

# Lake Okareka Application for Variation to Resource Consent 60776 to Increase Lake Okareka Discharge Limit from 239 Litres per second to 500 Litres per Second and to Install a temporary Second Discharge Pipe

## Project Summary, AEE and Consultation Details

Note Reference to 'Figs' are Maps, Photos and Graphs in Appendix 1

### 1 Variations Sought

Bay of Plenty Regional Council (BOPRC) holds resource consent (No 60776) to undertake the following activities associated with the discharge of water from the Lake Okareka Canal which is located below the Lake Okareka outlet;

- a) Pursuant to section 13 (1)(a) of the Resource Management Act 1991 to Use and Maintain an Existing Intake Structure in the Bed of a Canal from Lake Okareka; and
- b) Pursuant to section 14 (1)(a) of the Resource Management Act 1991 to Take Water from Lake Okareka; and
- c) Pursuant to section 13 (1)(a) of the Resource Management Act 1991 to Use and Maintain an Existing Outlet Structure in the Bed of the Waitangi Stream; and
- d) Pursuant to section 15 (1)(a) of the Resource Management Act 1991 to Discharge Water Into the Waitangi Stream;

The resource consent was publically notified and went through a public submissions and hearings process. The resource consent was issued in May 2001 and expires in May 2016.

**The proposed variations apply to the following sections, additions shown in red and erasures shown as strikethrough changes;**

- 1 **Purpose** For the purpose of managing the level of Lake Okareka by taking water from Lake Okareka at a controlled rate of flow, diverting the water through **two pipelines (one being a temporary pipe)**~~a pipeline~~, and then discharging to the Waitangi Stream.
- 2 **Location** The intake (point of water take) is located at the ~~western~~ **eastern** end of Lake Okareka, and the outlet (point of discharge) is located in the Waitangi Stream, as shown in **Figures 1-6** ~~2 of Environment B-O-P Operations Report 98/18~~ submitted with the application for this consent **variation**~~being BOPRC Plan Number RC 60776~~.
- 5 **Inlet and Outlet Structures** 5.1 The consent holder shall ensure that the inlet, outlet and pipeline structures **are** ~~is~~ operated at all times in accordance with the information provided in the consent **variation** application dated **21 July 2017** ~~9 May 2000~~.
- 6 **Discharge Quantity** 6.1 The rate of discharge shall not exceed ~~239~~ **500** litres per second (L/s).

**8 Management and Maintenance of the Lake Level Control Structures** 8.1 The consent holder shall operate the inlet, outlet and pipeline structures to achieve the most effective lake level control for Lake Okareka, within the target range of 353.5 metres minimum lake level (Moturiki datum) and 353.9 metres maximum lake level (Moturiki datum).

8.2 The consent holder shall submit a report to the Group Manager Regulatory Services BOPRC setting out guidelines that will be followed for the effective day to day management of the inlet, outlet and pipeline structures to achieve optimum control over the target range for the Lake Okareka lake levels. The report shall be forwarded no later than **30 September 2017** ~~30 September 2004~~, and include, but not be restricted to:

- Schedule for regular checking of lake levels; and
- Schedule for regular checking of screen intake; and
- Guidelines for setting of valve in response to lake level readings; and
- Responsibilities for carrying out the day to day management; and
- Provision for regular review of the day to day operational guidelines.

## **2 Reasons for the Proposed Variation to Consent 60776**

BOPRC holds resource consent to discharge water from the Lake Okareka outlet canal at a maximum rate of 239L/s. A series of large rainfall events in 2017 have elevated lake levels to the highest since the outlet control structures were installed in 1965. The discharge is controlled by a pipe with a control valve which has a maximum operating capability of approximately 360L/s. On 23rd June 2017 under s330 of the Resource Management Act (Emergency Works), BOPRC applied for the valve to be opened to its maximum physical capacity of 360L/s.

Three flow scenarios have been considered without rainfall, assessing the time for the lake level to reduce from the level of 354.38m at 12.00 on 20/07/17 to the maximum target consent level of 353.90m which is a fall of 480mm.

- a. Current Consent limit (239L/s)
  - b. Current Valve Fully Open (360L/s)
  - c. Addition of a second pipe to increase total flow capacity to 500L/s
- a. Discharging under the current resource consent limit of 239L/s, the lake level will fall by approximately 3-4mm/day, taking approximately **137 days** to reach the consent maximum level of 353.9m
  - b. Under current operating conditions (above consent) of 360L/s, the lake level will fall by approximately 5mm/day, taking approximately **96 days** to reach the consent maximum level of 353.9m
  - c. Under the proposed increased flow rate of 500L/s the lake level will fall by approximately 6-7mm/day, taking approximately **74 days** to reach the consent maximum of 353.9m

The above values do not include rainfall in the calculation. In the time that the valve has been fully open (26 days) there has been 407mm of rainfall and the lake level has risen by 140mm. This equates to approximately 29mm of lake level increase per 100mm of rainfall at current ground saturation conditions. This clearly demonstrates

that the current discharge system, even operating at maximum physical capacity and outside current consent limits is unlikely to have the capacity to reduce lake levels to the target range going into winter in a year of exceptional storm events. In addition as a result of each higher rainfall event there is an immediate response in lake level of about 70 to 80 % of the rainfall. I.e. A 100 mm rainfall over a day immediately raises the lake level by about 70 to 80 mm.

For this reason BOPRC is seeking resource consent to allow the current discharge system to be operated at maximum flow capacity of 360L/s and to add a temporary second pumped discharge system with the intake and discharge points located adjacent to the current pipe to increase the maximum discharge to a total capacity of 500L/s. The outlet pipe was recently upgraded to replace the top section of concrete pipe. The concern was that corrosion of the pipe could have resulted in catastrophic failure and the first 1500 m have been upgraded to a 600 mm polythene pipe. Now the main restriction to flow is the bottom end of the pipe. This is a 300mm steel pipe. The intention is to upgrade this to a 450mm polythene pipe that will enable the flow of more than 500 L/s.

### **3 Background**

#### **3.1 Locality**

Lake Okareka is a small lake in the Rotorua District situated between Lake Tikitapu and Lake Tarawera. It has a surface area of 3.46 km<sup>2</sup>, a land catchment area of 19.8 km<sup>2</sup>, and a maximum depth of 33.5 metres. The lake is regarded as mesotrophic, which is intermediate between oligotrophic (low in nutrients, generally in “natural” condition), and eutrophic (high in nutrients, typical of a highly modified or pastoral catchment).

#### **3.2 Lake Okareka Outlet Control Structure**

An outlet structure was constructed at Lake Okareka in 1965. Lake Okareka is land locked with no natural surface outlet. The outlet control structure to drain water from Lake Okareka into the Waitangi Stream was initially installed following very high lake levels in the 1950's and early 1960's. The purpose of the outlet control structure was to provide some degree of control over water levels within Lake Okareka. The current resource consent issued in 2001 aimed to regulate the level of the lake within a target range of 353.3 metres minimum to 353.9m maximum lake level (Moturiki datum). The key site features locations are shown in figs 8,10,14-18 and listed below;

- 1 Lake Outlet Pipes NZTM 1895725 5769066
- 2 Pipe Intake NZTM 1895994 5769027
- 3 Control Valve NZTM 1896276 5769036
- 4 Dissipater NZTM 1896398 5769012

The diversion of water from Lake Okareka to the Waitangi Stream involves the following):

- Water drains from Lake Okareka into an outlet canal through a set of six parallel culverts, of varying diameters and invert levels. The inlet is also effectively a weir between the lake and the outlet canal with potential to overtop as the water rises at times of high lake level. At the current high lake levels, the weir has been overtopped.

- The canal is approximately 280 metres long, passing through farmland (Playne Property).
- At the eastern end of the canal is a screened intake to a pipeline. The pipeline consists of 150m of 600mm diameter polyethylene pipe, 167 metres of 450mm diameter steel pipe and 125 metres of 300mm steel pipe, separated by the gate valve which controls flow.
- The discharge from the pipe is into an energy dissipater (concrete trough) in the bed of the Waitangi Stream. The water from the discharge overflows into the Waitangi Stream and then flows into Lake Tarawera at Waitangi Bay.

Figs 8, 10, 13 show the location of the pipes and structures

The gate valve in the pipeline is used to regulate flow and therefore control lake levels. Condition 8.2 of the resource consent required the consent holder to operate under a set of approved operational guidelines which outline the day to day management of the system. The current guidelines are attached as Appendix 3. The guide contains winter and summer operating schedules. The table below shows the summer schedule. Note that the guidelines allow some operator discretion.

<b>SETTING</b>	<b>Lake Level</b>	<b>FLOW (litres per second)</b>
Valve fully open	>353.75	239
	353.65 - 353.75	100-150
	353.55 - 353.65	50
Valve fully closed	<353.55	0

The previous consent application noted the following;

*'50 mm of rain in the Lake Okareka catchment would increase lake level by 100mm. At a discharge rate of 239L/s, the pipe is capable of draining 5mm of lake level per day, so it would take 20 days to drain the 50mm of rain.'*

*Therefore when there are periods of prolonged rainfall, the lake level can rise quickly, and be difficult to control, as the maximum controlled discharge is not high.*

*The control structure is also limited in terms of maintaining minimum lake levels, as the invert of the inlet effectively sets the minimum level that can be controlled. If the lake falls below the invert level of the inlet, then the control structure is unable to influence any control at all over the lake level.*

## **4 Proposed Changes**

There will be no changes to the lake outlet bund or the array of 6 culvert pipes at the lake outlet or the 280 meters long canal.

### **4.1 Existing Pipe**

The eastern end of the canal flows into a grate protected 600mm PE pipe which feeds

into a steel pipe containing the control valve. The lower end of the pipeline will be upgraded to 450mm to increase capacity. However the immediate increase in capacity will be provided by a temporary pump and pipeline as described below.

The variation is seeking to allow the valve to be open to its full capacity of 360L/s rather than the current consent limit of 239L/s until such time as the permanent changes to the pipeline can be made.

#### 4.2 Dissipater

The current pipe flows to a gully head and discharges into an energy dissipater and large riprap to remove some of the energy before the discharge flows into the Waitangi Stream. An engineering assessment of this structure will be made and the structure will either be upgraded in its current location or slightly moved to a more appropriate location for energy dissipation (see section below on additional pipe).

#### 4.3 Additional Temporary Pipe and Pump

Section 2 and Figs 25-36 show that in the current high lake level and high rainfall period the current pipe system (even operating at the increased 360L/s discharge level) will not reduce the lake level to its target limits. Engineering assessment of the stream channel below the dissipater is capable of carrying a flow of 500L/s without damage to the streambed or banks. The variation proposes to add a second pipe (450mm diameter PE). The intake will be at the intake grate on the current pipe (see figs 17-17). A pump will be fitted to lift the water from the canal. The pipe will be placed on the surface of the access road, generally adjacent to the existing pipe. A terminal structure will be fitted to the pipe which will be similar to the current structure and both will discharge into the dissipater which will either be an upgraded version of the current structure, or a new dissipater in a slightly revised location.

### 5 Assessment of Environmental Effects 2001

The 2001 resource consent application was publically notified on Friday 19 May 2000, with submissions closing on Monday 19 June 2000. A total of nine submissions were received as set out in the table below.

<b>Table summarising submissions to Consent Application 60776</b>			
<b>Submitter</b>	<b>Address</b>	<b>Oppose Support</b>	<b>Comments</b>
Rotorua District Council	Rotorua	Support	Supports application
Tarawera Lakes Protection Society Inc	Lake Tarawera	Oppose	Inadequate AEE, contrary to RMA, contrary to relief sought on District and Regional Plans, fails to acknowledge intrinsic ecological & hydrological nature of Tarawera Lakes Environment
CA & J Watmore	Lake Tarawera	Oppose	Concern that a minimum discharge should apply to ensure adequate water for trout habitat, also water quality issues.
Te Arawa Maori Trust Board	Rotorua	Oppose	Expects to be consulted, does not want to prejudice discussion on Tarawera variation.

Department of Conservation	Rotorua	Oppose	Notes the range of protected species in Lake Okareka area, not consistent with RMA (natural character, habitat, significant indigenous species, public access and trout habitat), effects on terrestrial and aquatic habitat, potential passage way for unwanted species, water quality decline, setting of base flow discharge, effects on marginal strips around lake Okareka.
Lake Tarawera Ratepayers Association Inc	Lake Tarawera	Oppose	Setting of minimum base flow, water quality effects.
Lake Okareka Ratepayers Association Inc	Lake Okareka	Oppose	Existing pipe size does not allow for adequate lake level control, adverse effects of inadequate lake level control, septic tanks riparian management and building levels are of concern, Necessary works should be funded under Tarawera Rangitaiki River scheme, effective lake level control has regional benefits.
Anaru Rangihueua	Lake Tarawera	Oppose	Inadequate consultation with relevant hapu, cultural issues associated with water as a taonga, having a mauri, mixing of different waters.
Fish and Game New Zealand	Rotorua	Oppose	Setting of minimum base flow, water quality concerns at Lake Okareka.

The following actual or potential effects *shown in italics* were identified in the application process for the current resource consent issued in 2001 and were addressed in the consent process and controlled by the current consent. Within each section, **comments** have been added where relevant to the current consent variation application.

- *Potential effects on base flow in Waitangi Stream system if minimum discharge limits are not set.*
- *Potential effects on water quality of receiving environment of Waitangi Stream and at Waitangi Bay in Lake Tarawera.*
- *Effects on cultural issues relating to:*
  1. Water quality of Lake Okareka;
  2. Discharge into the Waitangi Stream;
  3. Mixing of two different water bodies each with their own mauri.
- *Inadequate provision for effective control over lake levels within Lake Okareka, and effects on other matters as a result of inadequate control.*
- *Potential for transfer of pests from Lake Okareka to Lake Tarawera via the pipeline control system.*
- *Ecological concerns relating to potential effects on the special nature of Lake Tarawera, as well as natural character, public access and marginal strips around Lake Okareka.*

## 5.1 Minimum Discharge Limits

*The Lake Okareka control pipeline has been discharging into the Waitangi Stream since 1965. The natural base flow of the Waitangi Stream is estimated to be typically in the order of 100 litres/second as set out in Appendix II of the Environment B·O·P report, Lake Okareka Level Control dated February 1999. The discharge from Lake Okareka can be presumed to be an important component in maintaining an effective base flow (based on water quantity) for aquatic habitat within the Waitangi Stream. A number of different parties have suggested that a minimum discharge limit of 100 litres/second should be set on any conditions of consent, to augment the natural base flow.*

**2001 Assessment:** *While the figure of 100 litres per second as a minimum discharge limit appears to be reasonable, there are practical problems in achieving this figure. Firstly, the control over the gate valve does not appear to be sufficiently sensitive to achieve a flow of 100 litres/second. Secondly, if the level in Lake Okareka drops to below the invert level of the pipeline intake, then no flow will occur through the pipeline. Thirdly, there will be times when the valve in the pipeline may need to be closed completely (such as for maintenance, or if there is a threat of an unwanted species in Lake Okareka). Notwithstanding these potential problems, the matter of setting a minimum discharge flow (as far as practicable) is considered appropriate if the consent is to be granted.*

**2017 Comment** *The changes to the discharge system will begin at the downstream end of the discharge canal. There will be no change to the lake discharge weir and 6 parallel pipes, so the same constraints still apply, except the introduction of a second pumped discharge will allow for maintenance to be undertaken on one pipe whilst retaining base flow.*

## 5.2 Water Quality of Lake Okareka

*There is ample evidence to show that the water quality of Lake Okareka is generally lower than the water quality of Lake Tarawera. Lake Okareka TLI 3.3, Lake Tarawera TLI 3.0) The reasons for this are related to the catchment characteristics of each of the lakes as well as associated land use and contaminated discharges that may contribute to lake water quality.*

*It is contended as being self-evident by submitters that the water quality of Lake Okareka is adversely affected by seepage from septic tanks during periods of high lake levels, and also from pastoral land use within the catchment and adjacent to the margins of the lake and inlet canal.*

**2011 Assessment** *The matter of septic tank contamination of Lake Okareka is not disputed. However, the consent application is for a discharge of up to 239 litres/second. The consent conditions pertaining to this application are not able to address a higher limit than that applied for. That would require a new consent application. Therefore, any possible improvement on managing the lake level controls to minimise the times when lake levels are high cannot be addressed by increasing the discharge rate. Instead, there must be reliance on other management methods (such as regular cleaning of the intake screens, closer monitoring of lake levels and valve settings etc). While it is not disputed that high lake levels increase the risk of septic tank contamination to Lake Okareka, the matter of septic tank problems can be more properly addressed through the Bay of Plenty On-Site Effluent Treatment Regional Plan (OSET Plan).*

*Following the pre hearing meeting, Mr JJ McIntosh, Manager Environmental Investigations (Environment B·O·P) was asked to assess the potential effects of the discharge on the water quality of Lake Tarawera as a result of the discharge from Lake Okareka. Mr McIntosh concluded that the outflow from Lake Okareka would not have an adverse effect on the quality of the waters of Lake Tarawera. His report is included as Appendix I.*

*There is an acceptance that increased nutrients and bacterial contamination may be caused by pastoral land use, particularly on the margins of water bodies where stock has direct access to water. However, the ability of the applicant to address this issue within conditions of a resource consent is somewhat limited in this situation, as the applicant does not own the pastoral land grazed by stock. There is a legal easement over the pipeline, but not over the inlet canal which is open to stock grazing. The applicant therefore has no direct control over the riparian margins. The Operations and Rural Services Department of Environment B·O·P has the ability to assist landowners in protecting riparian margins through voluntary means using Environmental Programmes, and it is likely that this may occur on the margins of Lake Okareka and the inlet canal in the near future. In fact it is probable that this will occur before June 2005, as Rule 13.2.5(l) in the proposed Regional Plan for the Tarawera River Catchment (Tarawera Plan), states that from 1 July 2005, stream beds within the Tarawera Catchment (including Lake Okareka) will need to be protected from uncontrolled stock grazing. (A number of farmers in the Tarawera catchment consider rule 13.2.5(l) to be unreasonable and are pursuing other options to look at alternatives, but the rule currently has status). It is considered that the grazing of stock adjacent to the inlet canal may adversely affect the water quality of the discharge. Notwithstanding the fact that the applicant does not own the land, the preparation of a management plan for the protection of the inlet canal from stock could be appropriate as mitigation if the consent is to be granted. Implementation of the plan would rest with the landowner. Regardless of whether the plan is implemented immediately or not, Rule 13.2.5(l) of the Tarawera Plan would come into force after 30 June 2005.*

**2017 Comment** There is still a difference in water quality between the two lakes (Lake Okareka TLI 3.3, Lake Tarawera TLI 3.1). Since the last consent application, Okareka has been converted to a reticulated sewage system (2010). In addition Lake Ōkāreka has been subject to targeted land use change to reduce the nutrient loading from farming within the catchment. Additional evaluation of this change is currently underway.

### **5.3 Consultation and Cultural Issues**

*The applicant has undertaken consultation with representatives of Tangata Whenua. The applicant reported from the consultation meeting with Mr Rangiheuea and Mr Tahana held on 31 July 2000, that there was concern expressed about the water quality issues of all the Rotorua Lakes. While Te Arawa were not necessarily opposed to the pipeline per se, they wanted to see an improvement in the water quality. At the pre hearing meeting, Mr Rangiheuea also expressed strong concerns regarding the cultural offensiveness of mixing the waters of Lake Okareka directly with the Waitangi Stream. He also expressed concern in terms of the special historical significance of the Waitangi Stream.*

**2011 Assessment:** *The cultural offensiveness of mixing waters from two different water bodies (each with their own mauri) is a very real concern to Tangata Whenua. The fact*

*that the control system has been in place for decades does not lessen that concern. It could be argued that water seepage underground from Lake Okareka to the Waitangi Springs recharges the base flow of the Waitangi Stream, so therefore they are part of the same water system. However, Maori lore recognises that water can be cleansed by flowing through Papatuanuku (Mother Earth), and therefore, underground seepage is quite different to surface flow. While the outlet structure does provide control over lake levels and therefore benefits local residents and visitors to Lake Okareka, the cultural concerns may be unable to be adequately addressed if consent is granted.*

**2017 Comment** There has been consultation with Ken Raureti (Ngati Rangitihi) and Allan Skipwith (Tuhourangi). The consultation discussions are detailed in Appendix 4. This discussion has highlighted clear concerns regarding the long term management of the lake level control. Due to the urgency of this activity to lower the lake level full discussions on these matters have not yet been undertaken and so a response to these concerns is not appropriate at this time. However, BOPRC Lake Operations staff wish to fully engage with iwi and the wider community to understand particular perspectives and identify how the various concerns can be addressed.

#### **5.4 Provision of Effective Lake Level Control**

*The Lake Okareka Ratepayers and Residents Association Inc (LORRA) have submitted that the current discharge rate should be increased to provide more effective lake level control. The applicant has stated that the current regime, with a maximum discharge rate of 239 litres per second is operated so as to try and keep lake levels between 353.5 metres (Moturiki datum) and 353.9 metres. Historical records show that under the current regime, the lake levels were kept within the desired range 78% of the time between January 1978 and August 1998. Lake levels were in excess of the maximum 10% of the time, and below the minimum for 12% of the time. In this respect, the application has shown clear beneficial effects over time, in terms of lake level control. The managed discharge of water from Lake Okareka through the pipeline has given a relatively high degree of security to Rotorua District Council and Lake Okareka residents by protecting physical resources, particularly public and private property.*

*Data provided by the applicant in response to a request for further information indicates that a number of houses and basement /garages could be flooded if the pipeline was to be closed. This could range from 8 houses and 3 basement/garages flooded (within a year of closure) for average rainfall patterns, up to an estimated minimum of 17 houses and 6 garage/basements flooded if rainfall reached the high levels experienced in the 1950s and 1960s.*

**2011 Assessment:** *The application is to authorise an existing structure that has provided clear benefits by protecting physical resources in the Lake Okareka catchment. The applicant has applied for a specific maximum rate of discharge. Under the current application, it is not possible to increase the maximum discharge rate. To satisfy the concerns of LORRA, a new consent application would be required. This would also require re-advertising for public submission.*

**2017 Comment** With one or two exceptions, the lake level has generally been managed within the consent upper and lower target limits, however a number of rainfall events through February to April have created prolonged saturated ground conditions and the highest lake levels since 1967. These coupled with evidence of changes in rainfall patterns indicated that additional discharge capacity is needed to maintain the lake levels within the consented target range. The 2001 assessment made reference to a

number of properties being at risk of flooding. At 16 July 2017, the lake level was recorded at 354.43m. The 2001 report recorded the lowest floor level of a dwelling to be 354.50m (that dwelling has now been removed) with a number of other low lying dwellings potentially at risk (354.94m). There is concern that the prolonged high lake levels could affect the foundations of properties before they risk becoming inundated as well as damage to road foundations. There is also identifiable damage to footpaths/walkways and many boat jetties and the boat ramp are totally submerged (see figs 20-23). The proposed changes contained in this resource consent application appear to be in line with those requested by LORRA in 2001.

## **5.5 Potential for Transfer of Pests from Lake Okareka to Lake Tarawera**

*The potential adverse effect involving transfer of unwanted species from Lake Okareka to Lake Tarawera has been raised in the submission from the Department of Conservation. However, the issue is implied in other submissions as well. There is a slight potential that this could occur, and the adverse effects could be very serious. The applicant has pursued the matter with the Department of Conservation, as well as with a technical consultant, and pest management staff of Environment B.O.P. The general agreement is that the likelihood of transfer of unwanted pests via the pipeline is very low, compared to other possible mechanisms.*

**2011 Assessment:** *Given the low likelihood of transfer, it is considered that appropriate consent conditions (if the consent was granted) would be to ensure that a surveillance programme is implemented to detect any occurrence of unwanted species early, and to close the valve in the pipeline until a management response is agreed upon and implemented. Any management response would require the input of other parties including Department of Conservation as well as Fish and Game New Zealand.*

**Comment 2017** The above comments are still applicable to the proposed changes in the current application proposal.

## **5.6 Ecological Effects**

*One submitter contended that the operation of the discharge structure to control the lake level of Lake Okareka, means that the natural situation of wide fluctuations in lake level allowing inundation of possible wetlands does not occur.*

**Comment:** *While control over natural lake level fluctuation may be considered unnatural, it also provides an opportunity to manage the lake margins within more defined limits. It is considered that the effects on the ecology of Lake Tarawera are more difficult to define, as the discharge is of such a low volume that any effects are unable to be measured, apart from the beneficial effects on trout habitat within the Waitangi Stream.*

**Comment 2017** This resource consent application does not propose to change the current lake level operating range. The objective is just to provide additional resources to ensure that the level remains within the range where practicable. However, through consultation with iwi and the communities of Lakes Ōkāreka and Tarawera the operating guidelines could be agreed that provide clear guidance on achieving lake level control to protect infrastructure whilst also having regard to other concerns around natural cycles and downstream effects. This is a matter that will require considerable discussion as we move from the emergency situation into consideration of the long term management of Lake Ōkāreka and its outflow.

## 5.7 **General Concerns Relating to Resource Management Act (Part II Matters)**

*The submission from the Department of Conservation expressed concern over matters such as natural character, public access and effects on marginal strips and wetlands around Lake Okareka. There is a conflict between provision/security of public access around Lake Okareka by providing lake level control, but losing possible wetlands that would otherwise be inundated with high lake levels at certain times if the lake levels were not controlled.*

**2011 Assessment:** *There is a conflict of interest between provision of lake level control compared to no control. The community of Lake Okareka includes physical resources (jetties, boat ramps, property development) that have been legally established and now provide part of the character that is Lake Okareka. No control over lake levels gives more weight to the natural environment at the expense of the physical environment. Matters such as security of public access around the lake rely on a degree of control over lake levels. There is uncertainty over whether there would be more wetland if lake levels were allowed to fluctuate naturally. It is considered that any future management of lake margins around Lake Okareka would be more easily accomplished if lake levels continue to be controlled.*

**2017 Comment** The above comment still applies. The 'character' of Lake Okareka and its surroundings be it natural or manmade is being affected by prolonged high lake levels. Access to the lake is more difficult and lakeside paths and tracks are inaccessible and in some cases damaged (see figs 20, 22, 23).

## 5.8 **Summary of Effects 2001**

*The effects discussed above relate to the taking, diversion and discharge of water through the existing pipeline. It is evident that the pipeline provides benefits in terms of lake level control within Lake Okareka. Given the range of potential and actual adverse effects, it is considered that most of the adverse effects of the activity could be avoided, remedied or mitigated by the proposed consent conditions, if consent was granted. Some of the adverse effects covered in submissions are more appropriate to be dealt with under other mechanisms. The one issue that is unable to be addressed by appropriate consent conditions is the cultural matter relating to the mixing of two different water bodies, with the discharge of water from Lake Okareka into the Waitangi Stream.*

**2017 Comment** The above still applies to the current consent application. Further discussions are necessary to explore how the mixing of water from Ōkāreka can be managed possibly to address(in part) the concerns that continue today.

## 6 **Additional Environmental Effects of Proposed Resource Consent Variation 2017**

Section 5 of this application considered the potential and actual effects of the activity listed in the 2001 application with comments on their relevance to the current situation and proposed changes. These are other potential effects associated with the changes.

In considering the proposed increase in flow to 500L/s, it should be noted that the lake discharge has been managed within the current consent discharge limit of 239L/s since 2001. Graph x shows that in the 16 years consent period there have been three other

occasions when the lake level has exceeded 354.25m which means that for the vast majority of the time a 239L/s maximum discharge rate has been sufficient to manage lake levels. Having additional flow capacity means that as lake levels rise, the discharge rate can be increased to maintain lake capacity and when rain ceases, the lake level can be reduced more quickly to recreate capacity. The current problem is that there is no capacity in the lake so further rain increases the level above the management range. Under the proposed changes, once the lake level returns to within the target management range, barring exceptional circumstances it is unlikely that the 500L/s discharge rate will be required very often, but it will be a useful tool to have, particularly as exceptional weather events are occurring more frequently

### **6.1 Additional Water Take Structure**

The current water take is an engineered structure when the outlet canal discharges into a pipe. The pipe intake is protected by headwalls and a metal debris screen (See Figs 15 and 17). The additional temporary pipe intake will be fitted into this structure and the pump will be placed adjacent to the structure. The installation will cause minimal ground and vegetation disturbance

### **6.2 Additional Discharge Structure**

The current pipe discharges into an energy dissipater which removes some of the energy from the flowing water. It then cascades over large riprap to dissipate more energy before flowing into the Waitangi Stream. Two options are currently being investigated. One will be to upgrade the current location and add the second temporary discharge pipe, the second is to slightly modify the location if it provides better energy dissipation.

### **6.3 Additional Flow on Waitangi Stream**

The lake discharge was increased for the consented 239L/s to 360L/s on 23 June 2017. The stream has been monitored since that time and the additional flow has not increased erosion or sediment generation

### **6.4 In-stream Structures**

There are three culverts in the stream between the dissipater and Lake Tarawera. These are; Spencer Road, 341 Spencer Road Right of way and a private property close to the lake.

- Spencer Road - The culvert has a diameter of 1150mm. Fig xx shows the pipe approximately 35% full with a flow rate of 360L/s. RLC and BOPRC Engineering staff have confirmed that the pipe is more than adequately sized to convey a pipe discharge of 500L/s- See Appendix 4 Communication
- 341 Spencer Road Right of Way - This culvert is located approximately 140m downstream of the Spencer Road culvert and also has a diameter of 1150mm. This pipe is also deemed to be more than adequately sized to convey a pipe discharge of 500L/s- All residents have been contacted and a number of them have provided emails of support. None of the respondents have objected to the increase. See Appendix X Communication

There is a 900mm diameter culvert on a private property close to the lake. Under the current flow regime of 360L/s this pipe is running at close to full capacity and in its current

configuration would not be able to convey the additional flow generated at between 360 and 500L/s discharge. BOPRC engineering staff are in consultation with the owner and Eastern Region Fish & Game and have reached agreement that a 450mm over flow pipe will be fitted above the current stream flow level.

## **6.5 Fisheries Values**

The Waitangi Stream is listed in Schedule 1A of the Bay of Plenty Regional Water and Land Plan *'Important Habitats of Trout' - Regionally significant habitat and fisheries values*. There has been consultation with eastern Region Fish and Game (ERFG) and the landowner to address potential adverse effects on the fishery. ERFG have provided written support of the measures to reduce the level in Lake Okareka but have requested further discussion in addressing potential effects and have requested to see this AEE. BOPRC is happy to work with ERFG and the land owner to ensure protection of this valuable fishery habitat to ensure its protection.

## **6.6 Cultural Values**

BOPRC representatives have been in contact by email and telephone with Allan Skipwith (Tuhourangi Tribal Authority) and Ken Raureti (Ngati Rangitahi) and a site visit was undertaken on 19th July. Some concerns were raised about the timing of events and lack of communication over recent management of the outflow. Also concerns were reiterated (referenced in the 2001 application) that they would like to see outflow controls removed and the lake be allowed to fluctuate within its natural levels. Concerns are summarised in the email from Alan Skipwith dated 20 July 2017. One aspect that will be addressed is communication with stakeholders on the day to day management of the outfall, ie notification of the management plan and providing advanced notice (where practicable) of changes to flow). See Section 6.9. Clearly in the current circumstances a full discussion on the impacts to iwi and potential solutions and mitigations has not taken place. BOPRC Operations staff commit to undertaking appropriate engagement with iwi in an attempt to find solutions to address the concerns raised. Due to the nature of the situation with houses and infrastructure now located in areas at risk of flooding -it is likely that some compromise will be necessary.

## **6.7 Okareka Community**

Not surprisingly, many members of the Lake Okareka community are concerned about the high lake level and the adverse effect on property (jetties, gardens and lake margin protection) as well a potential effects on low lying dwellings, Other facilities such as the Okareka boardwalk and the Boyes Beach - DOC campground walk way have been adversely affected by the high levels (see figs 20, 22, 23). There have been a number of community meetings and circulars which have been distributed by Lake Okareka Community Association with updated information placed on their website. An email of support has been provided by LOCA which is attached in Appendix 4 Communication. A presentation was made to the RLC Community Board on 20th July 2017.

## **6.8 Tarawera Community**

Some members of the Tarawera community attended the Community Board meeting on 20 July 2017. There has also been telephone communication with Fred Stevens Deputy Chair Lake Tarawera Residents and Ratepayers Association. Fred stated that they opposed the increase in discharge rates. He also stated this at the Community Board meeting on 20th July. Fred is also president of Lake Tarawera Protection Society. Both

organisations opposed the outflow consent in 2001 and continue to oppose it. A full discussion is necessary with the Lake Tarawera Ratepayers to clarify issues with the discharge and identify mitigations if appropriate.

## 6.9 Neighbours

Immediate neighbours who are potentially affected by the proposal have been contacted and where appropriate followed up with site meetings and other communication. Neighbour communications is attached as Appendix 4

## 6.10 Operating Procedures (inspections etc

Consultation with affected parties has highlighted the need for better communication with stakeholders around the operating of the outfall, keeping parties informed about changes in outflows and where possible provide advanced warning. The current Operational Guidelines are attached as Appendix 3. These will be revised to incorporate the additional discharge capacity and also to consider responses to climate change and more extreme weather events. The revised plan will also include a clear communications strategy with affected parties.

## 7 Statutory Considerations

Section 104 RMA requires the consideration of Part II matters, and that regard be had to: any actual and potential effects on the environment of allowing the activity (s.104(1)(a), National Policy Statement 104(1)(b)iii, Regional Policy Statement

### 7.1 Part II Matters

The most relevant Part II matters are as follows:

*Section 6 **Matters of National Importance** In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:*

6(a) *The preservation of the natural character of the coastal environment (including the coastal marine area) wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision use and development*

6(e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga*

*Section 7 **Other matters** In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to;*

7(a) *kaitiakitanga*

7(d) *intrinsic values of ecosystems*

7(f) *maintenance and enhancement of the quality of the environment:*

7(h) *the protection of the habitat of trout and salmon:*

*7(i) the effects of climate change:*

It is considered that the proposed variation is consistent with the relevant Part II matters and that the proposed mitigating measures and consent conditions have regard to those matters, but it is noted that iwi concerns about water levels have not been addressed.

## **7.2 Section 104 - Operative Bay of Plenty Regional Policy Statement**

The Regional Policy Statement (RPS) became operative on 1 October 2013. It is considered that relevant sections of the RPS include:

- Objective 11 An integrated approach to resource management issues is adopted by resource users and decision makers.
- Objective 12 The timely exchange, consideration of and response to relevant information by all parties with an interest in the resolution a resource management issue.
- Objective 13 Kaitiakitanga is recognised and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) are systematically taken into account in the practice of resource management.
- Objective 14 Partnerships between Bay of Plenty Regional Council, district and city councils and iwi authorities.
- Objective 15 Water, land, coastal and geothermal resource management decisions have regard to iwi and hapū resource management planning documents.
- Objective 17 The mauri of water, land, air and geothermal resources is safeguarded and where it is degraded, where appropriate, it is enhanced over time.
- Objective 20 The protection of significant indigenous habitats and ecosystems, having particular regard to their maintenance, restoration and intrinsic values.
- Objective 21 Recognition of and provision for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga
- Objective 27 The quality and mauri of water in the region is maintained or, where necessary to meet the identified values associated with its required use and protection, enhanced.

Environment B·O·P, Rotorua District Council and the Te Arawa Maori Trust Board are partners in developing a Management Strategy for the Rotorua lakes. A key concern of the partners is the protection and enhancement of the water quality within the lakes.

## **9 Term of Consent**

This application is for a variation to consent 60776. The RMA s127 of the does not allow variation to the term of a consent, so the consent term expiry date will remain 31 May 2026.

## 10 Conclusion

The application is for variation to resource consent 60776 to:

- Increase the maximum Lake Okareka water discharge rate from 239L/s 500 L/s and use / maintain an existing intake in the bed of the canal below the lake outlet; and
- Adding a temporary second discharge pipe adjacent to the current pipe entrance and discharge at the same location as the current discharge (or revised location)
- Discharge water to the Waitangi Stream at a maximum rate of 500 litres per second and use / maintain an existing outlet in the bed of the Waitangi Stream; and
- Divert water from Lake Okareka to the Waitangi Stream at a maximum rate of 500 litres per second.

As a consequence of this activity, the lake level of Lake Okareka is controlled within general limits of 353.5 metres (Moturiki datum) and 353.9 metres.