discharge of Waste and Leachate to Land.

    Discharge Permit RM20.280.[insert consent number] Discharge of Landfill Odour and Dust and Landfill Gas and Flare Emissions to Air condition 7 imposes additional requirements for the discharge of highly odorous wastes.

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

36. Daily cover must be removed before waste 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.

37. Except within 10 m of the active landfilling area, 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 on the intermediate soil cover by hydroseed.

38. 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 x 10^{-7} metres per second; and

    b. 300 millimetres of growth media layer; and

    c. 150 millimetres of topsoil that is grassed, except that grassing is not required within 10 m of the active landfilling area.

39. Alternative final capping specifications to those specified in general condition 38 may be used where they provide equivalent or better performance and are submitted to the Independent Peer Review Panel for review and thereafter to the Otago Regional Council for certification in accordance with general condition 3.

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

41. 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 one month of each inspection.

Monitoring

42. 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. Resourcing and support to be provided for Te Rūnanga o Ōtākou participation in the monitoring programme; and

    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 commencement of baseline monitoring. Any amendments to the Plan arising from a review under general condition 42(c) must be provided to Otago Regional Council within 3 months of the review.

43. 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 5 m and 10 m above ground level. Wind speed data shall be appropriately corrected to provide a measurement equivalent to a height

of 10 m. 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

44. The groundwater monitoring wells and piezometers described in **Table 1** below and as shown on drawing 12506381-C309 must be installed at least 36 months prior to the commencement of construction of the landfill 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.

45. All groundwater monitoring wells and piezometers listed in **Table 1** of general condition 44 must be located and installed under the direction of a suitably experienced hydrologist or hydrogeologist, and any wells must be constructed in accordance with *NZ4411:2001 Environmental Standard for Drilling of Soil and Rock*.

46. All groundwater monitoring wells and piezometers listed in **Table 1** of general condition 44 must be maintained to prevent the ingress of contaminants and to enable accurate monitoring. In the event of a well or piezometer being destroyed or becoming unsuitable for sampling, the consent holder must replace it with a well or piezometer in the same general location within 3 months of the well or piezometer being destroyed or becoming unsuitable.

47. 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 **Table 1** of general condition 44,

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

    Sampling of groundwater and surface water must occur monthly 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.

48. 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 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.*

49. Rainfall data must be collected at least daily over the 36-month baseline monitoring period stipulated in general conditions 47 and 48 at the automatic weather station at the site required under condition 43.

50. At the conclusion of the 36-month baseline monitoring period identified in conditions 47 and 48:

    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; and

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 reviewed Landfill Management Plan under general condition 22.

51. The Landfill Management Plan required under general condition 15 must include practices and procedures for the long-term monitoring of groundwater and surface water during landfill operation, informed by the completion of baseline monitoring under general conditions 47 and 48 to achieve the following:

a. Confirmation of the effectiveness of erosion and sediment controls;

b. Identification of any potential leachate discharge to the environment;

c. The efficacy of the landfill liner and leachate collection systems;

d. Identification of any adverse effects arising from landfill operation on groundwater or surface water downgradient or downstream of the landfill respectively; and

e. Ensuring compliance with the conditions of these consents.

52. 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, frequencies, 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 53 to 58;

b. Hydrological and water level monitoring requirements for the wetlands within the site and the unnamed tributary of Ōtokia Creek, including locations, parameters and frequencies 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 55;

d. Monitoring methodologies; and.

e. Record keeping and reporting requirements.

53. 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 or suspended sediment; when monitored at the following locations:

a. Monitoring wells GW1 – GW7, and BH202 described in **Table 1** of general condition 44;

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; and

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

54. The baseline water data collected under general conditions 47 and 48 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. The lessor of the then existing trigger levels or those calculated from the preceding 5 years' monitoring data must thereafter be adopted;

    Advice Note: The 5 yearly reviews are intended to ensure changing land use over time (forestry cycles), slow rates of water quality improvements or deteriorations over time, and variability in baseline water quality are accounted for.

    b. Trigger levels for suspended sediments in surface water (SW1 – SW8) for non-flood events must be the greater of turbidity values recorded during baseline monitoring or the Regional Plan for Otago: Water Schedule 15 turbidity limit; and

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

55. 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 conditions 53 and 54, 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 **Table 3** water quality trigger levels caused by leachate or sediment, the consent holder must undertake an investigation into potential causes of the exceedance and prepare a report which must be 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 must 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.

56. Continuous monitoring of the sub-liner groundwater drainage system, sediment retention pond for the stage 1 area, and attenuation basin specified in **Table 3** must meet the following requirements:

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

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

57. The Landfill Management Plan must include contingency response procedures which must as a minimum include the relevant actions outlined in general condition 55.

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
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**.
	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 quarterly monitoring cycle per year	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**.
During stage 1 works, the sediment retention pond prior to discharge to the unnamed tributary of Ōtokia Creek During subsequent stages,	Continuous (when flows occur)	▪ Electrical conductivity (uS/cm) ▪ pH ▪ Temperature	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

Monitoring Point as shown on drawing 12506381-C309	Frequency	Parameters	Consent holder monitoring location specific actions where trigger levels are exceeded
the attenuation basin prior to discharge to the unnamed tributary of Ōtokia Creek.		▪ Turbidity ▪ Ammoniacal nitrogen (mg/L)	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), and SW8 if access is available (located downstream of the downstream pond).	Either: Weekly (when flows occur). If continued periods of surface water discharge occur, then monitoring will occur weekly. Or: As otherwise specified in the Landfill Management Plan.	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 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.

58. All groundwater and surface water sampling required under general conditions 47, 48 and 55 must meet the following requirements:

    a. Sampling must be undertaken at the specified locations indicated in general conditions 47, 48 and 55;

    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; and

    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.

Management of effects on wetland and freshwater ecological values

59. Adverse effects on wetland or freshwater ecology arising from any hydrological, hydrogeological or water quality changes associated with the construction and/or operation of the landfill must be managed according to the Vegetation Restoration Management Plan and required by general condition 61 and the Freshwater and Wetland Monitoring Management Plan required by general condition 64. Where residual adverse effects on wetland or freshwater ecology are detected via monitoring undertaken in accordance with the Freshwater and Wetland Monitoring and Management Plan, any offset or compensation must use methodologies that use accepted ecological principles to derive the related offset / compensation type and quantum, such as biodiversity offset accounting methods (where relevant).

60. Annual baseline wetland and freshwater 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 61. 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;

    c. Define and monitor the extent of the swamp wetland, vegetation transects using national wetland delineation protocols (e.g. Clarkson et al. 2013) 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 61, and the determination of monitoring triggers and requirements for any long-term wetland or freshwater ecology monitoring.

61. 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 on the swamp wetland and its riparian margin resulting from the exercise of these consents. 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 its riparian margin.

    b. A summary of baseline wetland ecology monitoring under general condition 60 that has been undertaken to inform the Vegetation Restoration Management Plan.

c. Wetland restoration measures, which as a minimum must include:

   i. Wetland restoration including a 10 m buffer from the wetland edge, except 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 and in which areas or circumstances gorse (or another specified plant pest) may be tolerated as a nurse crop.

   iv. Pest animal control.

   v. A process for reviewing and adapting pest plant and animal controls.

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

   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 include 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.

62. The Vegetation Restoration Management Plan must be assessed by a suitably qualified expert in bird strike risk assessment to confirm that any proposals for restoration will not increase aviation risk from birds. That assessment must be forwarded to the Independent Peer Review Panel with the Vegetation Restoration Management Plan for their review and confirmation in accordance with the process in general conditions 19 and 20.

63. 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 required under general condition 64. 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; and

   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. The 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 64.

64. 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 these consents are effectively remedied or otherwise mitigated. The Plan must be developed in consultation with Te Rūnanga o Ōtākou. As a minimum the Plan must include:

    a. A summary of the baseline wetland monitoring and freshwater ecology monitoring undertaken under general conditions 60 and 63;

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

    c. Pre, during and post construction monitoring methodologies for freshwater habitat conditions and freshwater macroinvertebrate and fish communities, with the aim of establishing any indirect effects on downstream freshwater and wetland environments attributable to the landfill's operation;

    d. Measures to remedy or mitigate any adverse effects on downstream freshwater and wetland environments that are the result of landfill construction or operation, and any appropriate methodologies for offsetting or compensating for any residual adverse effects if they are identified through monitoring;

    e. Annual reporting requirements, which must include but not be limited to reporting on mitigation or remediation measures implemented under (d) above and offset or compensation measures implemented under (d) above;

    f. Key personnel responsibilities for implementing the Freshwater and Wetland Monitoring and Management Plan; and

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

Complaints

65. The consent holder must provide contact details on the Dunedin City Council 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 to record the receipt and management of all complaints, including those regarding 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; and

    g. The response to the complainant.

    All complaints must be investigated, and a response provided to the complainant. The complaints record 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 conditions of these 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 them;

c. Any matters raised by the CLG and the consent holder's responses to those matters;

d. Any emergency management procedures and contingency response procedures specified in the Landfill Management Plan that were implemented during the preceding year;

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

f. 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, the Independent Peer Review Panel, Dunedin International Airport Limited and Otago Regional Council by 1 March each year unless an alternative date is agreed in writing with the Otago Regional Council. The consent holder must make the report publicly available on the Dunedin City Council website.

Bond

68. Prior to the placement of refuse at the site the consent holder must provide and maintain a bond in favour of Otago Regional Council to meet the requirements of general conditions 68 to 78. In the event of default by the consent holder, the bond must:
    a. Secure compliance with all the conditions of these consents and enable any adverse effects on the environment resulting from the consent holder's activities, and not authorised by a resource consent, to be avoided, remedied or mitigated;
    b. Secure the completion of rehabilitation and closure in accordance with the approved Aftercare section of the Landfill Management Plan;
    c. Ensure the performance of any monitoring obligations of the consent holder under these consents, as well as any site aftercare obligations such as care of the landfill cap and pollution prevention infrastructure;
    d. Provide for reconstruction of the landfill landform in the event of a mass movement; and
    e. Provide for early closure in the event of abandonment of the site.

69. 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 Otago Regional Council for review and approval prior to the commencement of the placement of refuse at the site. The amount of the bond must cover costs associated with completing work listed in general condition 74.

70. 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 placement of refuse at the site. 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.

71. 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.

72. 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. No further waste shall be placed at the site if the variation of the existing bond or the new bond is not provided in accordance with this condition.

73. The amount of the consent holder's bond shall be reviewed every five years from it being established, by means of a risk assessment using the criteria in general condition 77. 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 or the new bond is not provided in accordance with this condition.

74. The bond sum 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 holder's 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; and
        (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;
   (viii) Monitoring programmes for:
      1. Groundwater;
      2. Surface water;
      3. Leachate;
      4. Landfill gas; and
      5. Bird management, including before closure – adaptive management under Condition 56 of Discharge Permit RM20.280.[*insert consent number]* for the Discharge Waste and Leachate to Land Conditions.

d. Ensuring the performance of any monitoring obligations of the consent holder under these consents, as well as any site aftercare obligations such as care of the landfill cap and pollution prevention infrastructure (Aftercare);
e. Providing for reconstruction of the landfill landform in the event of a mass movement; and
f. Providing for early closure costs in the event of abandonment of the site.

75. 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 must be supported by a risk assessment carried out in accordance with the methodology detailed in general condition 77.

76. 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.

77. 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.

78. 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 77.

Review of Conditions

79. 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 these consents for the purposes of:

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

    b. Ensuring the conditions of these consents are consistent with any National Environmental Standards, relevant regional plans and the Otago Regional Policy Statement;

    c. Ensuring the waste acceptance criteria conditions of these consents are consistent with applicable Ministry for the Environment and Environmental Protection Authority guidance, standards and notices, including for emerging contaminants;

    d. Ensuring the bird management conditions of these consents are effective for ensuring there is no increase in existing bird strike risk to aviation at Dunedin International Airport;

    e. Reviewing the requirements and frequency of monitoring and reporting required under these consents; or

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

Advice Notes

a. For the purposes of these consents:

- *'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.*
- *'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*
- *'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.*

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 55:

a. The groundwater monitoring wells described in **Table 1** of general condition 44.

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 allowed) 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 53.

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	

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**
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 Permit RM20.280.[*insert consent number]*

Discharge of 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 in Schedule 1 – General Conditions and Attachment 1 to that Schedule. In the event of differences or conflict between the general conditions and the conditions of this consent, the conditions of this consent prevail.

Pre-Construction Investigations

3. Geotechnical investigations must be carried out as part of the detailed design of the landfill and must include the development of a geotechnical ground model for the site. The investigations must also include verification of the dip and dip direction of the Henley Breccia and strength assessment of the contacts between geological units. The location of investigation points must be determined during the initial stages of the detailed landfill design process.
4. Lime may be used for stabilisation of loess soils where those soils 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 used in both 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 the detailed landfill design for its suitability for use as a low permeable mineral liner within the landfill liner design by:
    a. Determining through a dispersivity test what percentage of lime or bentonite is required to stabilise the loess and reduce its dispersivity to a non-dispersive status. The dispersivity test shall be undertaken in both de-ionised water and a leachate equivalent solution;
    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 of each of the dispersivity, Atterberg limits and saturated hydraulic conductivity tests must be undertaken on the loess under condition 4 to ensure representative results are 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 must 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 conformance with conditions 4 and 5 of this consent.
6. If loess is identified as unsuitable for use as a mineral component of the landfill liner in accordance with conditions 4 and 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 required for loess under conditions 4 and 5 of this consent.
7. A Site Specific Probabilistic Seismic Hazard Assessment (SSSHA) must be undertaken as part of the 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 of NZS 1170.0.2004 for appropriate annual probability of exceedances based on the landfill's 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 landfill cut and fill slopes. This must be achieved by undertaking quantitative limit equilibrium slope stability assessments 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; and

    b. Waste stability analysis of each landfill stage.

    The analysis must utilise site specific parameters where possible for the various waste materials, and/or publicly available material data where site-specific information is not available. Where publicly available material data is used, verification that the construction materials align with any assumptions made as part of the slope stability analysis must be included as part of the detailed design documentation provided to the Independent Peer Review Panel for its review.

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; and

    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. It must include a separate groundwater quality monitoring sump from the leachate collection system.

12. The groundwater collection system must be maintained to enable its ongoing operation at all times and it must be restored as soon as practicable in the event of a system malfunction or fault. The Landfill Management Plan required by general condition 15 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 millimetre layer of leachate drainage material;

    ii. Protection geotextile;

    iii. 1.5 millimetre HDPE geomembrane;

    iv. Geosynthetic clay liner (GCL); and

    v. 600 millimetre 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 millimetre layer of leachate drainage material;

        ii. Protection geotextile;

        iii. 1.5 millimetre HDPE geomembrane; and

        iv. 600 millimetre 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 millimetre layer of leachate drainage material;

        ii. Protection geotextile;

        iii. 1.5 millimetre HDPE geomembrane;

        iv. Geosynthetic clay liner (GCL); and

        v. 600 millimetre 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, followed by submission to the Otago Regional Council for certification in accordance with the process set out in general condition 3.

16. If stabilised loess is used as a component of the liner system for the side slopes of the landfill, 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 include 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), including for 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 25. This report must be submitted to the Independent Peer Review Panel for its review 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 300 millimetres over all areas of the liner under normal operating conditions, apart from the sumps; and

    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 300 millimetres 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 15; and

b. For the first two years of operation of the landfill where there are insufficient records to calibrate the leachate storage and management systems, those 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. An on-site standby electrical supply must be provided at all times to ensure that the operation of the leachate collection system is not interrupted by any loss of mains power supply.

22. The leachate collection systems and leachate storage and management facilities must be maintained to enable their ongoing operation at all times and those systems and facilities must restored as soon as practicable in the event of a malfunction or fault. The Landfill Management Plan required by general condition 15 must include leachate collection systems and leachate storage and management facilities 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 from areas outside the landfill footprint into areas of exposed landfill liner, areas of uncovered waste and the leachate collection system. The Landfill Management Plan required by general condition 15 must describe the stormwater infiltration and runoff measures.

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 additionally provided to the Panel and Council as part of the Annual Report required by general condition 67.

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** to this consent. The sampling results must be provided to the Independent Peer Review Panel and Otago Regional Council within 1 month of the results being received by the consent holder.

Waste Acceptance and Placement

26. The landfill must not be open to the general public. Waste must be consolidated off-site prior to transport in bulk to the landfill.

27. Food and garden organic waste streams must be collected separately from the general waste stream and processed at the Bulk Waste Transfer Station to minimise disposal of this material at the landfill.

28. To the extent practicable, putrescible waste must be removed from the general waste stream and processed separately prior to transfer and final disposal of general waste at the landfill such that to the extent practicable putrescible waste makes up less than 10% of the waste going to the landfill (by weight). Practices and procedures must be included in the Landfill Management Plan required by general condition 15 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 the landfill, except that commercial waste transporters may deliver general waste directly to the landfill without being sorted at the Bulk Waste Transfer Station if the operator has a valid Waste Acceptance Agreement with the Dunedin City Council at the time of delivery and that Agreement requires less than 10% putrescible material of the total waste (by weight);

    c. Removal of putrescible waste from general waste at the Bulk Waste Transfer Station prior to consolidation and transfer of general waste to the landfill. Where putrescible waste contamination cannot be removed from general waste, that general waste must be quarantined and transferred separately to the landfill for disposal as special waste in accordance with condition 44 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 the landfill for disposal as special waste in accordance with condition 44 below; and

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 to the landfill, to confirm whether the waste received at the landfill 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; and

    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 15. The waste acceptance criteria must give effect to the following:

    a. Conditions 30, 31, 33, 34 and 35 of this consent;

    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; and

    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. Highly odorous waste must not be accepted for disposal unless the full bird strike risk assessment required under condition 52 of this consent confirms that the disposal of highly odorous waste will not increase the existing level of bird strike risk at Dunedin International Airport. Highly odorous waste includes, but is not limited to:

    a. Wastewater treatment sludges, biosolids, and screenings;
    b. Wastewater pump station screenings and grits;
    c. Animal remains;
    d. Waste from meat processes;
    e. Wool scour, tannery, and fellmongery waste; and
    f. Fish waste.

36. 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.

37. 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 22 to the Independent Peer Review Panel for review, followed by recertification by the Otago Regional Council of the Landfill Management Plan in accordance with general condition 3.

38. Waste must only be delivered to the 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.

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

40. 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.

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

    a. Monday to Friday 8.00am – 6.00pm.

    b. Saturday 9.00am – 5.00pm.

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

42. 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 15 must include practices and procedures for waste inspection and rejection of loads that contain hazardous waste.

43. 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.

44. Quarantined special waste received at Smooth Hill under conditions 28(c) and (d) and highly odorous waste received under condition 35 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.

45. The Landfill Management Plan required by general condition 15 must include specific practices and procedures for the pre-acceptance, handling and placement of quarantined special waste and highly odorous waste. This must include as a minimum the requirements for prioritising placement and covering of waste as required by general condition 34 and conditions 44(a) and (b) above.

46. The consent holder must maintain records of:

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

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.

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

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

Bird management

49. A Southern Black Backed Gull (SBBG) 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 SBBG population at Dunedin breeding sites where access is available, 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 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 Te Rūnanga o Ōtākou, the Department of Conservation and Dunedin International Airport Limited;

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

c. Measurable targets for the reduction of the SBBG population;

d. Description of management actions and methods to be implemented to limit SBBG breeding success at SBBG breeding sites identified under condition 49(b) 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; and.

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.

50. 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 required under condition 52 of this consent. The purpose of the monitoring is to supplement existing bird monitoring information and to:

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

b. Confirm how SBBGs have responded to management initiatives undertaken as part of the Southern Black Backed Gull Management Plan prepared under condition 49 of this consent; and

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

51. The bird monitoring under condition 50 of this consent 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 must 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 SBBG habitats and breeding sites across the Dunedin area and surrounds; and

e. Pre-development Smooth Hill site bird surveys.

The bird monitoring must inform the updated risk assessment under condition 52 of this consent.

52. 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 purpose of confirming the landfill will not increase the existing level of bird strike risk at Dunedin International Airport, taking into account the results of bird monitoring required by conditions 49 and 50 of this consent. The risk assessment must address the limitations outlined in the *Smooth Hill Preliminary Bird Hazard Assessment, Avisure, dated May 2021*, and address at least 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 International Airport strike data;

f. The management of highly odorous waste; and

g. 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 required under condition 57 of this consent.

53. The consent holder must appoint a Bird Control Officer responsible for overseeing bird management at the landfill 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 tasks:

a. Ensuring bird sightings at the site are recorded in the bird registers under condition 55 of this consent; and.

b. Identifying when bird trigger levels are exceeded, notifying Dunedin International Airport within 1 hour of the trigger levels being exceeded, and initiating and overseeing management actions required under condition 56 of this consent .

54. 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 56 of this consent:

    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; and.

    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.

55. 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 grams sighted (as per condition 57(f) of this consent these species must 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 56 of this consent at the site;

    e. The date/s bird control measures in condition 56 of this consent are implemented and the duration of their 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 grams to meet the trigger levels in condition 56 of this consent; and

    g. Sightings of eastern falcon at or near the landfill to 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, the Independent Peer Review Panel and Dunedin International Airport Limited.

56. Where the bird registers in condition 55 of this consent record the presence of any bird species with an individual body weight exceeding 50 g (as per condition 57(f) of this consent these species must 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 required under condition 57 of this consent. 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:

	Trigger level	Management Action
		a. Shooting of non-protected species, followed by b. Poisoning of non-protected species, followed by c. Colony control of Southern Black Backed Gulls by reactivating the Southern Black Backed Gull Management Plan under condition 49. 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 54(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.

57. 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 50 of this consent 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 52 of this consent;

    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 52 of this consent;

    e. Detailed operational practices and procedures, including for reducing putrescible and 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 grams 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 developed in accordance with condition 56 of this consent;

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 14 and 67, and conditions 49 to 60 of this consent;

j. Maintenance of bird registers in accordance with condition 55 of this consent;

k. A bird monitoring regime which enables comparisons to be made between the baseline (pre-operation) bird monitoring under condition 50 of this consent to assess aviation strike risk and success of bird management at the landfill; and

l. An adaptive management and review process in accordance with conditions 58 to 60 of this consent.

58. The Landfill Operational Bird Management Plan must be provided to Dunedin International Airport Limited for review and feedback, before being submitted to the Independent Peer Review Panel for review, followed by certification by the Otago Regional Council in accordance with general condition 3. 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 56 and the results of bird monitoring required by condition 57(k) of this consent. The risk assessment must as a minimum address 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 International Airport strike data; and

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 59 and 60 of this consent.

59. 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 Limited 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 landfill operation, and annually thereafter, to review the effectiveness of the management actions in condition 56 of this consent and the Landfill Operational Bird Management Plan, under condition 57 of this consent for the purposes of:

i. Whether there is a need escalate the management actions outlined in condition 56 of this consent 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; and

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.

60. Following any meeting under condition 59 of this consent 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 Dunedin International Airport Limited, to the Independent Peer Review Panel for review, followed by recertification by the Otago Regional Council in accordance with general condition 3.

Landfill Fire Prevention and Response

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

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

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

64. A minimum stockpile of 1500 m^3 of inert cover material must be maintained adjacent to the active landfill stage for fire response purposes.

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

66. At times 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 63 of this consent must be inspected daily and any combustible vegetation or material removed; and

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.

67. The Landfill Management Plan required under general condition 15 must include practices and procedures prepared by a suitably qualified person to ensure the 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, normal on-site workforce, after hours arrangements and 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 after-hours, including confirmation of daily fire danger ratings, 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; and

    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; and

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

g. Incident reporting and cause investigation protocol; and

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 number] are relevant to landfill fire prevention and response.

Litter and pests

68. Windblown litter must be prevented from 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 at least a weekly basis. The Landfill Management Plan required by general condition 15 must include practices and procedures for litter management, including but not limited to control methods, inspections and removal of windblown litter.

69. Pest plants, mammalian pests (rodents and mustelids) and feral cats within the landfill operational extent must be eradicated as far as practicable. The Landfill Management Plan required by general condition 15 must include practices and procedures for pest management, including but not limited to eradication methods and pest and cat monitoring.

Advice Notes:

a. 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:

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 occurring in accordance with an Eastern Falcon Management Plan developed in consultation with Te Rūnanga o Ōtākou and 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.

iii. Construction of the landfill occurring 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 should be developed in consultation with Te Rūnanga o Ōtākou and the Department of Conservation.

iv. Screen planting along the boundary with Big Stone Road, and along the north-eastern edge of the landfill facilities area, in accordance with the Landscape Mitigation Plan, Boffa Miskell Limited, 29 April 2022 prior to the operation of the landfill commencing.

v. Construction of the landfill occurring 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 are closed outside of operating hours.

vii. Heavy vehicles associated with the landfill using 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 Permit RM20.280.[*insert consent number]*

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 and Attachment 1 to that Schedule. In the event of differences or conflict, between the general conditions and the conditions of this consent, the conditions of this consent prevail.
3. There must be no odour or dust beyond the boundary that is noxious, dangerous, offensive or objectionable in the opinion of an 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 are to occur on the site.
6. The Landfill Management Plan required by general condition 15 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 odour monitoring.
7. To minimise odour emissions during handling of highly odorous wastes the following measures must be implemented:
   a. Loads of highly odorous waste must only be received between the hours of 9.30am and 4.00pm;
   b. Deliveries of highly odorous wastes must be pre-booked, to ensure preparations are made including ensuring cover material is available at the pit location;
   c. 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;
   d. Holding deliveries of unexpected highly odorous waste loads on site until preparations identified in (b) above are in place to enable disposal;
   e. Prioritising deliveries of highly odorous wastes for disposal ahead of more general waste and loads and covering highly odorous wastes immediately to meet the requirements of general condition 34;
   f. The Landfill Management Plan required by general condition 15 must include practices and procedures for the pre-acceptance, handling and placement of quarantined wastes and highly odorous wastes, including contingency measures in the event of an unexpected highly odorous waste load. This must include as a minimum requirement for prioritising the placement and covering of highly odorous waste as required by condition 7(e) of this consent, using special odorous waste placement areas that maximise separation distances to receptors, and the use of odour suppressing sprays/cannons.

Advice Note: "Highly odorous wastes" is defined in Discharge Permit RM20.280.[insert consent number] for the Discharge of Waste and Leachate to Land Conditions

Dust

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

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

10. Effective measures must be implemented to minimise dust emissions to meet the requirements of condition 3 of this consent. The Landfill Management Plan required by general condition 15 must include practices and procedures for dust management, including but not limited to water suppression of dust on unsealed roads and surfaces within the landfill site, stabilisation of earthworks and stockpiles, cleaning of the site access and sealed roads within the landfill site and imposing vehicle speed limits within the landfill site.

Landfill gas baseline monitoring and landfill gas risk assessment

11. A landfill gas (LFG) 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 LFG escaping laterally from the landfill. 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 LFG 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 of this consent 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** to this consent.

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

    a. Potential LFG related risks at the site, including potential sources of LFG, emission pathways and residential receptors of LFG emissions from the site;

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

    c. LFG management measures.

    The detailed LFGRA must further assess 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 15.

15. The LFGRA required under condition 14 of this consent 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 the granting of this consent, waste tonnages increase beyond 60,000 tonnes per year, or monitoring of LFG in accordance with condition 33 of this consent identifies LFG emissions that exceed trigger levels.

Landfill gas collection and destruction system

16. The landfill must be designed, progressively constructed and operated with a LFG collection and destruction system suitable for the anticipated rate and quantity of LFG generated by the landfill, which addresses the risks identified by the Landfill Gas Risk Assessment (LFGRA) in conditions 14 or 15 of this consent 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 LFG 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 LFG.

18. The LFG collection system must be designed and installed to prevent puncture of the landfill liner. In particular any vertical wells or pipes installed for the collection of LFG 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 LFG extraction wells must 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 must be allowed to burn the gas venting from the wells prior to connection to the gas extraction system.

20. All extracted LFG 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) of this consent, the principal flare(s) must be operated at all times unless it has malfunctioned or is shut down for maintenance; and

    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 LFG 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 LFG measured at the inlet to flare must not exceed 5% v/v oxygen.

24. The installation of the LFG 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 25. 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 LFG 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 15 must include practices and procedures prepared by a suitably qualified person to ensure:

    a. LFG is collected and destroyed;

    b. The escape of fugitive LFG and any potential exposure of people to LFG or LFG related odour is minimised;

    c. Risk of landfill fires is prevented as far as practicable; and.

    d. Achievement of the conditions of this consent.

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

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

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

    c. Description of the design of the LFG collection and destruction system, including wells, laterals, manifolds, flare system and the staging and timing of the installation of those components;

    d. Quality assurance procedures for installation of the LFG collection and destruction system;

    e. Operation and maintenance procedures for the LFG 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. LFG perimeter and surface monitoring locations, parameters, frequencies, 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 must address the monitoring requirements in condition 33 of this consent; and

    g. Record keeping and reporting requirements.

Landfill gas perimeter and surface monitoring

28. Where the LFGRA under condition 14 of this consent 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 of this consent.

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 15 must include practices and procedures for the long-term monitoring of LFG emissions during operation, informed by the completion of the LFGRA under conditions 14 or 15 of this consent to achieve the following:

    a. Identify potential escape of fugitive LFG to the environment at or near source to confirm the efficacy of the LFG 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 LFG emissions; and

    c. As far as practicable prevent and identify any landfill fires that occur.

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

    a. The LFG monitoring bore network;

    b. Areas of intermediate cover as required under general condition 37;

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

    d. The surface of the final landfill cap.

    The baseline gas data collected under condition 13 of this consent, and the LFGRA required under conditions 14 or 15 of this consent must be used to establish typical ranges for each parameter and establish trigger values for these ranges suitable to detect LFG 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, LFG concentrations must be monitored as follows:

    a. At least monthly at the LFG monitoring bore network; and

    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.

    LFG concentrations must be assessed against the trigger levels established under condition 31 of this consent 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 0.5 millimetres of rain having fallen for at least two days, and instantaneous wind speed is less than 25km/hr (ideally 5 – 10km/hr).

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			

D. Discharge Permit RM20.280.[*insert consent number]*

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 and Attachment 1 to that Schedule. In the event of differences or conflict, between the general conditions and the conditions of this consent, the conditions of this consent 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 Ōtokia Creek.
4. All stormwater that comes into contact with waste must be directed to the landfill leachate collection system.
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. 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, 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; and
    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.
7. Scour protection must be placed at the outlet and spillway of the attenuation basin.
8. Stormwater discharge systems must be maintained by the consent holder to enable their ongoing operation at all times and restored as soon as practicable in the event of damage or faults.

Vehicle wash bay and wheel wash

9. The vehicle wash bay must be designed, constructed and operated to ensure water that is not recycled for use in the wheel wash bay passes through appropriately sized sumps with oil and sediment traps before being routed to a sediment retention pond that discharges to the unnamed tributary of Ōtokia Creek.

Management of spills

10. Any spills of fuel, oil or similar contaminants to the environment must be contained and remediated as soon as practicable. The Landfill Management Plan required by general condition 15 must include practices and procedures for the prevention of spills and specify contingency measures to be undertaken 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 the 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; and

    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 retention 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 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 retention 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 15 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:

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

    b. Description of landfill 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 erosion and sediment 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 41 and 55 to 58;

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

    i. Procedures for decommissioning redundant erosion and sediment controls; and

    j. Record keeping and reporting requirements.

E. Water Permit RM20.280.[*insert consent number]*

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 6 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 and Attachment 1 to that Schedule. In the event of differences or conflict, between the general conditions and the conditions of this consent, the conditions of this consent prevail.

Take and use of groundwater

3. The taking of groundwater must not exceed 87 m^3/day and 1,600 m^3/year.
4. The taking of groundwater from the groundwater collection system under the landfill liner must only be used for non-potable water supply.
5. Leachate contaminated groundwater must be directed to the leachate collection system in accordance with **Table 3** of the general conditions.

Measuring and recording of take of groundwater

6. The take of groundwater under condition 3 of this consent must be measured and recorded as follows:
    a. Prior to the first exercise of this consent, the consent holder must install:
        i. A 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's website.

F. Water Permit RM20.280.[*insert consent number]*

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 and Attachment 1 to that Schedule. In the event of differences or conflict, between the general conditions and the conditions of this consent, the conditions of this consent prevail.

Perimeter drain and attenuation basin(s)

3. The permanent stormwater perimeter drain, other permanent drainage diversion channels and culverts, and any 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.
4. Suitable scour protection must be placed within the landfill perimeter drain where design flows exceed 0.8m/s to prevent scour.
5. Any attenuation basin must be covered with a net or an array of closely spaced wires to prevent the basin attracting birds.
6. The permanent stormwater perimeter drain, other permanent drainage diversion channels and culverts, and any 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.

G. NES-FM Consent RM20.280.[*insert consent numbers]*

Earthworks and Vegetation Clearance Land Use Conditions

Purposes of this consent:

a. To undertake earthworks within 100 m of the swamp wetland within the designated landfill site that may result in the partial drainage of that wetland.
b. To restore the swamp wetland within the designated landfill site.
c. To undertake vegetation clearance and earthworks within 10m of the swamp wetland within the designated landfill site.

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 and Attachment 1 to that Schedule. In the event of differences or conflict, between the general conditions and the conditions of this consent, the conditions of this consent prevail.

Vegetation clearance and earthworks

3. Vegetation clearance and earthworks within 10 m of the swamp wetland within the designated landfill site must ensure:
    a. No machinery is operated from within the bed of the wetland;
    b. Mixing of construction materials and the refuelling and maintenance of vehicles, machinery, and equipment is undertaken outside a 10 m setback from the wetland;
    c. There is no erosion of the bed or bank of the natural wetland;
    d. There is no smothering of indigenous vegetation in the wetland by debris or sediment;
    e. Best practice stormwater, erosion and sediment control management measures are implemented to ensure sediment generation and runoff from the site and into the wetland is minimised as far as practicable; and
    f. All cleared vegetation and debris within a 10 m setback of the 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.[insert consent number].

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 61.