Chair, Bay of Plenty Regional Council
Chief Executive Officer
Bay of Plenty Regional Council

28 July 2025

Dear Doug and Fiona

Letter of Demand: Ōhau Channel Diversion Wall & Water Quality in Lake Rotoiti

This submission was prepared by the Lakeswater Quality Society and the Lake Rotoiti Community Association (with support from other community organisations, refer letters of support) and is a demand on Regional Council to fix the Ōhau Channel Diversion Wall. It is the community's view that the Council is in breach of its own consent RM16-0527-AP by failing to maintain the wall and allow nutrient rich Lake Rotorua water to flow through the wall into Lake Rotoiti. This in turn is causing deterioration of the water quality of Lake Rotoiti. Regional Council response to date has been tardy and inadequate given the ongoing serious detrimental changes to the lake, such as the increased occurrence of algal blooms and reduced clarity.

We have strong evidence that water quality in Lake Rotoiti is deteriorating. Analysis of the data over the summer months, when the lake is most highly used, show:

1. The nitrogen (TN) is increasing
2. The TLI is increasing and well above its target of 3.5
3. The Secchi Depth is decreasing (i.e. the clarity of the lake water is declining)
4. Increasing occurrence of algae blooms
   (refer to graphs in supplementary evidence provided later)

Over the last two decades sewage reticulation around all of Lake Rotoiti was provided at substantial personal, ratepayer and government cost. The effectiveness of this major undertaking is being diminished by the Ohau Diversion Wall failure.

The existing wall is deteriorating but the king piles may still be sound. They represent a substantial asset and can still be protected and utilised by fixing the wall. They should not be left to deteriorate to a point where they cannot be effectively used. A short term lower cost solution would potentially lead to this risk.

Our understanding of the current position is:

1. Relating to the wall:
   I. The Regional Council is operating in breach of its consent for the Wall.
   II. The Regional Council regards the repairs to the wall as not being urgent as the leaking wall is only contributing to a small deterioration in the water quality of Lake Rotoiti (largely based on modelling of TLI values).and that this small change warrants delay in repairing the wall.
   III. Regional Council considers that the wall has a limited role in continuing the long-term improvement of water quality for Lake Rotoiti.

IV. The Regional Council considers that work in the Lake Rotorua catchment has improved the water quality in this lake so that the Ohau Channel wall is possibly no longer required and action to repair it can be deferred or delayed for a number of years or possibly indefinitely.
V. The Regional Council wishes to defer decisions on the repairs to the Ohau Channel Diversion Wall until the completion of the next PC 10 Science review due in 2027 and its next scheduled monitoring of the wall during 2026.
VI. The effectiveness of the Community Technical Panel is being limited by not heeding the advice of this group to go to the market and request proposals for a long-term fix (most likely Option 4 as presented by WSP).

2. Collectively, these positions are driving the ongoing deferment of important decisions regarding repairs to the wall, committing the necessary funds, distracting attention from long term water quality issues for Lake Rotoiti and showing disregard of your own regional policy statements, plans and resource consent.

3. The Community Technical Panel has been working with the Regional Council in good faith and has been expecting to provide elected members a proposal for repairs in a timely manner. The Community Technical Panel has identified an appropriate engineered solution for preventing the leakage and providing for a long-term solution to prevent nutrient rich water from Lake Rotorua entering Lake Rotoiti. At our most recent meeting of this group, it appeared that the input from this panel had been largely ignored as there was the suggestion that a low cost temporary option was back on the table.

Collectively, the community is demanding that the Regional Council move with speed to prepare a Request for Proposals based on Option 4 (or similar) and seek market input into expediting repairs to the Ohau Channell Diversion Wall as soon as possible. Ideally, a plan is in place before the end of this calendar year.

If there is additional information, that we are not aware of and which may alter the Community's position, then we would appreciate it if you could make this available to us.

Further delays by the Regional Council in taking the position that the repairs to the Wall are **not** urgent is clearly a breach of your own policies, plans, responsibilities and obligations to the Community. Furthermore, it is seriously impacting the future water quality and environmental values of Lake Rotoiti and making it less likely that the target TLI for this Lake will ever be achieved. It is also likely to be deferring high costs of future restoration for Lake Rotoiti which will ultimately be borne by ratepayers.

Lake Rotoiti is a special asset, among all the other Lakes in our region, and provides amenity values for people across the whole Bay of Plenty and well beyond. To let the Lake willingly deteriorate at the expense of this constituency has the potential to diminish the reputation of the region. The community will not allow this situation to occur. The community is prepared to use whatever tools are available to it to ensure that the long-term water quality of Lake Rotoiti is protected.

We would welcome an opportunity to discuss any of the above issues with you and provide further clarity where required. It would be helpful if this discussion could be arranged as soon as possible so no further delays to repairing the Ohau Channel Diversion Wall occur. We understand the wall will be considered at the 7th August Council Meeting and we would appreciate an opportunity to present at this meeting.

Yours Sincerely

LakesWater Quality Society, Chair
John Gifford

Lake Rotoiti Community Association, Chair
Peter Browning

Refer attached letters of support.

1. Te Kaunihera Pakeke o Ngāti Pikiao
2. Ngāti Pikiao Environmental Society
3. Hells Gate Tourist Park
4. Rotoiti Hot Pools
5. Classic Wooden Boats Association – Lake Rotoiti

Supporting Evidence

In the matter of Non-Compliance with Resource Consent RM16 – 0527-AP
RM16-0527-BC.01 Lake Structure
RM 16-0527-BC.02 Beds Damming and Diversion
Expiry 20 March 2052
For the Use and maintenance of a structure on the bed of Lake Rotoiti

The Lake Rotoiti Community allege that the Bay of Plenty Regional Council is in breach of the conditions of its resource consent as it relates to the use, maintenance and reporting of the Ōhau Channel Diversion Wall.

The breaches relate to:

"Condition 1 Purpose

1.1 For the purpose of using and maintaining a flow diversion structure on the bed of Lake Rotoiti to assist in preventing nutrient-rich water from Lake Rotorua entering the main body of Lake Rotoiti."

"Condition 5.2 Para 2

The structure and associated equipment authorised by this consent is maintained in good condition for the duration of this consent."

"Condition 10.6

All monitoring results shall be made publicly available on the Bay of Plenty Regional Council's (consent holder) website within two weeks of being finalised and available to the consent holder – noting that Condition 10.2 provides the consent holder to provide written reports to the Chief Executive of the Regional Council by June 30 of each year."

"Condition 10.7

The applicant shall meet with the Lake Rotoiti Community Association or any successive group representing the interests of the Lake Rotoiti residents annually to discuss the resource consent monitoring results and to discuss the following 12-month monitoring period."

Breach of Condition 1 Purpose

Background

- Water quality in Lake Rotoiti had declined since the 1950s (Vincent et al 1984).
- The declining water quality contributed to the occurrence of cyanobacterial blooms in the western bay and its other embayments.
- Water entering Lake Rotoiti from Lake Rotorua via the Ōhau Channel introduced algal inoculum to the lake, had high levels of suspended sediments and was enriched with nutrients (Vincent et al 1984; Gibbs 1992).
- Hamilton et al 2005 modelled 100% diversion scenario which provided a 40% reduction of cyanobacteria biomass by the 4th summer after completion of the diversion. On average 13.3 tonnes of TP/year and 164 tonnes of TN/ year entered Lake Rotoiti via the Ōhau Channel.
- Modelling for the design and placement of the wall was undertaken by Stephens (2004) and Hamilton et al 2005.
- The initial consent for the Ōhau Channel Diversion Wall was issued by the BOPRC in December 2006 for 11 years.
- BOPRC commissioned BECA to design the diversion wall in 2006.
- Tenders for the construction of the wall were issued in 2007.
- After tender negotiations the successful contractor was HEB Smithbridge Ltd.
- Final design, calculations and material supply was by ESC through NZ agent Ground Engineering Ltd.
- Main steel wall materials were manufactured in ECS's China factory.
- Rotorua Lakes Council was design peer reviewer and was asked to administer the build.
- The wall construction was completed in 2008.
- Construction costs for the wall were just under $9million.
- Design and consent costs were about $1.0m additional.
- Funding was by Environment BOP (approx. $6 million) and Central Government ($4million)
- The purpose of the wall was a separation barrier between Lake Rotorua and Lake Rotoiti and assist Council to meet the TLI target for Lake Rotoiti.
- The original consent issued in 2006 (expiry 2017) had a condition for annual inspections (Consent Number 63209).
- The RLC also provided a consent (62-05-114). This consent was for the construction and operation of a structure within Water A Zone. This consent does not have an expiry date.

Corrosion of the Wall and formation of holes in the sheet piles.

- Significant corrosion of the wall sheet piles was identified in 2014, and it was concluded then that the wall would not meet its intended 50-year life span. It was predicted that after 10 years it would be expected to see partial or complete structural failure of wall components (BoPRC internal memo 2019).

- The cause and extent of the corrosion has been attributed to lake water conditions, high manganese content in the steel used to construct the wall, the thickness of the steel used and microbial activity.
- Repairs to the wall were proposed and considered necessary in 2014 – but apart from further monitoring surveys and discussions about the degree of corrosion no specific action was taken (BoPRC internal memo – October 2014).
- Opus reported on possible solutions to the corrosion issues in Sept 2015 and noted that perforations in the wall would occur in 7 -10 years' time and require major intervention before the 50-year lifetime was reached (Report from Opus – Sep 2015).
- Opus (2016) suggested that polymeric sheets could be used to slow corrosion and used to prevent the exchange of water between Lake Rotorua and Lake Rotoiti through the wall.
- A structural management plan was developed and approved by Council March 2016 (ref – as above)
- A new resource consent was issued in 2017 (**RM16-0527-AP).** At this time the Regional Council considered that the wall was still deemed to be necessary and a non-permanent intervention (Staff report on the new consent (March 2017). Furthermore, the BoPRC considered removal to be inappropriate because the environmental improvements would be undone.
- Installed waler beams 2018/19 at an approx. cost of $684k – request that this funding is taken from the Tikitere Capital Budget.
- Inspection of the wall in 2019 recorded the presence of holes in the sheet piles (BoPRC internal memo, April 2019). Note the waler beam was to strengthen the wall structure and to support future repairs needed for the holes.
- The community noted significant leakage through the wall in early 2023 (Community Members pers comm).
- Regional Council accepts ownership and responsibility for the operation and maintenance of the wall. Staff note "repairing the holes was put forward as an option – this was not adopted by council and the decision to undertake leakage repairs is dependent on underwater inspections" (BoPRC memo, March 2023).
- WSP's corrosion assessment in 2023 noted that the structural integrity of the sheet piles would not be adversely affected – but noted that holes in the sheet piles affected the purpose of the wall. For the king piles these were not expected to need replacement until 2050. (WSP 2023).
- Regional Council admits that there were visual impacts with the wall, but focus has been on the structural integrity of the wall and indicates that it will assess repair options (BoPRC internal memo April 2023).
- Regional council says that it is unlikely that the sheet piles will be replaced, and more cost-effective solutions will be sought (BoPRC Internal memo, April 2023).
- During 2023 trials were undertaken using PVC sheets on the sheet piles. These were not completely successful and to date have not been used to repair the holes in the sheet piles.

- The holes in the sheet piles are increasing in size as the sheet piles continue to corrode, and this process is accelerating. The inflow of Lake Rotorua water into Lake Rotoiti is increasing markedly.

Leakage through the wall

- The wall was effective in diverting Ōhau Channel water away from Lake Rotoiti once installed.
    - Water quality data, current speeds and directions and satellite images and aerial images demonstrated that the diversion wall was performing to design specifications. Though there were concerns that there could be complex transport processes around the wall (Hamilton et al 2009).
    - Hydrodynamic model simulations (7-year review summary report,2024) showed that the wall was effective in reducing the accumulation of Ōhau Channel inflow in the Lake Rotoiti system. Without the wall the annual cumulative contribution of Ōhau Channel water to Lake Rotoiti was 22.0 %, but only 0.3% with the wall in place.
    - Regarding the residence time in Lake Rotoiti – the wall resulted in a substantial increase from 8.2 years without the wall to 26.9 years with the wall.
- The leakage of Ōhau Channel water into Lake Rotoiti is appreciable with estimates ranging from 3.3 to 9.8 %. Though these estimates were constrained by information on the size and number of holes, consequently these estimates have a high degree of uncertainty (7-year review report, 2024).

Conclusions

- The wall was constructed and consented to divert Ōhau Channel water from entering Lake Rotoiti.
- The wall was designed to divert up to around 100% of the Ōhau Channel flow from Lake Rotoiti
- Holes were found in the sheet piles of the wall in 2019.
- The holes increased in size and number to leak an appreciable quantity of Ōhau Channel water into Lake Rotoiti by 2023.
- Repairs to the wall have not been undertaken, so the holes have continued to increase in number and size and increase the level of leakage. The degree of leakage is currently unquantified.
- The wall in its current state is not diverting nutrient rich water from Lake Rotorua so that it does not enter the main body of Lake Rotoiti.

Breach of Condition 5.2 - Maintenance Work

Background

- The wall was designed and constructed to last for 50 years.

- The wall was designed to divert Ōhau Channel water from entering Lake Rotoiti.
- The BoPRC expected that the wall was to be an important part of the medium-term strategy (approx. 40 – 50 years to protect Lake Rotoiti from nutrient inputs from Lake Rotorua that might lead to eutrophic cyanobacteria dominate state of 2003 /4. (BoPRC Staff report for the consent for the Ōhau Channel Wall, March 2017).
- A new resource consent was issued in 2017 (**RM16-0527-AP).** At this time the Regional Council considered that the wall was still deemed to be necessary and a non-permanent intervention (Staff report on the new consent (March 2017). Furthermore, the BoPRC considered removal to be inappropriate because the environmental improvements would be undone. The consent was to 2052 which was based on the need to re-consent the wall for at least 35 years.

Condition of the Wall

- The evidence relating to the discovery of the holes in the sheet piles and their quantified impacts on Lake Rotoiti were presented above.
- The king piles, the main structural components of the wall may fail prior to 2038 also due to corrosion. All existing evidence suggests that the wall will deteriorate to such a condition that it will either fail completely or need to be removed by 2038. This is significantly shorter than the consented period to 2052 as proposed by the Regional Council.
- In 2017, following a scheduled evaluation of the wall, it was recommended to install a stiffening waler to resist wave load. The waler allowed a minimum thickness for the sheet piles to be reduced to 2mm (compared to 5.2 mm – Opus recommendation in 2015). This was believed to support the sheet piles for another 10 years and avoid leading to a collapse of the wall.
- During pre-tender inspections for the waler installation – signs of penetrations in the top 1 m section of the wall were first formally observed and reported.
- The 2023 assessment (WSP 2023) of the wall concluded:
  - The remaining life of the sheet piles can be taken as being longer than previously estimated in 2017, due to a lower corrosion rate. However, while the current and future overall corrosion affects the strength capacity of the sheet piles the pitting corrosion has a different effect. Most of the pitting occurs at the tops of the sheet piles, eventually leading to the formation of penetrations (of varying sizes) in the sheet piles. Over time, these penetrations will affect the ability of the wall to perform as intended – which is to prevent mixing of waters on two sides of the wall.
  - The expected remaining life of the king piles is still about another 25 years and repairs may be needed before 2050. Steel walers installed in 2018 can be expected to improve the performance of the wall (from a structural perspective) further by assisting with the catenary action and reducing the demand on the king piles. However, we (WSP) have not completed any quantitative assessment of this effect as this would require quite a complex analysis which was beyond the scope of this assessment.

- End of life for the sheet piles and king piles is summarised below (From WSP 2023). Most components of the wall will fail before the end of the consent period.

Table 5: Comparison of corrosion rates and remaining "end of life" for Sheet piles and King Piles (KP) based on 2017 and 2023 investigations.

Location	Component	Original thickness (mm)	Minimum acceptable Thickness (mm)	2017 corrosion rate (mm/year)	End of Life (2017)	2023 corrosion rate (mm/year)	End of Life (2017)
Top of wall	Sheet pile	8	3	0.305	2025	0.17	2038
Top of wall	KP Web	13	1.66	0.35	2041	0.39	2038
	KP Flange	20	6.66	0.262	2059	0.34	2048
Mid depth	KP Web	13	2.44	0.26	2049	0.18	2067
	KP Flange	20	7.44	.227	2064	0.28	2053
Lake bed	KP Web	13	4.44	.303	2037	0.26	2038
	KP Flange	20	9.14	0.268	2049	0.26	2050

From WSP Report 2023.

Conclusion

- The wall has not been maintained in good condition to meet the purpose of the consent and for the duration of the consent.
- The consent was to have an effective barrier in place to prevent nutrient rich water from the Ōhau Channel mixing with the main body of Lake Rotoiti until 2052 as this was the time frame expected to meet the intergenerational improvements in Lake Rotorua.
- The BoPRC has ignored recommendations regarding actions to prevent the leakage through the sheet piles, on the basis that:
  - The water quality in Lake Rotoiti is deteriorating somewhat independently of the poor water quality entering from Lake Rotorua, and
  - The water quality in Lake Rotorua has improved sufficiently that it is only having a minimal impact on the quality of Lake Rotoiti.
- Failure to address the leakage of the wall has compromised the water quality of Lake Rotoiti to an unknown extent.
- The water quality in Lake Rotoiti does not meet the current TLI target of 3.5 (refer to Additional Supporting Evidence provided later in this submission and related to the water quality in Lake Rotoiti.

Breach of Condition 10.6 &10.7

Background

- The LWQS has been representing the Lake Rotoiti community and its residents on the issue of the Ōhau Channel Wall since April 2023 (refer correspondence between Lake Rotoiti community members and the LWQS).
- The LWQS hosted a community meeting with Lake Rotoiti residents in June 2024 which included representatives from the Regional Council.

Reporting

- The Regional council has made no attempt to report to the LWQS or the Lake Rotoiti residents to specifically discuss the resource consent monitoring results, nor discuss the following 12-month monitoring period.

Conclusion

The BoPRC has never made an attempt to comply with Condition 10.7 and is therefore in breach of this condition.

LAKES WATER QUALITY
Lakes Water Quality Society Te Kahui Kounga Wai

Additional Supporting Evidence: The Wall Needs to be Repaired Urgently
Lake Rotoiti

Water Quality in Lake Rotoiti

1. The wall has a marked influence on the fraction of Lake Rotorua water mixing into Lake Rotoiti, as only 0.3% of the Lake Rotoiti water is derived from the Ōhau Channel with the wall in place and the residence time of Lake Rotoiti water increases from 8.2 years to 26.9 years with the wall in. So, the wall has a profound effect on the overall hydraulic conditions in Lake Rotoiti.
2. There is a thermal differential between Ōhau Channel water and Lake Rotoiti water with its summertime Lake Rotorua water being warmer and in wintertime temperatures cooler compared to Lake Rotoiti. This causes Lake Rotorua derived water to stratify as a top layer in Lake Rotoiti and bottom layer during summer and winter respectively. At times the Lake Rotorua water inserts at an intermediate depth.
3. The Ōhau Channel varies in temperature day to day- this will affect the insertion layer into Lake Rotoiti and make it quite variable (Hamilton et al 2005).
4. There is substantial variation in insertion depths of Ōhau channel water into Lake Rotoiti (Hamilton May 2005).
5. Internal waves within Lake Rotoiti also affect the depth of insertion of the Ōhau Channel water into Lake Rotoiti (Hamilton et al 2005).
6. Lake Rotoiti has a buffering capacity which affects the direct relationship between water quality in the Ōhau Channel and Lake Rotoiti. (7-year review report, 2024).
7. Legacy loads of nutrients in Lake Rotoiti or unquantified groundwater geothermal flux may be influencing the water quality in this lake.
8. TLI modelling alone is insufficient to draw conclusions about the long-term trajectory of water quality in Lake Rotoiti and the influence of the wall. There are many factors affecting the water quality in the lake and not all these factors are taken into account with precision using TLI and modelling.
9. Overall, the evaluation of water quality in Lake Rotoiti, including a systematic analysis of long-term datasets and detailed 3-D hydrodynamic-ecological modelling, shows that improvements in water quality in the lake were evident following the construction of the diversion wall. The 7 -year review report showed that the Ōhau Channel Diversion Wall was critical in preventing the degradation of Lake Rotoiti, but meeting the TLI target in the lake will be challenging if the removal of the wall occurs, even if TLI targets in Lake Rotorua are met. (conclusions from the 7-year review report).
10. The concentration of TN in Lake Rotorua is about twice that of Lake Rotoiti (Lake Rotorua has a TN of around 0.3-0.5 g/m3 whereas for Lake Rotoiti TN is around 0 2 – 0.25 g/m3 in the Eastern basin and 0.2-0.3 g/m3 in the Western Basin. The concentration of TN in the Ōhau Channel are quite variable and range from around 0.3g/m3 up to 0.5 g/m3. In the Okere Arm TN is around 0.3-0.4 g/m3. (Annual Monitoring report – 2018-2024).

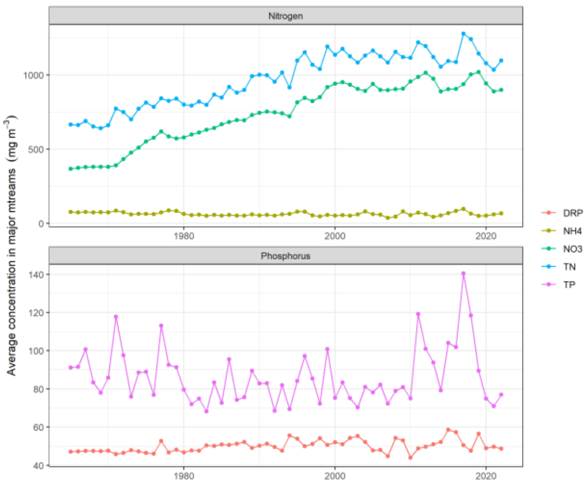
11. Results from the monthly sampling programme (undertaken as part of the conditions of the consent) indicate that the Ōhau Channel Wall prevented “red alerts” from reaching the main body of the Lake Rotoiti for the period Feb 2023 – April 2023. A similar result was observed for the 2023/24 monitoring season. This report concluded that overall the Ōhau diversion wall prevented elevated levels of blue-green algae in the main body of Lake Rotoiti (conclusions from the Annual Monitoring report – 2018-2024). Note – this was in spite of significant algae blooms being present in the Ohau channel and Okere Arm.
12. The monitoring report also concluded that there is no evidence that the water quality of Lake Rotoiti is still improving as increased phosphorus, nitrogen concentrations and increased incidence of blue-green algae blooms (recorded as alerts) are occurring (Annual Monitoring report – 2018-2024).
13. Algal assemblages in Lake Rotorua and Lake Rotoiti are likely to be markedly different as they are two completely different ecosystems with different geo chemical and hydrodynamic conditions.
14. Residents of Lake Rotoiti are constantly reporting significant visible changes to the water quality of Lake Rotoiti and that amenity values in many parts of the western end of the Lake are being adversely affected. These changes have accelerated since the wall leakage was identified.
15. There can be rapid switches between overflow and interflow conditions throughout the summer in Lake Rotoiti (Hamilton et al 2005). Also, it was concluded that the intrusion depth will strongly influence whether water from Lake Rotorua is likely to have an effect on Lake Rotoiti water quality (Hamilton et al 2005).

Lake Rotorua

Water Quality in Lake Rotorua

16. The current TLI for Lake Rotorua is 4.4 (as reported in the Lake statistics for 2023/2024). This is higher than the TLI values reported in the modelling and used by the Regional Council to suggest that the current state of Lake Rotorua will have a minimal impact on Lake Rotoiti (i.e Average 4.27 – Wall in scenario and average 4.27 Wall out and the other wall out scenarios)[1].
17. The TLI trend for Lake Rotorua is stable with the trend becoming uncertain to potentially increasing (PC 10 Review 2022).
18. There is a significant load of nitrogen to come – due to the groundwater residence time. Based on this, it is expected that Lake Rotorua will deteriorate further before it improves due to the catchment interventions undertaken over the last 20 years (nitrogen loads are expected to take a long time to improve).
19. The 2022 PC 10 review showed that TN values in the incoming streams to lake Rotorua were still markedly elevated and have not shown a significant decline since 2000 (refer graph below)

[1] For the wall out scenarios the Min TLI was 4.07 and max was 4.41



From: PC 10 Review 2022

Volumetrically weighted average concentration of nutrients in nine major stream inflows to Lake Rotorua, 1965 to present (NH_4 = ammonium-N, $N0_3$ = nitrate-N, TN = total nitrogen, DRP = dissolved reactive phosphorus, TP = total phosphorus and VOL = discharge). Values are presented for the hydrological year and are volumetrically-weighted. Total nutrients are *inclusive* of stormflow particulates.

20. The TLI values in Lake Rotorua consistently exceeded the target over the period 2018 – 2022 and this is related to Total Phosphorus (TP). During this period the elevated TP does not correspond to wet years (when high TP loadings may be expected (e.g. as for the 2018 – 2019 years). The 2022 review suggested that this increasing TP may be due to phosphorus mineralisation during warm calm summers deposited into the lake sediments during preceding wet years and that there may be an associated lag effect (from 2022 PC10 Review). Note – an increasing TP in Lake Rotorua will affect the TP concentration in Lake Rotoiti if the wall is removed or continues to leak).
21. From the 2022 PC 10 review the TN load (stream and peak contributions) is consistently higher than the 435 t N/year target for much of the period after 2010– yet the TLI reduces markedly after 2010 and hovers relatively closely to the TLI target of 4.2. Furthermore the 2022 review indicates that the TLI for Lake Rotorua was 4.43 in 2022, the highest observed since 2010. The most recent annual reporting of the TLI for Lake Rotorua was 4.4 with a 3-year average of 4.3.
22. Climate change is expected to intensify existing water quality issues in Lake Rotorua with the likelihood that this will increase the TLI due to higher water flows into the Lake from high intensity rainfall events and increased ambient temperatures. Completion of the PC10 review in 2027 is not likely to change this conclusion (it may refine it at best).
23. Regional Council claims that “As a result of the alum dosing programme, Lake Rotorua has been within 0.2 units of the 4.2 TLI target every year, and for 5 of those years it has achieved the target TLI. This is ahead of expectations without the alum dosing” ”As a consequence of the improved water quality flowing from Lake Rotorua it is important for decisions around the operation of the Ōhau wall to be informed of the water quality scenarios”. (Report to Regional Council December 2024).
24. An evaluation of the effect stratification and oxygen levels in lake Rotorua have on nutrient levels concluded that as long duration stratification events become more

common under changing climatic conditions then internal loading may drive increased nutrient supply (particularly P) to surface waters (from McBride (Limnotrack) 2022).

25. An evaluation of the relationship between periods of nutrient limitation and improved use of alum dosing concluded "although alum dosing is effective in removing DRP from the Utuhina and Puarenga stream inflows, that its effectiveness in reducing internal phosphorus loading in Lake Rotorua requires further evaluation".

Conclusions: Water quality assessments for Lakes Rotoiti and Rotorua

26. The impact of the wall on the water quality in Lake Rotoiti is complex and affected by many factors, residence time, insertion flows, weather conditions, internal waves, geothermal inputs and other yet unidentified inputs.
27. More understanding of these effects is needed before suggesting that the wall now has a limited impact on the water quality of Lake Rotoiti and that such impacts can be assessed based on modelling TLI changes.
28. Lake Rotorua water is still nutrient rich compared to Lake Rotoiti water, approximately twice the TN concentration.
29. Achieving the target TLI of 3.5 in Lake Rotoiti is going to require both improvements to Lake Rotorua (if allowed to flow into Rotoiti) and in Lake Rotoiti water.
30. As Lake Rotorua potentially becomes increasingly affected by internal loads of nutrients, in particular phosphorus, currently there is limited evidence that this load contribution can be managed with alum dosing alone.
31. The Regional Council has insufficient information to believe that Lake Rotoiti will deteriorate to a <u>limited extent</u> when compared to its current condition, if the wall is removed or continues to leak.

Resource consent and Regional Policies and Plans

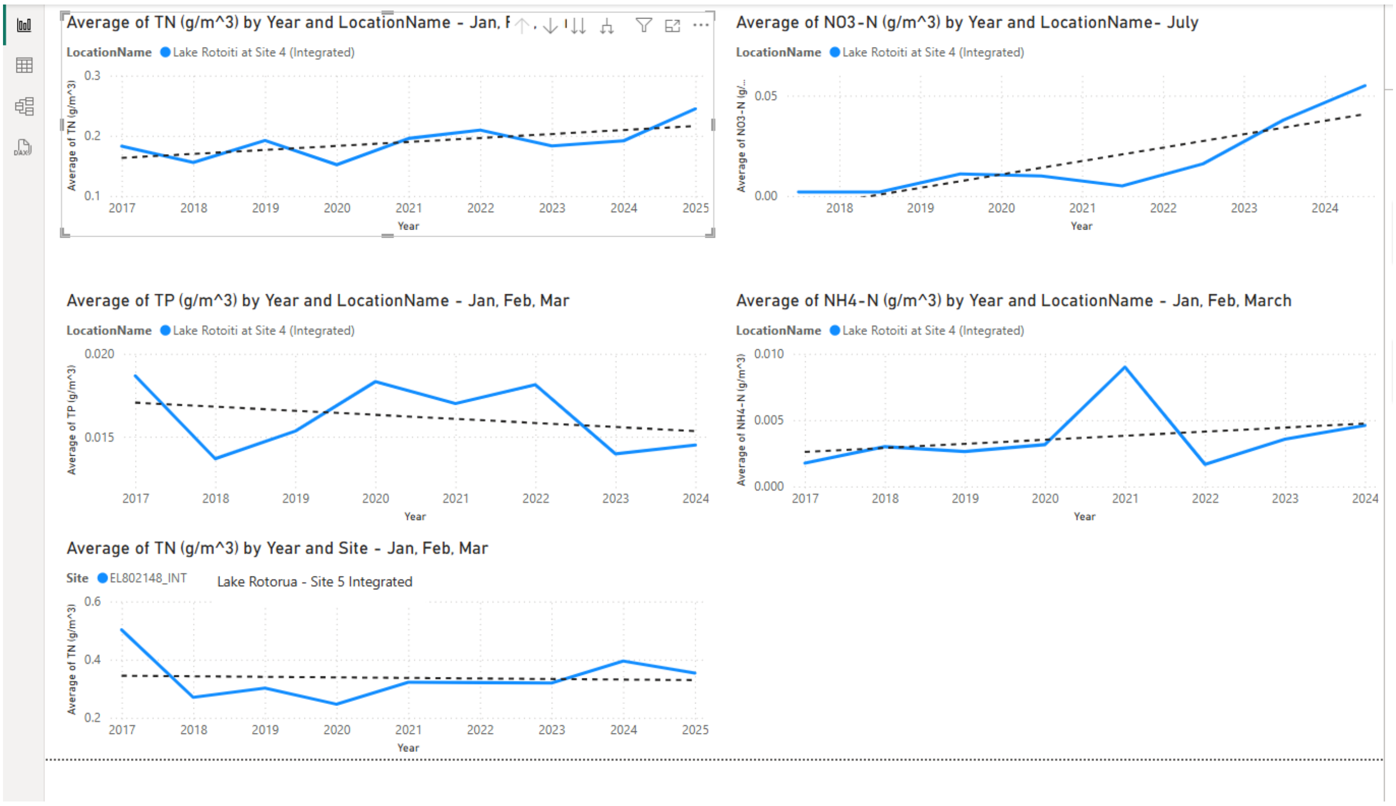
32. The Regional Council owns and has responsibility for the Ōhau Channel Diversion Wall.
33. The Regional Council is the consent holder for the wall.
34. The Regional Council needs to maintain the wall in good condition (a consent condition for the duration of the consent – to 2052).
35. The wall was expected to be in place and effectively divert water from the Ōhau Channel to the Kaituna River for up to 50 years.
36. The Regional Council has a policy target TLI for Lake Rotoiti of 3.5 (the current TLI value is 3.8 (with a 3-year average of 3.7 – close to the trigger point for follow up action).
37. The target for Lake Rotorua (as part of the Integrated Framework) is for a reduction of total nitrogen into the Lake of 320 tonnes by 2032. Current estimates of reduction are between 75 and 100 tonnes (i.e. 23 – 30 % of the target - but the policy was to achieve 70% of this target by 2022). Obviously, this target has not been achieved and increasingly it is looking as though the 320t reduction may well be difficult to achieve (by 2032). The Regional Council is falling short in meeting several components of the Integrated Framework.
38. The Regional Council is developing a Lake Rotorua land acquisition strategy to further reduce nitrogen inputs into the Lake. Wai Rotorua (a rural landowner catchment

collective) is proposing more cost-effective ways of achieving the same outcome for less investment and with a broader range of benefits (environmental, social and economic).

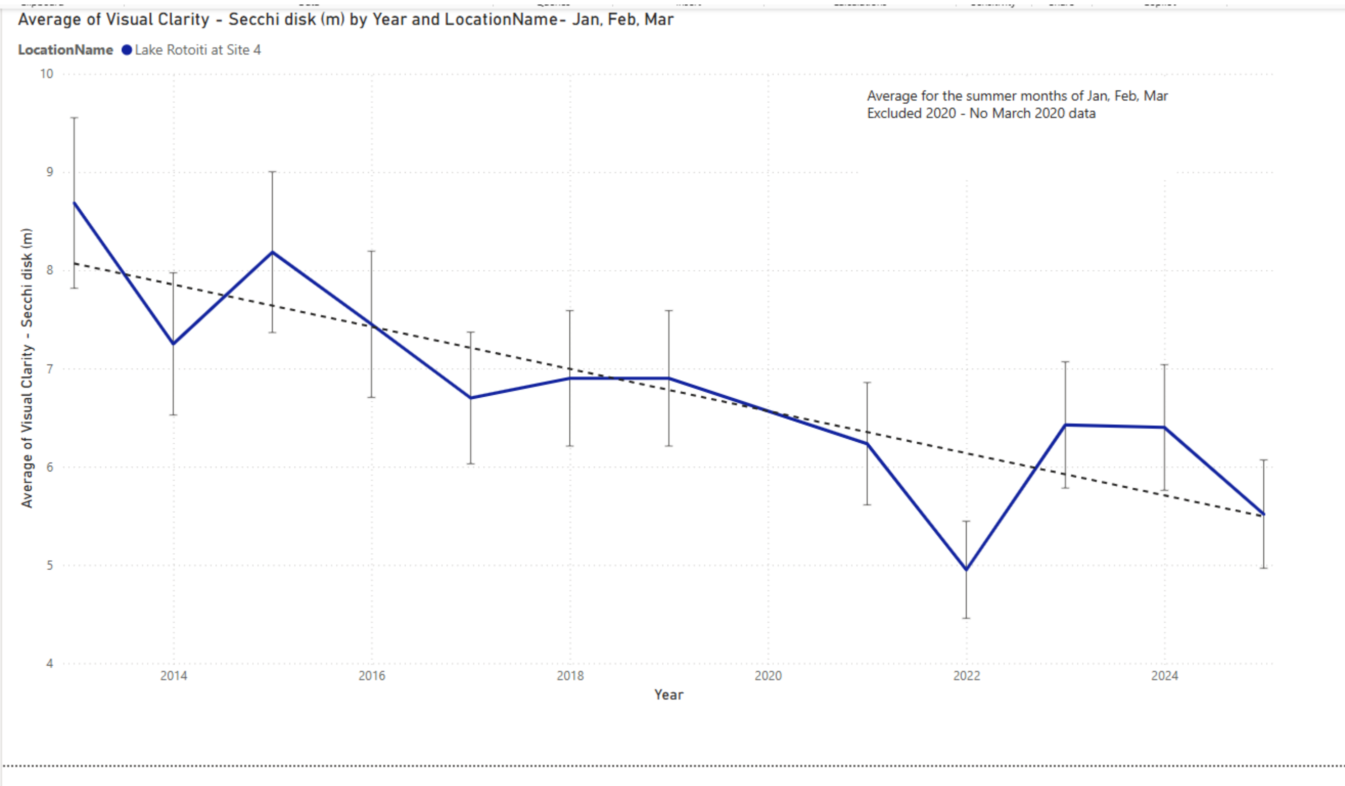
Overall Conclusions

39. The Regional Council is in breach of its Resource consent on three accounts:
    a. The purpose of the wall is no longer being met as designed,
    b. The wall has not been maintained in good condition for the term of the consent,
    c. The Regional Council has failed to meet the reporting requirements.
40. There is insufficient evidence currently available to predict the full impact of the leaking wall (or no wall scenario) on the water quality of Lake Rotoiti – current evidence suggests that Lake Rotoiti is deteriorating, it will not meet the target TLI of 3.5, and nutrient levels will continue to increase. The precise role of the wall in this is currently unknown.
41. There is insufficient evidence that Lake Rotorua has improved or will improve to a sufficient extent over the next 35 years to conclude that the wall is either no longer required or can leak in an uncontrolled manner and allow nutrient-rich water from Lake Rotorua to flow into Lake Rotoiti.
42. Based on current progress with the Integrated Framework for Lake Rotorua, it is evident that the Regional Council is unlikely to meet the 320 tonnes (at the lake) reduction as required by 2032.
43. The wall (sheet piles and king piles) is expected to experience “end-of-life” around 2038 – well short of the duration of the consent (to 2052).
44. Repairs to the wall to stop and control the leakage through the wall must be expedited as soon as possible as the long-term water quality of Lake Rotoiti is being compromised and the Regional Council is deliberately failing to meet the water quality objective of a TLI of 3.5 for this Lake.
45. Repairs to the wall are urgent so that the leakage is stopped and to allow a more comprehensive understanding of factors affecting the deteriorating condition of water quality in Lake Rotoiti (i.e. potentially the impact of the leaking wall).
46. The wall integrity is becoming questionable and significant maintenance is going to be required to reach 2052. This maintenance must be undertaken as soon as possible to reduce significant future costs and complete failure of the structure occurring due to corrosion and diminishing strength.
47. If the wall is ever to be removed – then maintenance is becoming critical as ongoing deterioration of the wall components is likely to make removal of the highly corroded sheet and king piles from Lake Rotoiti by 2038 costly.

Lake Rotoiti Water Quality trends – based on data supplied by the Regional Council. This data is compiled as part of the consent requirements (there appear to be some anomalies in this data in particular for the NO3-N values– Work is ongoing to reconcile these issues.[2]



[2] The regional council provided a new data set on the 21 July 2025 – a month and a half after the anomalies were first discussed. A new assessment is required for this new data set and this is still work in progress.



Average of Visual Clarity - Secchi disk (m) by Year and LocationName- Jan, Feb, Mar
LocationName
Lake Rotoiti at Site 4
Average for the summer months of Jan, Feb, Mar
Excluded 2020 - No March 2020 data
Average of Visual Clarity - Secchi disk (m)
10
9
8
7
6
5
4
2014
2016
2018
2020
2022
2024
Year

Te Kaunihera Pakeke o Ngāti Pikiao
(Ngāti Pikiao Council of Elders)
Chairperson: Te Maari A. Whare
I: temaari.w@xtra.co.nz

'He pukenga wai he pukenga kōrero'

16th April 2024

John Gifford- Chair LWQS
C/-- Dr. Kenneth Cameron Kennedy
Kaumatua
Lakes Water Quality Services
ROTORUA.

Tēnā koe te rangatira

Firstly, we thank you and your group for your dedication and heartfelt commitment in caring for the quality of the Rotorua Lakes. We hope that they remain a beautiful and cherished resource for tomorrows generations.

At our meeting of elders held Friday, 11th April it was resolved by unanimous resolution that:

"The Kaunihera Pakeke o Ngāti Pikiao (Wise Counsel of Elders) expresses their support for the Lakes Water Quality Society's letter to the Bay of Plenty Regional Council (BOPRC), emphasizing the urgent need to repair the Ohau Diversion Wall as soon as possible".

Tēnā kōtou katoa and best wishes.

TeMaari A. Whare

Te Maari A. Whare
Te Kaunihera Pakeke o Ngāti Pikiao.

30th June 2025

Chairs
Lake Water Quality Society (LWQS)
Lake Rotoiti Community Association (LRCA)

Tēnā kōrua,

RE: Support for Immediate Remediation of the Ohau Channel Diversion Wall

We write to you on behalf of Hells Gate to express our full support for the Letter of Demand you are presenting to the Bay of Plenty Regional Council (BOPRC) regarding the immediate remediation of the Ohau Channel Diversion Wall.

We share your deep concern about the clear breach of consent conditions relating to the wall's maintenance, and the resulting deterioration in Lake Rotoiti's water quality. The rising Trophic Level Index (TLI) runs counter to the Regional Plan's purpose and obligations, and we consider it unacceptable that this has been knowingly allowed to occur.

As a tourism business, our livelihood relies on the health and reputation of our local lakes and waterways to attract visitors to the region. We invest significant time, money, and effort offshore promoting Rotorua and the Bay of Plenty, leveraging Aotearoa's clean, green image as a core part of our story. This is undermined when negative stories emerge about the declining water quality of Lake Rotoiti — it directly harms the value of our regional brand and the wider visitor economy.

We strongly support your call for BOPRC to issue an urgent Request for Proposal (RFP) to the market and to commence the necessary work without further delay. There is no justification for further research delays when practical remedial action is overdue.

We also believe it is vital that all stakeholders uphold the principles of kaitiakitanga — ensuring the mauri (life force) of our lake is protected for future generations. Please include this letter with your formal demand. We are happy to continue supporting you in any way we can and welcome updates on how we can help further.

Ngā mihi nui,

Paul Rayner
General Manager
paul@hellsgate.co.nz
021 741 660

Address: 351 State Highway 30, Tikitere
Phone: +64 (0) 345 4117
Website: www.hellsgate.co.nz
Email: info@hellsgate.co.nz

30 June 2025

To the Chairs
Lake Water Quality Society (LWQS)
Lake Rotoiti Community Association (LRCA)

Tēnā kōrua,

We write on behalf of **Lake Rotoiti Springs** to express our full and urgent support for your **Letter of Demand** to the **Bay of Plenty Regional Council (BOPRC)** calling for immediate action to restore and remediate the **Ohau Channel Diversion Wall**.

This issue is not new to us. Twenty-five years ago, when the Lake Rotoiti Hot Pools had been closed and abandoned for 9 months following storm damage, I stepped in with a long-term vision to restore and reopen this iconic lakeside site. With the support of local iwi, we took on the lease, invested significantly in repairs and redevelopment, and reopened the site to the public. In the years that followed, however, water quality in Lake Rotoiti deteriorated to the point where visitors regularly fell ill, recreational use dropped off significantly, and the area became the subject of negative national attention. Businesses suffered, including ours, and I vividly remember headlines at the time describing Lake Rotoiti as "a national embarrassment."

That all changed when the Ohau Diversion Wall was installed. We were told—and it was clearly stated in the Resource Consent—that this was a 50-year solution. And for a time, it was. Water quality improved dramatically, the lake was revitalised, and the community returned. Residents settled, visitors came back, and we continued to reinvest in the pools—eventually becoming the **highest-rated hot pool destination in New Zealand**, operating 365 days a year. Over that period I have invested millions in the pools and only used local suppliers and labour.

Unfortunately, in recent years, we are seeing history repeat itself. Algae blooms, discoloured water, weed infestations, and odour are again degrading the health and mana of Lake Rotoiti. If BOPRC fails to act now, this deterioration will not only impact our business and others like it—it will undo two decades of hard-won progress and place the lake on the path back to abandonment and ecological failure. Once again it will attract negative national press. It will impact poorly on the Rotorua lakes area and economy.

The economic consequences extend well beyond our operation. We employ local staff year-round, and even more during the summer season. The lake supports a daily flow of activity from boat operators, water taxis, kayakers, fishermen, and other small businesses. Local contractors, suppliers, and the wider hospitality sector all benefit from a healthy lake. Conversely, poor water quality drives people away—residents, ratepayers, visitors, and investors.

We note with interest that substantial funding is now being directed toward protecting Lake Tarawera from sewage contamination. That is an important initiative—but Lake Rotoiti cannot be abandoned and left to decline. The situation here is just as urgent, and the cause—failure to uphold a council-managed structure under a Resource Consent—is entirely preventable.

We strongly support your call for BOPRC to issue an urgent Request for Proposal and to begin physical remediation work on the Ohau Diversion Wall without further delay. The excuses have run their course. The longer we wait, the harder and more expensive the recovery will be. This is not only a matter of compliance, but of community, economic stability, and environmental responsibility. The time for action is now.

Please include this letter with your formal submission. We welcome further communication and are ready to support your efforts in any way we can.

Nāku noa, nā

Tim Manning
CEO
Lake Rotoiti Hot Pools
Mobile: 027 493 1934

Ngati Pikiao Environmental Society

Jim Stanton
jim.stanton77@gmail.com

04 July 2025

Tēnā koe Jim,

The Ngāti Pikiao Environmental Society **(the Society)** advocates for the environmental interests of its members. Our focus includes the protection, preservation, enhancement, and conservation of the physical, biological, cultural, social, and aesthetic environment. This work is guided by a commitment to intergenerational wellbeing and recognition of the economic factors that affect and are affected by the environment.

On 26 June, Māori groups, including Ngāti Pikiao, filed proceedings in the High Court against the Crown. The proceedings cite a longstanding failure to uphold tikanga-based and Tiriti o Waitangi-guaranteed rights, interests, and responsibilities in relation to freshwater. This action follows more than a decade of Crown inaction, despite clear obligations under Te Tiriti and repeated findings from the Waitangi Tribunal and courts affirming Māori proprietary and kaitiaki rights.

In parallel, the Lakes Water Quality Society Inc (LWQS) and the Lake Rotoiti Community Association (LRCA) has raised serious concerns regarding alleged breaches by the Bay of Plenty Regional Council of its resource consent relating to the Ohau Channel Diversion Wall. Reports indicate that the wall is no longer effectively preventing nutrient-rich water from Lake Rotorua entering Lake Rotoiti and may not be adequately maintained. Additional concerns include failures in public reporting of monitoring results and in meeting with local community groups, as required under the consent conditions.

These developments reflect growing concerns about the governance, protection, and stewardship of freshwater in the Te Arawa Rotorua lakes region. The High Court proceedings highlight unresolved systemic failures by the Crown to meet its Tiriti obligations, while the issues raised by LWQS and LRCA point to potential shortcomings in local environmental management and community engagement.

The Society acknowledges and provides its tentative support for the concerns raised by Lakes Water Quality Society Inc and Lake Rotoiti Community Association. These matters collectively signal a need for urgent, coordinated, and principled action to ensure the rights of tangata whenua are upheld and the health of our freshwater ecosystems is preserved.

Nāku noa, nā

Pia Bennett
Co-President

Address for Service: ngatipikiao.taiao@gmail.com

Lake Rotoiti Classic and Wooden Boat Association
6 July 2025

To: Don Atkinson
Fix Ohau Wall Committee
Rotorua

Dear Don,

Re: Support for Remedial Work on the Ohau Diversion Wall

On behalf of the Lake Rotoiti Classic and Wooden Boat Association, I write to confirm our full support for the Letter of Demand to be sent to the Bay of Plenty Regional Council. This position was endorsed at our Annual General Meeting held in June 2025.

We believe it is essential that urgent remedial work is undertaken to restore the Ohau Diversion Wall so that it effectively serves its intended purpose, now and into the future. Maintaining the integrity of this structure is vital to the wellbeing of our lake and its surrounding communities.

Please do not hesitate to call on our continued support as this matter progresses.

Yours sincerely,
Aaron Martin
Commodore
On behalf of the Committee
Lake Rotoiti Classic and Wooden Boat Association