Tonkin+Taylor

Job No: 1011469
3 September 2021

Otago Regional Council
Private Bag 1954
Dunedin 9054

Attention: Hilary Lenox

Dear Hilary

Technical Review to Inform Notification Decision: Smooth Hill Landfill - Appendix 11 - Ecology Assessment

Introduction

1 Dunedin City Council (DCC) proposes to establish a new Class 1 landfill, to be located at Smooth Hill to the south of Dunedin Airport. DCC has applied to Otago Regional Council (ORC) for a range of resource consents required for the establishment and operation of the proposed landfill.

2 Tonkin & Taylor Ltd (T+T) has been engaged by ORC to undertake a technical review of the ecological assessment lodged by DCC in support of its resource consent applications.

3 The purpose of this report is to set out the findings or our technical review of DCC's ecological assessment to inform a decision to be made by ORC regarding notification of the resource consent applications.

4 The following documents have been considered as part of this technical review:

- **Dunedin City Council - Proposed Smooth Hill Landfill: Section 92 Review - Requests for Further Information:** *Report prepared for ORC by T+T, September 2020.* (Herein referred to as the 's92 Request').
- **Smooth Hill Landfill – Assessment of Environmental Effects for Updated Design:** *Boffa Miskell May 2021. Report prepared by Boffa Miskell for Dunedin City Council.* (Herein referred to as the 'AEE').
- **Revised Appendix 11 – Ecological Impact Assessment Report:** *Boffa Miskell May 2021. Smooth Hill Landfill Ecological Impact Assessment. Report prepared by Boffa Miskell for Dunedin City Council.* (Herein referred to as the 'Ecology Report').
- **Revised Appendix 9 – Surface Water Assessment Report:** *GHD May 2021. Waste Futures Phase - Smooth Hill Landfill Surface Water Assessment. Report prepared by GHD for Dunedin City Council.* (herein referred to as the 'Surface Water Report').
- **Revised Appendix 8 – *Groundwater Report:*** *GHD May 2021. Waste Futures Phase 2 – Work Stream 3. Smooth Hill Landfill Assessment of Effects to Groundwater. Report prepared for Dunedin City Council.* (Herein referred to as the 'Groundwater Report').
- **Smooth Hill Landfill further information:** *Provided by ORC as part of its s92 response of 4 August 2021.* (Herein referred to as the 'Further s92 Response').

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- **Smooth Hill Landfill Draft Landfill Management Plan:** Prepared for Dunedin City Council by GHD. (Herein referred to as the 'Draft LMP').
- **Smooth Hill Landfill Draft Conditions:** *Provided by ORC as part of its Further s92 Response of 4 August 2021.* (Herein referred to as the 'Draft Conditions').

5 This technical review has been undertaken by Mike Lake, Senior Freshwater Ecologist at T+T and Josh Markham, Senior Terrestrial Ecologist at T+T. Mike Lake has reviewed the aspects of the application relating to effects on freshwater ecosystems while Josh Markham has reviewed aspects relating to effects on terrestrial ecosystems including wetlands. It has been prepared in accordance with T+T's letter of engagement with the ORC dated 12 November 2019.

6 Mike Lake attended a site visit to the proposed landfill site on 6 October 2020.

Description of the proposal

7 The proposed Smooth Hill municipal landfill is intended to replace the existing Green Island landfill located in Dunedin. The Smooth Hill Landfill is reduced in scale from the original application as follows:

- A footprint of 18.6 ha instead of the original 44.5 ha.
- A gross capacity reduced form 7.9 million m^3 to 3.3 million m^3.
- Net waste capacity of 6.2 million m^3 to 2.9 million m^3.
- The predicted landfill life reduced from 55 years to years.

Freshwater ecology review

8 The proposed landfill is to be located in the upper catchment of the Ōtokia Creek, which flows into the sea at Brighton. The existing landuse for the proposed landfill catchment is plantation forestry with the last harvest of trees occurring in 2017. The catchment outside of the landfill footprint will continue to be used for plantation forestry and this activity is likely to exert a strong influence on the freshwater environments both within and downstream of the proposed landfill.

9 The classification of watercourses used by the applicant was based the system developed in the Auckland region. However, that classification system appears to be inconsistently applied within the Ecology Report, mainly with respect to the distinction between perennial[1] and intermittent watercourse types. Section 8.5.2 of the AEE refers to ephemeral and perennial watercourses but not any intermittent watercourses. The Ecology Report identified that the landfill designation contains only ephemeral watercourses with no defined channels although there is water at or near the surface as indicated by the presence of wetland vegetation. By the time the Ōtokia Stream tributary has reached the McLaren Gully Road (approximately 1.3 km downstream of the designation site) it has transitioned to an intermittent watercourse[2].

10 The Ecology Report identifies the watercourse between the designation site and McLaren Gully Road as being perennial, however, the subsequent description of that reach would more accurately describe an intermittent watercourse (surface water present for some but not all of the year). The point at which the watercourse transitions from ephemeral to intermittent watercourse has not been identified within the Ecology Report. The ephemeral – intermittent watercourse transition point is likely to be difficult to define due to the wetland occupying the valley floors and may shift from year to year in response to climate variability. At some point downstream of McLaren Gully Road the watercourse will transition from an intermittent to

[1] We have taken this to be equivalent to the classification of "permanent river or stream" used by Auckland Council.
[2] Based on observations made by Mike Lake during the site visit on 6 October 2020.

perennial (continuously flowing) watercourse and that point was also not identified in the Ecology Report. The distinction between ephemeral and intermittent/perennial watercourses is relevant because it helps determine when a watercourse meets the definition of a river under the Resource Management Act and provides an indication of when a watercourse can support aquatic communities.

11 Macroinvertebrate, habitat, and fish surveys were completed at four sampling sites in June 2020. It is not clear how long a section of channel was sampled at these sites. Macroinvertebrate communities were assessed using Macroinvertebrate Community Index (MCI) and Semi-quantitative Macroinvertebrate Index (SQMCI) metrics and utilising soft-bottomed tolerance scores appropriate to the stream environments that were sampled. MCI and SQMCI results were indicative of 'poor' stream health. In our view macroinvertebrate and habitat assessments were adequate for characterising freshwater values.

12 Fish surveys were completed in June 2020 and April 2021. The 2020 surveys consisted of electrofishing at the four sampling sites as well as at "a variety of locations along the downstream tributary, wherever sufficient habitat was found". Standard electrofishing sampling protocols were followed in 2020, however, because sampling was undertaken in winter it was outside of the recommended window for fish surveys. It is not clear if 150 m of channel was electrofished at each of the sites as prescribed in the protocols to give a total length of channel sampled of over 600 m. No fish were detected during the electrofishing survey.

13 Fish sampling was undertaken again in April 2021 to ensure that no species had been missed in 2020 because sampling took place in Winter. The April 2021 fish sampling was constrained by a lack of water in the stream following a long dry summer. Sampling was therefore limited to setting fyke nets and Gee's minnow traps in the only pool found to still contain water. One longfin eel and one shortfin eel were recorded during the April 2021 survey.

14 In our opinion the ecological surveys conducted in watercourses within the designation and in the Ōtokia Stream tributary upstream of McLaren Gully Road were sufficient for identifying fish values that were present. These watercourses would be very difficult to survey effectively because of their intermittent flow regime, shallow depth, and dense macrophyte cover. The use of eDNA sampling could have provided useful additional data to confirm fish community values as recommended in T+T's initial review of the draft Ecology Report[3]. We do not agree with the statement in the Ecology Report that eDNA samples could not have been collected or that sample contamination would have been an issue. Figure 9 of the report shows a fyke net set in the only pool that contained water in April 2021. Baited fyke nets set in this manner, with the leader sitting on the bank, is unlikely to capture any fish species other than eels. However, we accept that the eels are probably the only fish species that are likely to be able to persist in that habitat.

15 The applicant has not assessed the value of watercourses within the designation on the basis that all watercourses were classified as ephemeral and therefore do not provide any stream habitat. We agree with that approach noting that those ephemeral watercourses do provide ecological value as wetland habitats which are considered elsewhere in the application.

16 The applicant has assessed the section of the Ōtokia Stream tributary between the designation and McLaren Gully Road as having moderate ecological value. That assessment considered the relatively low Rapid Habitat Assessment and macroinvertebrate community metrics, the presence of At-Risk longfin eel and the fact that the watercourse is connected to marginal wetlands. We also agree with that assessment of ecological value.

[3] Dated 19 August 2020.

17 The proposed landfill has the potential to result in the loss of stream habitat as a consequence of reduced groundwater contribution to surface flows in the intermittent and perennial watercourses.

18 We support the recommendation in section 6.1 of the Ecology Report that changes to extent of perennial reaches that might support fish and large invertebrates be avoided. However, in our opinion, effects management should also include intermittent reaches of watercourses because these also support ecological values and functions. If the loss of habitat in intermittent reaches cannot be avoided, then that effect should be managed through adherence to the effects management hierarchy.

19 The Ecology Report concluded that there will be very low level of effects with respect to the loss of freshwater habitat. This conclusion was based on a negligible magnitude of effect on moderate ecological values. While we agree that the proposed landfill may result in a very low level of effects on surface water flow, we also note that there is considerable uncertainty as to how surface water flows may respond to the establishment of the landfill. The Ecology Report identifies changes in water quantity may occur along up to 300 m of channel. The AEE also states that the reductions in groundwater flow were anticipated to result in the stream "transitioning from an ephemeral to perennial stream" up to 45 m further downstream from its current location.

20 Given this level of uncertainty we are of the view that appropriate surface water hydrology monitoring should be established to ensure that the actual magnitude of effects is negligible or low. Wetlands are particularly sensitive to changes in hydrology, and it would therefore be appropriate to monitor changes in wetland extent as well. If the magnitude of effects is moderate or higher then additional effects management will need to be triggered. We note that Table D1 of the Groundwater Report refers to wetland monitoring but it is unclear how that has been carried through to conditions or whether the one site recommended is sufficient to monitor all of the wetlands present.

21 The Surface Water Report states that there will be no significant downstream effects on water quality. The Ecology Report goes further to state that there could be overall positive benefit due to a reduction in plantation forestry within the catchment, a landuse which typically has few sediment controls in place, and which can result in sediment discharges during harvesting phases. The overall level of effects on water quality were assessed as very low in the Ecology Report. We agree with that assessment but note that no ecological monitoring is proposed to ensure that the actual effects of the proposed landfill will be as low as predicted. It is unusual for some form of freshwater ecological monitoring to not be included in receiving environments for landfill stormwater discharges. We are therefore of the opinion that freshwater ecological monitoring be considered as part of the Landfill Management Plan.

22 According to the Ecology Report Potential effects of road construction on fish passage will be managed through adherence to National Environmental Standards for Freshwater (NES-F), or if necessary, separate resources consents. We are satisfied that the proposed approach would result in a very low level of effect on fish passage or be managed outside of the current application.

Terrestrial ecology

23 The ecological effects assessment in the Ecology Report and subsequent s92 responses have not been clear resulting in confusion of the magnitude and level of effect pre and post effects management. The Applicant has acknowledged this confusion in the August s92 response and they have provided further information for clarity and offered to update specific tables (namely table 18) within the Ecological Report. The further information provided by the applicant is brief and doesn't provide the clarity needed to assess this application.

24 The magnitude and level of effect for the ecosystem component of *downstream effects – swamp wetland* and *downstream effects – valley floor march wetland* appear to be understated without sufficient supporting information. The construction and management of the landfill has the potential to significantly alter hydraulic connectivity or input into any downstream wetlands which could cause a decrease in wetland area and the alteration or loss of species assemblages. Further to this it is also reported that a proportion of wetland along McLaren Gully Road will be reclaimed. Based on the information provided to date there is not enough detail to accept the applicant's assessment of *low and negligible magnitude of effect* and *low and very low level of effect*. At this stage without the requested detail (s92 Request October 2020. And June 2021) we consider that the level of effect may be underestimated, especially in terms of wetland reclamation, having ramifications on whether the proposed offset is enough to result in no net loss or net gain in ecological / biodiversity value.

25 In terms of herpetofauna, the magnitude and level of ecological effect pre mitigation is set at the Ecological District (ED) and National level and may result in the underestimation of ecological effect onsite. Based on the cryptic nature of indigenous lizard species the applicant has assumed that they are present onsite. In this case the mitigation applied by the implementation of a Lizard Management Plan (LiMP) will only likely avoid / mitigate impacts on a certain proportion of any onsite population resulting in a residual effect albeit reduced by implementation of proposed mitigation measures. Based on the detail provided the *low or very low level of effect* stated by the applicant maybe underestimated. Although we agree that the implementation of a LiMP is standard practice and will reduce the level of effect the remaining residual effect should be appropriately accounted for by offsetting.

26 In terms of avifauna and as discussed above, the magnitude and level of ecological effect pre mitigation is set at the Ecological District (ED) and National level and may result in the underestimation of ecological effect onsite. The level of effect assessment in terms of falcon being considered low if they are breeding onsite seems to be an underestimation if viewed at the site scale. As above, we agree that the implementation of a Falcon Management Plan is standard practice and will reduce the level of effect but if they are found to be breeding onsite and available breeding habitat is restricted in the surrounding environment then there would be a level of residual effect that would need to be accounted for by offsetting.

27 Further information has been supplied to quantify the proposed offset using a Biodiversity Offset Accounting Model. The applicant states that supporting benchmark data could have been supplied to support the models but has not. The rational for this is that the applicant believes that the proposed offset is a 100-fold increase when compared to the proposed residual ecological effect. Providing benchmark data is considered an important step in the process of ascertaining the appropriateness of the information used in the model and therefore if the modelled results are supported and if the predicted net gain in ecological / biodiversity value is accurate. It is important that the model and associated data are transparent and robust at this stage, as it should be used to ascertain standards to be incorporated into proposed conditions of resource consent. These standards can then be used to develop long term ecological monitoring to determine when or if the proposed net gain in ecological / biodiversity value is achieved.

Proposed conditions

28 In summary the proposed ecological condition set (v7) will need to be updated to reflect changes to the matters raised above.

29 It is noted that condition 46 is not enforceable by compliance as it refers to "to the extent possible". We suggest the deletion of this condition once the matters above have been addressed.

30 Conditions 47 to 51 follow a logical sequence of a typical ecological measures, however the detail of these conditions are likely to change to include specific standards to be complied with based on the further detail that has been requested.

31 We do note that the ecological condition set requires ORC to approve management plans. In terms of using correct language this should be change to certification.

Conclusion

32 With regard to freshwater ecological matters, we are in general agreement that the level of effects are likely to be very low provided all effects management actions are implemented. However, we note that a considerable level of uncertainty exists regarding the degree of hydrological alteration that may occur. We recommend that this uncertainty be managed though amendments to the consent conditions to include hydrological and ecological monitoring in the receiving environment, including adaptive management responses.

33 In terms of terrestrial ecological matters, we have low confidence with regards to the Applicant's magnitude and level of ecological effects conclusions. This low confidence in the level of ecological effects means that an assessment of the overall offset package is unable to be finalised, and a conclusion is unable to be reached as to whether it is appropriate and will result in no net loss and a preferable net gain in ecological / biodiversity value at this point. Well considered and detailed conditions of consent would need to be constructed and agreed to bridge the gap in knowledge and give confidence that the overall ecological effects can be appropriately managed and offset or compensated for.

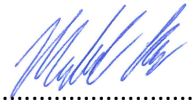
Applicability

34 This Report been prepared for the exclusive use of our client Otago Regional Council , with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Prepared by:



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