

5. KEY ISSUES

5.1. Introduction and Historical Context¹¹³

161. In the eyes of Te Arawa, the management regime adopted by authorities has been less than satisfactory. There has been a gradual denigration of the mauri of the waiariki as a result of changes to the hydraulic characteristics of the catchment. These changes have caused a cascade of impacts upon mauri over the past sixty years.
162. The first significant denigration occurred as a result of the discharge of primary treated effluent from the city sewers into Rotorua at Sulphur Point. In the 1950's there was large scale clearing of the Rotorua catchment converting native forest to farmland made viable by the application of super-phosphate to overcome nutrient deficiencies in the soils. This reduced attenuation times for runoff causing flooding of lakeside house sites and also increased the flow of nutrients into Rotorua.



Photograph 15 – Land management practices for forestry¹¹⁴

163. To alleviate the flooding, the Ohau was channelised (straightened and deepened) destroying the spawning habitat and transferring the flooding problems from Lake Rotorua to Lake Rotoiti and the lower Kaituna River. As noted earlier, in the early 1980's the natural ledge restricting flow at the outlet from Rotoiti was removed to allow greater flows and the Okere Control

¹¹³ The information in this section was provided by Dr Kepa Morgan.

¹¹⁴ Photograph supplied by Dr Kepa Morgan on 6 February 2016.

Gates were installed to protect farming activities on the lower Kaituna river as well as raise Rotoiti lake levels to improve navigation.

164. The Okere Control Gates moderated flows having the effect of capturing greater quantities of sediment originating from the denuded Rotorua catchment and the Rotorua wastewater discharge at Sulphur Point and retaining this in Rotoiti. Evidence given in the Kaituna claim to the Waitangi Tribunal described the Rotorua wastewater scheme as turning the Ngāti Pikiao food bowl into a toilet bowl, and with the flood gates installed making Rotoiti the septic tank. The effects of primary treated effluent discharges into Lake Rotorua at Sulphur Point were by then becoming troublesome for water front property owners, and Council proposed to pipe the effluent directly to Okere for discharge into the headwaters of the Kaituna river. This proposal was stopped by the late 1970's Waitangi Tribunal claim which provided the genesis for land based disposal of treated effluent into the Waipa forest. Higher lake levels were desired for Lake Rotorua and so in 1989 the Ohau weir was constructed to regulate lake levels on that Lake. This new structure restricted fish passage.
165. Management of the geothermal fields associated with Puhotu geyser were modified in the late 1990's, which had the unintended impact of also reactivating the natural geothermal springs at Sulphur Point. The result of this increased sub-surface activity was to stir up lake bed sediment re-suspending this material in the water column. These nutrients along with fertilisers applied in the Rotorua catchment created ideal conditions for algal blooms which became a problem for Lakes Rotorua and Rotoiti in the early 2000's.¹¹⁵ The solution was to construct a diversion wall that runs from Te Takinga to the Okere Control Gates, however the wall installation has altered currents in Lake Rotoiti, changing the flow of mauri. Since the construction of flood banks on the lower Kaituna river during the late 1980's, the Okere Gates have been re-purposed by vested interests to control lake levels optimised primarily for boat users.

5.2. Te Arawa Lakes Trust Concerns

166. At the time of the 2010 consent renewal hearings, Te Arawa Lakes Trust noted that tāngata whenua had a number of concerns relating to the "values of mauri, tapu and kaitiakitanga" and around "the possible effects of the structures on traditional food sources and customary practices, beaches, wāhi tapu and the condition of the Ohau Channel."¹¹⁶

¹¹⁵ Refer to: Bodger, S "Toxic danger lurks under lake surfaces", New Zealand Herald, 30 June 2000; and Winstone, C "Not enough action to save Rotorua lakes, say residents", New Zealand Herald, 22 September 2003.

¹¹⁶ Statement of Evidence of Roku Mihinui, Chief Executive Officer of Te Arawa Lakes Trust, 19 November 2010, at paragraph [14].

167. While supporting the retention of the Okere Gates and Ohau Weir at that time; Te Arawa Lakes Trust has concerns about the elevated groundwater levels and surface flooding in Hinehopu (Tamatea Street) and the impacts this has on property amenity and potentially occupier health.¹¹⁷
168. Te Arawa Lakes Trust representatives also noted that there were adverse cultural effects arising from managed lake levels – such as the inability to carry out rama koura.¹¹⁸
169. In relation to kaitiaki matters, it is acknowledged by Te Arawa Lakes Trust that tāngata whenua are the mandated bodies to convey the position in respect of kaitiakitanga of the Lakes and Rivers and that tāngata whenua consider the mauri of the Lake is best protected by a return to more natural lake levels and flows.¹¹⁹

5.3. Ngāti Pīkiao Concerns

5.3.1. Artificial Control of Lake Levels

170. The people of Ngāti Pīkiao are proud and grateful to their ancestors for their gift of occupation, use and connection to Lake Rotoiti. Over the last 20-30 years there has been an upsurge of resentment towards the installation of various man-made structures associated with the lake that have had a negative influence on the surrounding environment.

“Since these gates were put in, rising lake levels have destroyed all of the beaches that once were in all the bays of Rotoiti. The level of the lake is so high that erosion is now a problem and our whenua is falling into our moana, altering many of our sites of significance and changing the landscape as we know it.” – Te Ariki Morehu¹²⁰

171. The effect of the current narrow lake level range is to destroy beaches and encourage dense lake weed growth to the light tolerance depth. The proliferation of lake-weed has made chemical spraying necessary resulting in decaying vegetation that causes odour problems. The destruction of beaches has removed habitat essential for ecological processes and the full enjoyment of Lake Rotoiti by Ngāti Pīkiao (koura are more difficult to gather, there are no longer beaches for whanau or for safe travel along the Lake edge).
172. Ngāti Pīkiao have “consistently sought a return to more natural lake levels and flows which are seen to be in the best interests of the mauri of the

¹¹⁷ Statement of Evidence of Roku Mihinui, Chief Executive Officer of Te Arawa Lakes Trust, 19 November 2010, at paragraphs [22] and [28].

¹¹⁸ Personal comment by Roku Mihinui, at 4 December 2015 hui.

¹¹⁹ Statement of Evidence of Roku Mihinui, Chief Executive Officer Te Arawa Lakes Trust, 19 November 2010, at paragraph [16].

¹²⁰ Statement of Evidence of Te Ariki Morehu (English version), In the matter of claims in the Central North Island Inquiry (Wai 1200), 7 February 2005, at paragraph [32].

lakes".¹²¹ Ideally Ngāti Pikiao would like the Okere Gates and Ohau Weir to be removed.¹²² It is recognised that this outcome is not a matter that can be achieved through the review of the consents. In saying this, what is really being sought by Ngāti Pikiao is that the Lake levels fluctuate in accordance with natural fluctuation. Ngāti Pikiao would like the Council to consider if this is something that can be achieved with the structures in place but not used (e.g. gates left open and weir not used).

5.3.2. Loss of Beaches

173. A key consequence of the maintenance of high lake levels has been the loss of beaches.

"When I was growing up we had a beautiful beach at Ruato Bay. It was a really nice clean beach where we shared it with everybody who came and stopped along the road to have a swim or just have a picnic. Today that doesn't happen, simply because we don't have a beach and now it's just a grass verge right to the edge of the water." – **Ngawhakawairangi Hohepa**¹²³

174. The loss of beaches can be seen pictorially when comparing historical photographs with current photographs, for example at Korokitewao:



Photograph 16 – Korokitewaho – then¹²⁴



Photograph 17 – Korokitewaho – now¹²⁵

¹²¹ Statement of Evidence of Roku Mihinui, Chief Executive Officer of Te Arawa Lakes Trust, 19 November 2010, at paragraph [16].

¹²² Submission on behalf of Ngāti Pikiao, presented by Joe Tahana, to the Bay of Plenty Regional Council Hearings Committee, 8 December 2010.

¹²³ Personal comment of Ngawhakawairangi Hohepa during interview on 6 November 2015.

¹²⁴ Korokitewaho – Tapuaeharuru, Matawhaura Bluff, Lake Rotoiti, date unknown, courtesy of Rotorua Museum Te Whare Taonga o Te Arawa (CP-396).

¹²⁵ Korokitewaho – Tapuaeharuru, Matawhaura Bluff, Lake Rotoiti, Photo Taken by Wairangi Whata, 13 December 2015.

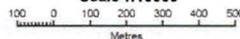
175. The loss of beaches is a direct result of the high lake levels.¹²⁶ An aerial photograph showing the changes in the extent of the beaches from the 1970's to today was prepared by the Council and is set out below.



HORIZONTAL DATUM: New Zealand Geospatial Datum 2000
 For practical purposes, NZGD2000 equates to WGS84
 VERTICAL DATUM: Mafuriki
 PROJECT ION: New Zealand Transverse Mercator 2000
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Korokitewao Bay, Lake Rotoiti

Scale 1:10000



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 Sheet 1 of 1
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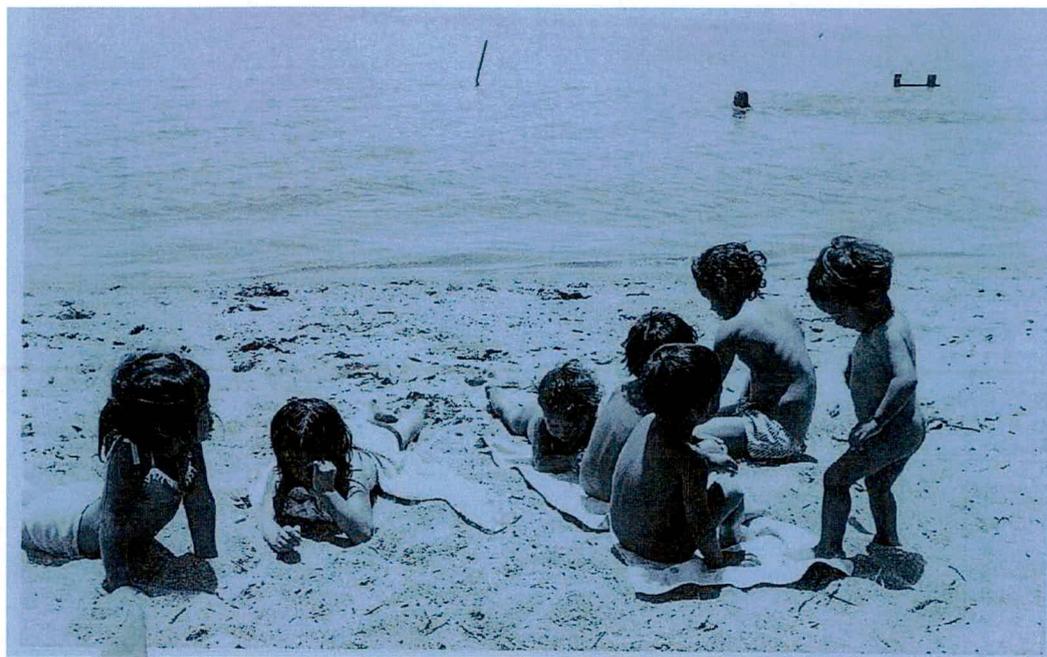
Photograph 18 – Aerial photographs of Tamatea Street – then and now¹²⁷

5.3.3. Loss of Safe Recreational Areas

176. With the loss of the beaches Ngāti Pikiao, and indeed the wider public, have lost key recreational areas beside the lake. The beaches used to provide safe areas for picnics, volleyball, walks and general recreation.

¹²⁶ McMillan, O Investigation of Reduced Lake Water Level Range on Beach Erosion and Bank Formation, and Implications for the Okere Flood Gates at Rotoiti (Department of Civil Engineering, University of Auckland, 2013), sections 3.1 and 4.

¹²⁷ Photograph supplied by the Council on 21 December 2015 via email from Trig Gates at 3:34pm.



Photograph 19 – Beach at Ruato Bay¹²⁸

177. However, now with no beach area, these opportunities are lost and there are safety concerns for those wishing to access the Lake given the lack of space for footpaths and the proximity of State Highway 30.

"...we used to have a little narrow path, a beach that we used to walk down to Tapuaeharuru because that was the safest way to get down to the pa." – Joe Tahana¹²⁹

5.3.4. Impacts on People

178. The artificial controls imposed on the Lake and the inability of Ngāti Pikiao to manage their taonga according to their tikanga has caused adverse effects on its people. Living with the burden of the controls has caused frustration, disempowerment, and disappointment, and has constrained Ngāti Pikiao's ability to fully carryout kaitiakitanga and manākitanga responsibilities:

"If my parents could only see the lake now, they would be very disappointed with us for allowing the degradation that has occurred..."

We continue to have foreign ideas of conservation imposed upon us by those who refuse to listen to us...

Swans and Canadian Geese are also a continuing problem. Though we have complained about the increases in the swan population and the detrimental effect they have on our lake, we are still not allowed to shoot them. We are forced to standby as they keep soiling our lakes...

¹²⁸ Photograph of Te Rangi Whanau taken in the 1960's, supplied by Joe Tahana.

¹²⁹ Personal comment of Joe Tahana during interview on 9 November 2015.

Our main frustration continues to be the fact that nobody listens to us. For these reasons, I have not found that being on the Scenic Reserves Board or the Lakes Clean-up Committee has really been effective for my people. We remain unheard and more often than not, we are outvoted. – **Te Ariki Morehu**¹³⁰

179. The artificially high lake levels have also meant that the Lake is not able to be used and enjoyed in the same way it has been previously and that in-turn has resulted in a loss of traditions and heritage for the current generations:

"...in terms of beaches you know all the family around the lake had their own beach, their own special beach... [a]nd that's the sad part. My daughter, she's 13 and the eldest is 21, they'll never know beaches. That's a tragedy. They've lost out on their heritage...they're entitled to have a look at what a beach looks like in their own way but somebody's taken that away from them" – **Joe Tahana**¹³¹

"Our enjoyment has gone, our children can't enjoy their lives here" – **Hakopa Paul**¹³²

5.3.5. Flooding

180. The constantly maintained high water levels have resulted in flooding at a number of locations around Lake Rotoiti. This has impacted houses, marae, open space areas, and has also resulted in a number of sewage and sewage reticulation issues around the Lake.¹³³

"Around about 2012 2013 there was a house at Otaramarae where the Lake level rose to floorboard level... the family eventually had to move out..." – **Tawhiri Morehu**¹³⁴

181. Some specific examples are discussed in the case study section below.

5.3.6. Wāhi Tapu

182. Wāhi tapu enforces the connection Ngāti Pikiao has to the whenua and moana. Many wāhi tapu have previously been subjected to damage and there is continuing apprehension amongst tribal members that particular areas are vulnerable to further desecration if Lake levels remain high. In particular:

- (a) some wāhi tapu are now underwater:

"...when we talk wāhi tapu it's something we've kept to ourselves as a people... the want is for people to be culturally sensitive... I mean right around to the base of our mountain here "Matawhau" you know there were heaps of wāhi tapu. Most of them now are submerged under water and it's

¹³⁰ Statement of Evidence of Te Ariki Morehu (English version), In the matter of claims in the Central North Island Inquiry (Wai 1200), 7 February 2005, at paragraphs [33], [37], [38] and [42].

¹³¹ Personal comment of Joe Tahana during interview on 9 November 2015.

¹³² Personal comment of Hakopa Paul at Ngāti Pikiao hui 4 December 2015.

¹³³ This concern was raised during a Steering Group meeting in December 2012 and recorded in a Draft Memorandum from Ohau Diversion Wall Cultural Advisory Panel to Lakes Programme Steering Group on Lake Rotoiti Issues, 11 December 2012.

¹³⁴ Comment made in email from Tawhiri Morehu to Joe Tahana on 10 March 2016.

sad because we can talk to our children about different places but we can't take them there because it's all under water now." - **Timi Te Po Hohepa**¹³⁵

- (b) some wāhi tapu are located in areas at risk of flooding/exposure due to the high water table:

"Huruhuru is one of our tūpuna and she's buried in a non-descript place. You'll see this really nice manicured lawn in front of this big property and in the corner there's this un-kept fenced section and that's where she is. And I just wondered... you know whether the raising of the water table (it) may flood there." - **Piki Thomas**¹³⁶

"I think our biggest fear is that as the lake gets higher and higher is... that whole thing will start coming back in and lifting up the ground again. Whereas ...when we didn't have the gates, the natural connection between Huruhuru and the lake was through little channels. Well those are gone now... we're not too sure what will happen... the old bones will come up again. And I think that's our biggest worry is that some of those old things that are still underneath... will be exposed by the high water table."

"And that... that one would be at risk in the next 20 years because that's lower than Kakanui. Kakanui's up... on the top of the hill, whereas that one there's on the side, lot more closer to the lake and it's on the sloping part so... once that lake just starts eating and eating and eating away... years say like in the next 50-60 years... that urupa will be at risk.

Well... a lot of bodies could... start turning up in the lake... if we don't address that stuff right now." – **Hakopa Paul**¹³⁷

5.3.7. Erosion

183. A key concern of Māori landowners adjoining the Lake has also been the significant tracts of land which are being eroded away by the high Lake levels.
184. Photographs taken at Tawhakarere Bay illustrate this erosion:

¹³⁵ Personal comment of Timi Te Hohepa during interview on 6 November 2015.

¹³⁶ Personal comment of Piki Thomas during interview on 12 November 2015.

¹³⁷ Personal comment of Hakopa Paul during interview in February 2016.



Photograph 20 and Photograph 21 – Lakeside erosion at Tawhakarere Bay¹³⁸

185. The Taheke marae case study also includes a section on the erosion issues that it and an adjoining property have faced.

5.3.8. Impacts on Food Sources

186. The higher lake levels have also had detrimental impacts on traditional food sources:

- (a) it is more difficult now to access kaimoana beds as you have to go out further;¹³⁹
- (b) prior to the Gates/Weir it was possible to gather kakahi and rama koura in water which was only about knee deep;¹⁴⁰ and
- (c) some tuna holes have been lost.¹⁴¹

187. These impacts are compounded by Ohau Diversion Wall which is blocking/making it difficult for inanga to travel up-stream.¹⁴²

5.3.9. Loss of Koropungapunga (Pumice Stone)

188. Prior to the installation of the Gates and Weir the beaches used to provide an abundant supply of koropungapunga (pumice stone). Now that the beaches have been lost so too has the pumice.¹⁴³

¹³⁸ Photographs supplied by Arapeta Tahana, March 2016.

¹³⁹ Personal comment of Te Rata Eapara during interview on 9 November 2015.

¹⁴⁰ Comment made in email from Tawhiri Morehu to Joe Tahana on 10 March 2016.

¹⁴¹ Comment made at Ngāti Pikiao hui 4 December 2015.

¹⁴² Personal comment Fred Whata, President of Ngāti Pikiao Environmental Society Incorporated, 27 October 2015; and Statement of Evidence of Anthony Waiomio on behalf of Ngati Te Takinga, 22 April 2005, (Wai 1200), Central North Island Inquiries, at paragraph [5(i)].

5.3.10. Weeds

189. Since the controls on Lake Rotoiti were put in place, tāngata whenua have observed a significant increase in the presence of weeds on the Lake bed:

"I remember as a child you could climb the hill here in Ruato and look down and see the bed of the Lake well now you can't all the weed that's in there..." - Timi Te Po Hohepa¹⁴⁴

190. The loss of beaches and the maintenance of water levels within a narrow range has also meant that grasses and weeds are now growing right up to the Lake edge.



Photograph 22 – Grass and weeds at Lake edge, Tapuaekura¹⁴⁵

191. It is noted that to address the weed issues, the Council has proposed the use of herbicide which in Ngāti Pikiao's view would create further issues in terms of it polluting the mauri of the water and the relationship of Ngāti Pikiao to the Lake.

5.3.11. Water Quality Issues

192. Since the Okere Gates and Ohau Weir have been in place Ngāti Pikiao have also noticed a loss of water clarity and a build-up of siltation:

"...what we used to do was, from one side of the bank to the other we'd all line up, we'd have rocks and we'd all be walking on the bottom of the Ohau from one bank to the other underwater, so we're all looking at one another and it's a race so

¹⁴³ Personal comment of Te Rata Epapara during interview on 9 November 2015.

¹⁴⁴ Personal comment of Timi Te Hohepa during interview on 6 November 2015.

¹⁴⁵ Tapuaekura, Lake Rotoiti, Photo Taken by Wairangi Whata, February 2016.

you're racing across the bottom of the river and my memory of that was how clean the river was, how the bottom of the river wasn't silted at all... if you have a look at it today its shallow and its silted." – **Laurence Tamati**¹⁴⁶

193. There is no doubt that water quality is a major issue facing the lakes. In relation to this issue, as far as we are aware, there is no information to suggest that water quality would be compromised by enabling the lake levels to be managed in accordance with more natural fluctuations. Rather, through the process, we heard suggestions from tāngata whenua that amending the regime to provide for natural fluctuations may provide water quality benefits (if for example a return to fluctuations was effective in eradicating some of the weed). If this is the case, this would be a strong consideration in our view.

5.4. Long Standing Concerns

194. Concerns of Ngāti Pikiao have been expressed with the Crown and the Council on various occasions. Some examples include:

- (a) the Minister of the Environment when Ngāti Pikiao (unsuccessfully) applied to be appointed a heritage protection authority in respect of the Kaituna River:¹⁴⁷

"Without acknowledgement of HPA status, the mana of Ngāti Pikiao will continue to be eroded. This wāhi tapu is not being respected and Ngāti Pikiao iwi are bearing the brunt of the consequences."

- (b) the Waitangi Tribunal during the Central North Island inquiry:¹⁴⁸

"Te Ariki Morehu told us about his frustration at the management practices of statutory authorities during their various and many historical attempts to deal with nitrates, weed, and other pollutants entering Lake Rotoiti via the Ohau Channel from Lake Rotorua.⁶⁸ He also told us about the works at Okere Falls. He alleged that this had occurred with minimal tāngata whenua participation." [footnotes excluded]

- (c) the Council during the consent renewal process (in correspondence, submissions and evidence);¹⁴⁹ and

¹⁴⁶ Personal comment of Laurence Tamati during interview on 4 November 2015.

¹⁴⁷ Te Runanga o Ngāti Pikiao, Application to become Heritage Protection Authority, 21 April 1994.

¹⁴⁸ He Maunga Rongo – Report on Central North Island Claims Stage One (Volume 4), Waitangi Tribunal, Wai 1200, 16 June 2008, at pages 1414 - 1415.

¹⁴⁹ Refer: Submission on behalf of Ngāti Pikiao, presented by Joe Tahana, to the Bay of Plenty Regional Council Hearings Committee, 8 December 2010; Letter from Joe Tahana on behalf of Ngāti Pikiao Mandated Representatives to Ken Tarboton, 65979 & 65980 Okere Gates and Ohau Weir, 30 November 2010; and Statement of Evidence of Dr Te Kipa Kepa Brian Morgan, Ngāti Pikiao, undated.

- (d) the Council following the grant of consent in hui such as that occurring between members of Ngāti Pikiao and the Council in January 2013 where the concerns were expressed as follows:¹⁵⁰

"[Ngāti Pikiao]

a) are concerned about the cumulative effects and wider implications of the Okere Gates operations and Rotoiti lake levels. Ngāti Pikiao have been expressing their views, and concerns for over 30 years.

b) are adamant that the Okere Gates is having a negative impact on water quality.

c) were not happy with the consent process and question whether the process was transparent.

d) they believe there are unresolved technical discrepancies. There has been too much emphasis on quantitative data (numbers).

e) they would like a 3 year trial to lower lake levels. Through the trial Ngāti Pikiao want to see if there are positive impacts such as whether the beaches will re-establish, or if weed problems and fish species improve.

f) they believe there are two conflicting views – iwi and the lake communities including the Lake Rotoiti Community Association. The association is concerned with access to jetties and not environmental impacts. Jetty owners are mainly non-residents, they live away from the lake.

g) they believe flushing does not work..."

- (e) the Council with the lodgement of Te Taiao o Te Whatuoranganuku Ngāti Tamateatutahi Ngāti Kawiti Hapu Environmental Management Plan 2015, which states:¹⁵¹

"Fluctuating lake levels have been a major concern for Ngāti Pikiao, with western science and local knowledge not always seeing eye to eye. Of particular concern has been the loss of beaches along the shores of Lake Rotoiti and Lake Rotomā. This is illustrated in an earlier black and white photograph of Tapuaeharuru Bay (1954). The demise of the shore area of some of our favourite swimming and mahinga kai areas from Tapuaeharuru to Korokitewao has been noticeable over the years. Some hapū members attribute this to the operation of the Okere Radial Gates, which control the level of Lake Rotoiti and Lake Rotorua."

5.5. Process Concerns

195. As well as having concerns regarding the impacts arising from the presence and operation of the Okere Gates and Ohau Weir, Ngāti Pikiao also has some process concerns that they wish to be recorded in this Plan.

¹⁵⁰ Notes of the Meeting between Members of Ngāti Pikiao and BOPRC, held at BOPRC Rotorua Office, 24 January 2013, section 2.

¹⁵¹ Te Taiao o Te Whatuoranganuku Ngāti Tamateatutahi Ngāti Kawiti Hapu Environmental Management Plan 2015, at page 36.

196. The first concern relates to the treatment of Ngāti Pikiao's expert evidence:
- (a) Ngāti Pikiao's proposed performance measures were disregarded or discounted in favour of "hard science". An example is contained in the evidence of Mr Robbin Britton for the 2010 renewals hearing:¹⁵²
- "...many of the Ngāti Pikiao performance measures were based on anecdotal evidence implying Lake Rotoiti levels were lower in the past than that indicated by the historical record. However historical lake level records were peer reviewed and found to be accurate."*
- (b) Evidence provided by Dr Kepa Morgan was criticised as not being "sufficiently objective or impartial",¹⁵³ and as a result very little if any consideration was given to the matters raised in that evidence.
197. A further concern was that evidence relied on by the Council, and in particular the NIWA record, was compromised as the record was adjusted when the measuring location was changed.¹⁵⁴ However, again, it appears that very little (if any) consideration was given to this point.
198. The purpose of raising these points here, is because Ngāti Pikiao wishes to ensure that any future process where cultural matters are considered, (including the consideration of this cultural management plan), takes a more appropriate, constructive and balanced approach.

¹⁵² Statement of Evidence of Robbin James Britton, Principal, Britton Consultants Ltd, November 2010 at paragraph [25].

¹⁵³ Statement of Evidence of Robbin James Britton, Principal, Britton Consultants Ltd, November 2010 at paragraph [26].

¹⁵⁴ Statement of Evidence of Dr Te Kipa Kepa Brian Morgan, Ngāti Pikiao, undated at paragraph [18]; and personal comment Dr Kepa Morgan, 4 December 2015.

6. CASE STUDIES

6.1. Taheke Marae¹⁵⁵

199. Taheke marae is located at 119 Okere Road, and is the closest marae to the water. Taheke marae is to home Ngāti Hinerangi.
200. Ngāti Hinerangi feel they have suffered the brunt of the man-made structures connected to Lake Rotoiti and the Ohau Channel. Ngāti Hinerangi suspected their area of the Lake would be a buffer zone and would experience negative impacts which they thought might be acceptable on the basis that their sacrifice was for the betterment of the whole Lake. What was not expected was the overwhelming extent of the impacts on the marae which is today suffering both culturally and financially.

"You know we wanted to make sure we played our part... we understand that it may have leached really up to the far end of Rotoiti. We didn't want that to happen so we said oh well we'll support it in the efforts of trying to clean up Lake Rotorua. ...(At) the same time don't put all this paru water right up to our (part of the) lake. At the same time we knew that we'd receive all the rubbish right on the front of Taheke Marae and it's probably ended up that way. First couple of years, really brilliant green, the algal bloom. ...when the algae dies... it was stink and we still have problems. ...we've been... in an adhoc manner going to the Council and Regional Council to say come and clean (up our area). If we have the Poukai down there we ask them to come and clean our foreshore up and they do. But still we want it to get back to the nice pristine position. ...[T]hose are some of the impacts we've been facing as a Marae. The silt, the erosion." – Piki Thomas¹⁵⁶

201. The significant adverse effects Taheke marae experiences as a result of the high water levels include:
- (a) erosion and actual loss of land;
 - (b) surface flooding;
 - (c) sedimentation, siltation and rubbish build up;
 - (d) loss of mātauranga and relationship with a naturally fluctuating lake;
 - (e) loss of wāhi tapu references; and
 - (f) a loss of identity.
202. Significantly, Taheke Marae has had to contend with the financial burden of installing and maintaining a retaining wall on their lakeside boundary as a direct result of the maintained lake levels, the eventual cancellation of a significant cultural event, the accumulation of debris within the confines of

¹⁵⁵ Material in this section was supplied by Wairangi Whata and Piki Thomas.

¹⁵⁶ Personal comment of Piki Thomas during interview on 12 November 2015.

their Lake interests; and the concerns over future investment needed to alleviate or resolve these issues for the long-term sustainability of the marae.

6.1.1. Erosion

203. Erosion on the lakeside boundary of Taheke Marae has caused the loss and degradation of marae land. These effects have led to Taheke marae having to install and maintain a retaining wall at its own cost.



Photograph 23 – Taheke marae water's edge before the retaining wall was built¹⁵⁷

204. While part of the cost (75%) was paid by the New Zealand Transport Agency this was to offset other monies owing to the marae. So while the marae only had to directly pay 25% of the cost, it effectively bore the full cost of the works.

¹⁵⁷ Photograph supplied by Piki Thomas in January 2016.



Photograph 24 – Taheke marae retaining wall post installation¹⁵⁸

205. After four years it is showing signs of failure. Water is penetrating behind the wall potentially requiring the marae to invest additional funds for repair or replacement.

"...for the marae down at Taheke.... we've noticed that there's been quite a bit of erosion on the front of our lakeside boundary and we've put in a retaining wall and even that's starting to erode out as well.... that's one of the negative impacts that we've seen in there." – Piki Thomas¹⁵⁹

¹⁵⁸ Photograph supplied by Piki Thomas in January 2016.

¹⁵⁹ Personal comment of Piki Thomas during interview on 12 November 2015.



Photograph 25 – Taheke marae retaining wall erosion¹⁶⁰

"...one of the biggest impacts that the raising of the lake is that it's... not just our properties but a lot of the properties around the lake are starting to erode around the banks and so it's not unusual for some of the properties, their sections are in the lake now and one of the at risk properties that we have down home is our marae, where even the retaining bank is not able to hold the water so what's happening now (is) the water's getting behind the retaining bank... a lot of the areas around the marae are starting to erode back in to the lake." – Hakopa Paul¹⁶¹

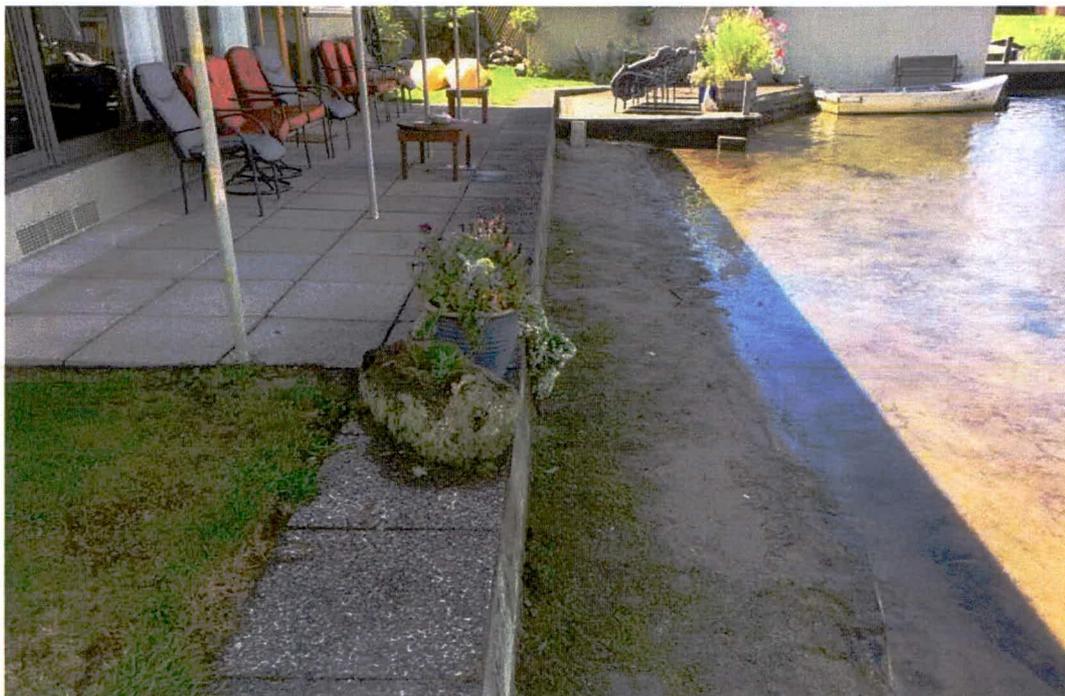
206. A neighbouring property owned by local whanau and currently operating under a land lease agreement has suffered a great deal of erosion amounting to metres of land being consumed by Lake Rotoiti.

"...the next door house as you come into the back of the marae, the property to the left of the marae. ...half of its property is in the lake... Now the house is only about a metre (from the lake). "...there was a lawn in front of the house. So we're looking at what - 30 years, 35 years since those gates have been up so that property which is leased ...the whanau still own the land... by the time they get their property back, probably half of that land will be in water." – Hakopa Paul¹⁶²

¹⁶⁰ Photograph supplied by Piki Thomas in January 2016.

¹⁶¹ Personal comment of Hakopa Paul during interview in February 2016.

¹⁶² Personal comment of Hakopa Paul during interview in February 2016.



Photograph 26 – Taheke Road neighbouring property, Lake Rotoiti¹⁶³

207. The photograph below shows the boundary peg for the neighbouring property is now located in the Lake itself.



Photograph 27 – Taheke Road neighbouring property boundary peg, Lake Rotoiti¹⁶⁴

¹⁶³ Photograph supplied by Wairangi Whata in February 2016.

¹⁶⁴ Photograph supplied by Wairangi Whata in February 2016.

6.1.2. Surface flooding

208. During heavy periods of rain Taheke Marae is susceptible to surface flooding. The poukai which is a significant annual cultural event in Ngāti Pikiao was suspended in early 2015 due to excess water around the atea affecting cultural protocols.

"Do you notice when it rains now for any length of time, it floods... it floods over there in front of the meeting house... (It) floods quickly". – Elaine Thomas¹⁶⁵

"Yeah it does. The last Poukai, we had to call it off." – Piki Thomas¹⁶⁶

"I'm not too sure what the meeting was, it might have been the Poukai. Yep we had to... actually call it quits because the water was just gathering. We had to cut it short because people were already standing in water." – Hakopa Paul¹⁶⁷

209. Another area prone to surface flooding is the land that sits between the whareniui and the Lake. It is a collection point for stormwater flow and run-off generating pools of water.

"...what happens is that you've got water coming down from the hills and you've got the lake up there so what you have is a gathering place on the marae, no way for the water to drain out into..." – Hakopa Paul¹⁶⁸



Photograph 28 – Rear car park Taheke marae¹⁶⁹

¹⁶⁵ Personal comment of Elaine Thomas during interview on 12 November 2015.

¹⁶⁶ Personal comment of Piki Thomas during interview on 12 November 2015.

¹⁶⁷ Personal comment of Hakopa Paul during interview in February 2016.

¹⁶⁸ Personal comment of Hakopa Paul during interview in February 2016.

¹⁶⁹ Photograph supplied by Wairangi Whata – February 2016.

6.1.3. Sedimentation and Siltation

210. The marae also experiences problems with sedimentation and siltation. In particular, there has been an issue with siltation in the stormwater drain:

"Certainly (we've) seen the build-up of... the storm water drain comes out right next to the pa, the amount of silt that builds up there, ... and we ask them (Council) to come down and clean that all the time." – **Piki Thomas**¹⁷⁰

211. There is also a build-up of rubbish (including oil containers) flowing downstream from the Gates and collecting on the edge of the marae.

"Okay I would say in the last 12 months it's been a lot better but it wasn't... I mean every year just collects rubbish, plastics and algae. ...even EBOP had to come out to get our digger there to take some of the rubbish away." – **Hakopa Paul**¹⁷¹

6.1.4. Loss of Identity

212. Traditionally Ngāti Pikiao relied heavily on its native fish species and native vegetation to survive. Ngāti Hinerangi in particular closely identify with the native toitoi plant.

"...when we grew up there was, around the other end anyway, there was a lot of beach areas around the lake and around the water and around the river. ... it was a good habitation for the cockabully and the whitebait or inanga. We hardly see that down the Okere arm now. In fact we don't even see the toitoi which is what we are named after – the "Nga toitoi o Okere" and so I guess we've lost part of our identity in terms of the toitoi. We have a saying back home – "kotahi te toitoi e hia nga inanga ka kai Hinerangi upoko maro" – **Hakopa Paul**¹⁷²

¹⁷⁰ Personal comment of Piki Thomas during interview on 12 November 2015.

¹⁷¹ Personal comment of Hakopa Paul during interview in February 2016.

¹⁷² Personal comment of Hakopa Paul during interview in February 2016. Timi Te Po Hohepa advises that the following is the more formal version of this saying: "Kotahi te toitoi e hia nga inanga ka kaingatia, Ngāti Hinerangi upoko maro".

6.2. Ohau Channel¹⁷³

213. For the hapū Ngāti Te Takinga, modifications to the Ohau Channel have resulted in a noticeable build-up of sedimentation at the base of the river. This has caused concerns around safety when swimming and has impacted on customary fishing practices.
214. In 2007 NIWA reported that the river channel works contributed to the reduction in the abundance of certain mahinga kai species in the river.¹⁷⁴ Hence the recreational merits and associated customary practices for tāngata whenua are slowly diminishing.

"It's just a shame that the beautiful river that was given to us... it's gone all dirty and polluted." – **Elaine Thomas**¹⁷⁵



Photograph 29 – Ohau Channel¹⁷⁶

¹⁷³ The information in this section was provided by Wairangi Whata.

¹⁷⁴ NIWA, Taonga and Mahinga Kai Species of the Te Arawa Lakes: A Review of Current Knowledge – Koura, NIWA Project TACF062, July 2007.

¹⁷⁵ Personal comment of Elaine Thomas during interview on 12 November 2015.

¹⁷⁶ Photo sourced from Bay of Plenty Regional Council, Rotorua Lakes Education Resource document, available at: <http://www.boprc.govt.nz/media/34201/teachers-090520-lakesresourcepart3historyandcultureactivities.pdf> and reproduced with the Council's permission.

6.2.1. Sedimentation

215. Increased sedimentation in the Ohau Channel has removed some of the recreational benefits enjoyed by the people of Ngāti Te Takinga. In addition it has added an element of risk especially for the younger generations.

"...we looked after one another really and the bottom of the river back then wasn't silted... we'd all line up, we'd have rocks and we'd all be walking on the bottom of the Ohau from one bank to the other underwater, we're all looking at one another and it's a race... And my memory of that was how clean the river was, how the bottom of the river wasn't silted at all..." - Laurence Tamati¹⁷⁷

"...everywhere was nice to swim but now you (have) got to pick and choose the places that are safe and it's not dirty or silted..." - Piki Thomas¹⁷⁸

6.2.2. Mahinga Kai

216. The river was a traditional mahinga kai for tāngata whenua. It provided ideal conditions for cultivating inanga and koura. These freshwater species were considered delicacies by the people of Ngāti Pīkiao. Over the years there has been a rapid decline in koura and inanga populations.

"The same with the koura. There's not a lot of koura down there at all either. The kids do go in there and... put their hands in the banks, but as I remember it what they get now compared to what we got back then it's not the same it's definitely not the same." - Laurence Tamati¹⁷⁹

"I used to remember when my grandmother used to wash the clothes in the river... she used to put in her whitebait net... wash her clothes downstream and when... she finish(ed) washing her clothes she used to pull her net out. She'd have a half a bucket so she used to go home with about two buckets in the day when they were running and then she would bag them, put some away and then feed some out to some of the families... and that was around about the mid-1970s. Fast-forward to 2010, you can hardly get a half a pot... that's really sad." - Roland Kingi¹⁸⁰

¹⁷⁷ Personal comment of Laurence Tamati during interview on 4 November 2015.

¹⁷⁸ Personal comment of Piki Thomas during interview on 12 November 2015.

¹⁷⁹ Personal comment of Laurence Tamati during interview on 4 November 2015.

¹⁸⁰ Personal comment of Roland Kingi during interview on 9 November 2015.

6.3. Rakeiao Marae

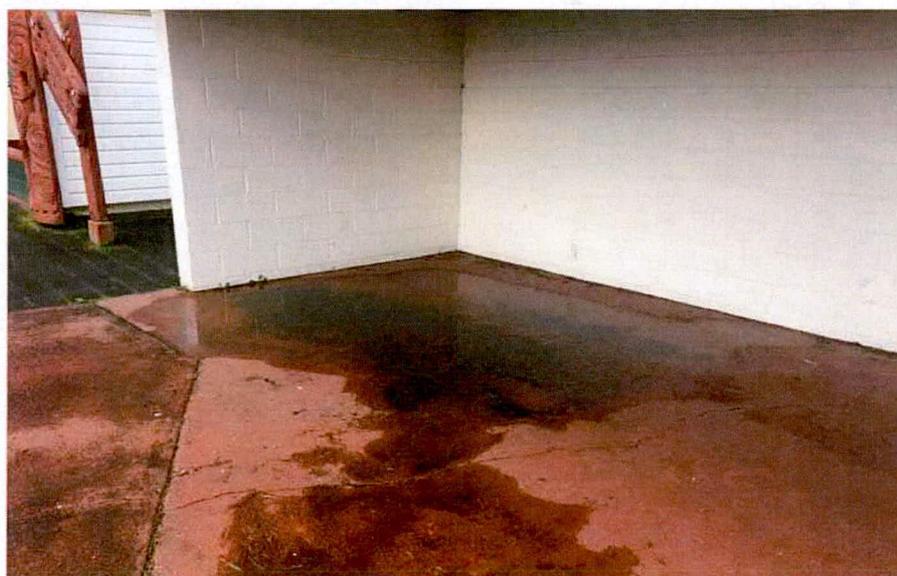
217. The high Lake level has created a constant struggle for whanau of Ngāti Rongomai who have exerted great effort to ensure the integrity of the marae is preserved and continues to exist for future generations. The main impact to the marae has been surface flooding. Throughout the last 20 years the whanau have tackled the issues flooding has inflicted on the marae.

"So you know we're going over and above what a marae would normally do but for us it's about sustainability... when we're gone it will be sustainable... We've just had to deal with our problems and come up with a solution... And it's all about keeping it for the next generation and hopefully the next generation after that." – Horiana Curtis¹⁸¹

6.3.1. Structural Works

218. During heavy rain the marae grounds would be consumed by water which led to the frequent flooding of marae buildings and regular replacement of internal fittings. As a result in the late 1990s major structural works were undertaken to raise Rakeiao.

"Yes our buildings were getting overtaken by the water and the water just sat there so we lifted our wharenuui... 1996-1997 the wharenuui was lifted and re-piled and I also remember the floor had to be done as well. They had to strengthen all the floor joists to take the new floor. ...all our new buildings, like the whare karakia, that was getting flooded regularly and all the other issues that go with it...we replaced carpets three or four times... (if) we couldn't afford it we just sort of opened the place and dried it out..." – Tewi Curtis¹⁸²



Photograph 30 – Flooding at Rakeiao Marae¹⁸³

¹⁸¹ Personal comment of Horiana Curtis during interview in February 2016.

¹⁸² Personal comment of Tewi Curtis during interview in February 2016.

¹⁸³ Photograph supplied by Wairangi Whata in February 2016.

219. The raising of Rakeiao prevented internal saturation of the whareniui however surface flooding continued to exist around the marae grounds. In 2006 the committee made the decision to install a drainage system to ease the excess water situation.

"... the marae had to fork out big money to put in a drainage system... It was about... getting close to twenty grand to put in a drainage system..." - Tewi Curtis¹⁸⁴



Photograph 31– Flooding of Rakeiao Marae grounds¹⁸⁵

220. Old and damaged toilets coupled with a high water table caused the leaching of sewerage from the septic tank. So in 2012 it was decided to build a new ablution block. This work was completed in 2013.¹⁸⁶

6.3.2. Financial Impact

221. Rakeiao Marae has suffered huge financial costs to alleviate the impacts of high Lake levels. In the early days they relied heavily on financial support from whanau and the success of Rotoiti Tours, a family operated tourism venture. In recent times the marae committee has used the support of charitable organisations.

"In those days we had raffles, batons up and housie... Whatever it took, golf tournaments, whatever it took." – Tewi Curtis¹⁸⁷

¹⁸⁴ Personal comment of Tewi Curtis during interview in February 2016.

¹⁸⁵ Photograph supplied by Wairangi Whata in February 2016.

¹⁸⁶ Personal comment of Horiana Curtis during interview in February 2016.

"Marae had to just get money together and pay for stuff... we hadn't actually used (charitable) funding until we had to get our toilets... so for all the (previous) work that's been carried out its been the money we've got from Rotoiti tours and everyone just making time to (do) fundraising. So it is sort of a little family effort" – **Horiana Curtis**¹⁸⁸

222. In spite of all the dedication and effort by the marae committee and whanau of Ngāti Rongomai they continue to suffer the effects of high lake levels at Rakeiao.

"... it (still) floods around the whare ... we're on a grinder pump now for our new toilets... but that still happens. The church is concrete so it still sinks. ... It's a concrete slab so it will keep sinking... But even mowing the lawns... it was pretty easy. It was damp but it wasn't as wet as it is now." – **Horiana Curtis**¹⁸⁹



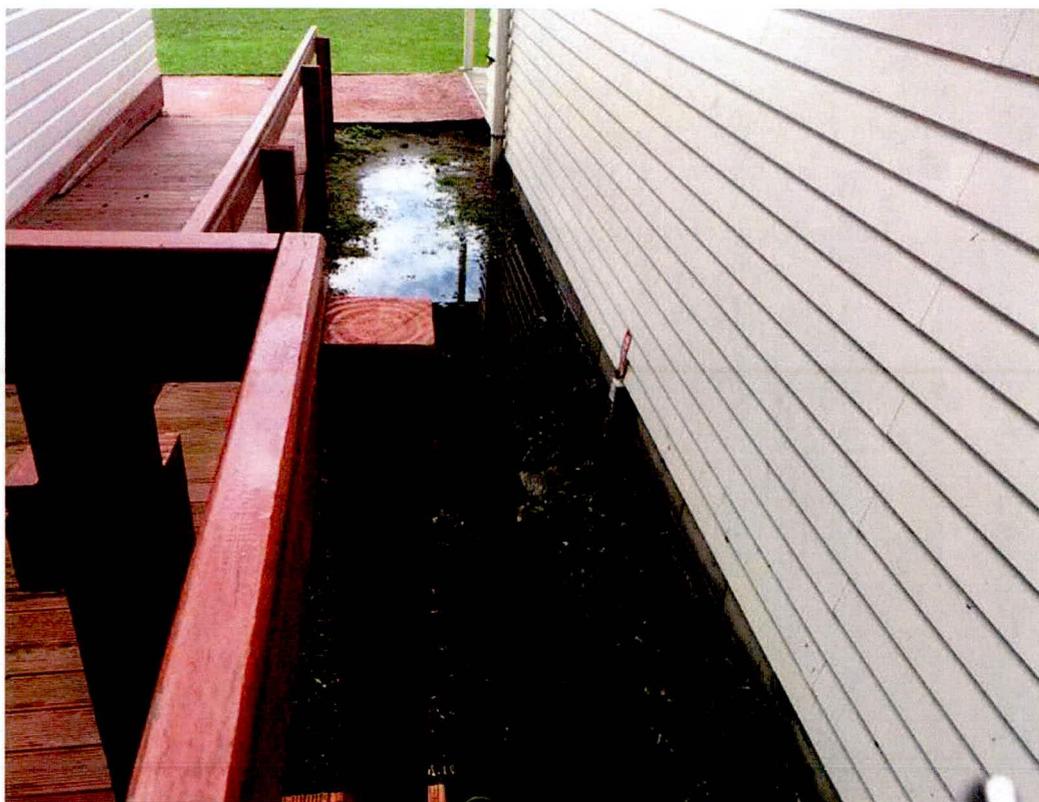
Photograph 32 – Ablution block flooding, Rakeiao Marae¹⁹⁰

¹⁸⁷ Personal comment of Tewi Curtis during interview in February 2016.

¹⁸⁸ Personal comment of Horiana Curtis during interview in February 2016.

¹⁸⁹ Personal comment of Horiana Curtis during interview in February 2016.

¹⁹⁰ Photograph supplied by Wairangi Whata in February 2016.



Photograph 33 – Ablution block flooding, Rakeiao Marae¹⁹¹

223. The determination of Ngāti Rongomai to ensure the long term sustainability of their marae is driven by their responsibility as kaitiaki to continue the legacy left by their tūpuna for future generations. A sentiment that is echoed throughout Ngāti Pikiao.

¹⁹¹ Photograph supplied by Wairangi Whata in February 2016.

6.4. Ruato Bay

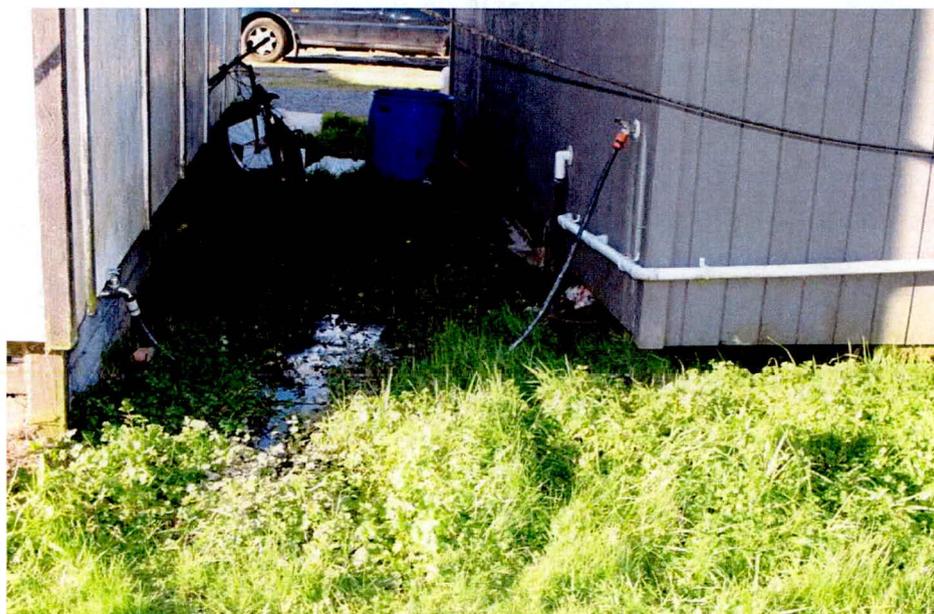
224. This case study involves four properties which have been significantly affected by ponding of effluent. The four properties are shown in the photograph below:



Photograph 34 – Ruato Bay properties affected by effluent¹⁹²

225. An investigation was carried out by wastewater treatment company Biolytix which found that two waste water treatment systems had failed with the one closest to the lake being most critical.

¹⁹² Photograph included in email from Terry Long to Karl Geiseler 28 January 2016 at 3:30pm.



Photograph 35 – Effluent ponding at Ruato Bay¹⁹³

226. While Biolytix did not express a view on the reason for the failure, a previous investigation of the managed Lake water level range by Oliver McMillan noted that:¹⁹⁴

"The inundation of septic tanks under the current regime suggests that the historic levels were much lower..."

227. In terms of the significance of the effects Biolytix commented that the property was "bordering on [third] world conditions and is a health risk to everyone."¹⁹⁵
228. To rectify the issue, the Council proposed a solution whereby a treatment and disposal system could be installed on property 1, which is the closest to the Lake.
229. However, it was noted that such a solution was unlikely to be effective so close to the Lake because of the high Lake levels (as well as the surcharging effect of the Highway and neighbouring property).¹⁹⁶
230. This case study provides an example of the flow on impacts of the continuously maintained high lake levels which have resulted in inundation of septic tanks and constrained the ability of a property owner to address significant effluent ponding effects.

¹⁹³ Photographs supplied by Dr Kepa Morgan on 6 February 2016.

¹⁹⁴ McMillan, O Investigation of Reduced Lake Water Level Range on Beach Erosion and Bank Formation, and Implications for the Okere Flood Gates at Rotoiti (Department of Civil Engineering, University of Auckland, 2013), section 1, page 2.

¹⁹⁵ Email from Karl Geiseler of Biolytix to Tait Wichman dated 28 January 2016, at 8:59am.

¹⁹⁶ Email from Dr Kepa Morgan to Terry Long and Karl Geiseler, dated 29 January 2016 at 10:41:12am.