

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER OF a review of resource consent conditions under
128 of the Resource Management Act 1991

BY MANAWATU-WANGANUI REGIONAL COUNCIL

AND an application for change of consent conditions
under section 127 of the Resource
Management Act 1991

BY HOROWHENUA DISTRICT COUNCIL

**COMMISSIONERS DECISION ON A REVIEW OF RESOURCE CONSENT CONDITIONS
AND AN APPLICATION FOR CHANGE OF RESOURCE CONSENT CONDITIONS BOTH
RELATING TO THE LEVIN LANDFILL OPERATED BY THE HOROWHENUA DISTRICT
COUNCIL**

18 NOVEMBER 2016

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1. INTRODUCTION

- 1.1 On 30 October 2015, the Manawatu-Wanganui Regional Council ("Horizons") issued a Notice of Review ("Review") of the Levin Landfill's ("Landfill") discharge permits 6009, 6010, 6011, 7289 and 102259 pursuant to section 128 of the Resource Management Act 1991 ("RMA"). In November 2015, the Horowhenua District Council ("HDC") responded to the Notice of Review under section 129, along with an application pursuant to section 127 of the RMA ("Application") to change some conditions of the existing Landfill consents.
- 1.2 Public notification of the review and the application resulted in an extensive number of submissions being received.
- 1.3 We have been appointed to hear and decide both the review and the application. Prior to the hearing visits to the landfill site by hearing participants had occurred and prehearing (Whakawatea) meetings took place on 6 April 2016, 2 August 2016 and 15 August 2016. We received and considered the Whakawatea reports prepared by Ms Christine Foster an independent facilitator who helpfully facilitated those prehearing meetings Expert caucusing took place which produced joint statements identifying points of agreement and disagreement. Issues could not be resolved without the need for a hearing so the usual pre-hearing evidence circulation took place. A hearing took place at Levin between Monday 19 September and Thursday 22 September 2016 at which we received much material.
- 1.4 At the conclusion of the hearing we adjourned enabling participants to provide us with further comments focused primarily on draft conditions which were in circulation and to enable HDC to exercise its right of reply.
- 1.5 On 28 October we closed the hearing.

2. DECISION FORMAT

- 2.1 To assist the reader, we signalled that we have set out our consideration and reasoning supporting our decision within this decision document. In terms of the outcome of our decision which relates to conditions of the various discharge consents we have started with the conditions resulting from the 2010 review.
- 2.2 What we have then done utilising that condition set is to mark up using highlighted text the conditions that this decision supports. We have not identified within the conditions set the alternative or competing condition wording proposed by various participants. We have simply recorded utilising mark-ups the conditions of consent that result from our determination of the review, the application, the correspondence exchange between HDC and Horizons, the evidence, and the joint witness statements and legal submissions.
- 2.3 The final result then is detailed utilising mark-ups within Appendix A which is attached to and forms part of this decision.

3. THE SITE AND SURROUNDS

- 3.1 To provide some context for this decision we provide a short description of the site and its surrounds.
- 3.2 The Levin landfill site is located on Hokio Beach Road approximately 4 km west of Levin. The landfill site itself is located within undulating sand dunes which are a typical feature of the surrounding area. It includes an unlined closed landfill and the currently operating landfill which is lined and contains a leachate collection system.
- 3.3 The landfill site is bounded by plantation pine trees and there are pine trees within the site itself. The site is also bounded by pastoral farm land.
- 3.4 There are a number of residential dwellings reasonably close to the landfill site. The Ngatokowaru Marae is less than 1 km from the landfill site. The Hokio stream is located nearby the landfill and flows from Lake Horowhenua to the sea with its mouth at Hokio beach. The stream is a short distance away from the landfill on the northern side of Hokio Beach Road.
- 3.5 The Tatana drain is located along the northern boundary of the landfill site and takes a right angled turn before flowing in a northerly direction into the Hokio stream. The Tatana land has a number of man-made drains on it as this land is susceptible to flooding in times of high rainfall. On the southern side of Hokio Beach Road there is another drain which appears to be connected to drains located on the Tatana land and also connects with the Tatana drain where it takes a right angle turn before flowing into the Hokio stream via a culvert under Hokio Beach Road.
- 3.6 All of these features are contained and better illustrated within Appendix 1 attached to Mr Andrew Bashford's the Horizons Planner section 42A report dated 26 August 2016. This appendix was placed on the hearing room wall and utilised by participants when presenting evidence. Appendix 1 identifies both the now closed and a currently operating Levin landfill the Tatana property and drain, the Grange property (which we discuss when considering odour) and the Marae.
- 3.7 It is important to note the Landfill site has active landfill activities occurring on some parts of the site while others landfill activity has ceased. In those inactive areas landfilling has been completed and that part of the site has been capped with a contoured grassed cover which is regularly mown.
- 3.8 From the active part of the landfill site odour discharges and the nature and character of those discharges are an issue for us. From the inactive part of the site or the closed landfill leachate leaving the landfill site is also an issue for us.

4. SHORT REVIEW HISTORY

- 4.1 No doubt because of real and significant interest on the part of the submitters who appeared before us and on the part of nearby residents, the Levin landfill has had a very active resource consent history

including a number of condition reviews and an investigation undertaken by the Parliamentary Commissioner for the Environment (PCE).

- 4.2 The site has been under the control of HDC since the 1950s. The site is both identified and described in Mr Bashford's Appendix A to his evidence. A small landfill has existed on the site since the 1950s. The then landfill activity occupied a limited area of the landfill site and it served the waste needs of Levin and its immediate surrounds. This original landfill activity on the site reached capacity in around about 1975. So a second landfill activity adjacent to the then existing landfill commenced with the original landfill being closed. The closure of the original landfill and development of the second landfill took some time. Both closed and active land fill activities occur within the site.
- 4.3 In 1994 HDC made resource consent applications to Horizons for the second or new landfill. These resource consent applications attracted a high level of submitter interest and consequently a protracted resource consenting hearing process meant that a Council level decision was not available until 1997. That Council decision being a regional Council decision was appealed to the Environment Court and resolved by mediation with a resulting consent order issued in 2002. The consent order provided the following consents:
 - (i) discharge of solid waste to land (discharge permit 6009)
 - (ii) discharge of leachate to land (discharge permit 6010)
 - (iii) discharge of contaminants to air (discharge permit 6011)
 - (iv) divert stormwater run-off from land filling operations (water permit 6012)
 - (v) discharge liquid waste to land (discharge permit 7289)
- 4.4 To be complete a further consent namely discharge permit 102259 enabling discharge of stormwater to land that may enter groundwater was granted to HDC in May 2002 on a non-notified basis and consequently was not subject to any environment court appeal process.
- 4.5 Overtime the landfill activities appear to have expanded in that refuse and waste has been accepted not only from Levin but from further afield from the likes of Kapiti District. As we understood it based on what we were told the decision to accept waste from outside of the HDC area was a decision made by HDC following a Local Government decision process. We understood there are no conditions of consent that prevent HDC from accepting waste from beyond the HDC District. Submitters we heard from certainly were dissatisfied with this circumstance.
- 4.6 So a key fact arising from this short history is the landfill activities are consented activities. This fact is particularly relevant to the scope and nature of the effects we can take into account when considering and determining the Review and the Application.
- 4.7 The next step in the landfill history was that the PCE initiated an investigation into the management and effects of the landfill. That investigation commenced in 2004 and resulted because complaints were

made relating to the operation of the landfill. PCE produced a report in 2008. That report contained a number of recommendations for both HDC and Horizons.

- 4.8 Horizons acting in part on the PCE report publicly notified a review of conditions of all of the consents relating to the landfill in late 2008. Many prehearing meetings took place and an agreed outcome of all parties involved in that process resulted in an amended condition as contained in a decision report dated 31 May 2010.
- 4.9 While not expressly part of the review history for the sake of ease of understanding, we record that following trials for flaring of landfill gas HDC applied for and was granted by Horizons in 2014 a discharge permit 1067984 for this activity. Later HDC made an application to change the conditions of that consent seeking more time before the flare had to be installed. That section 127 application was granted by Horizons on July 2015 and is referenced by the consent number APP-2013016220.01.
- 4.10 So the above history brings us to the point of the current reviews. Discussions between HDC and Horizons took place before the current review resulting in a change on a non-notified basis to the date by which a review must be initiated. That date was changed from April to October in June 2015.
- 4.11 The current reviews commenced on 30 October 2015 with Horizons serving the 2015 notice of review on HDC. HDC duly responded on 25 November 2015 proposing amendments to the Horizons conditions and proposing a number of additional changes to the relevant consent conditions. HDC also sought to apply to change or cancel a number of other conditions under section 127 of the RMA. They did that because, as we understand it, they considered those changes it sought to be outside of the scope of the review process. HDC agreed to publicly notify the section 127 application at the same time as the 128 review enabling all of the proposed amendments to be considered comprehensively.
- 4.12 Both the review and section 127 applications were publicly notified on 10 December 2015 with submissions closing on 29 January 2016. A total of 169 submissions were received. As we recorded earlier prehearing meetings took place in an endeavour to resolve issues as occurred in 2008. That did not eventuate and a hearing was convened.
- 4.13 We do need to record so as to help understand our decision a good deal of dialogue both informal and formal has taken place between the hearing participants. Causing between experts occurred both before and following the hearing. Given the nature of the applications before us that dialogue and caucusing focused on conditions. Both HDC and Horizons were able to make constructive progress. Also, following the formal hearing submitters took the opportunity to become involved in discussions relating to conditions.
- 4.14 All of these conversations were of significant assistance to us because we could better understand the competing positions on conditions and the reasons behind those positions.

5. SOME OBSERVATIONS AS TO SCOPE

- 5.1 Undoubtedly for genuinely held reasons the submitters within their written submissions and evidence raised many matters that we explained to them were beyond the scope of the review and the application. This was particularly so for those submitters that raised cultural based concerns. Other submitters wished to see the current landfill closed and the entire landfill site including the original landfill remediated. They also requested the decision made to accept waste from beyond the District be reversed. On many occasions, we endeavoured to explain to submitters such an outcome was not available given the jurisdiction we had as a panel to hear and determine both the review and the application.
- 5.2 Submitters raised issues such as the current environmental health of Lake Horowhenua including the effects of discharge of stormwater and effluent into that lake over time.
- 5.3 Clearly issues impacting on the environment in proximity to the landfill and the Lake are matters of serious concern for the submitter group. While many of the issues they raised were beyond our jurisdiction to deal with as a panel we were very impressed with the desire indeed insistence that their genuinely held concerns for the environment be both listened to and meaningfully addressed. With such active engagement and with both constructive and at times very challenging contributions it seems to us that the environmental interests of this part of the district and probably beyond were being very well looked after by very well-informed and passionate guardians.
- 5.4 We also record that Mr Bashford expressed his opinion that matters such as closure or decommissioning of the landfill, the landfill's location, and importation of waste from outside the Horowhenua District, the disposal of leachate to the Levin WWTP and the "Pot" and remediation of the closed landfill are all matters outside of the scope of the review process. We agree with him and we have excluded such matters in making our decision for that reason.
- 5.5 We observe here to add that while HDC was well within its rights to resist submissions and evidence beyond the jurisdiction of this panel it approached the hearing in a most constructive way.
- 5.6 HDC heard and received at times very critical opinions from submitters which were in some instances unreasonable both in terms of merits and the manner in which the opinion was conveyed. We took appropriate steps to remind submitters of the proper way to participate in hearings of this nature.
- 5.7 At other times the submissions and evidence received relating to matters both within and outside our jurisdiction was well researched, well thought out and presented in a very compelling way. HDC listened throughout and responded to the criticisms both justified and unjustified in a constructive way.
- 5.8 While both submitters and HDC clearly have differing points of view on a range of matters relating to the Levin landfill from our perspective as a panel we thought the ability of both submitters and HDC to come

together to exchange information and to try and resolve differences was commendable.

- 5.9 Our decision will simply be another decision in the landfills history. But we hope that continued dialogue and exchange of quality information and constructive debate between submitters and Council will continue enabling issues of common concern to be resolved.

6. LEGAL FRAMEWORK

- 6.1 Our jurisdiction to hear and decide both the review and application is limited to the matters in particular the specific conditions provided for within the Notice of Review, HDC's response and HDC's application to change nominated conditions of consent and finally where HDC accepts conditions.
- 6.2 Helpfully Mr Andrew Bashford and Mr David Allen legal counsel for HDC at the hearing produced tables identifying the relevant consents inclusive of the relevant conditions detailing which of the processes either the 127 or 128 process applied to what conditions. Mr Allen in his reply provided updates additions and amendments to those tables. We have utilised those tables for our deliberations and also for our decision.

The Section 128 Review

- 6.3 The 2002 Environment Court decision included separate review conditions within each consent specifying a specific time as to when the review may take place and also prescribing the purpose of the review. This decision was a consent order to which HDC, Horizons and the submitters involved in that process all agreed to.
- 6.4 These review conditions enabled Horizons to initiate a review for the purposes prescribed within the relevant review conditions.
- 6.5 Section 128 of the RMA in summary form provides that a consent authority may at any time specified for that purpose in the consent serve a notice on the consent holder of its intention to review the conditions of a resource consent.
- 6.6 Section 128 provides for three review purposes. Those purposes are found within section 128 (1) (a) (i)-(iii). Each of those purposes are separate and distinct.
- 6.7 In this case the notice of review issued by Horizons was issued at the time specified by the relevant review consent condition and for the purpose provided in section 128 (1) (a) (iii) which is for "any other purpose specified in the consent".
- 6.8 Each review condition for each consent has a purpose which generally includes assessing the adequacy of particularised conditions within the consent for the purpose of avoiding, remedying or mitigating adverse effects on the environment surrounding the Levin landfill.
- 6.9 The review process enables the consent holder to respond putting forward a response to the review. HDC provided a s 129(1) (d) response along with its own section 127 application.

- 6.10 As noted earlier the first constraint we have is that we can only review the conditions of each consent which have been identified within the s128 (1) (a)(iii) review notice itself and within the HDC s 129(1)(d) response to that notice.
- 6.11 To make matters even a little more complicated Mr Allen told us that the scope of the review is further limited by a letter from Horizons to HDC dated 30 October 2015 and a response from HDC to Horizons dated 2015 and to any further conditions that HDC specifically agrees to.
- 6.12 Subject to the above paragraph as we understand that the section 128 review mechanism enables a consent authority to ensure that conditions under review do not become outdated, irrelevant or inadequate.
- 6.13 Mr Allen made the point to us, which we accept, that a review does not enable the imposition of new conditions to prevent the activity for which resource consent was granted.
- 6.14 At first blush section 128, provided the requirements of subsection (1) are met seems very broad and very flexible. However, Mr Allen reminded us that the Courts when considering the scope of section 128 have held that application of section 128 does not allow consents to be terminated.
- 6.15 So amendments to conditions are limited only to the extent that they do not prevent the activity for which consent has been granted and critically in changing consent conditions a consent authority needs to consider whether as a result of the change the consent would still remain viable.
- 6.16 Examples we are familiar with include reviews of marine farming structures. As we see it a review may for example reduce the size and scale of the marine farm because of an adverse effect on the environment. However, a review could not require complete removal of the marine farm.
- 6.17 There are also other limitations provided in section 131. This section directs us to have regard to the matters in section 104 as well as the matters identified in the paragraphs above. We can also have regard to the manner in which the consent has been used.
- 6.18 In particular, section 131 requires us to be satisfied before changing the conditions of a discharge permit to include a condition requiring the holder to adopt the best particular option to remove or reduce any adverse effects of the environment, to be satisfied having regard to the particular circumstances and having regard to the nature of the discharge and the receiving environment and the financial implications for the applicant of including that condition and other alternatives, including a condition requiring the observance of minimum standards of quality of the receiving environment, that including that condition is the most efficient and effective means of removing or reducing that adverse effect.
- 6.19 This review is of course occurring in the context where HDC holds a resource consent for the Levin landfill. That fact is important because that consent authorizes certain effects on the environment.

- 6.20 So while we noted above the express conditions of the resource consents which are being reviewed enable us to assess the adequacy of those conditions for the purposes of avoiding remedying or mitigating any adverse effects on the environment surrounding the Levin landfill we can only take into account the effects not already provided for or unanticipated by the granted Levin landfill resource consent.
- 6.21 In deciding whether to change condition or add a new condition after consideration we agree with the identification of the legal steps as set out in Mr Allen's opening submissions at paragraph 5.2. So the steps are:
- (i) is the change within the scope of the review in particular does the change relate to the identified conditions and is the change for the purpose of avoiding remedying or mitigating the effects on the environment surrounding the Levin landfill;
 - (ii) if so do the changes or additions relate to a more than minor effect which affect is not provided for by the existing Levin landfill consents or is the effect unanticipated by those consents;
 - (iii) if so when assessing those effects under section 104 we must recognise the existing environment which includes within scope of that assessment all anticipated effects of the consented activity. In other words, it is only effects beyond those anticipated and provided for by the consent that we are able to assess under section 104;
 - (iv) next we need to consider the nature and values of the receiving environment;
 - (v) next we can have regard to the relevant provisions of the relevant planning documents;
 - (vi) next we can consider any other matter we consider relevant;
 - (vii) we must do all of the above within the constraints of section 131 if we are minded to amend change or include a new condition; and
 - (viii) if we have determined to change condition or add a new condition then before confirming that outcome we must apply an overall broad judgement Part 2 assessment.
- 6.22 Finally, there has to be an evidential basis established on the balance of probabilities to support or justify changes or new conditions sought by Horizons through this review process. The obligation is on Horizons to present that evidential basis though we are not prevented from relying upon evidence produced by any participant to this process.

Section 127 Process

- 6.23 Just as the case with section 128 section 127 is confined in its ambit. HDC is utilising section 127 as a consent holder and has applied to change conditions of the Levin landfill consent.

- 6.24 When assessing the environmental effects of an application to change conditions of consent both beneficial and adverse effects are open for consideration. However, recognising that there is a resource consent already in place it is only the effects of the changes sort that are relevant. Effects already authorised are not relevant because those effects form part of the existing environment.
- 6.25 We must approach the HDC application as if it were an application for a discretionary activity. Under section 104 we are able to consider effects on the environment subject to the constraint that there is already a consent in place that authorises certain effects on the environment. We can also consider relevant planning documents but we cannot update consent conditions so as to establish consistency with changes to the plan that may have occurred following the grant of the original consent.
- 6.26 The final limitation for the HDC application is that it cannot in a fundamental way alter the activity originally applied for and consented. In other words, the extent of change sought by HDC cannot be so great that a new resource consent would in fact be required.
- 6.27 The key point is it is only the effects of the changes proposed to the conditions by HDC that can be taken into account in determining the HDC application.

Key Issues

- 6.28 Having regard to the legal framework above particularly the constraints identified above the key issues that emerged for us are as follow:
- (i) The effects of **leachate** from the old closed landfill on the environment especially on the Tatana property, the Tatana drain, groundwater below the Tatana site, surface water on the Tatana site, and the Hokio stream;
 - (ii) The **odour** effects beyond the boundary of the landfill particularly what are the best practices to avoid noxious dangerous offensive and objectionable odour beyond those boundaries;
 - (iii) Whether or not there are any **cultural effects** arising from the review which were not anticipated and provided for by the original Levin landfill consent and which now need to be provided for by altering the conditions being reviewed or including new conditions;
 - (iv) What is the appropriate wording for the **stormwater** condition namely condition 5 of Discharge Permit 102259;
 - (v) Whether or not the **Neighbourhood Liaison Group** (NLG) conditions within discharge Permit 6009 need to be amended and if so what are appropriate amendments; and
 - (vi) What is the appropriate wording for the **review condition** namely condition 19 of Discharge Permit 102259.
- 6.29 Taking each one of these key issues we will now move to discuss the relevant evidence we received on that key issue focusing on the conditions relevant to that key issue which are the subject of the review,

the application, and or had been agreed to between HDC and Horizons. We will where we received competing or conflicting evidence from experts and submitters focus on those differences providing reasons why we preferred one over the other. We will also apply the legal framework we set out above to help guide our considerations and evaluations.

- 6.30 However, in the end as evidenced by Mr Allen's closing submissions many of the points of difference between the experts on the issues were much reduced. This is confirmed because many of the conditions proposed for both the review and the application were agreed between the relevant experts. Alternatively, issues in dispute were resolved because Mr Allen in his closing submission advanced on behalf of HDC an offer to include some conditions or acceptance of wording of others

7. LEACHATE – DISCHARGE PERMIT 6010 – DISCHARGE LANDFILL LEACHATE ONTO AND INTO LAND

- 7.1 Leachate is the waste generated by the decomposition of waste within the landfill and the movement of water through the waste, either due to rainfall infiltration through the landfill surface, or the lateral movement of groundwater if it ever rose to a height that it made contact with the waste.
- 7.2 The new, current, active landfill which commenced operation in 2004 has a liner at its base and a leachate collection system whereby leachate drains to a sump and is pumped to the leachate pond and then on to the Levin wastewater treatment plant. We received no information to suggest that any leachate is leaking from the active lined landfill.
- 7.3 The closed or inactive landfill that operated prior to 2004 is unlined and leachate seeps into the ground and mixes with the groundwater that is moving beneath the landfill.
- 7.4 The discharge of leachate from the landfill is authorized by consent 6010. The notice of review issued by Horizons, in their letter dated 30 October 2015, notes that landfill leachate has been observed "daylighting" into the open drain on the property to the north of the landfill owned by the Tatana family. This drain flows into Hokio Stream.
- 7.5 The notice states that the review, "will examine whether existing surface and groundwater standards and parameters are relevant and appropriate, and propose conditions to avoid the contamination of land and groundwater beyond the boundary of the site".
- 7.6 HDC in their S127 application have also sought changes to conditions in Consent 6010 that would alter the effects that are authorized by the consent and the monitoring of those effects.
- 7.7 So based on the two preceding paragraphs consideration of the leachate issue is within scope of the review and the application. So now we move on to consider the other legal steps.
- 7.8 Our consideration of this leachate issue has focused on:

- A: The information that previous decision makers received regarding the magnitude and extent of leachate effects emanating from the landfill, so as to determine if we are dealing with effects beyond those anticipated and provided for by the HDC landfill consent.
- B: What the current monitoring data shows about the extent or level of effect that landfill leachate is having on the surrounding groundwater and surface water environments, so as to determine whether any unanticipated effects are more than minor effects which again are not provided for by the HDC landfill consent.
- C: The basis for a previous consent condition that required a leachate capture drain and if the Tatana drain performs the same or a different function to that capture drain.
- D: What, if any, changes to conditions are required taking into account the nature and values of the receiving environment to manage effects that are causing a more than a minor change beyond the envelope of effects that are authorised by the current conditions of consent 6010.

Information Available to Previous Decision Markers

- 7.9 Based on our review of the previous decisions on consent conditions it is apparent that those previous decision makers were presented with information that described leachate effects beyond the landfill boundary as being at low, stable concentrations that migrated through the groundwater, with some of that leachate impacted groundwater entering Hokio Stream. Whilst leachate effects were noted from monitoring bores within the landfill site it was reported that these concentrations would be attenuated to low concentrations beyond the site boundary such that actual effects would be negligible.
- 7.10 For example, in section 2.1 of the 2010 review decision it is noted that the available information showed that, *"To date there is no evidence of adverse effects arising from the landfill operation, beyond the landfill itself."* This is consistent with HDC's opening legal submissions where Mr Allen drew our attention to the information provided to the 2010 review which stated, *"Given, however, the available monitoring records that cover a period of at least 8 years, the actual effects from the existing landfill to date appear to be negligible. There is no clear reason to expect that this situation would deteriorate substantially in the future."* (Paragraph 4.32 of the opening legal submissions).
- 7.11 We also note that none of the previous decision makers described the presence of Tatana Drain or the effects of leachate discharge from the landfill on water in that drain. They only described the movement of leachate to Hokio Stream occurring via groundwater, so there has previously been no consideration of water quality of the Tatana Drain.
- 7.12 It is also obvious that we are now considering a longer monitoring dataset, including monitoring post – 2010 that was not available to previous decision makers. So this information relating to effects on the environment cannot have been available to prior decision makers.

- 7.13 When considering the information available to previous decision makers, it is also worth noting the views expressed to us about Condition 2 of consent 6010 which requires that landfill leachate shall not contaminate adjoining land. HDC's legal submissions were that this conditions should have been removed from the 2002 consent order and has only remained due to an oversight by all the parties involved in that order (and the subsequent decision makers who reviewed conditions following the 2004 PCE report and the 2010 conditions review). We find the suggestion of such an error by such a range of decision makers to be most unlikely. Rather, we prefer to find that, as noted in the preceding paragraphs, those decision makers were advised that the concentrations moving beyond the landfill boundary were very low and stable such that they would not be considered to "contaminate" the adjoining land.

What the Current Monitoring Data Shows about Leachate Effects

- 7.14 Despite information to previous decision makers that the leachate emanating from the landfill was stable, the monitoring information provided by HDC's groundwater expert, Mr Stephen Douglass shows some increasing trends in monitoring bores that are close to the northern boundary of the landfill.
- 7.15 This data shows a long established pattern of leachate effects (elevated chloride, ammonia – N and boron) in boreholes close to the landfill and within the landfill site (boreholes B1, B2 and B3) and an increasing trend in a more northern borehole, C2. But increasing trends are now showing up in boreholes C1 and C2DS (which are still within the landfill site but right on its northern boundary) suggesting stronger concentrations of leachate moving beyond the landfill boundary than have previously been considered.
- 7.16 Furthermore, the 2015-2016 water quality data from Tatana Drain provided by Horizons Water Quality Scientist, Mr Logan Brown, shows significantly elevated ammonia – N and soluble inorganic nitrogen concentrations within the waterway. HDC's water quality expert, Dr Ausseil, agrees with Mr Brown that there is, "*clear evidence of leachate contamination of the Tatana Drain via shallow groundwater from the Landfill*" (paragraph 8 of Dr Ausseil's evidence in chief). As far as we are aware this recent sampling is the only water quality information available for Tatana Drain. Consequently, this drain provides a surface pathway for leachate to migrate to Hokio Stream that has not been reported to any previous decision makers. Those decision makers were concerned with migration of the leachate within groundwater to Hokio stream and not a surface water discharge via Tatana drain.
- 7.17 It is also interesting to note that some of the concentrations measured in Tatana Drain are of a similar magnitude to concentrations measured in groundwater monitoring boreholes B1, B2 and B3 which are close to the active landfill margin within the site. This suggests that the attenuation of leachate concentrations with increasing distance from the landfill, for at least some of the contaminants, is not occurring to the extent suggested by some groundwater experts to the previous decision makers.
- 7.18 Consequently, we conclude that the concentration of leachate derived chemicals migrating through the groundwater beyond the landfill

boundary and into Tatana Drain is of greater magnitude than would have been anticipated by previous decision makers.

- 7.19 The next question we consider is whether these changing patterns of leachate concentrations that were not anticipated by previous decision makers, are causing an adverse environmental effect that is more than minor, taking into account the nature and values of the receiving environment.
- 7.20 We were advised that the shallow groundwater in this area is of naturally poor quality due to the effects of peaty swampy inter-dune deposits.
- 7.21 Whilst it is not desirable for groundwater to be migrating beyond the landfill site boundary with elevated leachate concentrations, there are no reported abstractive users of that groundwater in the immediate vicinity of the landfill and the migration of that leachate impacted groundwater is not causing any obvious measurable impact on Hokio Stream based on the monitoring data to date (although we note that is relative to the current poor quality in Hokio Stream due to broader land use effects in the catchment and the quality of the outflow from Lake Horowhenua).
- 7.22 Some groundwater from beneath the landfill may also migrate into a deeper groundwater system that moves in a westerly direction toward the coast. This deeper strata contains better quality groundwater that is used for abstractive purposes, however the monitoring data in deeper wells does not currently show any significant adverse effects associated with landfill leachate along that migration pathway.
- 7.23 The new water quality information that has not been available to any previous decision makers is the water quality results for Tatana Drain, presented in Table 2 of Mr Brown's primary statement of evidence. These show very high concentrations of ammonia – N that Mr Brown states "would have significant adverse effect on any aquatic life that should be present in the Tatana Drain". Although he also notes that most aquatic life is most likely absent from the Tatana Drain as a result of the leachate. Dr Ausseil agrees in paragraph 14 of his evidence in chief where he says, *"I also agree with Mr Brown's assessment that what aquatic life may be present in Tatana Drain would likely be exposed to toxic effects from ammonia."*
- 7.24 Irrespective of the origin or status of the Tatana Drain (which we discuss later) it seems an undesirable situation to have such elevated concentrations in a surface waterway that has a surface connection to Hokio Stream.
- 7.25 HDC's Surface Water Quality Scientist, Dr Ausseil, noted that the upper section of the Tatana Drain is very shallow and presents extremely limited aquatic habitat. However, the lower part of the drain is likely to provide some, albeit limited actual or potential habitat for aquatic species, including invertebrates and fish (paragraph 7 of Dr Ausseil's primary statement of evidence).
- 7.26 Horizons Water Quality Scientist, Mr Brown, described how waterways such as Tatana Drain would provide a refuge for fish during times of high flow in Hokio Stream.

- 7.27 Regardless of whether the One Plan Target values or the NPSFM Bottom Line need to be met at Tatana Drain, they do provide a reference point to indicate whether the water quality in Tatana Drain may be causing an adverse effect for aquatic ecosystems that may access that surface waterbody in the way in which it has been described by Dr Ausseil and Mr Brown.
- 7.28 We note that even at the downstream sampling site on Tatana Drain, close to the Hokio Stream the pH adjusted Ammonia – N concentration from three (3) samples collected in July 2016, October 2015 and January 2016 range from 1.4-4.9 mg/L. These can be compared with the One Plan target of an average concentration of 0.4 mg/L and a maximum of 2.1 mg/L and the NPSFM bottom line (Band D) for ammonia toxicity of 1.3 mg/L (as annual median) and 2.2 mg/L as an annual maximum.
- 7.29 It is our finding for the reasons given that these elevated concentrations represent an effect beyond the landfill boundary that is an unanticipated, more than minor, adverse effect on a surface waterway that has a surface connection to Hokio Stream.
- 7.30 We acknowledge that Tatana Drain is a highly modified waterway with stock access and that measurable effects do not show up in the water quality sampling of Hokio Stream which itself has poor water quality inputs from upstream. However, those other adverse impacts should not be seen as legitimising the off-site effects of landfill leachate on the Tatana Drain.
- 7.31 We also note that the monitoring of water quality in Tatana Drain and the evidence of increasing groundwater concentrations close to the landfill site boundary also represents an unanticipated change that influences the cultural issues associated with landfill effects, as will be discussed later in this decision.

The Origin of Tatana Drain and the Requirement for a Landfill Cut-Off Drain

- 7.32 A variety of information was provided at the hearing regarding the origin of Tatana Drain and whether or not it fulfilled an earlier landfill consent condition requiring the construction of a drain along the landfill boundary, "to capture leachate running off the site on to neighbouring properties" (condition 3 of the 1998 decision on consent 6010).
- 7.33 The evidence from two submitters, Mr Everton and Mr Smith indicated that the previous owner of the Tatana property (Mr Ivan Jones) dug the drain with its current orientation and connection to Hokio Stream following discussions with HDC. Our understanding is that it was a privately excavated drain to improve his ability to utilize the land. In addition, Mr Landmark (for HDC) described how HDC re-contoured the surface of the closed landfill so that less surface runoff would drain towards the Tatana property. This modification would also lessen the effects of landfill drainage water onto the Tatana property.
- 7.34 We do not agree with the HDC Legal Council's submissions relating to the evidence of Mr Everton and Smith that the Tatana Drain was constructed specifically to capture leachate as envisaged by Condition 3 of the 1998 decision. This is because any capture drain had no

authorisation to discharge that leachate to Hokio Stream and that would not be a logical or environmentally acceptable pathway for a drain that was designed to capture landfill leachate.

7.35 Mr Bashford helpfully provided a Horizons internal file note from the time of the 2002 consent order which lists the following points:

- The decision to specify the drain in the conditions was a result of several factors. The main reason was to address perceived concerns of Mr Jones, adjacent property owner. Mr Jones was concerned with the runoff of stormwater and leachate from the site. Mr Jones no longer owns the property. It is unclear if the new owners share the same concern.
- The slope on the existing landfill has been re-contoured and now the majority drains to the south and away from the proposed drain location. As a result, the potential catchment of the drain has been considerably reduced and will not result in stormwater from any exposed refuse.
- In my view, providing leachate does not surface on the side of the landfill, the drain will not intercept leachate. It is possible that shallow groundwater contaminated with leachate may have ended up in the drain, but the proposed shallow groundwater monitoring should indicate the presence of any contamination.
- In summary, the drain and therefore the condition are no longer required.

7.36 In our view this explains why Condition 3 was removed. It is not because Tatana Drain was viewed as being the leachate capture drain, but rather, it was because the drainage issues on the Tatana property were no longer being raised as an issue of concern and the re-contoured landfill surface reduced the amount of surface drainage to the north.

7.37 Whilst the note acknowledges that groundwater contaminated by leachate may enter the Tatana Drain, the advice from the groundwater experts at that time was that groundwater concentrations beyond the site boundary were negligibly low due to attenuation mechanisms that would occur. So we conclude based on the evidence received that the Tatana drain was not constructed to intercept leachate. Its primary role was to drain an area of swampy ground on the Tatana property. As noted above, more recent monitoring now shows that the assumption presented to previous decision makers of stable, low concentrations in groundwater beyond the site boundary does not appear to be accurate.

7.38 We were also provided with contrasting evidence as to whether Tatana Drain should be considered as a river, and subject to the One Plan targets and the NPSFM criteria, or an artificial waterway and therefore exempt from those criteria. Whilst we recognise that Tatana Drain occurs in a wet area of land associated with the Hokio River floodplain, there was no definitive evidence to indicate that a natural surface channel existed connecting the downstream end of that wet land to Hokio Stream. Mr Brown and Dr Ausseil presented contrasting views on this and Ms McArthur (water quality expert for several submitters) noted that there is no unequivocal evidence of a natural surface water flow

from the wet land to Hokio Stream. Based on the information provided to us our finding is that it is more likely that the wetland was sustained by subsurface flow and occasional flood flows from Hokio Stream. The surface channel connection that now exists between the wetland area and Hokio Stream appears to be an entirely manmade farm drainage canal, which meets the RMA definition of an artificial watercourse.

7.39 Irrespective of that classification, we still need to consider the environmental effects that arise from having a surface water body that is affected by leachate and is hydraulically connected to Hokio Stream, for the purpose of evaluating the consent conditions that are within the scope of this hearing. With regard to that evaluation, we note the following:

- Leachate is already reaching Tatana Drain and having measurable effects that cannot be avoided or mitigated in the short term. However, we have no authority to require modifications to the Tatana Drain as it is on private land outside of the HDC landfill property.
- We can assess the effects of the water quality of Tatana Drain based on the expert evidence of its interaction with Hokio Stream, which is a relevant consideration irrespective of how the drain is classified.
- HDC, through their closing legal submissions, is giving an undertaking to construct a leachate capture drain inside the landfill boundary adjacent the Tatana property which in the longer term is likely to be the most effective measure that can be implemented to address the unanticipated, more than minor, leachate discharge effects that are occurring.

Leachate Conditions

7.40 Based on our understanding of the leachate issues described in the preceding paragraphs, we now consider the condition of consent 6010 which authorises the discharge of leachate.

7.41 In the s128 notice of review date 30 October 2015, Horizons proposed changes to conditions 3 and 11. They also proposed a new condition 2a requiring the discharge of leachate to cease to Tatana Drain. In their s129(1)(d) response, HDC provided comments on all the changes put forward by Horizons.

7.42 In HDCs s127 application they proposed changes to conditions 2, 5, 9, 10, 15 and 30 of consent 6010. They also proposed the deletion of conditions 18 – 27, but that request has subsequently been withdrawn in HDCs closing legal submissions.

7.43 Consequently, with the exception of conditions 18 – 27, we consider that all the other conditions listed in the preceding two paragraphs are within the scope of our consideration for consent 6010, recognising that the criteria for imposing any changes are different for those involved in the s128 notice as opposed to the s127 notice as set out in section 4 of this decision.

- 7.44 By the time the hearing closed, agreement was reached between the expert witnesses on the wording of several conditions. This greatly assists our decision making. HDC, Horizons and some submitters, while reserving their position on the status of Tatana drain, have agreed as detailed within Mr Allen's reply on changes to conditions 5, 9, 10 11(a) and 15(f). Given our finding on the status of the Tatana drain we do not need to be troubled by that reservation. Following the hearing of evidence in Levin, the experts from the various parties also agreed on a revised wording of conditions 3 and 11(aa), as set out in the HDC closing submissions. We generally agree with these revised wordings, which create the following changes:
- Allow for extra monitoring points at a deep well on the western margin of the landfill, two shallow wells adjacent to two of the Hokio Stream monitoring sites, a more appropriately located upstream monitoring site on Hokio Stream and a monitoring site on Tatana Drain (condition 3).
 - A reduction in the frequency of Hokio Stream monitoring if there is no statistically significant increase between the upstream and downstream monitoring sites for parameters with concentrations that are beyond the nominated Trigger values (condition 3).
 - More streamlined reporting data and laboratory analysis requirements for sampling (conditions 5, 9, 10 and 15(f)).
 - A separation of the groundwater and surface water considerations that must be undertaken if their respective trigger values are exceeded (conditions 11(a) and 11(aa)). We acknowledge the comments from the experts that the upstream:downstream comparison in condition 3J cannot be applied to monitoring in the Tatana Drain, because it only has one monitoring site. However, such a comparison is not required to determine if landfill leachate is causing the poor water quality in the Tatana Drain, because the water quality experts have already agreed that leachate is having a significant effect on Tatana Drain. The impact of these effects is covered off by new condition 11(aa)
- 7.45 We consider these agreed conditions provide helpful improvements that are more focused on the environmental effects of the leachate discharge as they are currently understood. However, because the water quality experts have indicated that Tatana Drain is affected by leachate, we think it is appropriate for the drain to be sampled for the comprehensive suite of analyses on a six-monthly basis to provide a more thorough check on the composition of the leachate that is emerging into that surface waterway.
- 7.46 We also note that some of the sampling sites are on land not owned by HDC, so we have added the proviso to the conditions that sampling is subject to landowner approval and if that approval is not achieved the sampling must be carried out at the nearest most suitable and accessible site where sampling can occur.
- 7.47 These proposed amendments can be specified in condition 3 and enable better monitoring of the leachate effects than is currently occurring.

- 7.48 There is disagreement, between the parties about condition 2. This requires that landfill leachate shall not contaminate adjoining land. HDC are of the view that this condition should have been removed when the leachate collection drain condition was removed.
- 7.49 As we have noted previously, we do not think that is correct. Rather the decision makers left it in place because they were advised of a situation that whilst groundwater from beneath the landfill would migrate towards the site boundary, it would only have low and stable concentrations of leachate and no overland flow would occur to contaminate the adjoining land.
- 7.50 So whilst that seems the likely explanation for its continued inclusion in the consent our current view is that elevated leachate effects in groundwater have already migrated beyond the boundary, as indicated by the trends in the bores C1, C2 and C2DS and the water quality analyses from Tatana Drain. Therefore, for condition 2 to remain in its current form would create a situation of immediate non-compliance for the landfill.
- 7.51 Mr Bashford sought retention of condition 2 to deal with break outs of leachate, which HDC considered to be a most unlikely occurrence that has never been reported (comments on condition 2 in closing legal submissions). On that basis, we feel it would be appropriate to retain an amended version of condition 2 that requires the following:
- “There shall be no overland flow discharge of leachate beyond the site boundary”
- 7.52 We have to recognize that there is a subsurface groundwater migration of leachate that has occurred to date. That is addressed as best it can be by condition 3, 11(a) and 11(aa) and by the future requirement for a cut-off drain (condition 2(a)), which we discuss next.
- 7.53 In response to our comment that HDC need to “sufficiently” mitigate the landfill leachate issue, HDC have volunteered a condition requiring them to install a cut off drain on the northern boundary of the landfill site and to irrigate the captured groundwater and leachate onto the landfill site.
- 7.54 Whilst such a condition is well intentioned and consistent with the undertaking given by HDC in the mid-late 1990’s, we have a concern that it has not been appropriately thought through and considered, particularly since such an approach is contrary to the evidence HDC presented at the hearing. In particular:
- Mr Saidy advised us of a range of cut-off drain options, all of which, “involve significant cost, but there is insufficient information to determine how effective any of them would be” (paragraph 81 of Mr Saidy’s primary statement of evidence).
 - Mr Landmark’s response to our questions indicated that a full leachate cut-off drain would be impractical.
 - Mr Douglas’s response to our questions indicated there was insufficient information at present to define the best interception

method and management of an interception system and uncertainty as to what it would achieve.

- 7.55 Against that background information we are uncertain of the detail in HDC's proposed condition regarding the maximum length (150 m) and depth (1.5 m) of the cut off drain and the disposal of the captured groundwater and leachate by irrigation onto the landfill. Based on the evidence presented by the HDC witnesses there must be considerable uncertainty as to what such a drain will achieve and how effective it will be to operate.
- 7.56 Due to this uncertainty, we prefer a condition that sets out a three step process:
- Firstly, a feasibility assessment that considers the options for the location and dimensions of a leachate cut-off drain, what the various options will achieve in terms of leachate interception and the options for management of the collected groundwater and leachate, with recommendations for a preferred approach.
 - Secondly, the recommendations for the interception system should then be presented to Horizons and the Neighbourhood Liaison Group to allow consultation with these groups prior to proceeding with a solution that will minimise the migration of leachate beyond the site boundary in a manner that avoids adverse effects on adjoining land and waterways and also avoids the creation of any new leachate related effects.
 - Thirdly, the preferred outcome from the consultation process shall be implemented within 18 months of the commencement of the decision on the 2015 review. We note that this is 6 months longer than proposed by HDC, which we consider to be a suitable time for a more carefully considered assessment of options and liaison with Horizons and the NLG.
- 7.57 Associated with this commitment to a new cut-off drain, HDC have now withdrawn the part of their S127 application to delete condition 18-27 which relate to the irrigation of leachate onto the landfill.
- 7.58 Consequently, those conditions will now remain as they were, as Horizons S128 notice of review did not propose any changes to those conditions. However, as noted above, we do not think those conditions should automatically define the discharge of the liquid collected from the cut-off drain. The most appropriate management option requires significantly more careful investigation and consideration of other alternatives to irrigation.
- 7.59 The only other condition of consent 6010 that requires our consideration is condition 30, which describes the future review process for the conditions of this consent. This review condition is common to all the consents involved in this review and is specifically addressed later in this decision. later in this decision.

8. ODOUR – DISCHARGE PERMIT 6011 – DISCHARGE LANDFILL GAS, ODOUR AND DUST TO AIR

Introduction

- 8.1 Given we are dealing with a landfill activity it is no surprise odour is an issue for this review and application.
- 8.2 Earlier in this decision we identified the legal steps to take in determining both the review and the application. When deliberating in relation to the odour conditions we found application of those legal steps to a degree superfluous because by and large Horizons and HDC either directly or through their experts had agreed changes to the conditions.
- 8.3 One exception relates to condition 3 in particular the issue of verification by a Regional Council Officer as to whether or not odour is objectionable or offensive. HDC considered that the changes advanced as a consequence of the joint witnessing statement dated 28 September 2016 and as a consequence of the Horizons letter of 29 September 2016 were not within scope of the review. We discuss condition 3 in more detail below.

Information available to Previous Decision Makers

- 8.4 Based on the evidence we have received we accept that the 1995 application identified odour as an issue particularly potential effects caused by odour migrating beyond the landfill site. In particular, the actual application itself detailed odour issues in section 4.2 on page 12.
- 8.5 It is also clear from the 1998 decision that a range of air quality experts provided expert evidence to the hearings panel. That evidence was to the effect that odour effects arising from site operations beyond the site boundary would be minimal particularly if the then proposed management plan was implemented.
- 8.6 The 1998 decision recorded the potential effects of the discharges or odour could be avoided remedied or mitigated provided that appropriate design and operation and management occurred at the landfill.
- 8.7 As required by the conditions of consent landfill management plans were prepared to deal with landfill operations including landfill gas control to control odour nuisances. We were referred to management plans dated November 2010.
- 8.8 So we conclude the previous decision-makers had information before them relating to odour effects. However, that information, based on reading the relevant decisions, convinced them that provided the mitigation measures were put in place there would not be serious odour issues arising beyond the boundary of the landfill site. In other words, the prospect of noxious, offensive, or dangerous odour occurring beyond the landfill site and having adverse effects was very unlikely given the proposed mitigation measures.

What the Current Information Shows about Odour Effects

- 8.9 In October 2015 Horizons issued the notice of review which included condition 3 of discharge permit 6011. We record that condition 3 relates to objectionable, offensive, noxious and dangerous odour effects occurring beyond the site boundary. Horizons as confirmed within the review notice was of the view that there was no apparent solution to ongoing recurring odour issues which we detail when we review the evidence.
- 8.10 Importantly the scope of the review was to examine current best practice in terms of capping of the landfill, surface emission testing and standards, and what further investigations can be carried out and mitigation measures implemented to avoid noxious, dangerous, offensive or objectionable odours beyond the boundary of the site.
- 8.11 A Levin Landfill annual compliance report dated August 2016 was also provided to us. That provided information on the entire landfill operation but in particular provided information relating to landfill gas monitoring. These management plans and reports detailed that the odour arising from landfill activities was to be controlled by keeping the refuse dry and covered by suitable materials as soon as possible following deposit. Complaints registers were to be kept with a copy of that record made available to Horizons on request.
- 8.12 Well after the 1998 decision, from early 2014 the Granges who occupy land close to the landfill as their residence began to lodge regular complaints with HDC about odour affecting them. An important point of their evidence was they told us they were exposed to odour on a recurring basis since December 2013. They have occupied the land at 645 Hokio Beach Road since 1974 a year before the landfill activity commenced in 1975. They told us their overall objective is to support the Horizons proposed strategy to contain what they called the stench from the dump within the dump boundary.
- 8.13 Among other things in their evidence they detailed they have been recording and monitoring odour at their residence from February 2014 except for a three month period when an odour monitor was operating at their property. They provided their view about the source of odour and described in detail the very serious effects that the odour was having on them, their family and visitors to their home.
- 8.14 In their assessment, serious and extreme odour issues were a frequent occurrence at their property. In terms of intensity they told us particularly during summertime the odour was unbearable. They used other descriptors such as stench and described the odour as extremely offensive. In our conversation with them we certainly understood they consider the odour is offensive and objectionable. However, we could not readily understand what caused either an increase or a change in the character of the odour discharge from the landfill in December 2013 and later.
- 8.15 Other submitters raised the odour issue but it is fair to say the Granges are the lay witnesses who provided the most in-depth information on odour.

- 8.16 From the evidence of the Granges and other submitters we gained an insight into the nature and values of the receiving environment. In short it is a rural environment in which agricultural and farming type odours could be expected from time to time. However, odours which are or are likely to be noxious, dangerous, offensive or objectionable to such an extent that they are likely to have an adverse effect on the environment are neither part of the nature or values of the surrounding rural environment.
- 8.17 HDC in response to the Granges complaints commissioned Dr Boddy to assess the odour discharge from the landfill. This assessment is noted in a report entitled "Levin Landfill Odour Assessment" of February 2015. It was his view that the potential for odour nuisance effects beyond the landfill site would be significantly reduced, provided mitigation measures were implemented.
- 8.18 As earlier noted against this background, particularly of complaints, Horizons determined that condition 3 of the discharge permit 6011 was a significant noncompliance in its compliance report dated 9 February 2015.
- 8.19 Further reports were completed in August and October 2015 by Dr Boddy. He still concluded that there was potential for odour effects beyond the landfill site. He had developed mitigation measures in his February 2015 report for the working face, the leachate collection manhole and Stage 2 capping as these were the likely areas where odour was and or could escape from. He recommended the mitigation measures be undertaken without any delay.
- 8.20 Mr Allen for HDC pointed out that these investigations and reports were expensive costing HDC in the order of \$120,000.
- 8.21 HDC following the issue of the notice of review by Horizons undertook a range of mitigation measures as recommended by Dr Boddy. Those mitigation measures included developing an odour management plan as part of the landfill management plan. It appears that the requirement to develop an odour management plan was not part and parcel of the original resource consent conditions of 2002.
- 8.22 Dr Boddy's recommendations about controlling odour at the working face by a change in the processes to cover waste by the use of clay were also adopted. Other recommendations were desludging the leachate pond and installing a weather station to assist with monitoring as well as constructing a bio filter at the leachate manhole cover. The final mitigation management measure involved a gas collection system and flare to burn landfill gas. Earlier in time HDC had utilised a gas collection system and flare but the flare failed and was uneconomic to repair.
- 8.23 Ordinarily one of the first matters for us to be clear on is whether or not the odour currently being discharged from the landfill site is greater or somehow significantly different from that anticipated in the original grant of consent to enable discharge of odour to air. HDC were very clear at its highest it was arguable whether the odour effects of the landfill activity had increased above and beyond those anticipated in earlier decisions.

- 8.24 We acknowledge and agree some odour was anticipated in the granting of the air discharge consent but the level of that odour discharge was anticipated to be minimal and not an odour that is or is likely to be noxious dangerous offensive or objectionable beyond the site boundary.
- 8.25 One of our challenges is that a number of expert witnesses and lay witnesses expressed the view that no objectionable or offensive odours were detected at or beyond the boundary of the landfill when site visits to the Granges property occurred. This is the evidence of Dr Boddy, Mr Landmark, Mr Standen and Mr Carlyon.
- 8.26 Data collection about odour issues was also problematic in that as we understood it the data or information collected by HDC in respect of odour supported the outcome that odour discharges beyond the boundary were not in the category of being more likely to be objectionable or offensive. Also, the Granges for their part discontinued their odour record during March to June 2015 so we did not have a complete record.
- 8.27 So we are left with the Granges very clear evidence that from their view the recurring odour experienced is most definitely offensive and objectionable. Indeed, it seemed to us that the Granges were describing a type of effect caused by exposure to chronic odour slowly but consistently accumulating over time. One of the outcomes of this circumstance is an increase in sensitivity in some persons. We understood this outcome was and had occurred for the Granges.
- 8.28 We also note that the joint expert statement of the air quality experts of 10 – 11 August 2016 states that there is no inconsistency between the Granges experience and the current odour sources at the landfill and all the experts agreed that the odour complaints from the Granges are credible.
- 8.29 Dr Boddy told us he considers there to be a potential for nuisance odour effects beyond the boundary. As we understood her evidence Ms Ryan, the odour expert for Horizons, was initially of the view that there was still the potential for odour from time to time occurring beyond the site boundary of the landfill.
- 8.30 We also acknowledge that Mr Standen's oral evidence was that he has never detected an objectionable odour. This is important because he utilised weather observations to determine the best conditions to attend the Granges property to detect odour. He did so on approximately 12 occasions not detecting objectionable odours. We are also aware of the fact that there are other residents who reside 300 m away from the landfill site which is an additional 100 m compared to the Granges and no odour complaints have been raised by those persons.
- 8.31 Nevertheless, if we were called upon to make a finding that odour which occurs beyond the site boundary is or is likely to be from time to time offensive and objectionable we think that on the evidence such a finding is available to us. This is based primarily on the Granges evidence and to a lesser extent on all of the steps taken by HDC because unless there was a serious issue about offensive and objectionable odour it is very difficult to see why HDC would have spent time energy and resources on the odour issue.

- 8.32 Clearly noxious, dangerous, offensive or, objectionable odour effects beyond the landfill boundary were not anticipated by the 1998 decision or the 2002 Environment Court decision. We also record such an effect is a more than minor effect which is not provided for appropriately by the existing Levin landfill consents. We also record based on the evidence received from both Horizons and HDC experts they were of the same view. However, determining if the odour effects beyond the landfill boundary are offensive and objectionable is not necessary for two reasons.
- 8.33 The first is the scope of the review we need to undertake is to make a decision about the best practice available to HDC to avoid noxious dangerous offensive or objectionable odours beyond the boundary of the site. There is no doubt that conditions relating to objectionable odour effects are within scope of the review. For reasons that follow it is our view the current conditions are not adequate to fully address odour issues. Given the approach of HDC and for that matter Horizons we consider they both accepted that position.
- 8.34 The second reason is that HDC has clearly stated it signals support for many of the proposed conditions arising from the odour issue. Through the actions HDC has already taken in response to Dr Boddy's various reports HDC intends doing all it can to ensure that noxious, dangerous and offensive or objectionable odours beyond the boundary of the site does not occur.

Changes within Scope of the Review

- 8.35 This approach of not being strictly constrained to the terms of the review notice was also evident in the approach taken by the odour experts Dr Boddy and Ms Ryan. Both experts in their evidence noted that in many instances the recommendations fell outside of the scope of matters raised within the review notice. They both made mention that the air specialist caucusing of the Whakawatea Forum raised questions which were wider in scope than the matters covered in the Horizons notified review of consent 6011. Ms Ryan in particular considered these additional matters were important to achieving a reduction in adverse effects from odour arising from the landfill discharges. We will return to this point when we discuss the flare.
- 8.36 So whether or not the odour beyond the boundary is offensive or objectionable is not the key point. The key point is whether or not the proposed conditions are the best practice to avoid noxious, dangerous, offensive or objectionable odours beyond the boundary of the site.
- 8.37 Ms Ryan for Horizons reminded us that the review is not about ensuring that there will be no odour effects but rather ensuring best practice is in place to avoid noxious dangerous offensive or objectionable odours beyond the boundary of the site.
- 8.38 When she was considering Dr Boddy's recommended mitigation measures it was her evidence that there will be a "huge reduction in odour through these measures". We note that Dr Boddy was very clear in his evidence that provided the mitigation measures he proposed were implemented that there is unlikely to be any further odour nuisance

effects arising in the community as a result of odour emissions at the landfill.

- 8.39 When we questioned Dr Boddy about the level of confidence he had he told us quite clearly and directly that he was very confident that these measures would ensure odour emissions beyond the landfill boundary were acceptable. Indeed, it was his view that the proposed mitigation measures went beyond best practice.

Odour Conditions

- 8.40 We now move to consider specific mitigation measures to address odour discharges from the landfill.

Verification to Determine if Odour is Noxious etc

- 8.41 Condition 3 was perhaps the most contentious condition between the parties. The first paragraph of condition 3 requires that there should be no discharge of odour or dust from the landfill that in the opinion of a Regional Council Enforcement Officer is Noxious, Dangerous, Offensive or Objectionable beyond the boundary of the property. Following that main paragraph there are a range of subparagraphs to condition 3 of the final legal submissions, which in our condition set (Appendix A) has been renumbered as condition 5, are addressed below.
- 8.42 The key area of contention between Dr Boddy and Ms Ryan was whether or not the opinion of the Regional Council Enforcement Officer should remain as a component part of that condition.
- 8.43 That point arose because the Granges property and the landfill itself is some distance from the place of work or general location of Regional Council Offices. So by the time Officers travel to the site to respond to an odour complaint the odour may have dissipated. The consequence resulting is that if the opinion of the Council Officer is determinative of the nature of the odour if the odour has dissipated at assessment time then the condition will not be breached.
- 8.44 To address that concern Ms Ryan recommended that we delete that part of the condition that referred to the opinion of the Regional Council Enforcement Officer and in its place, substitute an advice note providing guidance to determine non-compliance with condition 3.
- 8.45 Dr Boddy strongly disagreed. This disagreement was canvassed in principal evidence and effectively remained in place even during the expert witness conferencing which occurred on September 27 and 28 2016 following the hearing.
- 8.46 Dr Boddy contended Horizons has a duty to inspect the landfill and investigate and assess odour and a duty to investigate any complaint about alleged odour nuisance made by a member of the public. We do not disagree with him.
- 8.47 Dr Boddy was concerned to see that it was understood there is a distinction between an odour event as recorded in Mr and Mrs Grange's odour diary and an odour complaint as lodged with HDC and Horizons. He made the point that determining whether or not an odour event

beyond the site boundary is noxious, dangerous, offensive, or objectionable should not be left to a member of the public. He also made the point that when applying the FIDOL experience and expertise are required.

- 8.48 It was his very clear view that the experience and expertise needed would come from an Enforcement Officer or an independent assessor and not a member of the public. He was essentially concerned to see that the condition was not left in such a state that it would be enough for a neighbour or some other person within the relevant environment to consider the odour to be offensive or objectionable
- 8.49 As we see it then the tension between the experts is whether or not an Enforcement Officer's opinion is to be determinative of the issue that the odour discharge is noxious, dangerous, offensive or objectionable beyond the property boundary. We also see that we have to provide an odour condition which properly reflects important matters of context such as the location of the landfill and the usual location and time it would take for a Regional Council Enforcement Officer to attend at the scene.
- 8.50 Both experts referred us to the MfE Good Practice Guide for assessing and Managing Odour in New Zealand (June 2003) and the German standard IIA 3930 and the relevant Australian and New Zealand standards. They also referred and we discussed with them the relevant provisions of the One Plan in particular paragraph 15.3 of that plan.
- 8.51 As we see it there needs to be two parts to the condition. The first is that there shall be no noxious, dangerous, offensive or objectionable odour beyond the property boundary that has an adverse environmental effect. The second part of the condition deals with how to determine or how to assess that discharge of odour so as to determine that it is noxious dangerous offensive or objectionable.
- 8.52 We are aware that it is commonly the case that odour conditions of this type utilise the opinion of a Regional Council Enforcement Officer to assist in determining if the condition is breached or not. Indeed section 322 of the RMA, which provides for abatement notices, uses similar phrasing by referring to the opinion of the Enforcement Officer.
- 8.53 In our view that opinion is to be formed taking into account the relevant facts and circumstances of the case. We accept that one of the best facts available is for the Council officer to be exposed to the odour to assist in making the determination. We acknowledge this is not always possible so validating complaints in every instance is extremely unlikely to occur because odour emissions are typically highly variable with time. All sorts of influences can affect the assessment regardless of an officer's response time. There can be variations in the odour of emission itself, varying wind speeds or atmospheric stability, all of which will impact on odour assessment.
- 8.54 However, in our view if that direct validation is not possible this does not prevent the Enforcement Officer from reaching an opinion that the odour is noxious, dangerous, offensive, or objectionable. Clearly we accept it is more difficult for the Enforcement Officer when he or she has to rely on

other facts and evidence when they cannot directly experience the odour.

- 8.55 As Dr Boddy points out in his expert witness conferencing notes the test as to whether or not the threshold referred to in the condition is met or not is the ordinary reasonable person test. Expressed more fully the test of whether or not the odour is offensive and objectionable is whether or not an ordinary reasonable person would find it so. Refining that test to the context here we think the test here is how would the odours be perceived by an ordinary reasonable person exposed to them on a recurring basis in their home or workplace as are the relevant residents or submitters in this case. What is also important in this case is the cumulative or accumulated stress that can result from being exposed to odours on a recurring basis.
- 8.56 Considering Dr Boddy's preferred wording we acknowledge that it does not allow offensive or objectionable odours beyond the boundary. However, we are concerned that there is a linkage between the prohibition and the Regional Council Officer's opinion. We prefer the straightforward statement that there shall be no objectionable or offensive odour beyond the site be included within the condition. Also, what is missing from Dr Boddy's preferred words is that it makes no reference to effects. There should be reference to the point that the objectionable or offensive odour links to adverse effects at or beyond the boundary of the site.
- 8.57 One of the useful suggestions Dr Boddy made was to include a reference not only to a Regional Council Enforcement Officer but also to an alternate, being an independent and trained field odour assessor appointed by the Regional Council. The point here was to increase the number of persons who may be available to respond and assess odour. We agree that is a useful suggestion.
- 8.58 We think that rather than having an advice note to deal with the balance of the condition as Ms Ryan recommended we would support an additional condition. We think the wording of that new condition needs to refer to an appropriately experienced Enforcement Officer or a suitably qualified independent expert. Next we think that rather than using the word determining, it is more appropriate to approach the issue as a consideration of whether or not an objectionable odour beyond the boundary has occurred having regard to a range of factors which will include the FIDOL factors, and receipt of complaints from neighbours or the public.
- 8.59 The wording promoted by both Dr Boddy and Ms Ryan is silent on what occurs if the suitably qualified expert does consider there is objectionable odour effects beyond the boundary. Perhaps the assumption is that an abatement notice or some enforcement proceeding would result. However, we think that there should be a consequence provided for within the conditions for the consent holder acknowledging that other enforcement action may still occur.
- 8.60 We think that the consent holder needs to provide a written report to Horizons specifying the activities that were occurring on the site at the time of the objectionable odour discharge and the cause or likely cause of the event. Also, any factors that influence its severity and the nature.

The timing of any measures implemented by the consent holder to avoid remedy or mitigate any adverse effects and describe steps to be taken in future to prevent a re-occurrence should also be included. The condition should provide timelines for provision of this information.

- 8.61 We have endeavoured to address all of these issues in the wording that we have determined is appropriate as set out in condition 4 in Appendix A.

Daily Cover

- 8.62 Sand is used as the primary material for effecting daily cover over the operational fill area or working face at the end of each day. Horizons within its review sought to remove sand and replace it with soil or clay or an alternative where it can be demonstrated to provide comparable control of odour.
- 8.63 The experts after considering appropriate guides such as the WasteMinz guidelines for alternate alternative daily cover options concluded and agreed that sand at the specified minimum depth may be appropriate as a daily cover given its availability on site. This was however provided that mulched Woody material would be blended as needed to provide effective odour control. The experts determined that mixing mulched Woody material would overcome and address deficiencies of utilising sand alone. Those included the ease with which sand can be disturbed by one and for that matter escaping landfill gas.
- 8.64 On the matter of daily cover there was agreement then between HDC and Horizons which agreement is reflected in new condition 5(c) in Appendix A of this decision.

Intermediate Cover

- 8.65 Intermediate cover is the material to be placed over, and in addition to, daily cover to close off a fill area that will not receive additional lifts of waste or final cover for more than three months. The experts all agreed in caucusing that intermediate cover is more critical than daily cover for controlling landfill gas and odour. They also acknowledged that a key limitation at the Levin landfill is that the landfill was located in sand country and therefore there is an absence of suitable cover materials with a high percentage of clay.
- 8.66 The issue here was that Horizons within its notice of review specifically sought to exclude the use of raw sand for use as intermediate cover because raw sand was not a suitable material to appropriately control odour. HDC sought the exclusion of raw sand as an intermediate cover be deleted from Horizons proposed condition, in other words allowing sand to be used.
- 8.67 As a result of further caucusing between the odour experts Dr Boddy and Ms Ryan, they produced a joint witnessing statement dated 28 September 2016. That statement was attached as appendix D to Mr Allen's closing submissions. He records that HDC agrees with the amendments dealing with intermediate cover. Those agreed amendments are now recorded in new condition 5(d). The advice note

included after condition 5(d) is intended to address Ms Ryan's definition related concerns.

- 8.68 Ms Ryan also considered that clarification of the terminology relating to intermediate cover and temporary cover because it is confusing and requires better definition. Doing so would be helpful in developing an agreed set of conditions. She also noted that condition 14 of consent 6009 that a Land Management Plan (LMP) is required to include operational, intermediate and final capping requirements. It was her view that these terms are currently poorly defined in the current version of the LMP.

Surface Emission Monitoring

- 8.69 Horizons proposed a new condition to address the need for monthly surface emissions monitoring for all areas of landfill with final and intermediate cover and over the bio filter surface. Monitoring would not occur where there had been any rain in the previous 72 hours.
- 8.70 Again, very helpfully the experts discussed and caucused issues arising from surface emission monitoring while having appropriate regard to monitoring methodology referred to in New South Wales and Victorian EPA guidelines. Issues which were discussed and agreed related to rainfall, its quantity and duration and wind speeds. Other matters discussed related to the need for a threshold level for monitoring of methane. Horizons proposed 5000 ppm as the level where remedial action is to be taken for an exceedance.
- 8.71 In caucusing all specialists agreed that the Victorian EPA guidelines were appropriate to use because they provide a more proactive system for identifying and managing fugitive odour sources resulting from landfill gas emissions via the landfill surface. Further applying those guidelines, it was appropriate to adopt a lower trigger for surface methane as a basis to require remedial action. In the end, it was agreed 100 ppm for the final and 200 ppm for the intermediate cover areas were appropriate trigger points. We have reflected this in condition 5(f).
- 8.72 Notwithstanding the agreement between the air quality experts on these appropriate trigger points Mr Saidy for HDC raised practical issues with whether such extremely low limits can be met at the landfill especially as limits for methane gas down to 100 ppm at Levin compared unfavourably to 5000 ppm for the recently consented Bonnie Glen landfill. These contradictory views place us in a difficult position.
- 8.73 We have assumed when Dr Boddy agreed with Ms Ryan he would have taken into account whether or not the trigger points were practical. Also, our primary concern is to ensure that best practice is in place so as to avoid issues with odour beyond the boundaries of the landfill. If we have received expert advice on the best practice, we think we should follow it. So notwithstanding Mr Saidy's reservations we prefer the expert evidence of Dr Boddy and Ms Ryan on this point.
- 8.74 This matter of the appropriate climatic conditions to carry out surface emission testing is included within agreed condition 5(e) and referred to within the related advice note.

- 8.75 The new agreed condition 5(f) provided for the agreed wording around the threshold level or trigger for monitoring methane. There are related conditions again arrived at by agreement between HDC and Horizons namely condition 5(g) which relates to and including surface emission monitoring results in the annual report, a further new condition 5(h) to require ventilation of the leachate collection chamber to a bio filter within six months of the decision on this review. All of these conditions had been agreed to between HDC and Horizons.

Bio filter Monitoring and Performance

- 8.76 Following Horizons issuing HDC with a significant non-compliance in respect of condition three of discharge permit 6011 in February 2015 HDC commissioned MWH to investigate landfill odour resulting in a report titled "Levin Landfill Odour Assessment". One of the recommended mitigation measures arising from that report was the installation of a bio filter to deal with the extraction of gas from the leachate collection sump.
- 8.77 We sited the bio filter on our site inspection. Construction of the bio filter and bed have already commenced. To ensure appropriate performance monitoring and modelling conditions are required in relation to the bio filter.
- 8.78 In similar fashion the experts met and agreed a range of conditions in relation to the bio filter and its performance. Those conditions are included in the agreed condition set at condition 3(i) to (k) inclusive, which occur in Appendix A as conditions 5(i) to (k). We accept the expert evidence we have received that utilising a bio filter subject to the agreed conditions represents best practice for the Levin landfill.

Odour Investigations

- 8.79 There are a further series of conditions proposed requiring HDC in certain circumstances to investigate and identify and remediate odour. Initially HDC did not agree with these conditions being included within the reviewed consent. Also, Ms Ryan for Horizons did not support the inclusion of this batch of conditions because she considered the matter is traversed by these particular conditions were matters of enforcement.
- 8.80 Nevertheless, these proposed conditions are included within the proposed condition set attached to Mr Allen's reply. Condition 3(l) in the notice of review required HDC within one month of the commencement date of this review decision to investigate and identify the odour source identified in the MWH letter to HDC titled "Continuous Ambient Air Quality Monitoring for Hydrogen Sulphate-Levin landfill" dated 10 July 2015.
- 8.81 HDC did not agree with this condition and proposed an alternate condition. HDC did not agree with the Horizons review condition because HDC considered many of the issues identified in the MWH report had been addressed through this review and also as a consequence of additional conditions.
- 8.82 HDC put forward its alternate condition which essentially provides a 12 month period to run from the commencement date of the 2015 review

of conditions. If following that time a Regional Council Enforcement Officer determines that the discharge of odour from the landfill site is noxious, dangerous, offensive, or objectionable beyond the property boundary then HDC is required to investigate within the boundary of the landfill site and where practicable identify the potential odour source discussed in the MWH report.

- 8.83 As to the time period appropriate for this condition on balance we agree with HDC. What tips the balance in favour of HDC are subsequent conditions it has agreed to in relation to the gas collection and flaring of that gas on the site. We accept that the wording of new condition 5(l) advanced by HDC is to be preferred over that of Horizons because we do consider HDC through agreeing to a range of odour related conditions, as well as the new Flare condition has significantly improved odour management on the Levin landfill site.
- 8.84 New condition 5(m) is a follow on to condition 5(l) in that condition 5(m) requires HDC as consent holder to remediate the potential odour source identified in condition 5(l). There is little between HDC and Horizons on condition 5(m) and we agree with the HDC wording for condition 5(m) as that wording is more consistent with condition 5(l).
- 8.85 Condition 3(n) proposed in the review is a follow on condition requiring HDC as consent holder to provide a report to Horizons and the NLG within 20 working days of condition 3(m) being triggered. This is an agreed condition which we support, as shown in conditions 5(m) and (n) in Appendix A.

The Flare

- 8.86 We noted earlier HDC had operated a gas reticulation and related flare to burn off landfill gas. The Flare however ceased to operate and was uneconomic to repair. HDC had initiated a process to replace the flare however replacement was much more expensive than anticipated.
- 8.87 What was of interest to us was that the odour experts agreed that the collection and flaring of the landfill gas along with improved capping and intermediate cover were considered the priority matters to reduce off-site odour impacts.
- 8.88 The notice of review did not require a new flare condition but it is clear that the odour expert's individual evidence and their joint statement that the collection and flaring of landfill gas is one of the key components of controlling odour from the site. HDC recognising this agreed to the imposition of a condition that requires the installation and use of landfill gas flare on the site at all times. We have earlier recorded that HDC already holds the necessary consent for the operation of the flare. However, that consent, as is usually the case, is simply a permission to undertake the activity and not a requirement to do so.
- 8.89 The new condition being condition 5(o) proposed by HDC places upon it the obligation to maintain and utilise the gas collection and flare system at all times. This is in our view a significant advance in terms of dealing with odour.

- 8.90 The key point of difference between HDC and Horizons is the commencement date of this flare condition. Horizons seek a six-month period before implementation. HDC put forward 12 months. Horizons is motivated to ensure odour is addressed as soon as possible. However, HDC provided us direct evidence from Mr Saidy and Mr Landmark that 12 months is required for the design, construction and installation of a flare. In particular, Mr Landmark told us that procurement of a flare takes this amount of time because design is required. The design must meet the specific requirements of the site. In the face of no contrary evidence we questioned Ms Ryan as to her view about the 12 month period compared to the six month period. Ms Ryan told us in her evidence she had discussed commissioning of a flare with her colleagues who advised her that 12 months would be appropriate.
- 8.91 We also received evidence from HDC about the costs already expended on the now decommissioned flare and the likely costs of a new flare. We accept HDC is a small council with limited resource and we are conscious of the need to ensure we do not propose conditions which impact upon the viability of the consent. We took the evidence in the submissions made by Mr Allen to be to the effect that if we imposed a six-month period we would be precisely doing that. For these reasons then we accept that the wording of condition 5(o) proposed by HDC is to be preferred over that advanced by Horizons.

The Odour Management Plan

- 8.92 Another condition 5(p) not proposed in the notice of review but arising from the quality experts' agreement was that certain matters should be outlined in an odour management plan (OMP). The OMP under this condition would contain within two months of the commencement date of the review conditions a range of specifications methodologies and practices. The full detail as set out in the condition and we simply record we accept this is best practice.

Onsite Weather Station

- 8.93 Conditions 5(q) and (r) were not included in either the review or application but arose from expert conferencing following the hearing. The conditions provide for the collection of meteorological data from an on-site weather station. The only point of difference between Horizons and HDC was whether or not the data should be provided directly to Horizons on an hourly or at least daily basis as opposed to a monthly basis. The information we received in Mr Allen's reply suggested there was some doubt about whether or not information could be provided directly on an hourly or at least daily basis. However, we do note the condition itself required data to be provided as soon as possible upon request.
- 8.94 For the metrological data to be of value it needs to be supplied promptly particularly where there is an odour complaint. If the data is not provided in a way which can link to an odour complaint its value is compromised particularly where the delay in supplying that data may impact upon either verification or remedial action. We think best

practice accords with having the data provided to Horizons directly on a daily basis and have amended the condition accordingly.

Complaint Management and Response- Monitoring and Reporting Odour

- 8.95 New condition 6 A is a review condition requiring the consent holder to nominate a liaison person to manage any air quality complaint received. Within our Appendix A review condition 6 becomes new condition 8. Horizons seeks to have that liaison person available at all times to respond to odour or dust. As recorded within the expert evidence HDC at least initially agreed to new condition. However later HDC disagreed only to the extent that the liaison person is available at all times. HDC contended that the Horizons preferred wording is impracticable and unrealistic. In support HDC pointed out that the Bonny Glen landfill which is much larger and does not have conditions requiring the liaison person to be available at all times.
- 8.96 We consider HDC is well aware of how potentially serious odour issues are and we have no reason to think that HDC will not act reasonably. So on balance we prefer HDC wording for this clause though we have altered the condition to ensure that contact details of the liaison person include office telephone numbers or cell phone numbers and email addresses. Having all of these potential contact points available to persons who may wish to lodge a complaint will at least enable them to lodge their complaint irrespective of whether or not the liaison person is available to personally receive that complaint. Our wording is found at condition 8A in Appendix A.
- 8.97 Conditions 8 B –F inclusive were included within the notice of review. We have read and considered the expert evidence and also Mr Allen's Appendix A and Appendix D attached to his reply. The evidence and in particular those tables detail the points of difference between Horizons and HDC. The difference is minimal and in most instances there was agreement between the parties and in some instances that agreement arises from the witnessing statement prepared by Dr Boddy and Ms Ryan dated 28 September 2016. Since little dispute exists between the parties and because we are well satisfied the conditions do represent best practice we have mainly adopted them within the relevant conditions part of this decision.

Submitters Concerns

- 8.98 While we have not specifically detailed submitters concerns other than referencing the Granges particular concerns when considering odour we observe that Ms Ryan was of the view, which we accept, that many if not all of the Horizons proposed changes to the conditions of consent will help reduce odour emissions from the landfill operation. We also note that she was of the view that the efficient collection and flaring of landfill gas needs to occur for there to be a sufficient reduction in odour beyond site boundaries. While that will not happen immediately it will happen within 12 months. We consider all of these steps will appropriately address matters raised by submitters in their original submissions and in the evidence we received.
- 8.99 Also, it is important we think to record in our decision that we specifically asked submitters to address us on conditions explaining they

should not see our interest in conditions as predetermining the issue. Some submitters took up that invitation and we have taken their views into account.

9. CULTURAL ISSUES

- 9.1 We received submissions from a range of tangata whenua submitters. Some key points can be summarised as follows: Mr Phillip Taueki gave a brief outline of what he considered to be the Manawhenua status of Lake Horowhenua and its surrounds; that both Muaupoko and Pareraukawa have shared Manawhenua. His submission centred on two concerns. His first concern was the monitoring of the waste being dumped and the need for independent monitoring. This also included a need to eliminate material that could be recycled or could be deemed toxic waste. The second concern was the "treated waste water" being irrigated at the POT site.
- 9.2 Rachael Selby from Ngatokowaru hapu of Pareraukawa raised concerns over Kaitikitanga, environmental science and Tuna (Eels). Ms Selby gave a brief history of her hapu and its history of providing tuna to visitors. She talked about the history of the Ngatokowaru Marae and the impact of a piggery located adjacent to the marae. She expressed her concerns that the marae seemed to be surrounded by waste on adjacent lands. She expressed her sadness at Pareraukawa being labelled troublemakers. She proposed that if \$1million had been put aside each year for rehabilitation then there would be \$20mill available now. Lastly she stated their role as kaitiaki was for the tuna, and the tuna "run" or heke was in January/February.
- 9.3 Mr Pataka Moore gave his pepeha or statement of connection to Hokio. He was assisted in his presentation by his 7 year old daughter Pareraukawa. He gave an outline of the area in particular Hokio Stream. He stated that the stream had been dredged in 1947 which had significantly modified its course and lowered the stream bed by around 2m. He also commented on the treated "leachate" going to the POT and then into the Arawhata stream which ran through the irrigation area. He stated that the local environment had a history of abuse and that the dump (landfill) severs the connections of tangata whenua to the land. He then talked about the National Policy Statement for Freshwater Management. He then provided a GIS of the bores at Hokio Beach and commented that leachate had been found in the bores. He was asked by the panel if he had participated in the pre-hearing meeting facilitated by Christine Foster – he responded that he had not attended.
- 9.4 Mr Caleb Royal, outlined his background as a hearings commissioner, and submitted on the effects of landfills on Maori values. He then spoke about the legacy they would leave the next generation if they didn't oppose the discharges into the Hokio. He also spoke about tangata whenua providing tuna when the Maori battalion had gone to the 1st world war. Mr Royal spoke about the landfill consents and the review which he considered were within the scope of the panel. His question was "how has cultural wellbeing been given effect through the consents". He concluded with what he considered were the continued cultural abuse on Ngati Pareraukawa by the landfill and other environmental discharges.

- 9.5 Mr David Moore spoke about tanalising chemicals and other chemical he knows to have been disposed of in the landfill. He submitted that the Tatana Drain had been issued a non-compliance notice by Horizons, however this had then been withdrawn without discussion. He then expressed concerns over what he called the “venting of gas” and that this was the cause of the odour on the Grange property. He stated that in his opinion leachate from the unlined landfill was already entering the Hokio stream via the Tatana drain and that it would not be long until the unlined landfill breaks down completely. He wants a full cultural impact review “as one has never been done”. He also did not want the NLG conditions changed.
- 9.6 Key issues outlined relate to Leachate; Water quality; Odour; the NLG; Monitoring and non-compliant waste streams (material). As we have earlier noted many of these issues are beyond the scope of the review and the Application and we have no jurisdiction or legal power to consider them. However, we acknowledge these concerns are very important to this particular submitter group.
- 9.7 The consent holder (HDC) submissions acknowledged that the original 1995 consent, the 1998 decision and the 2010 review, in considering the cultural effects of the landfill, recognised the potential for contamination of the Hokio stream by landfill leachate; and that any contamination would likely have an effect on the relationship of Maori and their culture and traditions; in particular the mauri of the stream. Further, that the 2010 review decision proposed changes to conditions that took into account consideration of the relationship of tangata whenua to their culture and conditions; and this was achieved via a more robust monitoring programme with specific testing parameters for ground and surface water quality.
- 9.8 To further explore if any cultural effects arising from this review were unanticipated by earlier decisions we explore in more detail the key physical effects that are within scope and determinative of cultural effects, as we saw them

Leachate & Water Quality

- 9.9 In relation to the water quality issue the panel is asked to consider mauri. It is generally acknowledged amongst Maori that all things have mauri. Also, that collective entities within which each individual entity has its own mauri form a collective mauri. For example, a river, stream, or forest has a collective mauri, as does an iwi or community such as the tangata whenua (local people of the land). Also, large natural features such as mountains and hills, and lakes and coastal estuaries have their own mauri. In terms of the natural environment, to Iwi, mauri forms an important measure for sustainable resource management. Where the collective mauri of a forest, river or lake was adjudged by a tohunga (high priest or expert) to have been diminished in any way shape or form, measures were put in place to restore the mauri. One such measure was called rāhui.
- 9.10 We recognise that water quality information demonstrating that leachate is entering Tatana Drain was not considered, or available to, previous

decision makers. Even though there are no measurable concentrations caused by the leachate when it enters Hokio Stream, we recognise that its presence in Tatana Darin that flows directly into Hokio Stream is culturally offensive in a more than minor way.

Odour

- 9.11 The panel heard evidence regarding odour and the potential odour effects beyond the boundary of the landfill. Particularly what are the best practices to avoid noxious dangerous offensive and objectionable odour beyond those boundaries. We heard specific evidence focused on the adjacent Grange property due to the excessive number of odour complaints made by the properties owners.
- 9.12 Therefore, the panel considered both the generic effects of odour and the specific effects; i.e. the occurrence of odour beyond the site boundary at the Granges property. In both cases the occurrence of odour is recognised to give rise to a cultural effect that was not considered in previous decisions.
- 9.13 The panel heard from tangata whenua that odour was culturally objectionable. Ngatokowaru submitters provided the example of the previously adjacent piggery to the Marae, and the concerns that they felt about being surrounded by objectionable odour. The panel heard from the Grange family that their odour complaints have been ongoing, at least since 2014. Tangata whenua submitters noted that while HDC had already begun to implement mitigation and management measures to mitigate this odour the Grange family was still being subjected to unacceptable odour.
- 9.14 So overall we conclude the now understanding of odour effects beyond the landfill boundary were not anticipated in earlier decisions and if this is so then the cultural element of odour effects could not have been considered.

Conditions to Address Cultural Effects

- 9.15 The tangata whenua submitters proposed that the panel impose conditions to require a cultural impact assessment. While the panel considered a CIA, it was deemed to be outside the scope of the review provisions. However, we are adopting conditions that are expected to intercept leachate moving off site and to address offensive odour beyond the site boundary. We consider the implementation of those practical interventions represent a major factor to address cultural concerns.
- 9.16 Our conditions also ensure continued tangata whenua involvement in the NLG. By utilising an independent facilitator, we expect this will provide guidance for participants in the NLG to both promote cultural values yet guide workable solutions that give effect to the concerns of participants.
- 9.17 While the panel considers that the submissions on cultural monitoring and landfill were beyond the jurisdiction of the hearing, we have tried to adopt monitoring and compliance requirements that will help to address the physical effects that give rise to cultural concerns. The panel heard evidence concerning the review of monitoring and the use of appropriate

landfill cover at the end of each day the landfill accepts waste and considers those improvements will also assist in addressing cultural issues.

- 9.18 We feel these measures are all helpful, from a cultural perspective, and within the scope that we can operate. We recognise and acknowledge that our decision does not, and cannot, address all the issues of concern to tangata whenua, but such is the constrained nature of the review process.

10. DISCHARGE PERMIT 102259 – STORMWATER-CONDITION 5

- 10.1 HDC proposed to amend condition five within its response to the Horizons notice of review so that it is not obliged to keep the stormwater system clear of refuse at all times. HDC contended the condition as worded by Horizons was impractical and impossible to achieve rendering the exercise the consent invalid.
- 10.2 Mr Standen for Horizons was concerned that the changes promoted by HDC would effectively permit refuse in the stormwater system to occur most of the time. On the other hand, Mr Landmark for HDC acknowledged it was obvious and sensible to have a condition similar to proposed condition 5 to avoid the build-up of rubbish in the stormwater. As currently drafted he considered that condition would be impracticable. It was his view that the condition created an absolute requirement that fails to reflect the nature and circumstances landfill operations. He expressed the view that the key environmental issue is not that there is no refuse but that what refuse may collect is cleared on regular basis.
- 10.3 We do note in his oral evidence Mr Standen clarified that his concerns were mainly about refuse which would create noxious effects as distinct from rubbish such as windblown bags and litter.
- 10.4 Nevertheless, we do agree with Mr Landmark that such conditions should be practical to implement. We think that the proposed wording by HDC is in the main appropriate. We think that some time period around regularity of inspection should be included and we have included the provision that the permit holder shall inspect the stormwater system on each working day including all drains and ponds to ensure the speedy recovery of any litter or refuse and shall remove that litter and refuse as soon as practicable. Given the relatively small size of the site we consider a daily inspection should be achievable.

11. DISCHARGE PERMIT 6009 – DISCHARGE SOLID WASTE TO LAND CONDITION 32 – NEIGHBOURHOOD LIAISON GROUP CONDITION

- 11.1 Condition 32 was included within the Horizons notice of review. HDC in accordance with section 128(1)(a) (iii) responded to that review seeking changes to condition 32 and related conditions 33,34and 35.
- 11.2 In our view, based upon the evidence received from submitters HDC and Horizons the current NLG conditions are not appropriate. They are not meeting the needs of any of the parties. In our view submitters concerns that the NLG is no longer inclusive and is unwieldy because of its size were made out. We accept HDC's concerns that the time and

expense in operating and supporting the NLG is out of balance. All of the parties complained that the wording of the NLG conditions were uncertain and lead to problems and challenges in the application.

- 11.3 As we listened to the evidence it became clear to us that the submitters and HDC and Horizons all had different understandings as to the purpose and role of the NLG. Some submitters appeared to advance the proposition that the NLG had some power of veto over the resource consent granted to HDC. That is not the case. HDC considered that the purpose of the NLG is to review and provide comment to HDC on environmental and monitoring results in relation to environmental mitigations at the landfill in accordance with the conditions of consent. Submitters in support of the NLG considered it could require HDC to take action steps in response to its review and comment of such matters. That is incorrect.
- 11.4 Most importantly it appeared to us the NLG was dysfunctional because membership of that group was uncertain and too large. It seemed to us the NLG frequently came into conflict with HDC and dispute and division was the outcome of exchanges between NLG and HDC. This circumstance was problematic and difficult for both submitters and HDC to both understand and manage.
- 11.5 To overcome some of these issues based on the evidence we received and based on the experience that all parties to this process enjoyed at the prehearing meetings there was strong support to include an independent facilitator to assist all parties.
- 11.6 Also, it also seemed to us based on evidence received from the submitters that many submitters considered the Whakawatea Forum with reduced membership function effectively. There were 5 to 6 people involved in that process.
- 11.7 Overall we found ourselves in agreement with submissions that the purpose of the NLG should be refined. Membership of the NLG should be more certain and inclusion of a facilitator would all be beneficial outcomes in so far as the NLG conditions are concerned.
- 11.8 In terms of the range of amendments to condition 32 there was little between Horizons and HDC in terms of points of difference. However, we have added a requirement that the independent facilitator must be agreed to by both HDC and Horizons.
- 11.9 Condition 33 as currently worded provides for meeting frequency. Horizons favoured frequent meetings after the commencement of the 2015 review of conditions and then meetings at intervals of six months for the first 18 months thereafter and following that individuals of no more than 12 months. Horizons still supported retaining the proviso that unless 80% of the people attending a meeting agree that changes the intervals are acceptable changes to review periods will not occur.
- 11.10 HDC were of the view that that wording is uncertain to keep the proviso relating to 80% of the people attending a meeting and simply creates potential for more disputes. HDC preferred that NLG meetings be held at intervals of no more than 12 months.

- 11.11 We prefer that the first meeting of the NLG be held six months following the consents 2015 review of conditions. This will enable HDC to undertake work and actions in relation to the reviewed conditions and also take appropriate steps in relation to the NLG itself. If meetings were to occur almost immediately following the review HDC would be precluded from taking steps to better enhance the NLG. Following the first meeting being six months following fee consents 2015 review of conditions meetings should be at intervals of no more than 12 months. We do not support the proviso of 80% of the people attending a meeting agreeing that changes to the intervals are appropriate. This meeting frequency is a minimum and we feel that a well facilitated and constructive NLG would enable more frequent meetings if particular issues arose that would benefit from information sharing, but that does not need to be prescribed in conditions.
- 11.12 Turning to condition 34 we agree this condition is the appropriate condition to provide for the purpose of the NLG. We consider that HDC agreeing to provide the opportunity to NLG meetings to inspect operations on the site subject to usual constraints are acceptable and will allow and provide for full exchange of information in an appropriate context. We also agree the provision to the NLG of all monitoring reports and other documentation provided they are not commercially sensitive is appropriate. We also think this will lead to informed, reasoned and rational discussions. We think it very useful as well that HDC is required to give reasons to the NLG representatives at an annual meeting on environmental monitoring results in relation to the environmental mitigations proposed by NLG which have not been accepted. However, we do not consider it is the role of the NLG to advise or direct HDC on how they should be running the landfill. Our rewording of the condition is found in conditions 32 to 35 within Appendix A for Consent 6009.

12. REVIEW TIMING

- 12.1 All of the discharge permits that are the subject of the HDC application have individual but commonly worded conditions providing for further review. Condition 30 of the discharge permit 6010 contains the setting against which HDC sets out its disagreement with the position taken by Horizons. The disagreement centres around whether or not the five year period for reviews is retained or as HDC would prefer reviews take place only at 10 yearly intervals.
- 12.2 Mr Bashford for Horizons reminds us that the review provision as it now provides for five yearly rolling reviews and also includes a provision that such reviews will take place unless the NLG agrees that a review is unnecessary. Based on the evidence received from submitters who had been involved with the NLG the prospect of the NLG agreeing that a review is unnecessary is most remote.
- 12.3 Notwithstanding the current condition was included by agreement between the parties, including Horizons, Mr Bashford supports change to the review condition to remove the compulsory and publicly notified nature of the review and replace it with a discretionary element. Secondly he recommends to amend the possible frequency of the review and the thirdly to remove the discretionary powers granted to the NLG.

- 12.4 Mr Bashford considers that section 128 provides a discretion to the consent authority as to whether to review the conditions of consent or not in other words it is not mandatory that a review take place. We agree with him the currently worded condition subject to the HDC application because it includes the word shall makes it is mandatory that the Regional Council initiate a review of the named conditions.
- 12.5 Mr Bashford prefers the discretion under 128 applies rather than the mandatory nature of the existing condition. His reasons are that a review can be costly and raises risks that the rights provided under the resource consent may be limited.
- 12.6 As to notification Mr Bashford considers it more appropriate to rely on RMA provisions on notification and not allow the notification to be determined by a resource consent condition. He therefore agrees with HDC that the mandatory nature of public notification be removed and replaced with a discretionary approach as evidenced by the word "may".
- 12.7 What he does not agree with is the requested change to 10 yearly intervals for when a review can take place. He justifies that position by saying that the current issues of odour and daylighting of leachate have only come to light since the previous review in 2010. He also notes the landfill site is an active site and matters can change within a short time period therefore five years continues to be an appropriate time period for reviews and has few.
- 12.8 If the changes he supports were included in the condition it is his view that the discretionary power provided to the NLG becomes redundant therefore he supports its removal.
- 12.9 We understand that the submitters who are linked to the NLG would strongly prefer to have in NLG's position as evidenced in the current condition wording retained.
- 12.10 HDC's position is that the review period should extend to 10 years. Its argument is that reviews are costly and it agrees with Mr Bashford that reviews are often seen to derogate the rights of the consent. However, it also contends that the existing and proposed monitoring and mitigation conditions would ensure that any potential significant odour and leachate adverse effects of the landfill are identified and adequately responded to. Mr Allen drew our attention to the new requirements that this review imposes in relation to odour management conditions including significant additional monitoring of water quality requirements, to undertake remedial action if significant elevations of contaminants attributable to the landfill are detected and the proposal to include a new cut-off drain to reduce the flow of rental leachate contaminated shallow groundwater discharge into the Tatana drain.
- 12.11 We are very aware that since the first landfill application was made there have been frequent hearings that have largely traversed similar ground. We have sought to adopt a set of conditions that will minimise most off-site issues of concern and on that basis, we see little benefit in continuing with five yearly reviews. We think that HDC has made significant advances and appropriate concessions surrounding the review and application. We think that HDC should be given time free of costly reviews to spend time and resource in implementing these conditions

arising from this review. In our view if they are left to do so the submitters will derive greater benefit from that rather than spending time and effort in a combative review process. We think that both HDC and the submitters would gain more if HDC is able to implement these reviewed conditions as soon as possible.

12.12 After all we are only dealing with review conditions and Horizons has available a significant number of other tools as do submitters if they consider that HDC is not appropriately satisfying the conditions of these consents.

12.13 So for all of these reasons we think it appropriate the review period be extended to 10 years for all consents. We expect this will require one review between now and when work will be underway for any ongoing consents after the current consents expire in 2037. We have included appropriate wording to all of the review conditions for each discharge permit. T

13. OVERALL CONCLUSIONS

13.1 Within each section when we have been considering specific discharge permits and conditions we have come to apply the statutory framework identified by both Mr Allen and Mr Bashford. We have also endeavoured to identify actual and potential effects on the environment primarily in relation to water quality and air quality. We have of course both considered and had close regard to relevant effects raised by submitters.

13.2 In relation to relevant statutory documents Mr Bashford pursuant to section 104 (1) (b) helpfully identified for us relevant provisions of the National Policy Statement for Freshwater management (NPSFM) in relation to water quality and relevant provisions of the One Plan as they related to both water quality and air quality.

13.3 In paragraphs 63 through to 71 of his S42A report he drew our particular attention to the relevant objectives and policies of the NPSFM. We agree and accept they are relevant objectives and policies for us to consider particularly those policies that enable regional councils to impose conditions on discharge permits to ensure that limits and or targets can be met. We also observe that other objectives and policies provide for the involvement of iwi and hapu and to ensure that Tangata Whenua values are identified and reflected in the management of and decision-making regarding freshwater.

13.4 We have considered these objectives and policies and we are satisfied that our decision relating to the conditions is in accord with those objectives and policies.

13.5 In a similar way Mr Bashford identified for us key chapters and objectives and policies of the One Plan relevant to our considerations. He sets out those details in paragraphs 72 to 84 of his report. We agree he has identified relevant provisions and we have considered them and we are of the view our decision in relation to conditions is consistent with them.

- 13.6 In respect of other relevant matters under section 104(1)(c) he considered the Lake Horowhenua Accord was a relevant matter. Broadly we understand the Accord contains a vision, objectives and identifies key issues and management goals for restoration of the waterbody and also the Hokio Stream. We think we have in our decision particularly addressed water quality issues relating to that stream.
- 13.7 While there is some variation between the conditions we have ultimately decided upon those proposed by Horizons. We are of the view that the conditions we favour are directed at mitigating odours from the landfill that may potentially adversely affect the community and values of the surrounding rural area. Taking into account the relevant planning provisions Mr Bashford has directed our attention to it is our view that the conditions we have decided upon are consistent with the relevant objectives and policies relating to air quality and odour within the One Plan.

Section 131 Matters

- 13.8 We are satisfied that the changes we have made and those that have been agreed to the conditions of the discharge permits having regard to the particular circumstances of this case, or will or will the nature of the discharge and the receiving environment and the financial implications for the applicant are the most efficient and effective means of removing or reducing that adverse effects of objectionable or offensive odour beyond the boundary.

Overall Broad Judgement Part 2 Assessment

- 13.9 We preface our comments under this heading that there was much, commonality between Horizons and HDC meaning that we were not facing competing considerations raised by the two councils.
- 13.10 In terms of section 6 matters we considered that section 6 (a) and (e) are the most relevant. We accept in terms of section 6 (a) Tatana drain and its surrounding environment lacks any significant natural character values because it is highly modified. However given the content of the leachate discharge there is the risk that aquatic life may further degrade. Overall we think the conditions we have amended will improve the water bodies natural character potential.
- 13.11 In respect of section 6 (e) we think in our consideration and amendment of the conditions we have both recognised and provided for the relationship of Maori and their culture and the effect of the proposed activity on the relationship of Maori with their ancestral lands water and sites as best we can within the limited scope of our consideration which is constrained by the review process.
- 13.12 Section 7 matters that we have had particular regard to have been identified by Mr Bashford in his report at paragraph 91 through 92. We agree with his identification of the relevant matters. We have had particular regard to those matters in reaching our decision on these conditions.
- 13.13 In terms of section 8 which requires us to take into account the principles of the Treaty of Waitangi we consider we have done so being

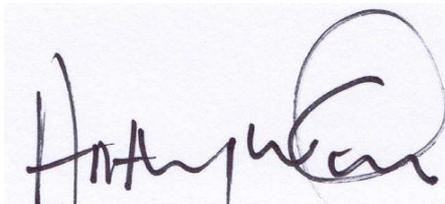
particularly informed by evidence from submitters on relevant Treaty related issues.

- 13.14 Turning to section 5 in our view the conditions we have decided upon and enables the use of the resource namely the landfill, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety, while in particular, safeguarding the life supporting capacity of their, water, soil and ecosystems and avoiding, remedying or mitigating any adverse effects of the activity on the environment.

DECISION

After being satisfied the review circumstances as required by s 128(1)(a)(iii) are made out and after considering and having proper regard to the matters provided for in section 131 and for all of the reasons referred to above in relation to the Application by HDC and the Review by Horizons to vary and review conditions of the Discharge Permits before us pursuant to section 104 and section 132 of the Resource Management Act 1991 we grant that Application and Review to the extent that the approved conditions for each discharge permit are detailed and marked in Red within Appendix A which forms part of this decision.

Dated this 18th day of November 2016



Anthony Olsen Commissioner



Peter Callander Commissioner



Paul Rogers Commissioner (Chair)

APPENDIX A - DETERMINATION

As earlier noted Appendix A utilises the form set of conditions for all of the resource consents following the 2010 review decision of conditions.

In this decision, we have not recorded the wording of conditions promoted by HDC, Horizons, or submitters. Using markups in RED we have simply recorded the changes to the conditions of each discharge consent arising from our decision.

Discharge Permit 6009

Consent is granted to the Horowhenua District Council to **discharge solid waste to land** at the Levin landfill, Hokio Road, Levin, legally described as Lot 3 DP 40743 Blk II Waitohu Survey District, for a term expiring 35 years from the commencement of the consent subject to the following conditions:

1. This permit does not authorise the disposal of liquid waste to land at the Levin Landfill.

Liquid waste is defined as:

Septic tank waste, grease trap waste, sewage and any material that contains free liquids.

The presence of free liquids may be determined by either of the following methods, whichever is most practicable at the time:

- i. The "Paint Filter Test"; or
- ii. Material which may be loaded, transported and deposited at the landfill without the risk of free liquid seeping from the material, and without the risk of having the deposited material flow under gravity down any slope on the landfill shall be deemed to not contain free liquids.

General Conditions – Discharge Solid Waste to Land

2. The Permit Holder shall take all practicable measures to avoid the discharge of waste from within the landfill to surrounding land. To this end, the Permit Holder shall ensure:
 - a. The amount of refuse exposed at any one time is confined in dimension to 800 square metres of tipping face; and
 - b. Exposed refuse is covered at the end of each day that refuse is received at the landfill.
3. If refuse is discharged from within the active landfill areas to land outside the legal boundary of the landfill property, the Permit Holder shall ensure that such waste is cleared and removed to the landfill as soon as practicable.
4. The Permit Holder will monitor the landfill at least once every two weeks for the build-up of litter, paper and other deposits outside the active landfilling areas, and remove such material as required.
5. The Permit Holder shall regularly inspect for the presence of vermin, birds and other pests take appropriate measures to control them.
6. The Permit Holder shall regularly inspect the landfill for noxious weeds, and take appropriate measures to control those noxious weeds.

Hazardous Material

7. The Permit Holder shall not allow the disposal of waste of an explosive, flammable, reactive, toxic, corrosive or infectious nature, to an extent that the waste poses a present or future threat to the environment or the health and the safety of people.
8. The Permit Holder shall develop and implement a procedure for the landfill operator, such that potentially hazardous material, as listed in Annex 1 attached to and forming part of this permit, will not be accepted for disposal at the Levin landfill without specific authorization. The Operations Manager of the Horowhenua District Council, or some other designated person, is able at their discretion to accept quantities of such wastes. The waste shall be accompanied by a Hazardous Waste Manifest, as listed in Annex 1, which will form part of the permanent record and shall be reported by the Regional Council by **30 September** each year for the term of this Permit.
9. The Permit Holder shall maintain a secure facility for any small quantities of hazardous waste, pending a decision on treatment, disposal or transfer to another facility.
10. Hazardous waste stored at the facility described in Condition 9 shall be stored in a sealed and bunded area to avoid adverse effects from spills.
11. Any hazardous waste accepted for disposal shall be disposed within an adequate volume of mature refuse, in accordance with Centre for Advanced Engineering's Landfill Guidelines (2000).

Monitoring and Reporting

Specific Conditions – Discharge Solid Waste to Land at Existing Landfill

12. No solid waste shall be disposed to the existing landfill, after two years from the commencement of this consent.
13. All new fill should be placed on top of at least 2 metres of existing material in the existing landfill.
14. The Permit Holder shall update the Landfill Management Plan in respect of the operations on the lined landfill to the satisfaction of the **Regulatory Manager at the Regional Council within six months of the commencement date of the decision of the 2015 review of conditions of consent**. The Landfill Management Plan shall include, but not be limited to:
 - a. The specific conditions contained herein, related to the operation, management and monitoring of the landfill.
 - b. A description of the development and maintenance of the landfill.
 - c. A description of how the consent will be exercised in a manner to ensure compliance with the consent and the conditions thereof and the Resource Management Act 1991.
 - d. A description of how the consent will be exercised to minimise adverse effects on the environment.

- e. A description of the hazardous waste acceptance criteria, including the criteria set out.
- f. The emergency procedures to be followed in the event of natural emergencies and hazardous waste spills.
- g. The methods of controlling dust and odour emissions including the criteria for assessing when, and how regularly, roadways and the landfill are dampened by water or otherwise.
- h. Details of measures to avoid nuisance effects on adjacent properties i.e. birds and vermin, as a result of landfill activities.
- i. Operational, intermediate and final capping requirements.
- j. Closure and aftercare.
- k. Procedure to update the management plan, in light of changing circumstances, to continue compliance with Conditions of this Permit.
- l. A screen planting implementation description.
- m. ~~deleted~~

The Permit holder shall prepare a Closed Landfill Aftercare Management Plan in respect of the closed landfill (Area "A") to the satisfaction of the Environmental Protection Manager at the Regional Council within six months of the completion of the review of the consent conditions. The Closed Landfill Aftercare Management Plan shall include, but not be limited to those aspects that are detailed in Appendix E of the MfE publication entitled 'A guide for the Management of Closing and Closed Landfills in New Zealand (May 2001)'. The Closed Landfill Aftercare Management Plan shall require at the least:

- n. Grading to a final slope on the landfill faces and caps of between 1V:3H (1 in 3) and 1V:40H (1 in 40);
- o. Ensuring the final landfill surface is sloped to promote run-off toward the outside of the landfill footprint and prevent surface water ponding on the landfill cap;
- p. Ensuring the landfill cap incorporates a layer at least 700 mm thick. All material added to the existing cap to bring the thickness up to 700 mm, or for future cap maintenance purposes, is to have a permeability of not greater than 1×10^{-7} m/s.
- q. Establishing and maintaining a grass or tussock vegetation cover on the capped landfill consistent with an ongoing ability to monitor and maintain the integrity of the landfill cap as per Condition 15 (d) of Consent 6010.
- r. Monitoring the landfill cover on an annual basis to identify areas of differential settlement slope stability issues, erosion and changing vegetation patterns, including a topographic survey to ensure Conditions 14(n) to (q) continue to be met;

The Permit holder shall submit an annual report to the Regional Council by **30 September** each year for the duration of this Permit documenting the condition

of the unlined landfill and any maintenance carried out during the previous year. The annual report shall address but not be limited to those aspects listed in Conditions 14(n) to 14(r) above. The annual report shall include a plan of the unlined landfill specifically documenting the shape of the closed landfill and any changes during the previous year related to Condition 14(q) [The annual report can be written in conjunction with the annual report required as part of Condition 15 (f) for Consent Number 6010]

Specific Conditions – Discharge of Offal and Dead Animals to Land

15. Offal waste shall be immediately buried in depth of 0.6 metres upon delivery.
16. All animals disposed of as diseased animals under the Animal Act 1967 shall be immediately buried to a depth of at least 1 metre.
17. Pits for the burial of offal and animals shall be excavated in mature refuse and shall be away from the public tipping area.
18. Pits for the burial of offal and animals shall be at least 10 metres from any landfill batter slope.
19. Pits for the burial of offal and animals shall not exceed a maximum size of two metres by 15 metres.
20. The immediate cover material of all offal and animals shall be a minimum depth of at least 100 millimetres unless these conditions specify otherwise. Pits shall be filled to within one metre of the prior refuse surface level and reinstated with appropriate compaction with previously removed refuse or other suitable material.
21. Pits for the burial of offal and animals shall be demarcated as such and shall be fenced off.
22. Any other malodorous wastes not already covered specifically by these conditions shall be covered immediately upon disposal.

Specific Conditions – Discharge of Biosolids and Sludges to Land

23. Biosolids, sludges and similar materials which do not contain free liquids may be accepted at the landfill as solid waste. This shall include dewatered municipal wastewater treatment plant solids, dewatered processing plant solids and dewatered agricultural wastes.

The presence of free liquids may be determined by either of the following methods, whichever is most practicable at the time:

- i. The "Paint Filter Test"; or
 - ii. Material which may be loaded, transported and deposited at the landfill without the risk of free liquids seeping from the material, and without the risk of having the deposited material flow under gravity down any slope on the landfill shall be deemed to not contain free liquids.
24. If not co-disposed of within the landfill, the biosolids, sludges and similar materials shall be applied to the landfill surface in accordance with the 1992

Ministry of Health Guidelines for the "safe use of sewage effluent and sewage sludge on land".

25. The Permit Holder shall maintain records of:
 - a. The type of waste received;
 - b. The volume of waste received;
 - c. Source of waste; and
 - d. The location in which the material was placed.
26. Disposal of site-generated sludge from cess-pits, leachate ponds or other site activities that contain free liquids is acceptable to facilitate site operation, provided this does not adversely affect landfill stability or face operations.

Specific Conditions – Discharge Solid Waste to Land at Lined Landfill

27. Design specifications and a set of construction drawings for the lined landfill shall be forwarded to the Regional Council (Environmental Protection Manager) for certification, to ensure compliance with the conditions of this consent and all related consents, at least three months prior to the intended construction of the lined landfill begins.
28. The Permit Holder shall construct the liner system for all new cells to include the following elements:
 - a. A smooth base constructed from insitu materials the level of which is above the winter groundwater level.
 - b. A geosynthetic clay liner (GCL) a minimum of 5mm thick, with a coefficient of permeability not exceeding 3×10^{-11} m/s. The Permit Holder shall supply documentation from the manufacturer demonstrating quality control procedures ensuring that 95 % of the GCL meets the coefficient of permeability standard required.
 - c. A synthetic flexible membrane (high density polyethylene, HDPE with a minimum thickness of 1.5 mm, or polypropylene, PP with a minimum thickness of 1.0 mm).
 - d. A protective layer of sand 100 mm thick on the base overlain by a 300 mm thick gravel drainage layer, and on the side slopes a confining layer of gravel 300 mm thick, lain on top of a protective geo fabric and geo-grid, appropriately designed for the site conditions.
 - e. Provision for the collection of leachate from the liner and reticulating to a treatment system outside the landfill area.
 - f. An alternative to any of the above as agreed from time to time, in writing, between the Permit Holder and the consent authority.
29. deleted
30. If any ancient human remains or artefacts are discovered during any earthworks activity associated with the construction and maintenance of the landfill, then

works shall cease, and the Consent Holder shall immediately inform the Environmental Protection Manager of the Regional Council and relevant iwi. Further work in the vicinity of the find shall be suspended while relevant iwi carry out their procedures for the removal of taonga. The Environmental Protection Manager of the Regional Council will inform the Consent Holder when work can recommence in the vicinity of the find.

31. The Regional Council **may** initiate a review of Conditions 2, 8, 14 (a) to (m), 28, 32, 33, and 34 of this permit **following the expiration of 10 years from the commencement date of the 2015 review decision**. The reviews shall be for the purpose of:
- a. Assessing the adequacy of the management plan outlined in Condition 14 of this consent; and/or
 - b. Assessing the effectiveness of Conditions 2, 8 and 28 of this consent.
 - c. Assessing the effectiveness of the NLG outlined in Conditions 32, 33 and 34.

In avoiding, remedying or mitigating adverse effects on the environment surrounding the Levin Landfill, the review of conditions shall allow for:

- d. Modification of the management plan outlined in Condition 14 of this consent;
- e. Deletion or changes to Conditions 2, 8 and 28 of this consent;
- f. Deletion or changes to Conditions 32, 33, and 34; and
- g. Addition of new conditions as necessary.
- h. An alternative to any of the above as agreed from time to time, in writing, between the Permit Holder and the consent authority.

To avoid, remedy or mitigate adverse effects on the environment surrounding the Levin Landfill.

Specific Conditions – Neighbourhood Liaison Group (hereinafter “NLG”)

32. The Permit Holder shall **administer and manage a NLG and appoint an experienced and independent facilitator for the purpose of chairing the NLG. The facilitator shall be jointly agreed to by the Permit Holder and the Regional Council’s Regulatory Manager.**

The following shall be eligible to **have one representative**:

- a. the Lake Horowhenua Trustees;
- b. Ngati Pareraukawa;
- c. the owners and occupiers of those properties adjoining the Levin Landfill property described as A through to N on Drawing 2181 attached;
- d. Horowhenua District Council;

- e. the Manawatu-Wanganui Regional Council;
- f. the permit holder (if a different entity from HDC).

Technical advisors as appointed by the permit holder and/or the Regional Council may be invited to NLG meetings if the permit holder and the Regional Council's Regulatory Manager consider it reasonable to assist the discussions with the NLG.

The permit holders staff and contractor shall be able to attend and watch the NLG meetings and assist on the invitation of the permit holder's representative.

The representatives on the NLG are responsible for reporting back to their members and interested parties. The permit holder will make (unless confidential) the reports and information provided to the NLG and the minutes of the NLG available on its website.

The permit holder is responsible solely for the reasonable costs of administering the NLG, such as providing a venue, the facilitator's costs and drafting up of minutes.

33. The Permit Holder shall:

- a. Convene one meeting six months after the the 2015 review decision is final;
- b. Thereafter at intervals of at least twelve months.

34. The purpose of the NLG is solely to review and provide comment to the permit holder on environmental and monitoring results in relation to environmental mitigations at the Levin landfill in accordance with the conditions of consent. The permit holder may accept or reject any comments with reasons to be provided to the NLG representatives.

35. The Permit Holder shall:

- a. Supply notes of each meeting to the Group Members;
- b. Forward an annual report to members and to the Regional Council and the District Council; and
- c. Forward any other information to the Group Members, in accordance with the conditions of the consents; and
- d. The Permit Holder shall ensure the NLG members are:
 - i. Given the opportunity to inspect the operations on site on the occasion of NLG meetings, and/or on such other occasions as are agreed by the Permit Holder and Landfill Operator. The Permit Holder shall not unreasonably withhold such agreement. The Permit Holder shall grant the NLG members access to the landfill property, during working hours, subject to relevant regulations, including health and safety regulations and the Management Plan.
 - ii. Provided with a copy of all monitoring reports and other documentation relating to the non-commercially sensitive, environmental operation of

the landfill, at the same time as such reports are provided to the Regional Council in accordance with the resource consents.

- iii. Given reasons from the Permit Holder for any comments from the NLG representatives at the annual meeting on environmental and monitoring results in relation to environmental mitigations at the Levin landfill being rejected.

Charges

- 36. Charges, set in accordance with section 36(1)c of the Resource Management Act 1991, and section 690 A of the Local Government Act 1974, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of this resource consent and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

[**Note:** Section 36(1)c of the Act provides that Council may from time to time fix charges payable by holders of resource consents. The procedure for setting administrative charges is governed by section 36(2) of the Act and is currently carried out as part of the formulation of the Council's Annual Plan.]

DISCHARGE PERMIT 6010

Consent is granted to the Horowhenua District Council to **discharge landfill leachate onto and into land** at the Levin landfill, Hokio Beach Road, Levin, legally described as Lot 3 DP 40743 Blk II Waitohu Survey District, for a term expiring 35 years from the commencement of the consent subject to the following conditions:

1. Charges, set in accordance with section 36(1)c of the Resource Management Act 1991, and section 690 A of the Local Government Act 1974, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of this resource consent and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

[**Note:** Section 36(1)c of the Act provides that Council may from time to time fix charges payable by holders of resource consents. The procedure for setting administrative charges is governed by section 36(2) of the Act and is currently carried out as part of the formulation of the Council's Annual Plan.]

General Conditions – Discharge leachate to ground

2. ~~Landfill leachate shall not contaminate adjoining land~~ There shall be no overland flow discharge of leachate beyond the site boundary.
- 2A ~~In order to reduce the flow of leachate influenced groundwater to the Tatana Drain and through neighbouring land to the north of the landfill and to minimise adverse effects on downgradient surface and groundwater, the consent holder shall undertake the following actions:~~
 - a) ~~Carry out an options assessment regarding the location, dimensions, operation and management of a leachate interception, treatment and disposal system and the effectiveness of each option in minimising the movement of leachate beyond the site boundary and minimising adverse effects on downgradient water bodies. A report on the options assessment with a recommendation for a preferred option will be prepared.~~
 - b) ~~The recommendations from the assessment carried out under condition 2Aa) shall be presented to Manawatu-Wanganui Regional Council and the Neighbourhood Liaison Group (required by consent 6009). The consent holder shall consult with Manawatu-Wanganui Regional Council and the Neighbourhood Liaison Group to determine the most appropriate leachate interception, treatment and disposal option to proceed with.~~
 - c) ~~The consent holder shall design, construct, operate and maintain a cut off drain (or another suitable method such as a series of shallow bores) on the northern boundary of the landfill site between the closed landfill and the boundary with Lot 1, DP 40743 that is designed by a suitably qualified engineer and implements the preferred option determined by condition 2Ab).~~
 - d) ~~Conditions 2A a), b) and c) shall be completed with a fully operating interception, treatment and disposal system within 18 months of the commencement of the condition changes in the 2015 review decision.~~

3. The Permit Holder shall commence the following monitoring programme:

Table A: Landfill Groundwater Monitoring Locations, Parameters, and Frequency – Deep Aquifer Wells

Location	Parameters and frequency
C2dd, E1d, E2d and any other future deep monitoring well unless installed for background monitoring purposes.	Quarterly comprehensive for 2 years. <i>Subsequently, conditional</i> Annual comprehensive Quarterly indicator.
G1d, <u>Xd1</u> and any other future deep monitoring well installed for background monitoring purposes.	Quarterly comprehensive for 1 year <i>Subsequently</i> Annual comprehensive Quarterly indicator
All monitoring wells where indicator parameters show leachate influence over 3 consecutive sampling rounds.	Annual pesticide / semi VOC

Table B: Summary of Landfill Groundwater Monitoring Locations, Parameters, and Frequency – Shallow Aquifer Wells

Location	Parameters and frequency
C1, C2, C2ds, D4 B1, B2, B3s, E1s, E2s and any other shallow Compliance monitoring well installed in the future.	Six monthly comprehensive for 2 years Quarterly indicator <i>Subsequently, conditional</i> Annual comprehensive Quarterly indicator
D5, F1, F2, F3 and any other shallow monitoring well installed to monitor leachate irrigation areas in the future.	Six monthly comprehensive for 2 years Quarterly indicator <i>Conditional</i> Annual comprehensive Quarterly indicator
G1s and any other shallow Background monitoring well installed in the future.	Quarterly comprehensive for 1 year <i>Subsequently, conditional</i> Quarterly indicator
D1, D2, D3r, D6, <u>Xs1, Xs2</u> and any other Early Detection wells installed in the future.	Quarterly comprehensive for 2 years <i>Subsequently, conditional</i> Annual comprehensive Quarterly indicator
All monitoring wells where indicator parameters show leachate influence over 3 consecutive sampling rounds.	Annual pesticide/ semi VOC

Groundwater levels are to be measured and recorded during each sampling procedure.

Conditions: A reduction in sampling frequency at any groundwater monitoring point is conditional on:

- A. Completion of the initial monitoring program;
- B. Good consistency of groundwater sample analysis results, or a clearly identified reason for inconsistent results that excludes the contaminant source being landfill operations, stored waste or leachate;
- C. No decline in groundwater quality as determined from indicator parameter trends over a period of four consecutive sampling rounds;
- D. If a well being monitored on a conditional frequency becomes non-compliant with condition C, the monitoring frequency for that well should return to the initial monitoring frequency until conditions B and C are again being fulfilled.

Sampling frequency for the shallow monitoring wells installed to monitor proposed leachate irrigation areas as defined in Table B may begin on the conditional basis, however the frequency is to revert to the unconditional frequency if leachate irrigation begins and continues from that date as if the monitoring well had been newly installed.

If site management planning indicates any early detection monitoring well is likely to become buried or otherwise destroyed within the following year as a result of normal operations:

- E. This must be communicated to the regional council as soon as practicable;
- F. A replacement well is to be constructed in a position agreed upon with the Environmental Protection Manager at Horizons Regional Council;
- G. The replacement well should be installed in a position suitable to act as an early detection well and be classed as an early detection well; and
- H. The replacement well should be constructed as a nested well (or two separate wells) with screens positioned in both shallow and deep aquifers.

Table C: Other Water Monitoring Locations, Frequencies and Parameters

Location	Parameters and frequency
<u>HS1</u>	<u>Monthly comprehensive for comparison purposes with HS1A. Monitoring to be discontinued after 2 years</u>
HS1 <u>HS1A</u> , HS2, HS3	Quarterly comprehensive for 2 years <i>Subsequently, conditional</i> Six monthly comprehensive Quarterly indicator
<u>ID1</u>	<u>Six monthly comprehensive</u> <u>Quarterly Indicator</u>
Leachate Pond Outlet	Quarterly <u>Monthly</u> comprehensive for 2 years Six monthly pesticide / semi VOC <i>Subsequently, conditional</i> Six monthly comprehensive Quarterly indicator Annual pesticide / semi VOC

Conditions: A reduction in sampling frequency ~~at~~for the Hokio Stream monitoring locations (HS1A, HS2 and HS3) after an initial two year period of monthly sampling following the commencement of the condition changes in the 2015 review decision is conditional on:

- I. No significant increases in the concentrations between monitoring sites HS1A and HS3, for parameters exceeding the Trigger values contained in Table C1 at Site HS3;~~Completion of the initial two year monitoring program;~~
- J. To determine whether there is a significant increase in contaminant levels the consent holder shall engage a suitably qualified freshwater scientist to assess the 24 month water quality monitoring results obtained for the Hokio Stream against the trigger values specified in Table C1, after 24 months of monthly data collection. Should any of the trigger values be exceeded at the downstream monitoring site (HS3 as per Fig. X) the consent holder shall propose a statistical analysis approach to the Regional Council for certification. The analysis shall be run, for the parameter(s) exceeding the relevant trigger value, on the last 24 consecutive samples to determine if there are any significant increases in concentrations between upstream and downstream. This analysis shall be provided to the Regional Council within 3 months following the completion of the 24 month monitoring period~~Good consistency of water sample analysis results, or a clearly identified reason for inconsistent results that excludes the contaminant source being landfill operations, stored waste or leachate;~~

Table C1: Trigger Values

<u>Parameter</u>	<u>Measure</u>	<u>Value</u>
<u>Total ammoniacal nitrogen</u>	<u>Maximum (g/m³)</u>	<u>2.1</u>
<u>Total ammoniacal nitrogen</u>	<u>Average (g/m³)</u>	<u>0.400</u>
<u>ScBOD₅</u>	<u>Monthly average (g/m³)</u>	<u>2</u>
<u>Aluminium</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.055</u>
<u>Arsenic</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.024</u>
<u>Cadmium</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.0002</u>
<u>Chromium (Total)</u>	<u>Dissolved, median concentration (g/m³)</u>	
<u>Copper</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.0014</u>
<u>Lead</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.0034</u>
<u>Nickel</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.011</u>
<u>Zinc</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.008</u>
<u>Mercury</u>	<u>Dissolved, median concentration (g/m³)</u>	<u>0.0006</u>

- K. Following the initial 24 month monitoring period, there shall be no significant increases in concentrations between monitoring sites HS1A and HS3 for parameters exceeding the Trigger values contained in Table C1 at Site HS3. The consent holder shall use a statistical approach certified by the Regional Council to determine whether there has been a significant increase in concentrations, based on samples collected over the previous 36 month period.~~No decline in water quality between monitoring sites HS1 and HS3 as determined from indicator parameter trends over a period of four consecutive sampling rounds.~~
- L. If the Hokio Stream monitoring locations are being sampled on a conditional frequency and do not meet~~become non-compliant with~~ condition K, the monitoring frequency for all three monitoring locations (HS1a, HS2 and HS3) ~~should~~shall return to the base case intensive monitoring until conditions J and K are again being fulfilled.

Conditions: A reduction in sampling frequency at the leachate pond outlet is conditional on:

- M. Completion of the initial 2 year monitoring program;
- N. Good consistency of water sample analysis results, or a clearly identified reason for inconsistent results;
- O. No decline in water quality over a period of four consecutive sampling rounds.
- P. If the leachate pond outlet is being sampled on a conditional frequency and becomes non-compliant with condition O, the monitoring frequency should return to the base case intensive monitoring until conditions N and O are again being fulfilled.

If existing analysis records indicate that the water quality at a monitoring location complies with the requirements permitting a shift to a conditional sampling schedule, this may be done immediately. If the site complies, sampling for these parameters can be instigated following the base schedule while sampling for the other parameters can be continued based on the conditional schedule.

Locations: (Unless otherwise stated, locations are described on Figure 4, attached to and forming part of this consent, with some of the additional monitoring sites added in the 2015 review shown in Figure X attached to this consent).

Table D: Monitoring Point Locations

Monitoring group	Monitoring point	Location
Shallow groundwater	B1	
	B2	
	B3s	
	C1	
	C2	
	C2ds	
	D1	
	D2	
	D3r	
	D4	
	D5	Lined landfill area groundwater bore
	D6	Lined landfill area groundwater bore
	E1s	
	E2s	
F1	Groundwater bore downflow from irrigation area	
F2	Groundwater bore downflow from irrigation area	
F3	Groundwater bore downflow from irrigation area	
G1s	South Eastern boundary of the site (proposed location)	
	<u>Xs1</u>	<u>Adjacent to Hokio Stream, opposite the landfill access road</u>
	<u>Xs2</u>	<u>Adjacent to Hokio Stream, near the HS2 monitoring site</u>
Deep groundwater	C2dd	
	E1d	
	E2d	
	G1d	South Eastern boundary of the site (proposed location)
	<u>Xd1</u>	
<u>Hokio Stream</u>	<u>HS1A</u>	Hokio Stream – upstream site up-gradient of landfill groundwater plume (Refer Fig X)
	HS1	Hokio Stream – <u>opposite landfill access road (refer Fig. X) upstream of landfill (Refer Fig. 2)</u>
	HS2	Hokio Stream – alongside landfill (Refer Fig. 2X)
	HS3	Hokio Stream at or about 50 metres downstream of landfill property boundary(Refer Fig. 2X)
<u>Tatana Drain</u>	<u>TD1</u>	<u>South-western corner of Tatana Drain</u>
Soils	Refer Condition 5	In land disposal area
Leachate		Pond outlet

Alternative Sampling Sites: Some of the sampling sites are located on land that is not owned by the consent holder. Sampling at these sites is subject to the land owner approval. If that approval is not given, then samples must be collected from the nearest suitable and accessible site, as agreed to with the Regulatory Manager at the Regional Council.

Parameters: The comprehensive and indicator parameter lists referenced in Tables A, B and C are presented in Tables E and F.

Table E: Comprehensive Analysis List

Type	Parameters
Characterising	pH, electrical conductivity (EC), alkalinity, total hardness, suspended solids
Oxygen demand	COD, <u>scBOD₅</u>
Nutrients*	NO ₃ -N, NH ₄ -N, DRP, SO ₄
Metals*	Al, As, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Zn, <u>Hg</u>
Other elements	B, Ca, Cl, K, Na
Organics	Total organic carbon, total phenols, volatile acids
Biological	<u>Faecal coliforms</u> <u>E. coli</u>

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations.

Table F: Indicator Analysis List

Type	Parameters
Characterising	pH, EC
Oxygen demand	COD, <u>scBOD₅</u>
*Nutrients	NO ₃ -N, NH ₄ -N
*Metals	Al, Mn, Ni, Pb, <u>Hg</u>
Other elements	B, Cl

* Analyses performed for nutrients and metals are for dissolved rather than total concentrations.

Schedule: The sampling regime defined in Tables A to C shall be undertaken based on the following schedule:

- Q. The first samples for all parameters shall be taken in July 2010.
- R. Quarterly monitoring referred to in Tables A and B shall be carried out in January, April, July and October.
- S. Six monthly monitoring referred to in Tables A and B shall be carried out in April and October.
- T. Annual monitoring referred to in Table A shall be carried out in April.

4. The Permit Holder shall monitor soils in the irrigated areas. The first soil samples from an irrigation area shall be taken in the first year that leachate is irrigated to land in that area and shall be taken prior to irrigation. Thereafter, samples shall be taken on the schedule provided in Table H.

Table H: Soil Monitoring Locations, Parameters, and Frequencies

Location	Parameters and frequency
All soil sampling locations.	Background prior to irrigation Six monthly metals and other elements for 2 years Annual pesticide / semi VOC <i>Subsequently, conditional</i> Annual metals and other elements

Parameters: The analysis parameters applied for soil monitoring are presented in Table I:

Table I: Irrigated Soil Analysis List

Type	Parameters
Metals	Al, As, Cd, Cr, Co, Hg, Ni, Pb, Zn
Other elements	Cl, B
Organics	Pesticides to screen concentrations Semi-volatile organic compounds

Schedule: The sampling regime defined in Table H shall be undertaken based on the following schedule:

- A. Six monthly monitoring referred to in Table H shall be carried out in April and October.
- B. Annual monitoring referred to in Table I shall be carried out in April.

The first samples required by the schedule in Table H shall be taken during April or October immediately following the start of irrigation, whichever comes first.

Soil sample sites shall be chosen in consultation with the Regional Council. Soil samples shall be obtained from two locations within each leachate irrigation area, with the sampling locations separated by at least 50 m. In addition, a soil sample shall be obtained from one location down gradient from each leachate irrigation area, with the sampling point selected at a low point between dunes. Each soil sample shall consist of a continuous soil core obtained from the surface to a depth of 0.2 m.

Conditions: A reduction in soil sampling frequency for the sites located within a leachate irrigation area, based on the mean of the analysis results for the two sites, is conditional on:

- C. Completion of the initial two year monitoring program.
- D. Good consistency of soil sample analysis results.

- E. No continuous increase in contaminant concentrations in soils as determined from parameter trends for the majority of the metals tested over four consecutive sampling rounds.
- F. If a leachate area being monitored on a conditional frequency becomes non-compliant with condition E, the monitoring frequency for that area should return to the base case intensive monitoring until conditions D and E are again being fulfilled.
- G. Pesticides or semi-volatile organic compounds being below the screen detection limits in the leachate collected from the lined landfill during the previous two sampling rounds.
- 5. The results of monitoring under Conditions 3 and 4 of this Permit shall be reported to the Regional Council by ~~31 August~~30 September each year for the duration of this Permit.
- 6. The Permit Holder shall ensure the above monitoring programme is undertaken by either the Regional Council, or, an independent organisation approved by the Environmental Protection Manager of the Regional Council.
- 7. The Permit Holder shall inform the Neighbourhood Liaison Group of the identity of the organisation carrying out the monitoring.
- 8. The Permit Holder shall meet the costs of the monitoring.
- 9. The Permit Holder shall report the results of the monitoring to the Neighbourhood Liaison Group by ~~31 August~~30 September each year for the duration of the Permit.
- 10. ~~If a laboratory is used for water quality analyses which do not have independent accreditation for the parameters measured, then on each sampling occasion duplicate samples from a least one sampling location shall be analysed by a laboratory with independent accreditation for the parameters measured. Continued analysis by the unaccredited laboratory shall be at the discretion of the Regional Council. All analyses on water quality samples shall be carried out by an IANZ accredited laboratory.~~
- 11. (a) Should any shallow aquifer groundwater ~~and surface water~~ parameters tested for under Condition 3 of this consent exceed the Australian and New Zealand Environment and Conservation Council Water Quality Guidelines (2000) for Livestock Watering, the Permit Holder shall report to the Regional Council as soon as practicable on the significance of the result and, where the change can be attributed to landfill leachate, consult with the Regional Council to determine if further investigation or remedial measures are required.
 - (aa) Should any surface water parameters tested for under Condition 3 of this consent, including the Tatana Drain location, exceed the Australian and New Zealand Environment and Conservation Council Water Quality Guidelines (2000) for 95 per cent protection levels for Aquatic Ecosystems the Permit Holder shall report to the Regional Council as soon as practicable on the significance of the result. Where the change can be attributed to landfill leachate the Consent Holder shall consult with the Regional Council to determine if further investigation or remedial measures are required.

- (b) ~~In the event that the statistical analysis completed under Condition 3J shows a significant increase between upstream and downstream results in the Hokio Stream for any parameter exceeding the trigger exceeding the Trigger values contained in Table C1 at Site HS3 (except for scBOD₅), an investigation into the risk of significant effects due to the parameter(s) exceeding the water quality targets or trigger values at the HS3 monitoring site shall be undertaken. This investigation shall be consistent with the ANZECC guidelines framework and should consider, but not be limited to, water chemistry aspects (such as pH, water hardness, dissolved versus total concentrations etc.), and biological aspects. The Permit Holder shall report to the Regional Council, within 3 months of the date the report under condition 3J was submitted to the Regional Council, on the significance of the result and, where the change can be attributed to landfill leachate, determine what measures are required to remedy the significant increase. Should any surface water parameters tested for under Condition 3 of this consent indicate a decline in water quality between monitoring points HS1 and HS3, as referred to in Table E, the Permit Holder shall report to the Regional Council as soon as practicable on the significance of the result and, where the change can be attributed to landfill leachate, consult with the Regional Council to determine if further investigation or remedial measures are required.~~
- (c) In the event that a report is submitted to the Regional Council pursuant to Conditions 11(a) or 11(b) ~~and the Regional Council has determined that determines that further investigation or~~ remediation measures are required, then:
- (i) ~~The Regional Council may require the~~ Permit Holder ~~to~~ must develop a ~~mitigation or~~ remediation plan to remediate any significant effects attributable to the Landfill, and avoid future significant effects. The remediation plan shall be submitted to the Regional Council for certification within 3 months of submission of the report under condition 11(b).
 - ~~(ii) In the event that the Regional Council determines that a mitigation or remediation plan is required, the Regional Council shall advise the Permit Holder of this requirement in writing within two months of receiving the Condition 11(a) or 11(b) report.~~
 - ~~(iii) Within six months of receipt of advice in writing from the Regional Council pursuant to Condition 11(c) (ii), the Permit Holder shall submit a mitigation or remediation plan to the Regional Council for approval.~~
 - ~~(iiiv) Any mitigation or~~ remediation plan prepared in accordance with Condition 11(c)(i) shall include ~~a~~ an indicative timetable for its implementation.
 - ~~(iiiv) The consent holder must implement the actions specified in the remediation plan in accordance with the timetable agreed with the Regional Council. Following approval of a mitigation or remediation plan prepared in accordance with Condition 11(c) (iii), if the Regional Council determines that the adverse effects of the landfill activity itself on the shallow groundwater aquifer or surface water will be more than minor, the Regional Council shall require the Permit Holder~~

~~to implement the plan within the timeframe specified in the timetable for implementation required by Condition 11(c) (iv).~~

- (d) The Permit Holder shall annually review the data derived from the groundwater monitoring program and evaluate contaminant mass load projections for discharges from the landfill to the Hokio Stream. The contaminant mass load projections shall be based primarily, but not exclusively, on the monitoring data obtained for the "B", ~~and "C"~~ and "X" series bores indicated in Table D of this discharge permit. The annual report required under Condition 5 shall include the following information:
- (i) A summary of the methodology used to calculate the mass load projections.
 - (ii) The calculated mass loads transported in the groundwater and comparable mass loads in the Hokio Stream.
 - (iii) An analysis of the implications of the mass load calculations with respect to ensuring discharges from the landfill would not result in a decline in the water quality in the Hokio Stream under Condition 3.
- (e) Should the groundwater parameters tested for under Condition 3 of this consent, and subsequent evaluation and indicative assessment of contaminant mass loads under Condition 11(d) of this consent indicate that contaminants sourced from either the closed or active areas of the Levin Landfill are likely to result in a future decline in the water quality of the Hokio Stream, as defined under Condition 3, then:
- (i) The Permit Holder shall include in the annual report required by Condition 5 an analysis of the significance of the result.
 - (ii) The Regional Council may at any time require the Permit Holder to undertake further investigations and/or conduct a detailed assessment of mass loads to evaluate the actual likelihood of a future decline in water quality of the Hokio Stream as a result of landfill activities as measured under Condition 3. The Permit Holder shall provide a report to the Environmental Protection Manager at the Regional Council documenting the further investigations undertaken or the methodology, procedure and outcomes of the detailed assessment.
 - (iii) If the work required under Condition 11(e) (ii) discloses an actual likelihood of a future water quality decline of the Hokio Stream as a result of landfill activities, and the Regional Council determines that this decline in water quality would constitute a more than minor effect on the water quality of the Hokio Stream, the Regional Council shall require the Permit Holder to develop a mitigation or remediation plan.
 - (iv) For the purposes of quantifying whether the adverse effects of the landfill activity itself on the water quality of the Hokio Stream will be more than minor, any determination made by the Regional Council may be independently peer reviewed, at the request of either the NLG or the Permit Holder, by an appropriately qualified and experienced person. The request for a peer review must be lodged with the Regional Council within a period of one month following the determination by the Regional Council.

The peer reviewer shall prepare a detailed report which analyses the determination of adverse effects made by the Regional Council, and provide clear recommendations as to whether implementation of a mitigation or remediation plan is required for the purposes of adopting the best practicable option to remove or reduce the more than minor adverse effect on the water quality of the Hokio Stream. This report shall be completed within a period of three months of the request for a peer review.

Should a peer review of the determination be undertaken, the Regional Council shall take into account the outcome of the review in again determining whether this decline in the water quality of the Hokio Stream would constitute a more than minor effect on the water quality of that stream.

- (v) In the event that the Environmental Protection Manager at the Regional Council determines that a mitigation or remediation plan is required, the Regional Council shall advise the Permit Holder of this requirement in writing within two months of receiving the annual report.
- (vi) Within six months of receipt of advice in writing from the Regional Council pursuant to Condition 11(e) (v) the Permit Holder shall submit a mitigation or remediation plan to the Regional Council for approval.
- (vii) Any mitigation or remediation plan prepared in accordance with ~~Condition 11(e)~~ or Condition 11(e) (v) shall include a timeframe or threshold for implementation.
- (viii) Following the completion of the mitigation or remediation plan, if the Regional Council determines that the potential adverse effects of the landfill activity itself on the water quality of the Hokio Stream, as monitored under Condition 3, continue to be more than minor, the Regional Council shall require the Permit Holder to implement the plan within the timeframe specified in the timetable for implementation required by Condition 11(c) (~~viii~~) or alternatively when the threshold identified is triggered .

[Advice Note: Condition 11 may be subject to a review pursuant to s 128 (1)(a) of the Resource Management Act 1991 (see condition 31) and it is anticipated such a review will occur in the event of disagreement by either the Permit Holder or NLG with any determination of the Regional Council in relation to condition 11 (a) - (e)]

12. Should any parameters tested for under Condition 3 of this consent from the deeper gravel aquifer (bores identified as C2dd, E1, E2, the proposed G1d and any other monitoring bore intersecting the deep gravel aquifer), exceed the requirements of the Ministry of Health's Drinking Water Standards for New Zealand 2000, the Permit Holder shall report to the Regional Council as soon as practicable on the significance of the results and, where the change can be attributed to landfill leachate, consult with the Regional Council to determine if further investigation or remedial measures are required.
13. Sampling of the groundwater wells within a 1.5 km radius down-flow or across-flow from the landfill property boundary is to be carried out by the Permit Holders representative upon receiving a written invitation from the bore owners. The frequency of sampling is to be decided through discussion between the bore owner and the Permit Holder. Initial analyses from individual bores are to be tested for the parameters in the Comprehensive Analysis List in Condition 3.

Subsequent testing may be performed based on the Indicator Analysis List in Condition 3. Should analysis of water obtained from any groundwater wells used for human drinking water show concentrations of parameters which exceed the requirements of the Ministry of Health's Drinking Water Standards for New Zealand 2000, or repeated sampling from a specific bore indicates a decrease in water quality, the Permit Holder shall report to the Regional Council and the bore owner as soon as practicable on the significance of the results. Where the exceedance or decreasing water quality can be attributed to landfill leachate, the Permit Holder shall consult with the Regional Council and the bore owner to determine if further investigation or remedial measures are required.

14. Any currently active and future lined landfill area shall be closed and remediated by:
- a) Compacting refuse to such an extent and consistent with CAE guidelines of 600-800 kg/m³, to ensure post closure settlement is minimised as far as practicable; and
 - b) Grading to a final slope of less or equal to 1V:3H (1 in 3) on any face; and
 - c) Ensuring the landfill cap incorporates a layer at least 700 mm thick with a permeability of no greater than 1×10^{-7} m/s, or has a material and layer structure that reduces rainwater infiltration to the waste to an equivalent extent; and
 - d) Establishing and maintaining a grass or tussock vegetation cover on the capped landfill, unless it can be demonstrated to the Regional Council's satisfaction that a different vegetation cover can produce clear benefits through reducing infiltration to the covered waste. Any vegetation cover should be consistent with an ongoing capacity to monitor and maintain the ongoing integrity of the landfill cap.

In-situ refuse density shall be determined through annual calculation based on information derived from topographic surveys of the landfill and borrow areas, and from weighbridge records. The survey shall be carried out within one month of the anniversary of the previous survey.

Specific Conditions – discharge leachate to ground from existing landfill

15. The Permit Holder shall close and remediate the existing unlined landfill by April 2011 by:
- a) Grading to a final slope on the landfill faces and caps of between 1V:3H (1 in 3) and 1V:40H (1 in 40);
 - b) Ensuring the final landfill surface is sloped to promote run-off toward the outside of the landfill footprint and prevent surface water ponding on the landfill cap;
 - c) Ensuring the landfill cap incorporates a layer at least 700 mm thick. All material added to the existing cap to bring the thickness up to 700 mm, or for future cap maintenance purposes, is to have a permeability of no greater than 1×10^{-7} m/s;
 - d) Establishing and maintaining a grass or tussock vegetation cover on the capped landfill consistent with an ongoing ability to monitor and maintain

the integrity of the landfill cap. The vegetation is to be managed to exclude tree species that can potentially develop root systems capable of disrupting the landfill cap and thereby enhancing rainwater infiltration;

- e) Monitoring the landfill cover on an annual basis to identify areas of differential settlement slope stability issues, erosion and changing vegetation patterns, including a topographic survey to ensure Conditions 15(a) to (d) continue to be met; and
- f) The Permit holder shall submit an annual report to the Regional Council by ~~31 August~~ 30 September each year for the duration of this Permit documenting the condition of the unlined landfill and any maintenance carried out during the previous year. The annual report shall address but not be limited to those aspects listed in Conditions 15(a) to (e) above. The annual report shall include a plan of the unlined landfill specifically documenting the shape of the closed landfill and any changes during the previous year. [The annual report can be written in conjunction with the annual report required as part of Condition 14 for Consent Number 6009].

The area of the existing landfill to be remediated is defined as Area A on Figure 1 attached.

- 16. Within one month following the remediation of the Levin landfill, the Permit Holder shall report in writing to the Regional Council of the Permit Holder's compliance with Conditions 14 and 15 of this permit.

Specific Conditions – Discharge leachate to ground from lined landfill

Environmental Effects

- 17. There shall be no disposal of leachate sludge from the pond onto irrigation areas. Leachate sludge shall be disposed of in accordance with Condition 26 of consent number 6009 and Condition 18 of consent number 7289.
- 18. The rate of application of leachate irrigated to land shall not exceed 200 kg Nitrogen/hectare per year.
- 19. There shall be no ponding or runoff of leachate on or beyond the irrigation areas.
- 20. Subject to Condition 19 of this permit, application of leachate on to soil shall not exceed 50 millimetres per day. Notwithstanding, the maximum rate of application shall not exceed 5 millimetres per hour.
- 21. There shall be no discharge of offensive or objectionable odour at or beyond the legal boundary of the Levin Landfill property as shown on Figure 1 resulting from leachate irrigation.
- 22. Should the quality of leachate being irrigated exceed the STV parameters set out in the Australian and New Zealand Environment and Conservation Council Water Quality Guidelines (2000) for metals in Irrigation Water the Permit Holder shall report to the Regional Council as soon as practicable on the significance of the result and in consultation with the Regional Council determine if further investigation or remedial measures are required.

Process Management

23. The daily volume of leachate irrigated to land shall be metered and recorded.
24. The Permit Holder shall make regular and at least weekly, inspections of the irrigation system, including pumps, pipes, irrigators and vegetation to ensure that the system is operating efficiently and that vegetation is in good health.
25. The Permit Holder shall have carried out the works described in Condition 14(a) to (d) of this permit to rehabilitate:
 - a. Any lined landfill area within four months following the closure of that lined landfill area, if the landfill area is closed before 35 years from the granting of this consent.
 - b. Any lined landfill area before 35 years from the granting of this consent.

[Note: "lined landfill area" is defined as a distinct "cell" or stage of the landfill.]

Monitoring and Reporting

26. A plan of the leachate irrigation system shall be prepared to the satisfaction of the Regional Council's Environmental Protection Manager nine months prior to placement of refuse on the lined landfill. The plan shall include:
 - i. A map showing areas to be irrigated;
 - ii. Design of the recirculation, treatment and irrigation systems;
 - iii. Contingency measures in case of failures in the irrigation system;
 - iv. Criteria for installing aerators in the leachate pond;
 - v. Assessment of options for recirculating leachate over the lined landfill;
 - vi. Assessment of groundwater profile beneath the irrigation area and effects leachate irrigation will have on groundwater;
 - vii. Groundwater and soil monitoring programme, including a map showing sampling locations; and
 - viii. Any other relevant matter.
27. The Permit Holder shall keep a log of:
 - a. The dates and times of leachate irrigation;
 - b. The total volume of leachate irrigated daily;
 - c. The volumes of leachate irrigated to specific areas;
 - d. Weather and ground conditions during irrigation;
 - e. Observations made during the weekly inspections of the pump, irrigation system and irrigation areas; and
 - f. Repairs and maintenance carried out on the irrigation system.

Copies of this log shall be forwarded to the Regional Council's Environmental Protection Manager on 28 February and 31 August of each year that the irrigation system is operated.

28. The Permit Holder shall inspect the landfill for leachate break out, settlement and other adverse environmental effects at least once per month until such time as discharge of refuse to the landfill ceases. Thereafter, the frequency of inspection shall be determined in consultation with the Regional Council.
29. The Permit Holder shall record the date, time, observations and any remedial action as a result of Condition 28. The record shall be made available to the Regional Council on request.

Review

30. The Regional Council **may** initiate a publicly notified review of Conditions 3, 4, 11 (a) – (e), 12, 13, 14, 24, 27, 28 and 29 of this Permit **following the expiration of 10 years from the date that the 2015 review decision is final**. The reviews shall be for the purpose of:
 - a. Assessing the adequacy of monitoring outlined in Conditions 3 and 4 of this consent; and/or
 - b. Assessing the effectiveness of Conditions 11(a) – (e), 12, 13, 14, 24, 27, 28 and 29 of this consent, in avoiding, remedying or mitigating adverse effects on the environment surrounding the Levin Landfill.

The review of conditions shall allow for the:

- c. Modification of monitoring outlined in Conditions 3 and 4 of this consent;
 - d. Deletion or changes to Conditions 11(a) – (e), 12, 13, 14, 24, 27, 28 and 29 of this consent;
 - e. Addition of new conditions as necessary, to avoid, remedy or mitigate adverse effects on the environment surrounding the Levin Landfill.
31. The Regional Council may initiate a publicly notified review of Conditions 11 (a) – (e) of this Permit at any time outside those reviews required by Condition 30. The review shall be carried out pursuant to section 128 (1)(a)(i) of the Resource Management Act 1991 and shall be for the specific purpose of:

- a. Assessing the need and appropriateness of implementing a mitigation or remediation plan as the best practicable option to remove or reduce any adverse effect on the water quality of the Hokio Stream.

The review of conditions shall allow for the:

- b. Deletion or changes to Conditions 11(a) – (e) of this consent;
- c. Addition of new conditions as necessary, to avoid, remedy or mitigate adverse effects on the environment surrounding the Levin Landfill.

The review of conditions shall have regard to:

- d. The nature of the discharge and the receiving environment; and

- e. The financial implications for the applicant of including that condition; and
- f. Other alternatives, including a new condition requiring the observance of minimum standards of quality of the receiving environment, having regard to the need to be satisfied that including that condition is the most efficient and effective means of removing or reducing that adverse effect.

DISCHARGE PERMIT 6011

Consent is granted to the Horowhenua District Council to **discharge landfill gas, odour and dust to air** at the Levin landfill, Hokio Road, Levin, legally described as Lot 3 DP 40743 Blk II Waitohu Survey District, for a term expiring 35 years from the commencement of the consent subject to the following conditions:

1. Charges, set in accordance with section 36(1)c of the Resource Management Act 1991, and section 690 A of the Local Government Act 1974, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of this resource consent and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

[**Note:** Section 36(1)c of the Act provides that Council may from time to time fix charges payable by holders of resource consents. The procedures for setting administrative charges are governed by section 36(2) of the Act and is currently carried out as part of the formulation of the Council's Annual Plan.]

Environmental Effects

2. The Permit Holder will ensure dust is controlled on access roads and on the landfill, if necessary, by watering or other methods.
3. There shall be no objectionable or offensive odour to the extent that it causes an adverse effect at or beyond the boundary of the site.
 - (i) Manawatu-Wanganui Regional Council staff or a suitably qualified independent person engaged by the Regional Council shall, whenever reasonably practicable respond to complaints logged with Regional Council by visiting the complainants address to gather information on the odour event and if possible, independently verify the alleged odour event. Data collected shall to the maximum extent possible, address all FIDOL factors; being frequency, intensity, duration, offensiveness/character and location.
4. If an appropriately experienced officer of the Manawatu-Wanganui Regional Council or a suitably qualified independent expert considers that an objectionable odour beyond the boundary has occurred, having regard to:
 - (i) a consideration of the FIDOL factors; and/or
 - (ii) receipt of complaints from neighbours or the public having considered (i); and/or
 - (iii) relevant written advice or a report from an Environmental Health Officer of a territorial authority, then

And the permit holder receives a request from the Manawatu-Wanganui Regional Council to provide them with a written report, then the report shall specify;

- (a) the activities that were occurring on the site at the time;
- (b) the cause or likely cause of the event and any factors that influenced its severity;

- (c) the nature and timing of any measures implemented by the permit holder to avoid, remedy or mitigate any adverse effects; and
- (d) the steps to be taken in future to prevent re-occurrences of similar events should this be necessary.

The permit holder shall provide its report for items (a), (b) and (c) within five days and for item (d) within 20 days of request. When notification of an alleged objectionable odour is delayed such that investigation by the permit holder is compromised, the report should as far as practicable include the information required by (a) – (d).

5. The Permit Holder will also ensure that:

- a. On-site and off-site Health and Safety Effects of landfill gas being emitted by the old landfill should be quantified by sampling groundwater monitoring wells for evidence of landfill gas when groundwater samples are taken from the wells. As a minimum, the gases tested for are to include methane, carbon dioxide and oxygen; and
- b. Any building constructed on the landfill site is adequately ventilated.
- c. From the commencement date of the decision of the 2015 review of conditions, the Consent Holder must place daily cover over the entire operational fill area to a depth of at least 150 mm by the end of each operating day. Daily cover material may comprise of sand, soil or mulched woody material and should be applied to ensure effective odour control.
- d. From the commencement date of the decision of the 2015 review of conditions, the Consent Holder must ensure that intermediate cover is placed over daily cover to close- off a fill area that will not receive additional lifts of waste or final cover for more than three months. The combined depth of cover, including daily cover, over the waste shall be a minimum of 300 mm and may comprise of uncontaminated soil, and/or a mixture of sand and mulched woody material. A temporary or permanent cap shall be applied on top of the intermediate cover within three months of an area last receiving fill. The temporary cap shall comprise of a layer of low permeability material (e.g. compacted cohesive soil with a thickness of at least 500 mm).

Advice note: The purpose of the temporary or permanent cap is to: reduce water and air ingress; reduce fugitive odour emissions; improve the aesthetics of the landfill; improve the management of litter, vermin and birds; and improve the efficiency of the gas collection system. The final (or permanent) must comply with condition 14 C of Discharge Permit 6010 i.e. comprise a layout of low permeability material (e.g. compacted cohesive soil with a thickness of 700 mm and a hydraulic conductivity of less than or equal to 1×10^{-7} metres per second. It may also be appropriate to make a temporary cap final by applying a cap with a thickness of 200 mm over the top of the temporary cap.

- e. The Consent Holder must carry out monthly surface emission testing for all areas of the landfill with final or intermediate cover, and the bio-filter bed. The monitoring of surface emissions shall be undertaken utilizing emission testing methods that have been given prior written certification as to their appropriateness by the Manawatu-Wanganui Regional Council's Regulatory Manager. The monitoring of surface emissions shall not be undertaken

during or immediately after heavy rainfall or during strong wind speed conditions, and the meteorological conditions at the time of the monitoring shall be provided in the monitoring report.

Advice note: Favourable meteorological for ~~emission~~ testing methane surface monitoring include those where weather and ground conditions are dry with less than 0.5 mm of rain having fallen for at least two days, and instantaneous wind speed should be less than 25 km per hour ideally 5 to 10 km per hour.

- f. Surface emissions of methane, as determined by monitoring carried out by condition 5(e) shall not exceed the following trigger levels:
- i. 100 parts per million (ppm) for final capped areas;
 - ii. 200 ppm for intermediate cover and temporary capped areas;
 - iii. 5,000 ppm for onsite buildings and structures.

An exceedance of the above limits requires remedial action to be undertaken within 24 hours and retesting within 24 hours of remediation being completed. If the second round of testing results in a continued exceedance at the same location then an action plan shall be developed and implemented to reduce methane concentrations below the specified limits and details provided to the Manawatu-Wanganui Regional Council within 48 hours of the retest.

- g. Records of surface emission monitoring for methane must be included in the Annual Report and provided to Manawatu-Wanganui Regional Council on request.
- h. Within six months of the commencement date of the decision of the 2015 review of conditions, the leachate collection chamber must be vented to a bio-filter. The bio-filter must be designed by a suitably qualified and experienced person.
- i. The Consent Holder must employ an appropriately qualified person to undertake a comprehensive assessment of the bio-filter performance on an annual basis. The assessment shall include, but not be limited to, an evaluation of the media size distribution and composition and effectiveness in removing contaminants.
- j. The Consent Holder shall maintain the biofilter, measure and record the following parameters:
- Daily visual inspection of the state of the biofilter bed, particularly for signs of any short-circuiting, clogging of the bed, compaction and weed growth.
 - Daily inspection of the inlet gas fan and ductwork and any maintenance;
 - Continuous display of differential pressure for the biofilter;
 - Weekly recording of pressure across the biofilter bed;
 - Weekly inspection to check for odour at the biofilter (i.e. assessment of odour intensity in accordance with the most up to date good practice guidance for assessing and managing odour).

- Weekly monitoring and recording of the biofilter media moisture content;
 - Monthly monitoring and recording of the pH of the biofilter media;
 - Quarterly raking and loosening of the biofilter media, or as otherwise required, to reduce the potential for short-circuiting, clogging of the bed, compaction and weed growth.
- k. The Consent Holder must ensure that the biofilter and bed complies with the following limits at all times:
- Pressure drop across the biofilter shall be less than 100 mm water gauge;
 - Biofilter media moisture content shall be between 40-60% moisture content;
 - The air flow rate shall not exceed 100 cubic metres per hour per square metre of biofilter media;
 - The pH of the filter material shall be between 6 and 8 pH units;
 - An even distribution of gas flow through the filter bed; and
 - There shall be no short circuits of untreated air through and filter bed.
- l. If, after 12 months of the commencement date of the 2015 review of conditions, the Manawatu-Wanganui Regional Council determines that the discharge of odour from the Landfill site is noxious, dangerous, offensive, or objectionable beyond the property boundary, the Permit Holder shall investigate and where practicable identify the potential odour source discussed in the MWH report titled Continuous Ambient Air Quality Monitoring for Hydrogen Sulphide – Levin Landfill and dated 10 July 2015.
- m. The Consent Holder shall remediate the potential odour source identified in condition 5(l) should the source be located on the Levin Landfill property.
- n. The Consent Holder shall provide a report to Manawatu-Wanganui Regional Council and the Neighbourhood Liaison Group that outlines the remediation actions taken and outcomes within 20 working days of condition 5(m) being completed.
- o. As soon as practicable and no later than 12 months of the commencement date of the 2015 review of conditions, the Permit Holder shall install a landfill gas collection system and flare on the site. The gas collection and flare shall be maintained and utilised at all times.

Advice Note: HDC holds Discharge Permit 106798 for discharges from the flare.

- p. Within 2 months of the commencement date of the 2015 review of conditions, the Permit Holder shall prepare an Odour Management Plan (OMP) that includes:
- i. Design specifications for daily, intermediate and final capping;
 - ii. Methodology for monthly field odour monitoring;
 - iii. Methodology for monthly surface monitoring for methane;
 - iv. Methodology for biofilter monitoring;

- v. Odour control practices relating to the leachate pond;
 - vi. Odour control practices for the working face of the landfill;
 - vii. Locations of odour control/treatment equipment (e.g. biofilter and flare);
 - viii. The odour complaints investigation and recording procedure;
 - ix. The phasing of the Landfill construction and operation (filling), including within 12 months the design and collection efficiency of the existing and proposed gas collection system (GCS). This shall also include a description of the thickness and type of cover and capping material used at different phases of the landfill development;
 - x. The operational procedures regarding the use of the biofilter and within 12 months the flare and GCS, including maintenance and breakdown procedures and methods to be followed to prevent a significant discharge of odour;
 - xi. The resource consent conditions relevant to discharges to air at the landfill;
 - xii. Staff training requirements to implement the monitoring and controls stated in the resource consent conditions.
- q. The Consent Holder shall collect meteorological data from an on-site weather station. The data recorded shall consist of wind direction, wind speed, air temperature, barometric pressure, relative humidity and rainfall. The meteorological monitoring shall be:
- i. In general accordance with the Good Practice Guide for Air Quality Monitoring and Data Management, Ministry for the Environment, 2009, or subsequent updates;
 - ii. Continuous for the duration of the consent comprising, 1 min data, collected and averaged to 10-min and 1-hour time periods; and
 - iii. At a point that is representative of local weather conditions across the site.
- r. The Consent Holder shall provide the Manawatu-Wanganui Regional Council with information collected from the weather station referred to in condition 5(q). The data shall be in a suitable data file format that allows the Manawatu-Wanganui Regional Council to upload it on a data management system. The data shall be provided on a daily basis, or as soon as possible upon request.
6. There shall be no deliberate burning of waste or other material at the landfill. If fires occur at the landfill they shall be extinguished as quickly as possible.
7. The Permit Holder shall take all practicable steps to avoid, remedy or mitigate significant adverse effects of the discharge of landfill gases to air.

Monitoring and Reporting

8. The Permit Holder shall keep a record of any complaints received. The complaints record shall include the following, where possible:
- a. Names and addresses of complainant;
 - b. Nature of complaint;
 - c. Date and time of the complaint and alleged event;
 - d. Weather conditions at the time of the event; and
 - e. Any action taken in response to the complaint.

The record shall be made available to the Regional Council on request.

The Permit Holder shall also keep a record of landfill gas monitoring results including:

- a. Date and time of sampling;
- b. The concentrations of gasses detected.
- c. Weather conditions at the time of sampling.

The monitoring results shall be made available to the Regional Council on a quarterly basis.

- 8A The consent holder shall nominate a liaison person to manage any air quality complaint received. The name and contact details, which will include a landline telephone number, a cell phone number, and email address of the liaison person, shall be provided to the Manawatu-Wanganui Regional Councils Regulatory Manager. The consent holder shall ensure a liaison person is available to respond to odour or dust complaints in a reasonable manner as per condition 8B below.
- 8B The consent holder shall ensure any complaint received from a member of the general public regarding odour or dust originating from the landfill site is investigated as soon as practicable and within 24 hours of the complaint being received, or at a time mutually agreeable with the party making the complaint.
- 8C The consent holder shall notify a Manawatu-Wanganui Regional Council Consents Monitoring Officer and the Mid-Central District Health Boards Medical Officer of Health as soon as practicable after becoming aware of any offensive or objectionable odour emanating beyond the boundaries of the landfill site. An explanation as to the cause of the incident, details of any remedial and follow-up actions taken and the wind speed and wind direction measured at the landfill at the time of the incident shall also be provided to the Regional Council Consents Monitoring Officer.
- 8D The consent holder must undertake monthly field odour investigations at the working face, at the areas with intermediate cover, temporary capping and final capping and around the boundary of the landfill site, particularly those sections of the boundary that are between the landfill and residential houses, until such time as discharges of refuse to the landfill ceases. Thereafter the frequency of investigations shall be determined in

consultation with the Manawatu-Wanganui Regional Council. The monitoring shall be undertaken using a modified German VDI standard 3940 method as agreed by the Manawatu-Wanganui Regional Council Regulatory Manager, or subsequent method.

8E The consent holder must carry out a weekly walkover site inspection of all the landfill surfaces, including the area around the biofilter and leachate pond. The purpose of the walkover site inspection is to check for odour, cracks in the landfill surface and integrity of gas collection or leachate pipework.

8F The consent holder shall maintain a log of all other inspections, investigations and actions taken in accordance with all monitoring and odour inspection conditions of this consent. The log shall be made available to the Manawatu-Wanganui Regional Council on request and submit a summary of all results and assessments presented in the Annual Report.

9. The Regional Council may initiate a publicly notified review of Conditions 4, 5 and 8 of this permit in 10 years from the date of the commencement date of the 2015 review of consents decision. The reviews shall be for the purpose of:

a. Assessing the effectiveness of Conditions 4, 5 and 8 of this consent;

in avoiding, remedying or mitigating adverse effects on the environment surrounding the Levin Landfill, the review of conditions shall allow for the:

b. Changes to Conditions 4, 5 and 8 of this consent; and

c. Addition of new conditions as necessary;

to avoid, remedy or mitigate adverse effects on the environment surrounding the Levin Landfill.

DISCHARGE PERMIT 7289

Consent is granted to the Horowhenua District Council to **discharge liquid waste onto and into land** at the Levin landfill, Hokio Road, Levin, legally described as Lot 3 DP 40743 Blk II Waitohu Survey District, for a term expiring 35 years from the commencement of the consent subject to the following conditions:

1. Charges, set in accordance with section 36(1)c of the Resource Management Act 1991, and section 690 A of the Local Government Act 1974, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of this resource consent and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

[**Note:** Section 36(1)c of the Act provides that Council may from time to time fix charges payable by holders of resource consents. The procedure for setting administrative charges is governed by section 36(2) of the Act and is currently carried out as part of the formulation of the Council's Annual Plan.]

2. Liquid wastes shall only be placed at the Levin Landfill as a contingency to normal disposal.
3. For the purposes of this Permit, contingency conditions are circumstances where liquid waste is unable to be treated and disposed of at its regular location, for reasons of either, unforeseen events, breakdown or temporary closure for maintenance purposes.
4. Liquid wastes are defined as the following:
 - a. Septic tank waste ("septage");
 - b. Grease trap waste;
 - c. Sewage; and
 - d. Any material that contains free liquids.

The presence of free liquids may be determined by either of the following methods, whichever is most practicable at the time:

- i. The "Paint Filter Test"; or
 - ii. Material which may be located, transported and deposited at the landfill without the risk of free liquid seeping from the material, and without the risk of having the deposited material flow under gravity down any slope on the landfill shall be deemed to not contain free liquids.
5. The Permit Holder shall notify the Regional Council's **Regulatory Manager** as soon as practicably possible after receiving notification of the intention to dispose of waste at the landfill under the terms of this consent, or as soon as practicable following urgent disposal in accordance with Condition 3.

The Permit Holder shall detail the reason for the discharge, volume of discharge and timing of the discharge.

6. The maximum annual volume of liquid waste discharged shall not exceed 150 cubic metres (150 m³) in any calendar year. (Calendar year is defined as being over any 12 month or 365 day period.)
7. Subject to Condition 6, the volume of liquid waste discharge shall not exceed 75 cubic metres (75 m³) during any seven day period.
8. Subject to Condition 6 and 7 the maximum daily volume of liquid waste discharged shall not exceed 20 cubic metres (20 m³).
9. The liquid material shall be placed in trenches which are no more than 2m wide, 1.5m deep and 5m long which are excavated in compacted refuse which is at least six months old and located within a lined landfill area.
10. Only one trench shall be open at any one time.
11. Trenches shall be at least 10 metres from any landfill batter slope.
12. The open trench shall be open for no longer than two weeks.
13. Trenches shall be filled with liquid wastes to a depth of not less than 1m below the prior refuse surface level and reinstated with appropriate compaction with previously removed refuse and cover.
14. The location of placement and cumulative volume will be identified on a site plan which shall be made available to the Regional Council upon request.
15. The location and placement shall be appropriately signed and fenced.
16. The Permit Holder will ensure odours, vermin and flies are not generated from or do not accumulate in open trenches.
17. The Permit Holder shall maintain records of:
 - a. The type of liquid waste received;
 - b. The volume of liquid waste received;
 - c. The source of liquid waste; and
 - d. The location in the landfill in which the material was placed.
18. In addition to the material that is accepted on the basis set out above, the consent holder may dispose of site-generated sludges that contain free liquids from cess-pits, leachate ponds or other site activities to facilitate site operation, provided this does not adversely affect landfill stability or face operations. The disposal of such materials is not to be included within the quantity restrictions as set out in Conditions 6, 7 and 8 of this permit.
19. The Regional Council **may** initiate a publicly notified review of Conditions 5, 9, 12 and 17 of this permit **following the expiration of 10 years from the date that the 2015 review decision is final**. The reviews shall be for the purpose of:
 - a. Assessing the adequacy of the monitoring conditions outlined in Conditions 5 and 17; and

b. Assessing the effectiveness of Conditions 9 and 12 of this consent, in avoiding, remedying or mitigating adverse effects on the environment surrounding the Levin Landfill.

The review of conditions shall allow for the:

- c. Modification of monitoring outlined in Conditions 5 and 17;
- d. Changes to Conditions 9 and 12 of this consent; and
- e. Addition of new conditions if necessary, to avoid, remedy or mitigate adverse effects on the environment surrounding the Levin Landfill.

DISCHARGE PERMIT 102259

The Team Leader Consents of the Manawatu-Wanganui Regional Council (trading as horizons.mw) has considered this non-notified application. On 15 May 2002 the Team Leader pursuant to delegated authority under section 34 of the Resource Management Act, grants Discharge Permit 102259 pursuant to section 105 of the Act, to Horowhenua District Council to **discharge stormwater to land and potentially to groundwater via ground soakage** from the Levin landfill, Hokio Beach Road, Levin, subject to the following conditions.

1. This Permit shall be for a term of 35 years from the date of commencement of Levin Landfill Consents 6009 – 6011 and 7289.
2. Pursuant to section 125(1) of the Resource Management Act 1991, this Permit shall not lapse within its duration of 35 years.
3. The activities authorised by this Permit shall be restricted to the discharge of stormwater to land via ground soakage originating from the existing fill site or any part of the new lined landfill that has had, or is intended to have, refuse placed beneath or upon it, as shown on Plan C102259 attached to and forming part of this Discharge Permit.
4. All works and structures relating to this Discharge Permit shall be designed and constructed to conform to best engineering practices and shall at all times be maintained to a safe and serviceable standard.
5. The Permit Holder **shall inspect the stormwater system once a day when the site is in use to ensure the speedy recovery of any litter or refuse and shall remove any litter as soon as practicable.**
6. The Permit Holder shall ensure the stormwater soakage ponds are inspected regularly and maintained to optimise their performance at all times. This shall include de-sludging or remediating the ponds as required.
7. **deleted**
8. There shall be no runoff or existing discharge of stormwater beyond the property boundary that has originated on any landfill area or new lined landfill area that has had, or is intended to have, refuse placed on it.

Management – Existing Landfill

9. As far as practically possible, the Permit Holder shall ensure that all stormwater from the existing landfill area is directed to **the centralised soakage area as shown on the latest version of the Stormwater Plan.**

Management – New Landfill

10. Where it is practical and economical to do so, the Permit Holder shall ensure that within the operational landfill cell the minimum amount of stormwater shall be allowed to come into contact with refuse. This shall be effected by constructing impermeable barriers, diversion drains or bunds on the side slopes and within the base of the landfill.

11. There shall be no contamination of stormwater with leachate. Leachate includes any stormwater within an operational cell that is not separated from refuse by a barrier as defined in Condition 10.
12. The Permit Holder shall ensure that a suitable stormwater soakage area is available for a given design storm and the area of the operational cell from which the stormwater is collected.
13. Areas designated for stormwater discharge to land and their catchment and reticulation system shall be identified and located on site plans and their dimensions submitted for approval by horizons.mw's Team Leader Compliance prior to their use.

Monitoring

14. The Permit Holder shall monitor groundwater quality in at least one upgradient and one downgradient bore of the existing landfill stormwater soakage area, and at least one upgradient and two downgradient bores of the new landfill area. The location and number of bores is to be determined in consultation with horizons.mw's Team Leader Compliance. Groundwater samples shall be taken quarterly in January, April, July and October for the term of this Discharge Permit, beginning in October 2002, and analysed for the following parameters:
 - PH
 - Conductivity
 - Ammonia-N
 - Nitrate-N
 - Sodium
 - Boron
 - Chloride
 - Iron
15. Monitoring bores required in Condition 14 of this Discharge Permit can be incorporated into the monitoring programme of other Levin Landfill Consents (6009-6011 and 7289), providing the information sought is obtained at the frequency specified and reported as required for this Permit.
16. The results of monitoring under Condition 14 of this permit shall be reported to Horizon Manawatu's Team Leader Compliance by 31 August each year for the duration of this Permit beginning 31 August 2003. The annual report shall be supplemented by the raw water quality analysis data being forwarded to the Regional Council as soon as practically possible following the receipt of laboratory analysis certificates.
17. If a laboratory is used for water quality analyses which does not have independent accreditation for the parameters measured, then on each sampling occasion duplicate samples from at least one sampling location shall be analysed by a laboratory with independent accreditation for the parameters measured. Continued analysis by the unaccredited laboratory shall be at the discretion of horizons.mw.
18. Should any groundwater parameters tested for under Condition 14 of this consent exceed the Australian and New Zealand Environment and Conservation

Council Water Quality Guidelines (2000) for Livestock Watering, the Permit Holder shall report to horizons.mw's Team Leader Compliance as soon as practicable on the significance of the result, and where the change can be attributed to the landfill operation, consult with horizons.mw's Team Leader Compliance to determine if further investigation or remedial measures are required.

19. The Regional Council **may** initiate a publicly notified review of all conditions of this Permit **following the expiration of 10 years from the date that the 2015 review decision is final**. The reviews shall be for the purpose of:
 - i. reviewing the effectiveness of these conditions in avoiding or mitigating any adverse effects on the environment; and/or
 - ii. reviewing the adequacy of the monitoring programme required by this discharge permit.

The review of conditions shall allow for:

- i. the deletion or amendment to any conditions of this permit; and
- ii. the amendment or addition of new conditions as necessary to avoid, remedy or mitigate any adverse effects on the environment

If necessary and appropriate, the review provided for under this condition shall require the Permit Holder to adopt the best practicable options to avoid, remedy or mitigate any significant adverse effects on the environment.

20. Charges, set in accordance with section 36(1)c of the Resource Management Act 1991, and section 690 A of the Local Government Act 1974, shall be paid to horizons.mw for the carrying out of its functions in relation to the administration, monitoring and supervision of this resource consent and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

[**Note:** Section 36(1)c of the Act provides that horizons.mw may from time to time fix charges payable by holders of resource consents. The procedure for setting administrative charges is governed by section 36(2) of the Act and is currently carried out as part of the formulation of horizons.mw's Annual Plan.]



Extra Groundwater Monitoring Points and
 Hoki Stream Monitoring Points added
 by the 2015 review labelled by hand.