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Levin Water Supply
Water Harvesting & Resilience Project

Assessment of Environmental Effects for Abstraction of Water from the Ohau River and Activities to Enable Augmentation of the Levin Water Supply via Water Harvesting & Reservoir Storage

Horowhenua District Council

November 2024

FOR LODGEMENT

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1 INTRODUCTION AND REASONS FOR THE APPLICATION

Horowhenua District Council (the Council) provides a public water supply to the community of Levin. The current consent (ATH-1991006011.03) authorises the abstraction of up to 15,000 m^3/day of water from the Ohau River to meet the public water supply needs of Levin.

At the time that the consent was granted (2017), it was anticipated that this allocation would be sufficient to meet the projected demand through until the expiry of consent in 2042. However, Levin has been growing at a significantly faster pace than projected and it is now clear that the existing allocation is not sufficient to meet the community's needs through to 2042. When granted in 2017, it was anticipated that there would be a total of 2% growth over 50 years. However, the growth that has occurred since grant of consent has been approximately 2% each year.

The Council has undertaken significant investment in network management and pressure controls to ensure it can actively monitor and manage network efficiency and to enable network leakage to be brought within best practice benchmark standards. It has also recently initiated universal water metering, and is in the process of installing water meters with leak detection capability on all properties. These improvements have resulted in the average water demand being generally consistent with what is calculated as reasonable and justifiable for a public water supply under Policy LF-FW-P15 of the Horizons Regional Council's One Plan. Despite these significant improvements and due to the pace and scale of growth in Levin, additional allocation is required to meet the community's projected growth needs.

In addition to ensuring that adequate quantity of supply is available to meet the human health and drinking water needs of the Levin community, the Council is seeking to improve the way in which it takes water from the Ohau River. The National Policy Statement for Freshwater Management 2020 (as amended in 2024), herein referred to as NPSFM, introduced the fundamental concept of Te Mana o Te Wai into freshwater management in Aotearoa New Zealand and the NPSFM requires that freshwater is managed in a way that gives effect to Te Mana o Te Wai. To do this, the Council seeks to reduce its reliance on the abstraction of water from the Ohau River at times of minimum flow as far as possible. This will reduce potential adverse effects on the River and ensure the health and well-being of the water body is protected and provided for. Additionally, Council proposes a low flow abstraction management regime within which iwi / hapū have a direct role.

At the moment, there is only about 1 day's storage in the system. The Council also seeks to increase the resilience of the Levin drinking water supply to the effects of climate change and variability, including in particular highly variable and extreme weather conditions, and improve resilience to natural hazards including earthquakes, by providing alternative/additional supply within the system that is not reliant on the river take. The provision of storage provides an alternative water source during high flow / high turbidity periods in the River. High flow periods in the River can result in very high turbidity such that water cannot be treated to drinking water standards in sufficient quantities to maintain uninterrupted supply. Such events are infrequent, but can be expected to increase with climate change, and have significant consequences in terms of public health and community wellbeing. An example occurred in June 2021 when high turbidity in the raw water resulted in the treatment plant not being able to produce drinking water fast enough to meet community demand and supply to the community was interrupted. Further, the River is located on a fault line, and there is potential for the supply to be interrupted in the event of a significant earthquake. Recent post-earthquake experience in New Zealand has demonstrated a need to have an alternative drinking water supply to meet post-earthquake needs.

Therefore, to ensure that the Levin Water supply take and operational regime gives effect to Te Mana o te Wai and is able to meet projected growth needs and to achieve a resilient supply (ie in the order of 30 days' storage), the Council proposes to construct a large off-river water supply

reservoir on Council owned land located off Poads Road, approximately 3 km upstream of the existing intake.

In summary, the key reasons for the application are:

- To reduce the need to take from the river when it is below minimum flow thereby reducing the effects of the take on the River;
- To provide long term supply to Levin to meet growth projections which are significantly greater than when the existing Levin water supply consent was granted;
- To provide resilience within the Levin drinking water supply network by introducing large scale water storage and reducing risk associated with drought/low flow, high flow and highly turbid source water and emergency supply;
- To reduce the need to abstract large volumes of water from the existing intake structure, given sedimentation issues and the need to periodically scarify the river bed;
- To enable the construction, maintenance and operation of a new intake on the Ohau River and large off-river reservoir to be able to harvest and store water for later supply to the community;
- To provide flexibility and optionality within the water take permit structure to ensure security of supply and efficient use of resources and existing infrastructure by:
    - Providing flexibility between the two intake sites (being the existing intake site and a new reservoir intake site).
    - Ability to take the full consented volume from the new reservoir intake in emergency situations.
    - Providing for a short term abstraction of water for construction of the NZTA Ōtaki to North Levin project in order to enable efficient allocation of water for a project of national significance, which will have wide ranging benefits for the district.

This Application seeks to secure all regional resource consents for the activities required to provide the proposed augmentation to the Levin Water Supply. District Council planning approvals are being sought separately, noting that the project is enabled by the network utility provisions of the District Plan (i.e., it is considered to be a Permitted Activity) and that the Council intends to designate the reservoir site.

In summary, this Application seeks consent for the following activities:

- A new water permit to enable water storage to be provided within the Levin Water Supply System (via use of the new reservoir). The new water permit will replace the existing water take permits.
- Construction, operation and maintenance of a new intake structure and associated riparian works in order to improve optionality within the Levin Water Supply System and address and improve operational issues being experienced at the existing water treatment plant intake as well as to reduce adverse effects to the river bed associated with maintenance of the existing intake.
- Large scale earthworks to enable the construction of the off-river reservoir, including consent to undertake earthworks within, and within 100 m of, a natural inland wetland (marginal classification) located within the reservoir footprint.
- Construction and use of a new pipeline bridge to enable connection of the new reservoir to the existing water treatment plant.
- Intermittent discharge of overflow from the reservoir.
- Diversion and discharge of groundwater from under the reservoir.
- Any consents necessary to undertake wetland and stream enhancement, weed and plant-pest removal, and restoration on the lower terrace and floodplain area of the reservoir site in order to

implement the Cultural Offset Management Plan (COMP) agreed with iwi as appropriate mitigation measures for the effect of the water take and associated activities on the mauri of the awa.

This document has been prepared in accordance with the requirements of section 88 and Schedule 4 of the Resource Management Act 1991 (RMA) to support an application by the Horowhenua District Council ('the Applicant', 'the Council', 'HDC' or 'District Council') for resource consent from the Manawatū-Whanganui Regional Council ('Horizons' or 'Regional Council').

The Applicant requests that this application be processed by way of Public Notification.

2 CONSENTING FRAMEWORK

2.1 Consenting Approach and Other Consents Required

The consenting approach for this project has been to undertake an iterative process for developing a pragmatic and effective option for increasing resilience in the Levin Water Supply, applying key statutory policy drivers and the regulatory framework alongside technical optioneering and wider considerations for obligations to Te Tiriti o Waitangi partners and good environmental outcomes.

There are three key consenting phases, as described below. The water take permit and associated activities as described within this application are the key, primary activities for which resource consent needs to be secured. This is due to the significance of these activities for the Awa and within the planning framework (refer particularly to the discussion of the key policy drivers for the project in section 5 below) and for iwi / hapū, and the criticality of needing to secure a different take regime in order to fill and utilise the reservoir. In determining the more detailed logistical aspects of the proposal (eg location of pipes and equipment and realignment of Poads Road) it is important that there is sensitivity for the potentially affected landowners and ability to work iteratively with them. This process requires a not insignificant level of detail and time, and the Applicant needs to progress with the critical regional consents as these discussions and processes continue.

2.1.1 Securing Additional Core Allocation (Completed)

Throughout the project, critical pathways have been identified in order to ensure that matters arising could be appropriately addressed within the context of the above drivers. One of these was securing consent to take core allocation water (as per the One Plan), given advice from Regional Council that available core allocation was limited. It became clear during 2022 via assessment of water supply options that an alternative source supply in a different location from the Ohau River was likely not possible nor pragmatic and that storage near the existing source was necessary to increase resilience in the network. It was critical then that the District Council ensure that it had sufficient water take optionality to be able to fill any new storage (ie reservoir) so that this could continue to be a viable option. The ability to fill the reservoir needed to be independent of any additional consenting requirements for a new take from a new intake structure, given the uncertainty associated with consenting of supplemental (ie non core allocation) water takes under the One Plan.

Hence, in March 2022, the Council applied for consent (new abstraction from adjacent to the proposed reservoir site) to take 3,564m^3/day of water, being the remaining core allocation that Horizons had advised was available from the Ohau River, for the purpose of filling the proposed storage reservoir.

Soon after lodgement of that application, the Council was advised by Regional Council that previous advice regarding the volume of core allocation remaining for the Ohau awa was in fact incorrect and that only 409m^3/day of core allocation was available. There was some discussion between the councils, as drinking water supplier and consent authority, regarding whether or not 'there was any

point' to apply for the remaining core allocation, given that it was significantly less than the volume originally sought. From the drinking water supplier point of view, there did remain a need to apply for this lesser volume to provide some certainty regarding the ability to fill the reservoir, and it was also considered prudent to secure what water was available given that growth projections indicated that the need for drinking water for Levin may exceed the amount able to be supplied under the current regime by 2025. District Council subsequently amended the application[1] to seek only the 409m^3/day remaining core allocation and that consent (ATH-2022203743.00) was granted as a controlled activity on 15 November 2022.

2.1.2 Securing Key Regional Consents (this Application)

The next critical pathway identified for the project, in terms of consenting and the relevant RMA framework, is to secure the key resource consents from Regional Council to ensure that the project is able to go ahead with a water take permit with the correct optionality to enable water harvesting and security of supply, and the ability to construct the reservoir, new intake and pipe bridge, as well as the ability to implement cultural mitigation plans, being the activities for which consent is sought by way of this application.

2.1.3 District Council Approvals

Consultation by the project team with the District Council as consent authority has indicated that the construction of the reservoir appears to be a permitted activity under the District Plan. Likewise, it is expected that new pipework will be permitted under the network utility provisions of the Plan. The Applicant recognises however that the reservoir introduces large scale infrastructure into the local environment and critically, will provide critical long-term community infrastructure that requires protection including through to any water service entity that may be required to manage this facility in the future (depending on the outcome of Local Water Done Well water reform processes). Hence the appropriate consenting pathway has been determined to be to designate the reservoir site.

The Applicant owns the site upon which the reservoir will be located, noting that some of the intake infrastructure is located within the neighbouring property and engagement and discussion with that landowner is ongoing. It is also noted that part of the reservoir is proposed to be on what is legal road, and the specific legal and property arrangements are in the process of being established to support a Notice of Requirement. The proposal includes moving the current alignment of Poads Road such that it is in the paper road corridor, and the details of this are to be confirmed with the adjacent land owner given that access to that property would be changed and new access is to be satisfactorily established. An Outline Plan of works will be submitted for confirmation at the time that detailed design for the reservoir is completed.

2.2 Existing Consents

Horowhenua District Council holds the following consents from Horizons Regional Council in relation to the Levin Water supply take and treatment plant:

[1] *Letter to Sarah Sandilands, Horizons Regional Council from Annette Sweeney, Good Earth Matters Consulting on behalf of Horowhenua District Council dated 28 March 2022 Project Ref: 27036.001.*

Table 2.1: Existing Consents

Consent No.	Consent Type	Activity	Granted	Expires	Activity Status
ATH-1991006011.03	Water Take - Surface Water	Abstract 15,750 m^3/day of surface water from the Ohau River for municipal water supply and treatment plant backwash purposes at Gladstone Road, Levin. (note: any abstraction above 15,000 m^3/day is non-consumptive and must be returned to the river within 400 m of abstraction).	03.08.2017	01.07.2042	Non-complying
ATH-2022203743.00	Water Take - Surface Water	Abstract 409m^3/day surface water from the Ohau River for municipal water supply purposes at Poads Road, Levin (enables abstraction to occur 100 m up and downstream of new intake site).	15.11.2022	05.12.2027 See Note below	Controlled
ATH-2008010962.02	Land Use - River Bed	Gallery maintenance (periodic scarifying, flushing, backwash, flood debris removal).	26.08.2015	06.05.2043	Discretionary
ATH-1995003230.01	Discharge Permit	Discharge 1,000m^3/day of WTP reservoir overflow water, rain water run-off, filter cleaning and backwash water from the twin settlement treatment ponds to an Ohau River open drain at Gladstone Road, Levin.	20.03.2015	01.07.2042	Discretionary

Note: A short term consent only was granted as Horizons Regional Council understood that this application would be lodged within this timeframe.

This Application does not propose any changes to the existing land use (river-bed) consent (ATH-2008010962.02) and the existing discharge permit (ATH-1995003230.01). The existing water take permits (ATH-1991006011.03 and ATH-202203743.00) will be surrendered subject to grant of the consents sought by this application.

2.3 Resource Consents Sought and Activity Status

This Application seeks consent to replace two existing surface water take permits (ATH-1991006011.03 and ATH-2022203743.00) held by Horowhenua District Council for the taking of water from the Ohau River in order to supply drinking water for Levin, with a single new consent that is subject to a different take regime than provided for under the existing consents and to secure supplementary allocation for the primary purpose of filling the proposed reservoir. Concurrently, consent is sought for land use activities including the construction, operation and maintenance of a

new intake structure within the bed of the Ohau River; construction of the off-river reservoir including earthworks impacting a marginal natural inland wetland; and construction of a new pipeline bridge over the Ohau River to enable connection of drinking water pipes from the new proposed drinking water reservoir to the existing Levin drinking water treatment plant. Consent is also sought for a new discharge permit for the diversion and discharge of groundwater from below the proposed reservoir to the Ohau River and an intermittent, low frequency discharge of stored reservoir water to the Ohau River in the event of overtopping and if maintenance[2] draw down is required.

The proposal falls to be considered as a non-complying activity under Horizons Regional Council's One Plan and the National Environmental Standards for Freshwater (refer discussion in Section 8).

The specific resource consents sought by way of this Application for the above activities under the One Plan and NES-Freshwater are as follows:

Table 2.2: Resource Consents Sought

Activity	One Plan Rule	Activity Status	Site Details
Water take permit to abstract 16,159m^3/day from the Ohau River (Being 15,409 m^3/day of consumptive take and 750 m^3/day of non-consumptive take) (Core Allocation).	LF-TUD-R47 Takes and uses of surface water not complying with core allocations or takes and uses of water taken at or below minimum flow	Non-Complying	Ohau River at existing and new intake structures; Short term take at Ō2NL Project site for Ō2NL construction water.
Water take permit for supplementary allocation to enable water harvesting at times when the River is above median flow and which, in total is not to exceed 10% of the actual flow in the river at the time of abstraction. (Supplementary Allocation).	LF-TUD-R47 Takes and uses of surface water not complying with core allocations	Non-Complying	Ohau River at new intake structure.
Land use (bed of river) consent to construct, operate and maintain a new water intake structure (infiltration gallery) for drinking water supply purposes including intermittent air backwash of the system.	LF-AWBD-R76 Activities in the bed of a river that do not comply with other rules LF-LAND-R8 Vegetation Clearance, Land Disturbance	Discretionary Discretionary	Lot 1 DP 12594 116 Poads Road
Land use (bed of a river) consent to construct, operate and maintain a water pipe bridge over the Ohau River to convey water from the water storage reservoir to the drinking water treatment plant.	LF-AWBD-R68 Activities affecting RP-SCHED2 Value of Flood Control and Drainage	Discretionary	Road Reserve [DP 555714]

[2] *Maintenance in this context being for the purpose of maintaining either the physical assets, or maintaining water quality of stored water.*

Activity	One Plan Rule	Activity Status	Site Details
Land use (earthworks) consent to construct off-river reservoir and associated infrastructure of approximately 855,000 m^3 total volume.	LF-LAND-R6 Large-scale land disturbance, including earthworks	Controlled	Lot 9 DP 555714
Discharge permit for the intermittent discharge of stored water from the reservoir via spillway to the Ohau River if overtopping occurs or if maintenance draw down is required.	LF-LW-R38 Discharges of water or contaminants into surface water that do not comply with other rules or are not otherwise regulated	Discretionary	Lot 1 DP 12594 116 Poads Road; and Lot 9 DP 555714
Diversion of groundwater under the reservoir.	LF-TUD-R51 Diversions that do not comply with permitted activities and controlled activity rules	Discretionary	Lot 9 DP 555714
Discharge permit for the discharge of groundwater from under the water storage reservoir to water or to land which may result in some overland flow to the Ohau River.	LF-LW-R38 Discharges of water or contaminants into surface water that do not comply with other rules or are not otherwise regulated	Discretionary	Lot 9 DP 555714
Planting and Restoration in and around a rare habitat (wetland).	ECO-R2, Some activities within rare and threatened habitat	Non-Complying Activity	Lot 9 DP 555714 (COMP Area)
Land use (bed of a river) consent to construct shallow bores for abstraction of water in the vicinity of SH1 bridge.	RP-LF-AWBD-R54, Structures and disturbances involving a reach of river or its bed with RP-SCHED2 Values of Natural State, Sites of Significance - Aquatic, and Sites of Significance – Cultural	Discretionary	Ohau River in vicinity of Ō2NL Project site
Activity	**NES-Freshwater**	**Activity Status**	**Site Detail**
Earthworks within and within 100 m of a natural inland wetland (marginal classification), in a manner that will result in complete drainage of the wetland, required for the construction of specified infrastructure.	Regulation 45	Discretionary Activity	Lot 9 DP 555714
Discharge of groundwater within and within a 100 m setback from a natural inland wetland.	Regulation 39(3A)	Restricted Discretionary Activity	Lot 9 DP 555714 (COMP area)

2.4 Consent Duration

The term of consent sought is 35 years. The majority (15,000 m^3/day plus 750 m^3/day of non-consumptive take or 97% of the District Council's existing allocation) is consented through to July 2042. The Applicant seeks a 35-year consent term in this application, which would serve to extend this allocation timeframe a further 17 years.

This term is appropriate given the level of reasonable and justifiable need for the water as demonstrated within this Application; the level of planning and investment undertaken by the Applicant in developing the proposal and its importance for contributing to a reliable and resilient drinking water supply for Levin and surrounding communities; and because the proposed activities will not result in a more than minor adverse effects on the environment.

3 DESCRIPTION OF EXISTING WATER SUPPLY SYSTEM AND THE PROPOSED RESERVOIR AND INTAKE SITE

This section includes a detailed description of the existing Levin Water supply system; how the Council is managing the water supply network and community demand to achieve efficient water use; and details of projected community growth and what this means in terms of water demand and allocation requirements.

It also includes a detailed description of the sites at which the works proposed in this application are to be undertaken, including the new reservoir intake site and riparian area; reservoir site; cultural offset mitigation area, and proposed pipe bridge.

3.1 Levin Water Supply System

The Levin Water supply system abstracts water from an existing subsurface intake on the Ohau River approximately five kilometres south-east of Levin centre. The reticulation network provides water to domestic, community, commercial and industrial uses and delivers water for both potable and non-potable uses. However, as the water is supplied via a single reticulation network, all water is required to meet drinking water standards.

The Levin Water supply has a resource consent to abstract water from the Ohau River via an infiltration gallery. The consent enables the council to take up to 15,000 m^3/day under normal conditions. When the river is below its minimum flow defined in the Regional Council's One Plan (0.820 m^3/s), the Council is required to reduce its abstraction to 13,000 m^3/day. Further, an additional 750 m^3/day may be taken for non-consumptive purposes within the treatment process. This additional non-consumptive take must be returned to the river within 400 m of the abstraction point.

Water is treated to NZ Drinking Water Standards[3] via a Water Treatment Plant (WTP) at the same site. The treatment process currently consists of clarification, UV disinfection and chlorine dosing.

There is 12,000 m^3 of post-treatment water storage at the WTP site. This storage comprises a 6,000 m^3 steel tank installed in 2017 and two older concrete tanks with a combined capacity of 6,000 m^3. These storage tanks provide only approximately 1.25 days storage at current average demand and therefore their functionality is limited to assisting to meet short-term (ie diurnal variations) peak demand and providing firefighting capacity. The tanks do not provide sufficient storage to cater for growth, enable water harvesting, or to meet any extended interruptions to the supply. Further, it is expected that the available storage would decrease to approximately 6,000 m^3 in the event of a major earthquake given the age of the older tanks and their likely susceptibility to cracking in a major seismic event. Council is currently planning to construct some additional post-treatment storage, however this will be of similar scale to the existing storage and by no means sufficient enough to provide for growth or significantly improve resilience of the scheme.

[3] *Water Services (Drinking Water Standards for New Zealand) Regulations 2022 and in accordance with Taumata Arowai's Drinking Water Quality Assurance Rules which specify how water suppliers must demonstrate compliance with the Standards.*

Treated water is delivered to the Levin urban water reticulation network which currently services approximately 22,000 people across 8,500 properties throughout Levin and parts of Ohau and Hokio Beach. Feasibility studies have previously been undertaken to connect the currently self-serviced areas of Ohau and Waitārere Beach to the Levin Water supply in order to provide those communities with a safe and sufficient supply of water. Securing supplementary allocation from the Ohau River and constructing the proposed reservoir would provide sufficient water to meet the needs of these communities from the Levin Water supply, should Council determine this is the preferred solution for those communities in the future. The Council's 2024-2044 Long Term Plan's Infrastructure Strategy states that "the requirements for a reticulated water supply to growing smaller settlements, such as Waitārere Beach and Ohau … will only be considered once a long-term water source for Levin has been secured" (i.e. this application). For the absence of doubt, the activity which is subject to this application includes any future provision of water from the Levin water supply scheme to service Waitārere Beach, Ohau and other communities in proximity to the existing water supply network.

The Council is required to manage the supply in accordance with a Water Demand Management Plan that is reviewed no less frequently than every three years.

Figure 3.1: Location Overview

3.1.1 Statutory Obligation to Provide Water Supply and Plan for Future Growth

The Council has several statutory and policy obligations that require it to meet the community's water supply requirements now and into the future. These include obligations under the Local Government Act, Water Services Act and via the National Policy Statement on Urban Development.

Local Government Act

The purpose of the Council, as defined in the Local Government Act (LGA), s10(1)(b) is to *"promote the social, economic, environmental, and cultural well-being of communities in the present and for the future."* Provision of water services is a fundamental contributor to community wellbeing.

Section 125 of the LGA requires the Council to *"inform itself about the access that each community in its district has to drinking water services by undertaking an assessment of drinking water services"* and, consider the findings and implications of this assessment in relation to its *"current and future infrastructure strategy and long-term plan"* (section 126). A likely outcome of these assessments (combined with the Water Services Act discussed below) is that the Council will be required to expand its water services to currently unserviced communities if there is a risk to the community arising from the absence or deficiency of a water service.

Under section 131 of the LGA, Council may only close a water service if there are 200 or fewer persons served by that water supply. Therefore, there is an obligation to maintain the Levin Water supply service[4].

Water Services Act

The Council is a water services provider in terms of the Water Services Act 2021. Under this Act, the Council has a duty to ensure that safe drinking water is supplied (s21) and that there is a "sufficient quantity of drinking water" at each point of supply (ie at each property supplied) (s25).

The Water Services Act also sets up an accountability and transparency mechanism by which water service providers are required to report on their performance with respect to environmental performance measures. For water services, this includes a series of industry best practice measures for assessing the efficiency of the water supply network. This process provides for regulatory oversight by Taumata Arowai and public reporting on the performance of water supply networks across the country. This is discussed further in the Options Report in Appendix A. This process ensures that common and appropriate measures for assessing network efficiency, including leakage, are used across all Council water supplies in the country.

Under the Water Services Act requires the Council to undertake its functions, powers, and duties in a manner that gives effect to Te Mana o te Wai.

National Policy Statement on Urban Development 2020

The Council has responsibilities under the National Policy Statement on Urban Development 2020 (NPSUD). The District Council is classified as a Tier 3 local authority under the NPSUD. In accordance with Policy 2, the Council must "*at all times, provide at least sufficient development capacity to meet expected demand for housing and for business land over the short term, medium term, and long term*." Clauses 3.2 and 3.3 of the NPSUD define what is meant by "sufficient development capacity". That states that the development capacity must be plan enabled, **infrastructure ready** and feasible and reasonably expected to be realised.

"Plan-enabled" and "Infrastructure ready" is defined in clause 3.4. For development capacity to be considered "plan-enabled", short term requirements must be at least zoned in the District Plan; medium term requirements must be either zoned in the operative or proposed District Plan and, long term requirements must be either zoned in the operative or proposed District Plan or identified on a Future Development Strategy.

For development capacity to be considered "infrastructure ready": short term needs must already have infrastructure in place; medium term needs must either have infrastructure in place or funding to support that infrastructure in the Long Term Plan; and long term needs must either be in place,

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[4] *Note that, the Local Water Done Well reform programme is requiring councils to consider its water service delivery plans including whether or not to join with other councils and provide services via council controlled organisations or similar entities. Irrespective of any future reform, legislative arrangements will require the ongoing operation of the Levin water supply. Further, the requirement to provide for community wellbeing and to assess the risk to communities in relation to access to drinking water services is likely to remain with the Council.*

have funding available in the Long Term Plan or, as a minimum, the development infrastructure must be identified in the Council's infrastructure strategy.

Under the NPSUD 'long term' is defined as 10 to 30 years. Further, under the Local Government Act (s101B), the Council is required to develop an Infrastructure Strategy which has a minimum planning horizon of 30 years.

It is therefore appropriate that, to ensure that the obligation to ensure infrastructure ready development capacity is able to be given effect to, Council has sufficient water rights to be able to meet the projected community need for a minimum of 30 years.

3.1.2 Constraints and Risks Associated with Existing Water Supply

There are a number of constraints and risks associated with the existing water supply that can affect the ability of Council to meet the current demand. The proposed improvements which are the subject of this application allow the Council to reduce these risks, in addition to providing supply to meet growth needs. The key risks include:

Existing Intake

The existing infiltration gallery, located in the bed of the Ohau River adjacent to the WTP, was constructed in 1993. It comprises two arms orientated parallel to the bed of the river. The intake is a 750 mm diameter Aluflo slotted pipe. The upstream arm is 175 m long and the downstream arm is 66 m long. Both arms connect to a common intake chamber from which water is abstracted and pumped to the treatment plant.

While the existing intake can, and regularly does during summer periods, enable abstraction up to near the existing consented limited, it is preferable for this intake to be operated at an overall lower abstraction rate for operational and resilience reasons. At present, the Council needs to undertake regular scarification of the riverbed in order to maintain the required level of sub-surface flow into the intake pipework. Further, there is some concern regarding the structural resilience of the intake chamber. Enabling the existing intake to operate at a lower abstraction rate would increase the remaining life of the asset, and would reduce the amount of bed disturbance required to maintain the supply.

High Turbidity River Flows

High flows in the Ohau River can lead to high turbidity in the source water which impacts treatment plant production rates. In June 2021, elevated turbidity in the source water resulted in the treatment plant not being able to produce compliant water in sufficient quantities to maintain supply to the network. This resulted in treated water reservoir levels being depleted and supply to the community being interrupted. Some industries and businesses were required to cease operation because of the shortage of water supply. Tanker water was made available for residential users in some places. Following heavy rain on 27 June 2021, Council issued a notice (28 June 2021) requesting all residents to "reduce or stop using water immediately". The notice stated that "*Due to the most recent rainfall event, the water treatment plant [is] struggling to effectively treat the muddy river water for our drinking water supplies. The community demand including residents and businesses connected to the town water supplies are exceeding what the treatment plant can deliver. There is a real risk that the water supply will run-out and the community will need to rely on bottled water or water tank supplies to service their minimum requirements.*[5]" It stated that residents could expect this situation to continue for at least 48 hours. Water tankers were deployed throughout the community to provide drinking water.

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[5] *HDC news published on HDC website, 28 June 2021.*

Council staff[6] stated that turbidity levels in the river were five times the level required for the treatment plant to meet the drinking water standards.

While this is an infrequent situation, it is one which creates significant disruption to the community including significant impacts on social and economic wellbeing.

Abstraction when the River is below Minimum Flow

The current system has only minor post-treatment storage (just over 1 day at average demand) and therefore there is no alternative supply during times when the river is at or below minimum flow. Ongoing abstraction during these times is therefore required to meet the community's needs. This is permitted by the existing consent but is not considered to be consistent with Te Mana o te Wai.

The Options report in Appendix A discusses the frequency and duration of minimum flow events in the River.

From the flow record available, the frequency and duration of minimum flow occurring in the Ohau River at Rongomatane is as follows:

- The river has entered minimum flow conditions on 6 years since 1979 ie on average, 1 in every 14 years.
- The maximum number of days per year that the river is below minimum flow is 50 days. This occurred in the 2003/2004 summer.
- The maximum consecutive number of days that the river is below minimum flow is 25 days. This also occurred in the 2003/2004 summer. In the other five years that minimum flow conditions occurred, the maximum consecutive number of days that the river was below minimum flow was less than 10 days.
- When the river has fallen below minimum flow, this has always been in January to May. The river has not fallen below minimum flow in June to December.
- The months that have most frequently experienced minimum flow conditions are March and April (that is, minimum flow is more likely to occur in late summer/early autumn). For the flow record available (1979 – 2021)[7], the total number of days when the river was below minimum flow was:
  - January: 13 days
  - February: 18 days
  - March: 38 days
  - April: 29 days
  - May: 10 days
  - July - December: 0 days

Table 3.1 summarises the expected duration of consecutive days below minimum flow for various return period events[8].

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6 *Stuff article, 7 July 2021, "Investigation into alternative water source from Horowhenua".*

7 *Analysis was undertaken as part of the Options report in Appendix A, hence this timeframe.*

8 *Assuming a Pearson Type 3 statistical distribution.*

Table 3.1: Estimated Consecutive Days Ohau River is Below Minimum Low

Return Period (Average Recurrence Interval, ARI) (Years)	Estimated Consecutive Days below Minimum Flow
5	0
10	2
20	6
50	16
100	26
200	37
500	53
1000	66

Therefore, if the water supply was to be limited such that abstraction was not allowed below minimum flow, the supply could be expected to be interrupted, on average, once every 10-14 years. Interruption of supply could occur for up to 26 days in a row (estimated at a 100 year return period event). The most likely time of the year for minimum flow conditions to occur is mid-late summer and early autumn.

Earthquake Resilience

At present, there is very little stored water and no alternate water supply in an event such as an earthquake that impacts the existing intake and supply. The Options report in Appendix A references the approach of Wellington Water given their close geographical and similar seismic conditions. Wellington Water has identified that, following a major earthquake, the majority of the urban area would be without water for 15-30 days, with some parts being without water for more than 100 days. At present, HDC has no means of being able to provide this or similar level of service post-earthquake.

Climate Change Effects

There is potential for the flow regime of the Ohau River to change from that experienced historically as a result of effects of climate change. Horizons Regional Council has commissioned a "Regional Climate Change Risk Assessment"[9]. This assessment found that:

> *"Precipitation changes have seasonality and spatial variations throughout the region, particularly when looking out to the end of the century. Precipitation is projected to on average decrease on the eastern side of the Ruahine and Tararua ranges in the spring and winter months by mid-century, whilst there is a north- south divide present in summer precipitation changes. Northern areas of the region are projected to experience a 5% increase in summer precipitation, whilst southern areas are projected to have a 5% decrease. Winter rainfall by the end of the century is projected to increase by 20% in the north west of the region, and decrease by 20% in the south east of the region. The north-south divide is no longer present in summer months at the long-term timeframe, and spring rainfall is projected to increase by 5% across majority of the region (NIWA, 2016). Increases in precipitation can lead to the increased frequency and intensity of inland flooding and landslide events. Due to the geography (e.g. vast river networks) and geology (e.g. erodible soils) of the region increased precipitation is likely to exacerbate the impacts from these climate-induced hazard events."*

Projections for the Ohau River, being in the south-west of the region remain unclear. It is most likely that any changes in flow in the Ohau River, particularly over the short term, will be within the natural variation already experienced. This is because the flow regime is controlled by the weather systems

[9] *Tonkin + Taylor Ltd, September 2021, Manawatū-Whanganui Regional Climate Change Risk Assessment.*

and orographic effect of the Tararua Ranges. The climate risks to the District have been identified in the regional assessment as shown in Figure 3.2. This identifies risks to water supplies given the District's dependence on surface water takes.

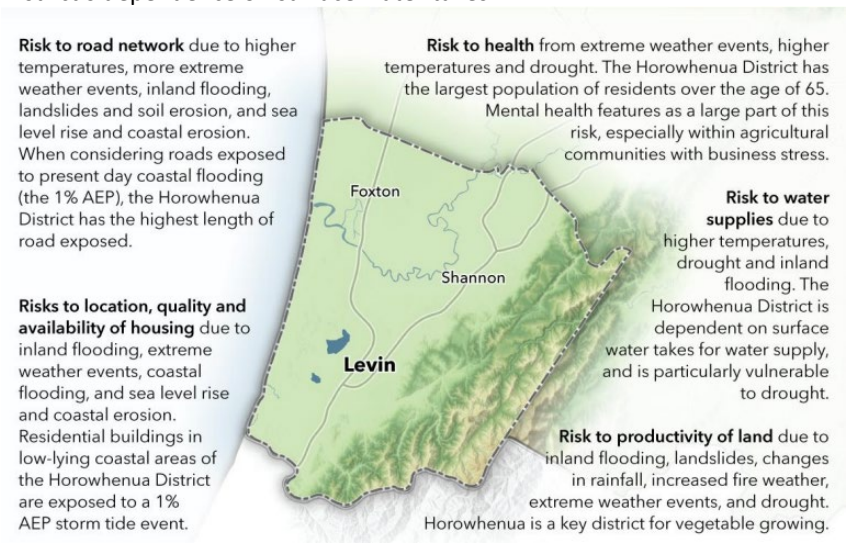


Figure 3.2: Overview of Risks for Horowhenua District
Source: T+T, September 2021, Manawatū-Whanganui Regional Climate Change Risk Assessment

In terms of risks to water supply, the regional risk assessment is shown in Figure 3.3. It also notes that:

> *"Adaptive capacity of water supply sources within the region will rely on the maintenance/enhancement of storage and the ability to manage water demand levels - particularly in areas such as Palmerston North, Ohakune, Feilding and Levin where development and growth is occurring. Targeted interventions such as demand management and behaviour changes could improve water efficiency within the region."*

Hazard	Present	2050	2100	Commentary
Drought	High	High	Extreme	Increased exposure of water supply sources with time, with Tararua district liekly to be the most affected. Sensitivities include reduced flows, over allocation, and reduced water availability and quality. Water restrictions and metering can help reduce the impacts of drought.
Higher temperatures	Low	Moderate	High	sources with time, with Tararua district liekly to be the most affected. Sensitivities include reduced flows, over allocation, and reduced water availability and quality. Water restrictions and metering can help reduce the impacts of drought.
Inland flooding	Low	Moderate	High	Increased exposure on the Manawatū Plains (including Manawatū, Rangitīkei and Whanganui). Flood waters can overwhelm groundwater wells and cause rivers to swell, leading to contamination. Legislation is in place to improve water quality within the region through One Plan and Water Matters.

Figure 3.3: Risks to Water Supply by Hazard as per Regional Climate Change Risk Assessment
Source: Tonkin + Taylor, September 2021

3.1.3 Current Water Demand

Current Community Demand

The community's current water demand is shown in Figure 3.4. This shows the trend in water consumption (as measured by the amount of water which leaves the treatment plant following the treated water storage tanks) as a daily demand since the existing consent commenced. This shows a typical municipal water demand pattern being a base flow in the winter periods, with a seasonal peak in the summer months. The base demand is in the order of 8,000-9,000 m^3/day and the peak summer demand is just over 12,000 m^3/day[10].

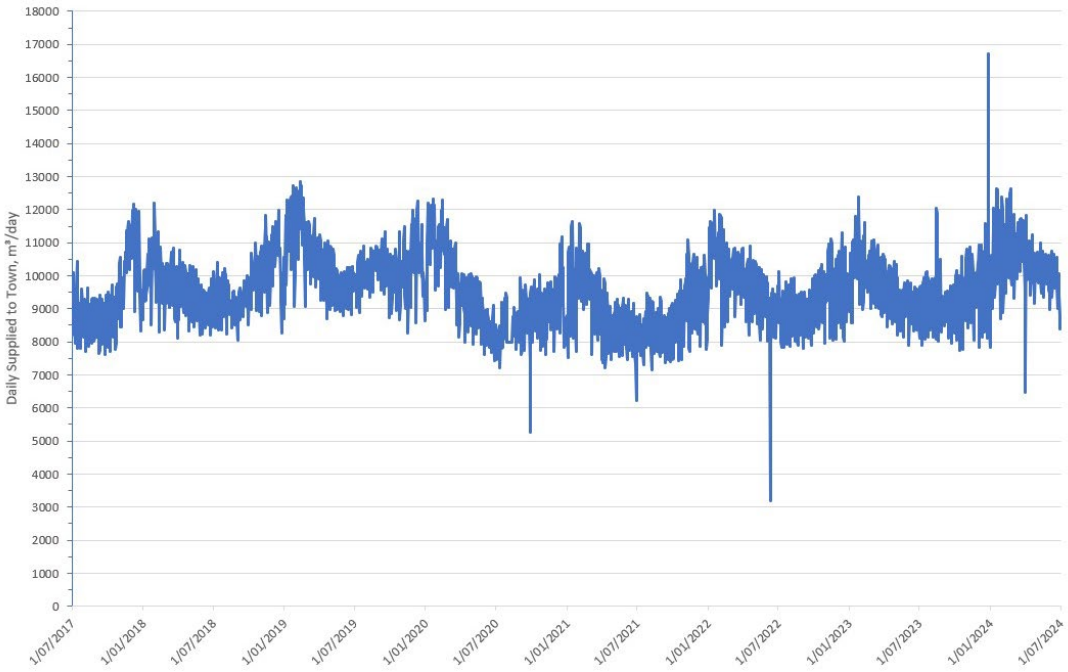


Figure 3.4: Community Water Demand

It must be noted that the water demand shown in Figure 3.4 is different from the amount of water which is abstracted from the river. Figure 3.5 shows the amount of water abstracted from the river over the same time period. This shows that the peak summer abstraction demand is in the order of 13,500-15,000 m^3/day.

[10] *Note that the peak of just under 17,000 m^3/day in late 2023 is considered to be an outlier. Peak abstraction from the river at this time did not exceed the consent limit of 15,000 m^3/day.*

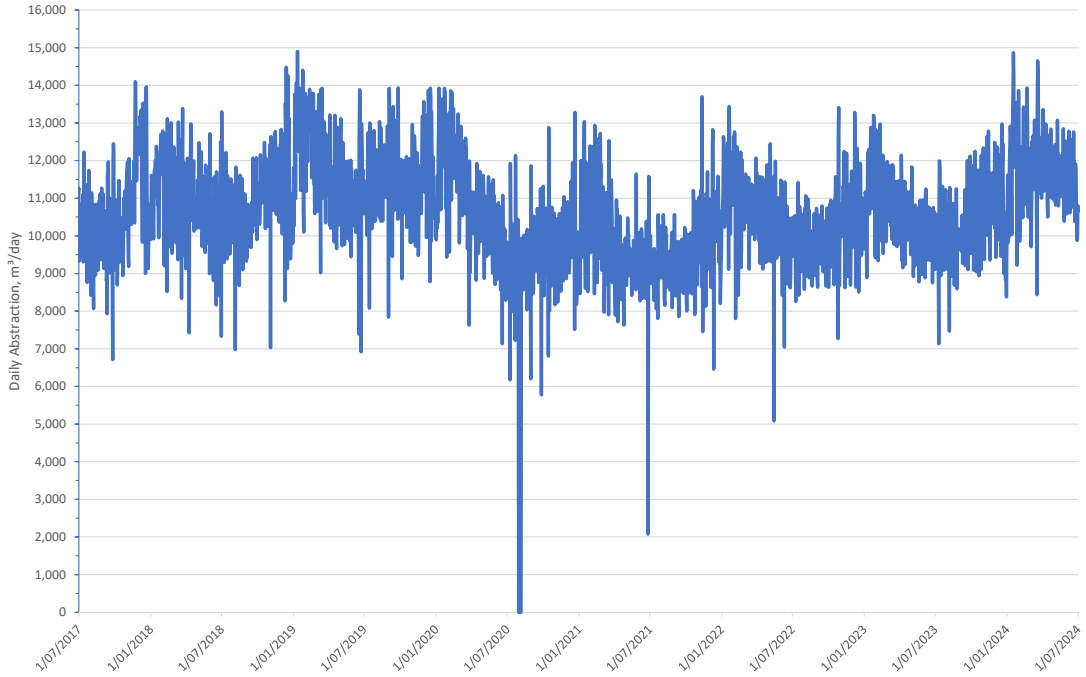


Figure 3.5: Daily Abstraction from River

The difference between the amount of water abstracted from the river and the amount of water delivered to the community is the non-consumptive water which is used in the treatment process, treatment losses (eg backwash water), and variation in abstraction as needed to maintain treated water storage at appropriate levels and maintain fire fighting supplies.

Council's Approach to Ensuring Efficient Use and Managing Water Demand

Council currently operates the system in accordance with the Water Demand Management Plan (WDMP) that was developed under, and required by, the existing resource consent for the abstraction from the Ohau River.

The Water Demand Management Plan[11] defines four trigger levels as a combination of river flow and water demand (refer Table 3.2). The actions relating to each trigger level are defined only within the Water Demand Management Plan, except that the consent requires the water abstraction to be reduced to 13,000 m^3/day at Trigger Level 4.

Table 3.2: Summary of Consent Triggers Levels

Trigger Level	River Flow Trigger (m^3/s)	Trigger Level Conditions in Demand Management Plan	Restrictions Applied (as per Demand Management Plan)	Maximum Abstraction
n/a	> 2.5	River Flow >2.5 m^3/s Demand < 10,000 m^3/day	None - no restrictions	15,000 m^3/day
1	1.5-2.5	River Flow 1.5-2.5 m^3/s Demand > 10,000 m^3/day	Time of use restrictions on garden irrigation; handheld irrigation allowed.	

11 *Version 7, updated July 2022.*

Trigger Level	River Flow Trigger (m^3/s)	Trigger Level Conditions in Demand Management Plan	Restrictions Applied (as per Demand Management Plan)	Maximum Abstraction
2	1.0-1.5	River Flow 1.0-1.5 m^3/s Demand >11,000 m^3/day	Increased restrictions on outdoor use, including alternate day use. No hosing of paved areas. Public spaces not to be irrigated from Levin Water supply	
3	0.82-1.0	River Flow 0.82-1.0 m^3/s Demand > 12,000 m^3/day	Increased restrictions on outdoor use including alternate day hand held hosing restrictions. No garden sprinklers or soak hoses allowed. Filling of pools restricted.	
4	<0.82 (Minimum flow as defined in the One Plan)	River Flow < 0.82 m^3/s	No outdoor use. Fountains not to operate. Restrictions on commercial outdoor use unless expressly approved by Council.	13,000 m^3/day

The demand management actions implemented by Council are based on a combination of communication and education programmes, incentives, regulation and internal (Council network) efficiency improvements. It relies heavily on behavioural change by consumers in response to water restrictions initiated by Council.

The current resource consent requires that the system be managed to ensure that leakage is less than 284 litres/connection/day. This target was required to have been achieved by June 2020 and to thereafter be achieved throughout the term of the consent.

In considering network efficiency and leakage, the Infrastructure Leakage Index or ILI is a key measure that enables benchmarking across supplies (Figure 3.6). As defined in Taumata Arowai's[12] 'Drinking Water Network, Environmental Performance Measures and Guidance Material' document:

> *"Infrastructure Leakage Index (ILI) is the non-dimensional ratio of Current Annual Real Losses (CARL) to Unavoidable Annual Real Losses (UARL). The ILI measures how effectively infrastructure activities (speed and quality of repairs, active leakage control and pipe materials management) are being managed at current operating pressure."*

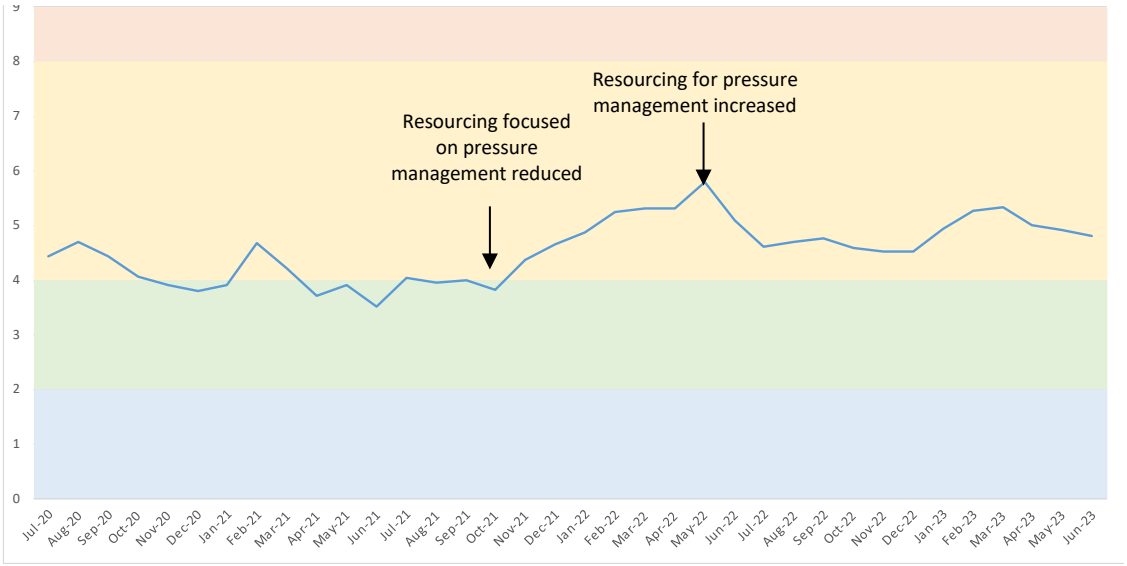
In addition to the leakage target in the consent, Council has adopted, in its Long Term Plan, a performance target of ILI in Band B (being an ILI of between 2 and 4), and a per capita usage target of 300 L/person/day.

Council actively monitors and assesses the leakage per connection (based on measured minimum night flows, with an allowance for actual night-time usage) and ILI on a monthly basis (Figure 3.6). Council is required to report this information to Taumata Arowai on an annual basis, in accordance with the Network Environmental Performance Measures under Section 146 of the Water Services Act.

The leakage target set in the current consent (284 l/connection/day) was derived from an ILI of 3.0. Since that time, Council has implemented a programme of active pressure management across the network and the system now operates at an overall lower pressure. The methodology for determining ILI, which is considered a more appropriate benchmark for assessing network performance, depends on network pressures. The leakage target in the consent of 284 l/connection/day now requires an ILI

[12] *Taumata Arowai is the drinking water services regulator for Aotearoa.*

of 2.73. Figure 3.6 shows the ILI for the system since July 2020. This application proposes that the current consented benchmarks for leakage are replaced with a requirement to set targets in the Water Demand Management Plan and to provide information and benchmarking on performance consistent with that required to be reported to Taumata Arowai as drinking water regulator.



ILI range	BAND	General description of Real Loss Management Performance Categories for Developed and Developing Countries
Less than 2	A	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost-effective improvement
2 to < 4	B	Potential for marked improvements; consider pressure management, better active leakage control practices, and better network maintenance
4 to < 8	C	Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyze level and nature of leakage and intensify leakage reduction efforts
8 or more	D	Very inefficient use of resources; leakage reduction programs imperative and high priority

Figure 3.6: Network Performance (ILI) for 2020-2023 Water Year

The current performance of the system does not meet the Council's Long Term Plan target of Band B for ILI, nor does it meet the target per connection leakage rate stated in the consent, nor the ILI of 3.0 from which that leakage rate is derived.

Figure 3.6 shows a period between late 2021 and mid 2022 when internal resourcing on leak detection was reduced and the impact this had on the ILI. Since resourcing was reinstated there has been a reduction and steading of the ILI, however there was a further increase in early 2023 which has now been trending down again. Council officers responsible for this work investigated the increase once it was detected and narrowed down to a couple of zones within the network where increasing leak detection efforts are now being concentrated. Figure 3.6 shows that the issue of network management and leakage control is one which requires consistent and ongoing effort.

Council has a programme of actions planned for addressing water efficiency and water demand and ensuring that water is used efficiently and effectively. This is a work in progress and, given that addressing water leakage requires a concerted effort and significant investment in pipe repair and approvals, needs to be undertaken in a timeframe that is achievable in terms of resourcing to complete the work and also from a funding perspective.

A significant change which Council has approved and funded is the introduction of universal water metering and charging for excess water use across the District. Council is in the process of installing smart-water meters on each connection to increase understanding of the amount of water consumed and also to assist to address leakage within the network and from consumer-side supply lines. This meter roll out is expected to be completed in 2025.

A comprehensive review and update of the WDMP is included as part of this proposal. This is discussed further in Section 4.1.

3.1.4 Projected Future Water Demand

The future water demand projections have been detailed in the options report included in Appendix A. The following provides a summary of those projections[13].

Population Projections

Horowhenua District is experiencing a period of rapid growth which is expected to continue. Since 2014, the district has experienced a growth rate of 2% per annum, with the June 2021 population estimated at 36,708. This growth rate significantly exceeds that assumed when the existing water supply consent was sought. When the application for the current water supply consent was lodged in 2014, the growth projection was only 2% total over the next 50 years (average growth rate of 0.04% per annum). At the time of the hearing, the growth projection had increased, but only to 0.4% per annum[14].

Council commissioned Sense Partners Ltd to advise on projected economic and population growth for the District. In their May 2020 Projections Update report[15], the District was projected to grow more quickly than the national average, quicker than the average of the District over the past 10 years, and substantially more quickly than previous projections. The projected population median and 95th percentile growth figures are given in Table 3.3.

Table 3.3: District Population Projections
(Sense Partners Ltd, May 2020)

Year	Median Growth		95th Projection	
	Per annum	Total population	Per annum	Total population
2019		34,956		34,956
2029	1.8%	41,896	2.6%	44,968
2039	1.2%	47,006	2.8%	59,010
2049	1.0%	51,862	3.0%	79,243
2059	0.7%	55,626	2.9%	105,044
2069	0.6%	59,172	2.3%	131,741

[13] *Note that these projections are drawn from the Water Supply Augmentation Operational Framework report (options assessment) included in Appendix A which was completed in March 2023, which forms the basis of the decision to proceed with this proposal. The projections have not been updated since then as they reflect the growth projections that have informed the proposal design.*

[14] *As reported in paragraphs 34-36 of evidence of Kim Fraser (Allocation Forecast), Beca Ltd, on behalf of Horowhenua District Council at the resource consent hearing for the existing water permit; May 2015.*

[15] *Sense Partners Ltd, May 2020, Horowhenua Socio-economic Projections Summary and Methods - Projections Update Report.*

For infrastructure planning purposes, the Council adopted the 95th percentile projections set out above. This is summarised in the Council's Infrastructure Strategy 2021 - 2051:

> *"Moving forward our district's population is projected to grow at a rate of; 2.6% per annum from 2021 until 2031, increasing to 2.9% per annum until 2051. This means our population will increase to over 62,000 by 2041 and over 80,000 by 2051.*
>
> *The increase in population means the number of houses throughout the district will more than double by 2051. The current number of houses is estimated to be 16,606 as of June 2021. This is anticipated to grow by 21,145 to 37,751 by 2051."*

The 95th percentile projections may be considered to be an extreme high scenario and therefore the options assessment in Appendix A also considered the likely future demand under the median growth projections. Council's most recent Infrastructure Strategy (2024 – 2044) states that: *"Growth forecasts have pulled back since 2021 lowering forecast population and household numbers from 2021 estimates, but Horowhenua is forecast to continue as the fastest growing district in the Manawatu-Whanganui region, and to grow strongly alongside the greater Wellington Region councils. Our district's population is projected to grow at a rate of 1.5% per annum from 2023 until 2030, increasing to 2.1% per annum until 2044. This means our population will increase to over 54,000 by 2044 and over 66,000 by 2054."* This places the latest projections somewhere between the median and 95th percentile projections on which the options assessment report is based.

In Levin rapid growth is occurring with Council completing rezoning of the Taraika Plan Change area to provide for new residential development. Taraika is located to the east of Levin and includes 420 ha which is now available for residential land use, together with some commercial and public areas to create a mixed-use urban area. Once fully developed, the Taraika area will result in at least 3,500 additional homes. The Plan Change is now fully operative.

This application seeks to secure sufficient water to enable it to meet the reasonable community needs for the projected population, noting that the Levin water supply currently provides water to approximately 60% of the District.

Basis of Projected Water Demand

The water demand projections adopt the growth projection rates and apply these to Levin's current water demand to develop projected water demand requirements for consenting purposes. This assumes that water demand is directly correlated with population growth (i.e., that per capita water demand does not vary). This is considered an appropriate basis for projections for purpose of infrastructure planning and consenting. In reality, the per capita water demand may vary if there is a change in the mix of residential to non-residential water users; or if water consumption patterns change or significant water efficiency improvements are made.

In terms of the mix of residential and non-residential water use, Council has some control over this factor via their Water Supply Bylaw and how they consider and approve applications for non-residential water connections. Any efficiency improvements will result in the actual water demand being below (less than) that projected. However, there is no certainty as to the quantum of efficiency or water conservation improvements that can be achieved nor how quickly these can be achieved. Therefore, the projections below are considered appropriate for the purposes of consenting given the statutory obligation to provide the water service.

The projections have been derived from measured water demand for the community over the last five years. This is the demand data (i.e. the amount of water supplied to the community as measured after the treated water storage reservoir) and does not include water abstracted on a non-consumptive basis (as allowed for in the consent to provide for backwashing in the treatment process). It also does not include any additional water abstracted at higher rates than the community demand, e.g. for purposes of filling the treated water storage.

Projected Peak Demand

Figure 3.7 shows the projected peak water demand, being the maximum daily demand required by the community each year. This is projected using data from recent years, noting that water restrictions have generally been in place when the peak day demand was recorded. Figure 3.7 therefore shows the projected peak daily demand assuming the current water restriction policy continues to be implemented as a minimum.

Given that treated water storage is only 1-day's peak demand supply, **the peak daily demand projections represent the water allocation required if there is no bulk storage in the system. This is the situation for the current system.**

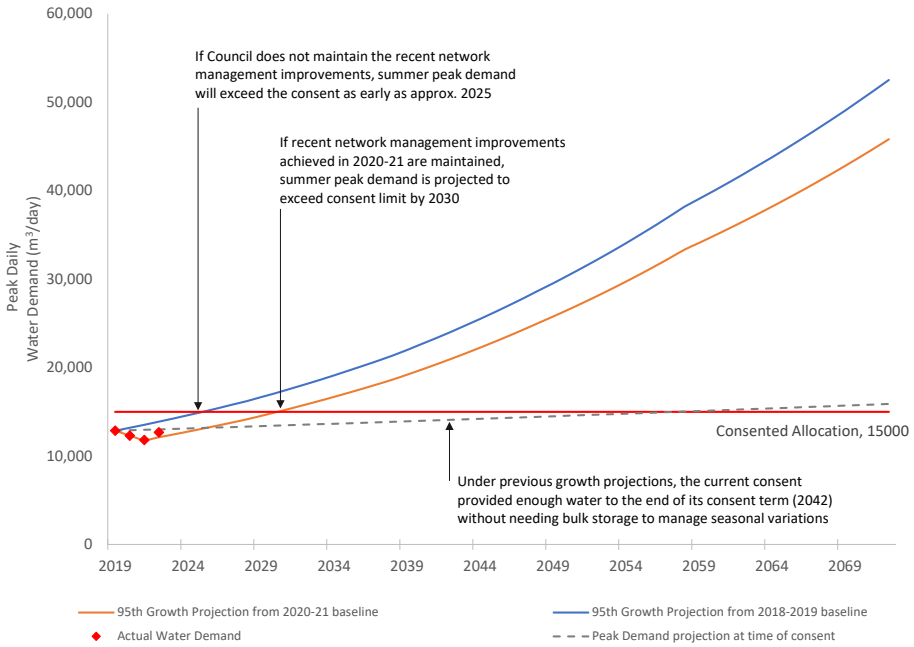


Figure 3.7: Peak Day Projections
Note: Peak day projection is indicative of resource consent allocation required if there is no bulk storage in the system; also indicative of treatment plant capacity required. Figure assumes 95th percentile growth projection and similar per capita demand as existing.

The above projection shows that the existing consent does not provide sufficient water to meet the community's needs beyond 2030. It also shows the importance of maintaining appropriate pressure management and addressing leakage in the system.

Projected Average Demand

If bulk storage is provided (such as that proposed in this application), water allocation requirements can be based on average water demand rather than peak water demand (i.e., by filling up the storage when demand is less than average and drawing from the reservoir when demand is above average). The following provides an analysis of demand projections based on average water demand.

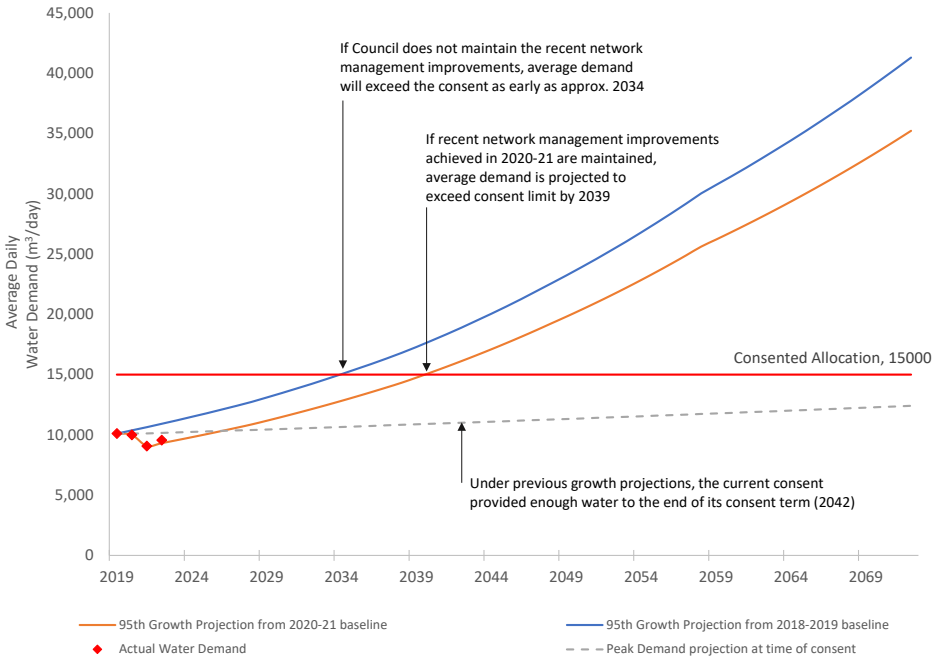


Figure 3.8: Average Day Demand Growth Projections

The above analysis shows that the existing consent does not provide sufficient water to meet the community's needs beyond 2039 even if raw water bulk storage is added to the supply system. For this reason, the Council is also seeking a supplementary allocation from the Ohau River.

Annual Water Demand

Understanding the annual water demand is necessary for determining the size of reservoir required and the Supplementary Allocation required.

Figure 3.9 shows projected water demand on an annual basis. This shows that, based on the projections that were available at the time the existing consent was determined, the consent provides sufficient water to meet the 50-year projected demand. However, because of the increased growth rates which have been experienced, and are projected to continue, the existing allocation is insufficient to meet the community's water demand over a 50-year planning timeframe.

Figure 3.9 includes two "available allocation" lines for comparison. The solid red line assumes that the consented 15,000 m^3/day is available to be abstracted 365 days per year. A 5-year return period event is likely to result in no days when river abstraction is constrained during low flow conditions. The solid red line in Figure 3.9 represents that scenario.

The dashed red line assumes that this is not the case, and the ability to abstract the full consented allocation is assumed (hypothetically) to be reduced as follows:

- For 16 days per year, water abstraction must be reduced because the river is below its minimum flow. This represents an estimated 50-year return period event. For planning purposes, the dashed red line in Figure 3.9 assumes that there is no abstraction when the river is below minimum flow.
- For up to 10 days per year, water abstraction must stop because of high turbidity in the river. Note that this is a conservative estimate and is highly variable depending on actual weather patterns and catchment conditions.

No analysis has been undertaken of the risk of having a year where both the above scenarios occur. The dashed red line in Figure 3.9 is therefore a conservative scenario and only indicative of what may occur. It represents 26 days of no abstraction from the river for some reason. This is also equivalent of likely maximum consecutive days the river is below minimum flow in a 100-year return period event.

The above assumptions are indicative for planning purposes only. Natural flow variations are such that each year may have more or fewer restricted abstraction days than assumed above.

The assumptions above indicate a total abstraction approximately 7% less than if the existing resource consent was exercised fully.

Figure 3.9 shows that, depending on the degree to which abstraction from the river is constrained (at either low or high flows) and the demand projection assumed, there is a shortfall of 7.8 - 10.0 million m^3/year between projected community demand and the allocation available under the Council's existing consent, assuming a 50-year planning timeframe. This planning timeframe is longer than required under the Council's Infrastructure Strategy and the NPSUD, however, it reflects the fact that assets such as a water storage reservoir and the connecting pipeline to the treatment plant have typical asset lives of at least 80-100 years.

If a 30-year planning horizon is adopted as per the Infrastructure Strategy and NPSUD definition of long-term, there is a shortfall in the order of 2.6-4.6 million m^3/year between projected community demand and the allocation available under the Council's existing consent.

At the 35 year consent term sought, there is a shortfall of 3.9 - 6.1 million m^3/year between projected community demand and the allocation available under the Council's existing consent.

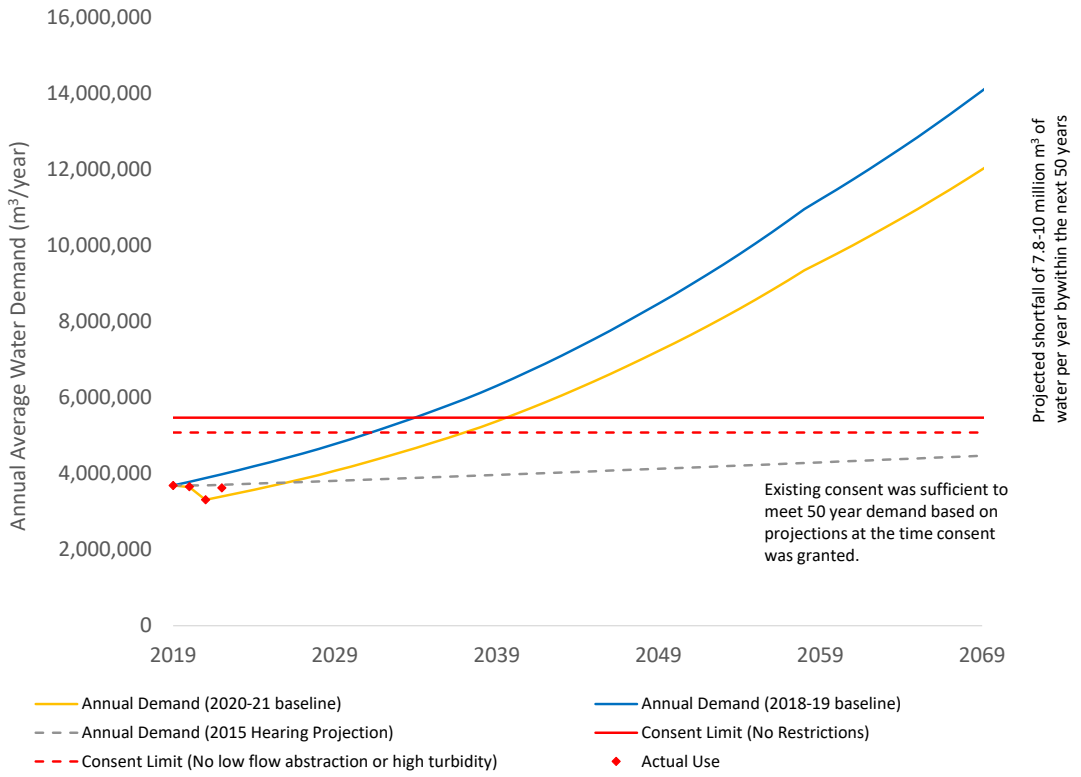


Figure 3.9: Annual Water Demand Projections

3.2 Description of Receiving Environment

The following describes the environment and existing sites where the proposed activities are to occur. In particular, the Ohau River from which the water is to be abstracted; the proposed reservoir intake site including the river bed and riparian area; the proposed reservoir site; and the pipe bridge site.

3.2.1 Ohau River

The Ohau River originates in the Tararua Forest and generally flows in a westerly direction towards the Tasman Sea. Approximately 800 m downstream of the proposed reservoir intake site, the Ohau is joined by the Makahika Stream. Three other tributaries join the Ohau River between the Makahika Confluence and the existing intake site, the largest of these being the Makaretu Stream.

The Ohau River is a significant water body within the Horowhenua District and is of cultural significance to iwi and hapū. The Ohau River is a taonga of cultural, material and spiritual significance and has been identified as a source of spiritual sustenance, mahinga kai and swimming and camping.

The hydrology of the River is described in the Hydrology Assessment report in Appendix D.

One Plan Water Management Areas and Values

Under the Regional Council's One Plan, the Ohau River and its catchment make up the Ohau water management area (Ohau_1) which comprises two sub-areas, being the Upper Ohau (Ohau_1a) and Lower Ohau (Ohau_1b). The separation point between the two sub-areas is the Rongomatane Gauging site approximately four kilometres downstream of the proposed reservoir intake site and 800 m upstream of the existing intake site.

In accordance with RP-SCHED2 of the One Plan, the Ohau River is to be managed to provide for the following values:

- Area Wide Values (these apply to the entire area):
  - Life supporting Capacity: Upland Hard Sedimentary for the Upper Ohau (Ohau_1a) and Hill Mixed for the Lower Ohau (Ohau_1b)
  - Aesthetics
  - Contact Recreation
  - Mauri
  - Industrial Abstraction
  - Irrigation
  - Stockwater
  - Existing Infrastructure
  - Capacity to Assimilate Pollution
- Site or Reach Specific Values. These apply to specific sites or reaches of the River as defined in RP-SCHED2 and listed below:
  - Natural State. This value only applies to the portion of the Ohau River which flows within the Department of Conservation estate. The proposed abstraction point is located approximately one kilometre downstream of the Conservation estate and therefore this value does not apply to the area of the proposed works nor any of the abstraction sites.
  - Site of Significance - Aquatic. This applies to the following parts of the Ohau and its tributaries:
    - Waiti Stream which is valued for Redfin Bully. The Waiti Stream is in the Upper Ohau and is a tributary of the Makahika Stream. It is in a different part of the catchment and upstream of the abstractions and therefore its flow regime or other attributes is not in any way affected by any of the activities which are subject to this consent.

  - The main stem of the Ohau River from the confluence of the Ohau River and Makahika Stream to approximately 600 m downstream of the existing intake site is valued for **redfin bully, bluegill bully and banded kokopu**. A further section of the Ohau River just downstream of Kimberley Reserve to approximately 1 km downstream of SH1 is also valued for Redfin Bully The abstraction sought has the potential to affect the hydrology and habitat in these areas. These effects are discussed in Section 9.3. The proposed reservoir intake site is also upstream of this reach of river. The construction will need to be managed to ensure sedimentation effects do not occur downstream of the proposed works so that this value is not affected in the main stem of the river.
  - The Makorokio Stream, a tributary of the lower Ohau River is also valued for redfin bully, lamprey and shortjaw kokopu. No works are proposed on this Stream and the Stream's hydrology is not affected by the proposed abstraction.
- Sites of Significance - Riparian. This value applies only to the lower Ohau River and the reach identified is from approximately 1 km upstream of the SH1 bridge to the Coastal Marine Area boundary. The riparian habitat to be protected is that of gravel and sand for dotterel, and mud/silt habitat and estuarine roosts for waders. The temporary abstraction for the Ō2NL construction is in this reach.
- Inanga Spawning. This value also applies only to the lower Ohau River and the reach identified is the most downstream 3km prior to the coastal area. There are no works proposed in this reach. The outlet watercourse from Lake Waitaha is also valued for Inanga Spawning. This watercourse is not affected by any of the proposed activities.
- Amenity Value. This value applies only to the lower Ohau River and the sites identified are Kimberley Reserve, Kirkcaldies Bridge Reserve, Gladstone Reserve and Parikawau Reserve.
- Whitebait Migration. This value applies only to the lower Ohau River and the reaches identified are the Lake Waitaha outlet watercourse and the Ohau River downstream of the Lake Waitaha watercourse confluence, being the furthermost downstream extent (approximately 3km) of the River towards the coast.
- Trout Fishery - Other (i.e. not nationally or regionally significant). This value applies to both the lower and upper Ohau River from the coastal marine area boundary to the source of the Ohau including the Makahika Stream and tributaries. The proposed activities occur within this reach.
- Trout Spawning. This value applies to both the lower and upper Ohau River. In the upper Ohau it applies to the Makahika Stream and its tributaries and to the Makaretu Stream and its tributaries, but not to the main stem of the Ohau. In the lower Ohau it applies to the Makorokio Stream and its tributaries but not to the main stem of the Ohau. None of the proposed activities affect the reaches to which the trout spawning value applies.
- Water Supply. This value applies to the Ohau River above the existing intake site. It is set to protect the ability to abstract water and to protect the quality of the water for drinking water purposes because of the Levin Water Supply. The activities covered by this application are provided for by this value.
- Domestic Food Supply. This value applies to both the lower and upper Ohau River throughout the catchment.
- Flood Control and Drainage. This value applies to both the lower and upper Ohau River. The main stem of the Ohau River is valued for Flood Control and Drainage from the confluence with the Makahika Stream to the coastal marine area boundary. In the lower Ohau River several tributaries also have this value.

The effect of the proposal on these values, where relevant, is assessed in Section 9.7.

One Plan Allocation Framework

The One Plan (combined Regional Policy Statement and Regional Plan) establishes an allocation framework consisting of the following elements:

- A minimum flow to be maintained in the River. This is set to protect the river's life supporting capacity and to provide for the water management values identified above (as per Objective LF-FW-O5 (1)(a) of the One Plan). In general, abstractions are required to cease when the River is below the minimum flow except that, in accordance with Policy LF-FW-P21, Essential Uses may continue provided there is a reduction in abstraction. The existing Levin Water supply consent enables abstraction to occur at a reduced rate of 13,000 m^3/day when the river is below minimum flow. The proposal will enable Council to avoid exercise of this abstraction except in exceptional circumstances as detailed in Section 4.2. **The minimum flow for the Ohau River is defined in the One Plan 820 L/s at the Rongomatane Gauging site**.
- A core allocation is set which is the total amount of water which can be taken above minimum flow whilst still providing for the water management values of the water body (as evidenced by the fact that applications to take from the core allocation are regulated as Controlled Activities under Rule LF-TUD-R44 of the One Plan). **For the Ohau River, the core allocation is 24,192 m^3/day as defined in RP-SCHED3. It is understood that this core allocation is fully allocated. HDC holds core allocation consents equating to 15,409 m^3/day or 64% of the total allocation**.
- **A supplementary allocation which can only be taken when the river is above median flow and which, in total is not to exceed 10% of the actual flow in the river at the time of abstraction**. The purpose of the supplementary allocation is to enable water to be taken at higher flows when the likely effects on the river will be less than minor. This enables water harvesting and storage schemes such as that proposed in this application.

3.2.2 Proposed Reservoir Intake & Spillway Discharge Site

The proposed reservoir intake site is located within and adjacent to the Ohau River bed as shown in Figure 3.10 including its location in relation to the other proposed activities and existing intake site.

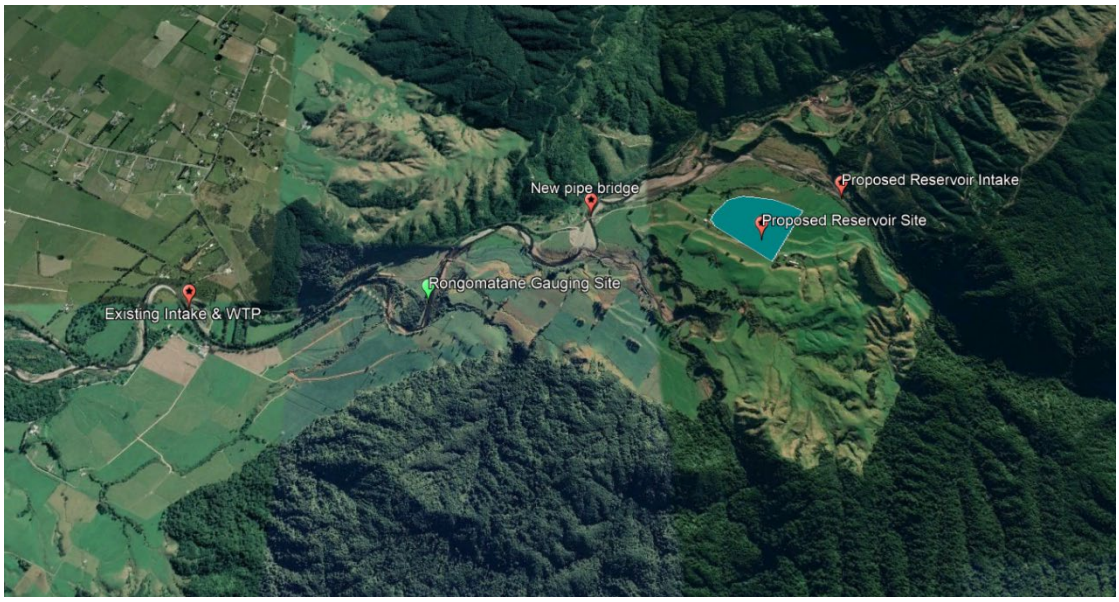


Figure 3.10: Location of Proposed Activities

The riverbed in this area is located within a property title described as Lot 1 DP 12594, at 116 Poads Road.

The proposed reservoir will include a spillway which, in infrequent circumstances, will discharge water back into the Ohau River. This activity is described in Section 4.3. The spillway will discharge water to the Ohau River immediately downstream of the intake location.

The habitat and ecology at this site, including the riparian vegetation which will be disturbed by the proposed works is described in the ecological assessment report included in Appendix G. It describes it as follows:

> *This section of river provides high-quality habitat for indigenous fish and macroinvertebrates, with riffles being a particularly productive habitat type within large river systems. Its position within the wider catchment means that it is also critical to maintain connectivity through this area, to allow the natural migration and movement of fish and macroinvertebrates in both upstream and downstream directions.*
>
> *The section of the true left bank along which the erosion protection armouring will be installed …is steep and covered in dense tutu (Coriaria arborea var. arborea), with occasional clumps of toetoe (Austroderia fulvida) ... Exotic pampas grass (Cortaderia selloana) is also present along the river margins. The understorey is a mixture of indigenous species including Coprosma spp., māhoe (Melicytus ramiflorus), and wheki (Dicksonia squarrosa) …*
>
> *No rare or threatened indigenous vegetation was observed during the site visit, with all indigenous species being widespread and common. Vegetation in the proposed impact area is therefore of moderate ecological value.*

Figure 3.11 shows the river in this location.

Figure 3.11: River at Proposed Intake Site (looking upstream)

There is a resource consent for gravel extraction which applies at and downstream of this location. That consent, ATH-2013014957.00, is to extract up to 6000 cubic metres of gravel at Hoggs Road and 10,000 cubic metres at Gladstone Road. It has expired, however, a renewal application has been lodged and is on hold. The expired consent remains active under s124 of the RMA. The proposed activities do not affect the ability for this gravel extraction consent to be exercised.

The site is zoned Rural under the Horowhenua District Council's District Plan and subject to a 200 m aggregate extraction buffer overlay.

3.2.3 Proposed Reservoir Site

The proposed reservoir site is located at the end of Poads Road as shown in Figure 3.10. The site is zoned Rural under the Horowhenua District Council's District Plan and part of the site is subject to a 200 m aggregate extraction buffer overlay.

An ecological assessment of the proposed reservoir site, including the lower floodplain terrace on the property, has been undertaken to assess the ecological values of the site and to determine if there are any natural inland wetland areas that would require a resource consent under the National Environmental Standards for Freshwater (NES-FW).

The ecological assessment identified five sites which required assessment and delineation to assess whether they are to be classified as a natural inland wetland under the NES-FW. These are shown in Figure 3.12, replicated from the ecological assessment in Appendix H.

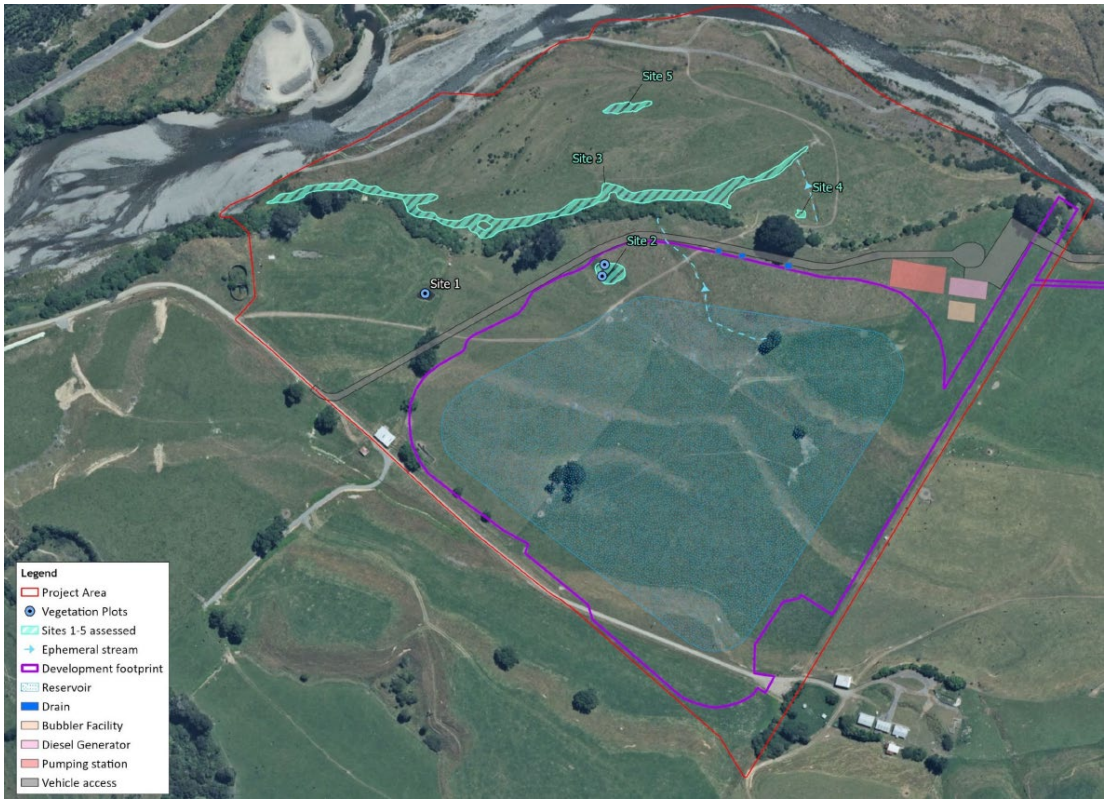


Figure 3.12: Areas Subject to Natural Inland Wetland Assessment
Source: Figure 1 of Wildlands report, Appendix H of this AEE.

These sites were assessed in accordance with the New Zealand vegetation tool for wetland delineation (Clarkson, 2013), being the standard methodology to assess the presence of plants adapted to wet conditions. The assessment methodology is detailed in the ecological assessment report in Appendix H. Wildlands also assessed if these sites would be classified as rare, threatened or at-risk habitats under the Regional Council's One Plan.

As shown in Figure 3.12, two sites were identified on the upper terraces where the reservoir is to be constructed, and three on the lower floodplain terrace where the cultural offset mitigation is to be undertaken (refer Section 4.6).

Possible Wetland Sites on Upper Terrace (Reservoir Site)

- Site 1: This site is outside of the reservoir footprint and also not affected by the access road and ancillary infrastructure proposed. Site 1 is not considered to be a natural inland wetland as it meets the pasture exclusion criteria. As it is not a wetland, site 1 is also not considered to be a rare, threatened or at-risk habitat.
- Site 2 is within the reservoir footprint and will be affected by the reservoir construction. It is described as:

  a small open-water shallow depression covering an area of c.400 m^2, with a narrow fringe of wetland vegetation that includes jointed rush (Juncus articulaus, OBL), water purslane (Ludwigia palustris, OBL) with abundant Yorkshire fog (Holcus lanatus, FAC), Mercer grass (Paspalum distichum, FACW), creeping bent (Agrostis stolonifera, FACW) and occasional patches of (Persicaria hydropiper, FACW), creeping buttercup (Ranunculus repens, FAC) sweet vernal (Anthoxanthum odoratum, FACU), and white clover (Trifolium repens, FACU).

  This site was assessed by Wildlands via two representative 2 x 2 metre vegetation plots in the narrow strip of vegetation surrounding the small area of open water. One of these plots was assessed as qualifying the site to be a natural inland wetland. The second plot met the pasture exclusion criteria of the NES-FW and was assessed as not qualifying the site to be a natural inland wetland.

  Overall, Wildlands assessment is that "*This site could be classified as a wetland but it is a very marginal classification*". Wildlands noted that "*although, technically, this site could qualify as a wetland, albeit marginally, in terms of the NPS-FM, it is highly modified, the vegetation is predominantly exotic, and it is not ecologically significant. It also has little potential for ecological restoration*." It was further assessed by Wildlands as not being a rare, threatened or at-risk habitat under the One Plan.

  Adopting a precautionary approach, this application has been prepared on the basis of this site being a Natural Inland Wetland under the NES-FW.

Figure 3.13: Site 2 within the Reservoir Footprint - Marginal Classification as a Natural Inland Wetland

Possible Wetland Sites on Lower Floodplain Terrace (Cultural Offset Management Area)

- Site 3 is a small watercourse which follows the toe of the slope from the upper terrace and connects with the Ohau River at the downstream end of the property. It has been assessed as a Natural Inland Wetland under the NES-FW, and as a Rare habitat under the One Plan RP-SCHED6.

This is an area which is proposed for active restoration under the Cultural Offset Management Plan (refer Section 4.6).

- Site 4 is a very small area (approximately 50 m^2) in a shallow depression. It was assessed to be a Natural Inland Wetland under the NES-FW, but does not qualify as a rare, threatened or at-risk habitat under the One Plan RP-SCHED6. Wildlands state that "*in isolation, it has little potential for ecological restoration*". This area is part of the active restoration area of the Cultural Offset Management Plan.
- Site 5 is approximately 276 m^2 formed in a shallow depression on the lower terrace. It is also considered to be a Natural Inland Wetland, but does not qualify as a rare, threatened or at-risk habitat under the One Plan RP-SCHED6. This area is part of the passive restoration area of the Cultural Offset Management Plan.

The above sites, including the plant species identified within each site, are discussed in more detail in the ecological assessment report in Appendix H.

Lizard Survey

Wildlands also undertook a lizard survey of the reservoir site (refer Appendix H), given the presence of potential lizard habitat on the site (particularly areas containing rock piles, deep leaf litter, and dense vegetative groundcover). The lizard survey did not find any lizards on the site, and concluded that:

> *If lizards are present, but below detection levels, the most likely undetected species is northern grass skink (Oligosoma polychroma - 'Not Threatened'), which is widespread in the southern North Island and known to be able to persist in disturbed and marginal habitat. However, based on the survey results, there is high confidence that lizards are not present and no further lizard management is necessary at this site.*

3.2.4 Proposed Pipe Bridge

The proposed pipe bridge will be immediately upstream of the existing Poads Road bridge across the Ohau River and within road reserve. The pipe bridge location and general alignment is shown in Figure 3.14.

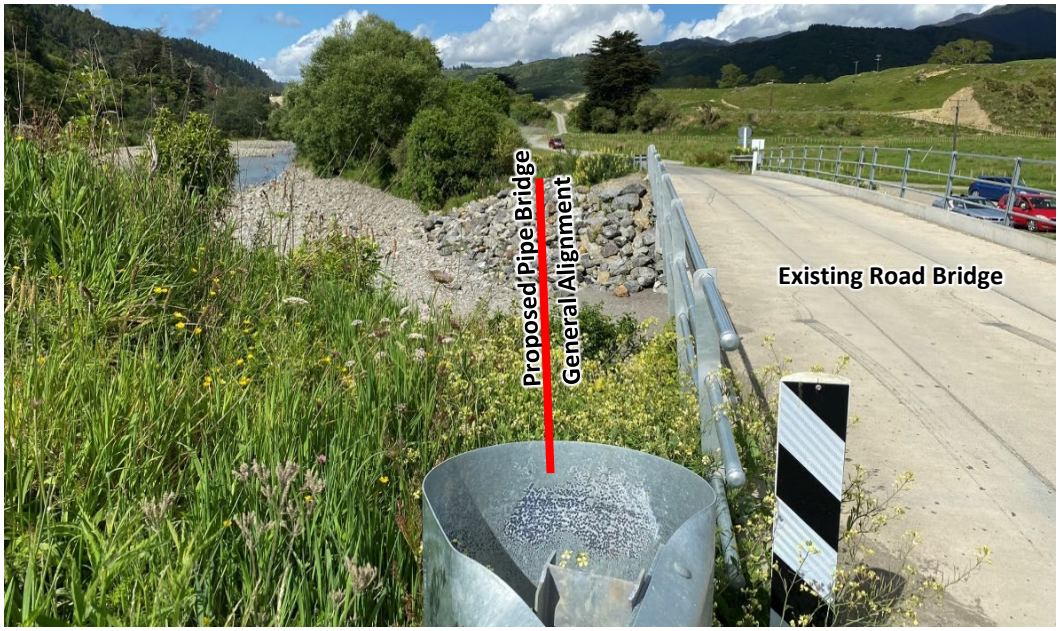


Figure 3.14: Proposed Pipe Bridge General Location

The pipe bridge will replace a previously disused pipe bridge which has only recently been removed from the same alignment. The decommissioned pipe bridge was used to convey water from the historic intake for the Levin Water supply which was constructed in the early 1900s and located upstream of the proposed intake site (refer discussion in Section 6.2.2). The previous pipe bridge is shown in Figure 3.15.

Figure 3.15: Poads Road Previous Road Bridge and River Crossing
(from true left bank looking towards Gladstone Road, Google Street View imagery, November 2019) Pipe bridge has since been removed and road bridge replaced.

3.2.5 Existing Intake Site

The existing intake site's location is shown in Figure 3.10. The existing intake consists of a perforated 750 mm diameter Aluflow Pipe laying parallel to the river flow and extending 66 m downstream and 175 m upstream and laid with the invert approximately 1 m below the river bed. These pipes feed into a central intake chamber from which water is abstracted and fed into the treatment plant.

This application does not include any physical works to be undertaken at this site. The Levin Water supply abstraction will continue at this site as described in Section 4.1.2.

The Council undertake regular maintenance and works in the river bed at this site in order to maintain the ability to abstract from this intake. This bed disturbance is authorised under resource consent ATH-2008010962.02 which authorises "periodic scarifying, flushing, back wash, flood debris removal in the Ohau River for Levin Municipal Water Supply Intake Gallery Operation and Maintenance Purposes". This consent is not subject to this application and will continue to be held by HDC. It expires in May 2043.

3.2.6 Proposed Abstraction Point for Ō2NL Construction Water

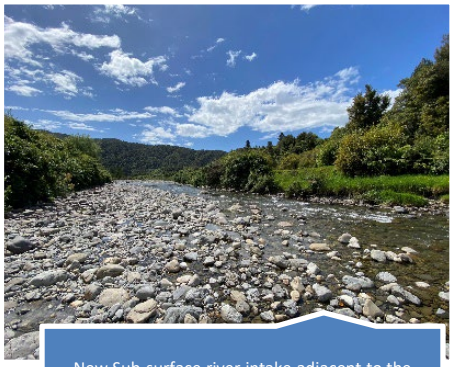
This application includes provision for a short-term abstraction of water from the Ohau River at or near the proposed Ō2NL bridge across the Ohau River, for purposes of supplying construction water for NZTA's Ō2NL Project (refer Section 4.1.2).

The Ohau River from which the water allocation is sought has been described above and in the hydrology assessment report included in Appendix D.

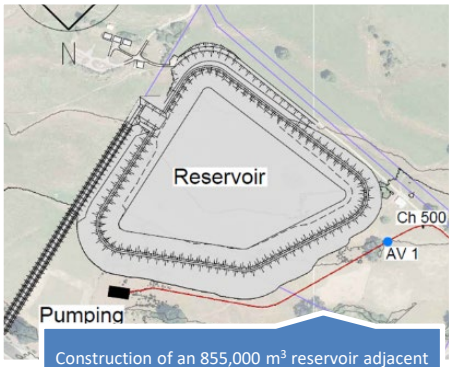
4 DESCRIPTION OF PROPOSED ACTIVITIES

In summary, the proposal is to create a large off-river reservoir adjacent to Poads Road which will improve the resilience of the Levin Water Supply; reduce the effects on the river from abstractions at times of minimum flow; and provide for community growth and wellbeing. Included in the application is all works to enable the construction, operation and maintenance of the reservoir and new reservoir intake, as well as a new water permit encompassing the council's existing core allocation and a new supplementary allocation. A Cultural Offset Management package has been developed via engagement with Muaūpoko Tribal Authority and this application is also seeking the necessary resource consent to enable these cultural offsetting works to be implemented.

The activities which are required to achieve these outcomes, and for which consent is sought, are summarised in Figure 4.1.



New Sub-surface river intake adjacent to the reservoir site including river-edge terracing and infrastructure



Construction of an 855,000 m^3 reservoir adjacent to Poads Road including emergency spillway discharge and ancillary infrastructure (pump house, emergency generator, etc)

Cultural Offsetting and Restoration / Enhancement Programme on lower terrace

New pipeline along the Poads Road - Gladstone Road corridor to convey stored water to the Levin Water Treatment Plant including new pipe bridge across the Ohau River.

New Water Permit to enable existing consented core allocation to be abstracted from either the existing or new (reservoir) intake PLUS new supplementary allocation sought to be able to fill the reservoir when river flows are above median flow.

Short term abstraction from the SH1 bridge site in order to provide construction water for the Ōtaki to North Levin NZTA project subject to overall consented abstraction limits not being exceeded.

Figure 4.1: Overview of Activities

4.1 Water Take

4.1.1 Existing Water Take Consents to be Replaced

HDC currently hold the following water permits to take water from the Ohau River:

- **ATH-1991006011.03 which authorises abstraction at the existing intake (Water Treatment Plant site) of 15,000 m^3/day from the Ohau River,** with the abstraction to reduce to 13,000 m^3/day when the Ohau River is below its minimum flow (820 L/s at Rongomatane Gauging site), plus an additional 750 m^3/day as a non-consumptive take. This water permit expires July 2042.

  This application will replace this existing consent. The proposal is to utilise the existing core allocation that has already been allocated to HDC through to 2042 in a way which provides for a more efficient use of water and infrastructure, by enabling abstraction from either of the existing intake site or the new reservoir intake site. The is described more in Section 4.1.2.

- **ATH-2022205111.01 which authorises abstraction of up to 409 m^3/day at the proposed reservoir intake site** (being the remaining allocation in the Core Allocation limit specified in the One Plan that was available in 2022 as discussed in Section 2.1.1). HDC sought this consent following feasibility assessment of the proposed reservoir when it became clear that the existing core allocation provided under ATH-1191006011.03 was insufficient to meet the community's needs for the projected growth and following the decision to proceed with seeking consent for the proposed reservoir.

  This application will replace consent ATH-2022205111.01 and will see the core allocation from this consent amalgamated with ATH-1991006011.03 into a single new water permit.

HDC therefore enters this consent process with existing consents authorising abstraction of a total of 15,409 m^3/day of the core allocation volume provided in the One Plan, plus an additional 750 m^3/day able to be abstracted for non-consumptive purposes at the WTP intake site.

4.1.2 New Water Permit Sought

The allocation sought via the new water permit is summarised in Figure 4.2 and detailed below.

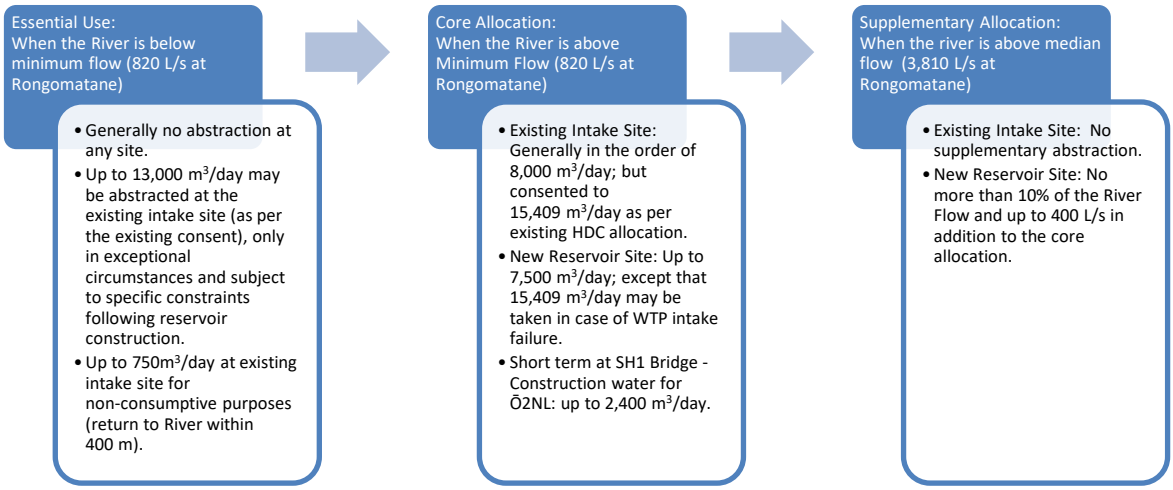


Figure 4.2: Water Allocation Sought

This consent application seeks the following:

Core Allocation

1. **A Core allocation of 15,409 m^3/day able to be taken at any time that the river is above the minimum flow**[16]**.** Consent is sought to enable this water to be taken from any of the following three location points, **subject to the total 15,409 m^3/day not being exceeded at any time**:
   a. **Existing intake (Water Treatment Plant site):**
      - **A consent limit at this site to enable a maximum of 15,409 m^3/day to be abstracted, at a maximum instantaneous rate of 206 L/s (as per the existing consent).** While this is sought as the maximum daily limit from this intake site (which would mean, on that date, the other two intake sites are not utilised), this will not be the normal operating scenario. A consented limit of 15,409 m^3/day from this site is the same as what is already authorised under the existing core allocation consents held by the District Council.
      - Under normal operating scenario (refer Section 4.1.3) abstraction from this site would more likely be in the order of 8,000 m^3/day. This equates to the current winter demand or base demand from the community and is also preferred in terms of enabling the existing intake to operate at its optimum abstraction rate. The intent is that the base demand (less any water drawn from the reservoir to provide for turn-over in the reservoir to maintain stored water quality) is drawn directly from the river at the treatment plant. Overtime, and depending on the rate of growth in the community and the performance of the existing intake, the normal operating abstraction from the existing intake site may increase to match base demand.
      - **As per the existing consent for this intake, a further 750 m^3/day of non-consumptive water may be taken (in addition to the maximum total consumptive take across all three intake sites of 15,409 m^3/day).** The existing consent provides for 750 m^3/day of non-consumptive water to be taken subject to it being returned to the Ohau River within 400 m of the point of take. To enable the ongoing operation of the intake and treatment plant, this non-consumptive take is required to be incorporated into the new water permit.
   b. **New Reservoir Intake site:**
      - **A core allocation consent limit at this site of 7,500 m^3 /day to be abstracted at a maximum abstraction rate of 400 L/s.** This is the total consented limit sought (15,409 m^3/day) less the likely base demand abstraction rate which will be abstracted at the existing treatment plant intake site. The full core allocation is not sought to be available at the reservoir intake site, as there is a smaller river flow at the reservoir intake site compared to the existing treatment plant intake site. Abstracting the full 15,409 m^3/day from the reservoir intake site on a regular basis may have an increased effect on the river, particularly at low flows.
      - In the event of a failure of the existing WTP intake, up to 15,409 m^3/day may be abstracted if necessary to maintain community water supply.
   c. **Temporary Intake for Purposes of Enabling the Construction of NZTA's Ōtaki to North Levin State Highway**. To enable the efficient allocation of water, HDC seek to provide, through this consent, the ability for NZTA to utilise some of the allocation provided to HDC for future growth so that they are able to use this water for purposes of construction of the Ōtaki to North Levin Project (Ō2NL Project). The location of this abstraction point is from the Ohau River immediately upstream and downstream of the proposed Ō2NL bridge, and within the area that has been designated for the State Highway. Water will be abstracted from the

[16] *The river's minimum flow is defined in RP-SCHED3 of the One Plan 0.820 m^3/s at the Rongomatane Gauging site.*

river and stored in water storage ponds[17] which are part of the construction works. Water will then be abstracted from the water storage as necessary to meet the construction project needs.

- Core allocation for this use shall be limited to 2,400 m^3/day and subject to the total daily core allocation abstraction authorised under this consent.
- The average rate of abstraction at this site is 28 L/s
- The maximum rate of abstraction at this site is 50 L/s.
- There shall be no abstraction from this site when the river is below minimum flow.

It is noted that use of water for the Ō2NL Project's construction is not enabled under the existing water permits. This application specifically includes use of water for Ō2NL Project's construction within the activity description to enable the use of water for the construction period. It is considered that enabling use of water for Ō2NL Project's construction via this consent application provides for efficient allocation of water as it provides short-term use for the Ō2NL Project's construction whilst securing medium to long term allocation of water to provide for community growth. Given the allocation status of the Ohau River, not seeking sufficient water for medium to long term community use would put security of supply for the community water use at risk, whilst providing for the Ō2NL Project's construction water within the consent ensures that allocated water is able to be used in the short term.

The use of water for Ō2NL Project's construction is to be limited to the duration of the construction period and will be subject to appropriate conditions of consent, similar to any consent granted directly to NZTA for the same purpose. The current programme is for the Ō2NL Project to be open to traffic by the end of 2029 with completion works continuing through 2030 and likely into 2031. To allow for any unforeseen delays in the construction period, the abstraction is sought for the period from commencement of consent until the end of the 2033 calendar year.

Supplementary Allocation

A supplementary allocation of up to 10% of the river flow above median flow as per Policy LF-FW-P20 of the One Plan is sought to be abstracted at the reservoir intake site.

The supplementary allocation shall only be available at the new reservoir intake site.

The reservoir intake and pumping system has been designed with a sub-surface infiltration gallery arrangement which will convey water via gravity into a pump chamber located outside of the riverbed but within the riparian area. Water will be pumped from that pump chamber to the reservoir. The design flow rate for the pumping system is 400 L/s and it is proposed to ensure that no more than 10% of the river flow is taken when it is above median flow via the imposition of staged daily abstraction limits in addition to that enabled under the core allocation. The following key flow statistics are provided by way of example and it is proposed to work with the consent authority to develop appropriate conditions as the consent progresses. Refer also to the discussion in Section 9.3. The following flow statistics are all based on the estimated naturalised flow regime for the river at the point of intake as per Table 5 of the Hydrology Assessment report in Appendix D (note that river flows specified the bullet points below relate to the estimated flow at the intake site and not at the Rongomatane gauging site):

- At the median flow (1.77 m^3/s), the amount of water which could be taken under the supplementary flow is 177 L/s or just under half of the maximum pump rate. The daily supplementary allocation abstraction at this point would be 15,327 m^3/day and would require the pump to be operating just under half of the time.

[17] *Note: The storage ponds do not form part of this consent application. They are authorised separately under the suite of consents held by NZTA for the Ō2NL Project.*

- At the 25th Flow Exceedance Percentile (FEP) flow of 3.21 m^3/s (ie the flow in the river that is exceeded 25% of the time), the amount of water which can be taken under the supplementary allocation is 27,734 m^3/day, which when the proposed core allocation is also provided for, would require the pump to be operating continuously.
- At flows above the 25th Flow Exceedance Percentile, the Council's abstraction is unable to abstract the full 10% of the river flow above median (at the proposed pump rate) and therefore there is supplementary allocation available for other users above these flows.

It should be noted that this assessment has been derived based on the naturalised flow regime at the intake site as determined by the hydrology assessment included in Appendix D. Further downstream (eg below the confluence with the Makakahi Stream) the river flows are increased and therefore the HDC abstraction does not prevent other users from being able to access supplementary allocation in accordance with the One Plan allocation framework.

Essential Use - Abstraction at or below Minimum Flow in the River

HDC currently has consent through to 2042 to abstract up to 13,000 m^3/day of water from the existing intake site when the river is below minimum flow, as well as a further 750 m^3/day for non-consumptive use. At the moment, the only criteria that needs to be met to be able to abstract below minimum flow is that water demand is managed in accordance with the Water Demand Management Plan (WDMP), and that water restrictions be at Trigger Level 4 as defined in the WDMP.

The ability to abstract below minimum flow is in accordance with Policy LF-FW-P21(4)(d) of the One Plan which provides for essential takes such as public water supplies to continue at times of minimum flow subject to a reduction in abstraction. This also recognises that the Levin Water Supply is nationally and regionally significant infrastructure in accordance with Policy EIT-P1(1)(i) of the One Plan.

Once the reservoir is constructed and operational, HDC will no longer need to be fully reliant on the minimum flow abstraction to meet its obligations under s25 of the Water Services Act to provide sufficient quantity of water to the community. It will, instead, be able to draw water from the reservoir and minimise or avoid the need to abstract from the river.

However, because of those obligations under section 25 of the Water Services Act, and because of the criticality of the water supply to provide for the health needs of the community and its social and economic wellbeing, HDC seeks to retain its existing minimum flow allocation **for use in exceptional circumstances**. Such emergency conditions may include extended drought periods lasting beyond the ability to meet supply from the reservoir, or reservoir supply pipeline failures occurring at a time of minimum flow in the river.

The consent therefore seeks to retain the ability to abstract up to 13,000 m^3/day from the river at the existing WTP intake site when it is below minimum flow as per the existing consent, but with the addition of more stringent conditions as to when this can be exercised. In addition, the 750 m^3/day non-consumptive water take (required to maintain efficacy of the treatment process) can also be taken at this time. **The proposed conditions require that, once the reservoir is operational, the minimum flow abstraction may only occur in the following circumstances:**

a. When the reservoir level is below 50% and the long-term weather forecast shows that minimum flow conditions are likely to continue; or

b. When the reservoir level is below 30% irrespective of the long-term weather forecast; or

c. When there has been a failure of the pipeline conveyance between the reservoir and the water treatment plant (eg pumping failure, pipeline break) that is unable to be remedied within 12 hours.

In all of the above circumstances, the following criteria will also be required to be met:

- The highest (most restrictive) restriction level in the Water Demand Management Plan shall be enacted and actively monitored and enforced by Council.
- If the abstraction is exercised due to reservoir level triggers, there shall be prior notification to iwi/hapū and Horizons Regional Council. If the abstraction is exercised due to conveyance pipeline failure, these parties shall be notified within 24 hours of the minimum flow abstraction commencing.
- Weekly status updates as to the reservoir levels, effectiveness of restrictions, actions being undertaken to give effect to any repairs (if applicable), and likely timeframe for ceasing the minimum flow abstraction shall be provided to iwi/hapū and Horizons Regional Council for the duration of the minimum flow abstraction period. These updates shall be in an appropriate format (eg email or similar).
- Within two months of the minimum flow abstraction ceasing and the system returning to normal operating conditions, a report to sufficient detail and appropriate format to address the matters (eg email , memo or similar), shall be provided to iwi/hapū and Horizons Regional Council detailing the reasons for the minimum flow abstraction occurring, actions taken during the minimum flow abstraction period to minimise effects on the awa, and any recommendations to minimise the potential for the need for this abstraction in the future (if possible).

The above constraints are proposed in order to achieve an appropriate balance between the need to maintain supply to the community for public health and wellbeing purposes, with the need to give effect to Te Mana o te Wai, and to protect and provide for the awa and its life supporting capacity. It ensures that the ability to abstract is available in exceptional circumstances but avoids this being exercised on a regular basis. The notification, reporting and post-event review requirements, which will also require involvement of iwi/hapū, are proposed to ensure that there is transparency, accountability and a continual improvement approach.

4.1.3 Flow Metering & Reporting

The Applicant has telemetered flow metering on its existing Water Treatment Plant (WTP) intake which provides real time data to Horizons Regional Council and also provides data into the HDC's SCADA system and compliance and data recording system (currently Infrastructure Data). This enables real time alerts and operator actions to be taken in the event of potential exceedances of consent limits or other operational matters. The Infrastructure Data system also enables dashboarding of the water supply and wastewater systems that the Council operates. A Levin WTP dashboard has been created for oversight and reporting on the operation and compliance of the system from both a resource consent compliance and drinking water standard compliance perspective. The SCADA system also enables remote operational control so that operator attendance at site is not necessarily required to address operational matters.

The new reservoir intake will include flow meters which are verified in accordance with manufacturer requirements, and which have telemetry output to enable real time data provision to both District Council (as consent holder) and Regional Council (as consent authority). The flow meters and telemetry systems at both intakes will continue to operate throughout the term of consent including regular flow meter verification as required under standard consent conditions imposed by Regional Council which are on the existing water take permit consent and would be expected to be imposed on any grant of consent to this application. This ensures compliance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

In addition to reporting of the amount taken at each intake, the SCADA and reporting system will be upgraded as part of the construction and commissioning of the reservoir, to include the following elements:

- **River flow monitoring at the reservoir intake site.** The design of the river flow monitoring system will be developed as part of the detailed design of the intake and will be submitted to Regional Council for technical certification prior to construction. The river flow data will connect to the pump control system for the river intake via the SCADA system. Set points will be established in the SCADA system which specify the median flow above which supplementary allocation can be abstracted, and the pump control system will vary the abstraction rate when the river flow is above median flow to ensure that no more than 10% of the river flow is abstracted. The SCADA system allows for set points and controls to be established at different authority levels, and these set points will be set to ensure that they cannot be overridden at operator level without prior approval and authorisation. The river flow monitoring will also be telemetered direct to Regional Council to add to their data records for river flows.
- **Integration of Intake Set Points**: SCADA rules will be established that provide for integration between the reservoir and WTP intake sites to ensure that the allocation limits set for each intake point, as well as the total daily allocation limits are not exceeded.
- **Reporting of Individual and Combined Daily Abstraction:** Dashboards and reporting will be established to enable daily reporting of the amount taken at each intake site as well as the total amount taken across all intakes to enable compliance reporting.
- **Provision of Telemetered Abstraction Data to Regional Council:** HDC officers will work with Regional Council officers to agree and develop protocols for provision of telemetered abstraction data into Regional Council's system. This is likely to include provision of abstraction at each intake site as well as combined abstraction data across all intake sites authorised under this consent.

Temporary Ō2NL Project Construction Water Take

The abstraction of water at the intake site for Ō2NL Project construction water will be carefully managed throughout the construction period with a high degree of communication between HDC and NZTA and its contractors. **HDC recognise and acknowledge that, as consent holder, they will remain responsible for compliance with the consent at the Ō2NL Project intake site.**

The intake at the Ō2NL Project site will include a flow meter and telemetry to enable real time abstraction data to be fed into both the HDC system (as described above) and Regional Council system.

HDC and NZTA have been engaging with iwi/hapū in developing the proposal for the use of water for the Ō2NL Project construction and agreeing protocols for how this will be managed. HDC and NZTA have entered into a Private Development Agreement (PDA) with respect to the overall Ō2NL Project construction and it is proposed that a water supply agreement be developed and included as a schedule to that agreement. A draft water supply agreement is currently being developed and it has been agreed between HDC, NZTA and iwi/hapū that it will be based on the principle of Te Mana o te Wai, namely

- Firstly, water is kept in the awa. There will be no abstraction at the Ō2NL Project intake site when the river is below minimum flow. The proposal to utilise some of HDC's allocation for the Ō2NL Project's construction water also means that additional water is not required out of the Ohau River that would result in over allocation of the river. Further, it reduces the amount of water that needs to be abstracted from other water courses along the Ō2NL Project corridor.
- Secondly, water is available for public water supply. NZTA recognises that it is only able to utilise any spare allocation within the HDC consent after the community water demand has been met.
- Thirdly, remaining allocation may be used by NZTA for construction water. This means that the water available to NZTA on any given season and day will vary. To manage this, a high degree of communication will be required between NZTA, its contractors and HDC. During winter, when the base demand for the community is low (ie, at present base demand is in the order of 8,000 - 9,000 m^3/day) there is the ability for NZTA to abstract the required amount on an ongoing basis without risking non-compliance with the overall water take. In these periods, demand for

construction water is also likely to be at its lowest. During summer (and shoulder months), community demand is higher and closer day-to-day management of the amount of water able to be taken for the Ō2NL Project construction will be required. The proposed communication protocols recognise this variability and include for more frequent (ie daily) communications between HDC and NZTA in summer / high demand periods. It is proposed to manage the system on a "by exception" basis whereby during winter periods, NZTA will be able to abstract up to their requested maximum unless HDC operators advise otherwise on any given day; during summer periods, the exception will be reversed in that NZTA will generally not be allowed to take (or will only be allowed to take to a much lower limit) unless HDC operators advise otherwise on any given day. Community demand is generally predictable on a daily-weekly basis by the operators based on recent trends and weather forecasts, and conservative estimates will be made by the operators to advise NZTA as to how much water is available for abstraction. NZTA and its contractors propose to utilise the Ō2NL Project's stormwater ponds for storage of construction water and therefore not being able to abstract on any day, or for periods at a time, is unlikely to impact the construction programme.

4.1.4 Operating Approach & Parameters

The above has described the water take activity in terms of the consented allocation and consent limits sought. That sets out the upper limits as to the proposed activity for which consent is to be sought and is the basis on which the assessment of environmental effects has been undertaken.

This notwithstanding, the actual operation of the system will generally not be occurring at the maximum consented limit. This section describes what the actual operating conditions may be under various scenarios that would be expected during the term of consent sought.

It describes the general operating principles under normal conditions (being whenever the river is above minimum flow), as well as general operating principles under drought (minimum flow) conditions, high turbidity and emergency conditions.

Normal Operating Conditions

The normal operating conditions are when the river is above minimum flow (ie. when the river is above 820 L/s at Rongomatane) and is summarised in Figure 4.3.

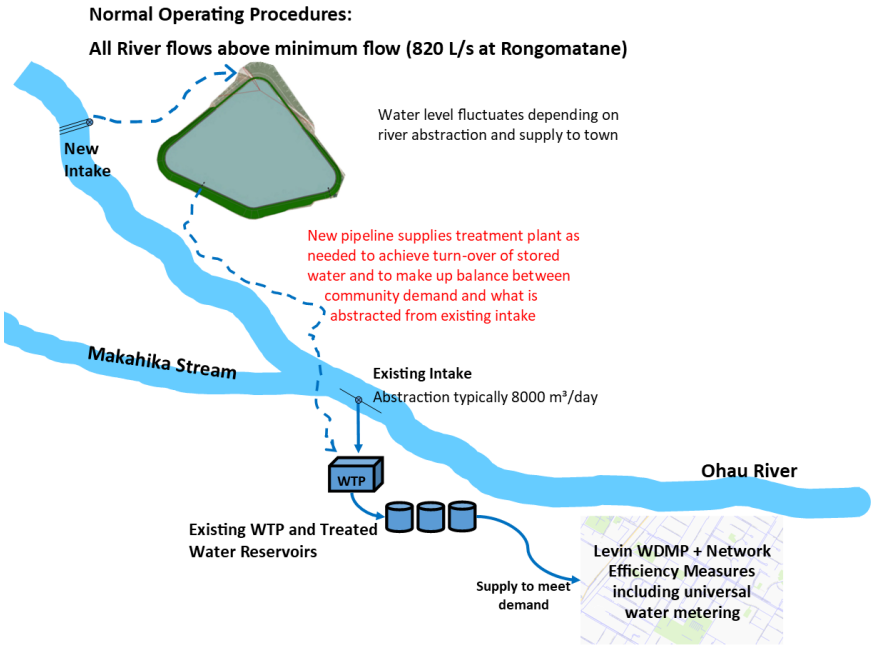


Figure 4.3: Overview of Normal Operating Conditions when the River is above Minimum Flow

The system will generally operate as follows:

Firstly, at all times, community demand will be managed through implementation of the Water Demand Management Plan including measures undertaken by Council to reduce leakage from the system (as described in Section 4.1.4), water metering and charging consumers for high water usage, and measures to encourage sustainable water use such as use of rainwater tanks on new properties. For example, the Taraika Plan Change which provides for the Taraika Growth area and some additional 3,500+ houses and mixed commercial area, requires rainwater tanks on all new dwellings to meet the District Plan permitted activity standards.

Water will be abstracted from the Ohau River at the existing intake site. This is from the core allocation under the One Plan which is already allocated to Horowhenua District Council. The abstraction may vary depending on specific operating conditions, but typically the abstraction at the existing intake site will match base demand less any water required to be supplied from the reservoir to achieve turn-over in the reservoir for purposes of maintaining stored water quality.

While more can and is routinely abstracted during summer periods at the moment, generally operating the existing intake at base demand levels will reduce the risk of failure of the existing intake and also reduce the frequency at which the existing intake needs to be scarified thereby reducing bed disturbance (via the exercise of consent ATH-2008010962.02).

The amount of water abstracted from new reservoir intake site will also vary depending on specific operating conditions, but will generally be as follows:

- When the river is above minimum flow (820 L/s) and below median flow (3,810 L/s at Rongomatane): Abstraction will be up to 7,500 m^3/day (ie being the 15,409 m^3/day total less the 8,000 m^3/day likely to be abstracted from the existing intake site and rounding that figure). This water is abstracted as part of the core allocation provided under the One Plan and already allocated to Horowhenua District Council and is to be used to fill the reservoir.
- When the river is above median flow (3,810 L/s at Rongomatane): Abstraction will be the amount of core allocation able to be abstracted as per above, plus 10% of the river flow, as measured at the abstraction point. The 10% of the river flow is the supplementary allocation provided for under the One Plan.

The reservoir would generally be operated to be as full as possible coming in to high demand periods, subject to community demand and abstraction restrictions. Some water will be routinely used from the reservoir to supply treatment plant as necessary to ensure adequate turn-over and maintain quality of stored water. As community growth occurs, more seasonal fluctuations in the reservoir level are expected. In general, the reservoir levels would be at their fullest leading into the summer period. During the summer period, abstraction to full the reservoir is likely to be more restricted as the river will be less frequently above median flows (in which case abstraction will be limited to the core allocation only and the additional supplementary allocation may not be available) and community demand will be at its highest. The reservoir levels will progressively decline over the summer period. During winter, the reservoir levels will then progressively increase as the community demand decreases and the ability to abstract supplementary allocation to fill the reservoir will increase. Ideally the reservoir will be maintained above 50% levels at all times in order to ensure there is sufficient stored capacity to maintain emergency supply to the community should that be needed.

Water from the reservoir will be supplied directly from the reservoir to the treatment plant via the new pipeline to provide adequate reservoir turn-over, and to make up the difference between the community demand and the amount of water which is abstracted at the existing intake. For example[18], if the community demand is 18,000 m^3/day then this would generally be supplied via abstracting 8,000 m^3/day from the existing intake site and 10,000 m^3/day from the reservoir.

[18] *This is an example only. For context, it represents the projected summer peak around the year 2036.*

Minimum Flow / Drought Period Operating Conditions (Ohau River is below 820 L/s)

A key benefit of investing in the reservoir is to be able to reduce the need to abstract from the River when it is below minimum flow. At present, Council is authorised to abstract up to 13,000 m^3/day from the Ohau River when the River is below minimum flow in order to maintain supply to the community, plus a further 750 m^3/day of non-consumptive take. The reservoir enables Council to not exercise the minimum flow abstraction (other than the non-consumptive take) except in extreme drought or exceptional circumstances (e.g. failure of the reservoir-treatment plant pipeline).

Normal operating conditions when the river is below minimum flow (820 L/s) will be as follows:

- No consumptive abstraction from either of the river intakes (ie no abstraction from the existing intake and no abstraction from the new reservoir intake).
- Up to 750 m^3/day of non-consumptive take at the existing intake.
- Highest level of water restrictions imposed on community water use in accordance with the WDMP.
- The community will be supplied with water directly from the reservoir to the treatment plant. No river abstraction, other than the non-consumptive take.

In extended drought periods, the Council may need to exercise the ability to abstract direct from the River at the existing intake site when the river is below minimum flow. This is likely to be in extended droughts only and will only be exercised if maintaining supply from the reservoir is not possible without significantly compromising the ability to meet water supply obligations or emergency reserves.

It is proposed that the existing ability to abstract from the river below minimum flow only be exercised if the criteria detailed in Section 4.1.2 are met.

One of the considerations is the likely remaining length of extended drought and the way in which the reservoir levels are balanced. For example, whether it is best to avoid any and all minimum flow abstractions from the river and draw down the reservoir to the lowest possible level. In this instance, if the drought extends beyond the reservoir's storage capacity there would be a need to abstract all of the necessary water from the river. Alternatively, it may be that in extended drought situations, abstraction from the river should occur when there is still a reasonable amount of water in the reservoir. In that case, the community's demand (restricted in accordance with the highest level of the Water Demand Management Plan) could be met by a mixture of supply from the reservoir and river abstraction at a lower rate. That is, is it better to have a shorter duration, higher take below minimum flow; or a longer period of abstraction below minimum flow but with lower abstraction rates?

This will always be a careful balancing act between the objective of not abstracting from the river under minimum flow conditions and the need to manage demand and storage levels to ensure continuity of supply and prevent public health risks associated with supply being interrupted. It is therefore important that the consent conditions provide the flexibility to enable management and operational decisions to be made that provide for community health whilst also providing for the life supporting capacity of the river; while at the same time being sufficiently restrictive that they do not encourage use of the minimum flow abstraction as an operationally easier route than managing the reservoir appropriately.

Figure 4.4 provides some indicative examples as to how this “balancing” act may play out, depending on when this event occurs during the term of consent and the level of demand. It assesses the projected water demand at two points. Firstly, the projected peak demand is assessed. In this scenario, it is assumed that the existing water conservation and demand measures continue and therefore the projected peak is simply the existing peak demand projected on the basis of population growth. The second scenario assesses the existing average demand projected forward on the basis of

population growth. This scenario, in essence, assumes that there is a significant change in the way in which people use water such that their overall water use is reduced considerably. In reality, what actually happens is likely to fall somewhere between these two scenarios.

In the example in Figure 4.4, it is assumed that, when the reservoir falls below 50% of its effective volume, the community demand is met by a combination of 8,000 m^3/day from the river and the balance from the reservoir. In this example, and with the current demand management / water restrictions in place (Scenario 1 in the figure), there is sufficient volume in the reservoir to maintain supply to the community in the 100-year return period event for consecutive days below minimum flow (26 days) and no abstraction from the river would be needed if this event were to occur in the near future. As the community grows and at the end of the consent term sought, the reservoir volume would need to be augmented by supply from the river to get the community through the 1:100 year drought period.

If community demand could be reduced to the point that future peak per capita demand is closer to the existing average per capita demand, then the reservoir provides sufficient volume to meet the 1:100 year minimum flow period without abstraction from the river through to approximately 2040. After that time, supply from the reservoir would need to be supplemented with a river abstraction.

Note that these are examples only. The actual growth that has occurred, community demand, abstraction rate from the river, drought period, reservoir level trigger points and minimum flow abstraction will vary. The operating principles will be further developed throughout the detailed design process and via engagement with iwi/hapū, and it is proposed that these be documented via a Water Supply and Reservoir Operational Plan to be prepared as a condition of consent. In terms of this application, the assessment of effects has been undertaken assuming a worst case scenario effect of the consent being exercised at its maximum extent as described in Section 4.1.1.

Effective Storage Volume - Resevoir Full	740,000	m3
Draw Down Reservoir to XX% before supplementing from River	50%	
When supplementing from river, abstract XX m3/day from River	8,000	m3/day
Minimum reservoir volume required	30	days @
	20	l/person/day

Scenario 1: Existing water demand management:
All projections based on 95th percentile growth

Time Period	Population	Demand (m3/day)	No. of days Supply is from Reservoir before needing to be supplemented with river abstraction	No. of additional days supply as combination of Reservoir and River	Total days of drought through which supply is able to be maintained
2025	22163	14,300	26	57	82
2030	25296	15,000	25	51	75
2040	29041	19,800	19	30	49
2045	33471	23,000	16	23	39
2055	51793	30,500	12	15	27
2060	59057	34,900	11	12	23

Scenario 2: Significantly Improved water demand management:
All projections based on 95th percentile growth

Time Period	Population	Demand (m3/day)	No. of days Supply is from Reservoir before needing to be supplemented with river abstraction	No. of additional days supply as combination of Reservoir and River	Total days of drought through which supply is able to be maintained
2025	22163	9,800	38	198	236
2030	25296	12,200	30	84	115
2040	29041	15,000	25	50	75
2045	33471	17,600	21	36	57
2055	51793	23,500	16	22	38
2060	59057	26,800	14	18	32

Shaded cells represent scenarios where supply is able to be maintained during the 100 year return period event for consecutive days below minimum flow (26 days)

Figure 4.4: EXAMPLE Supply Scenarios in Extended Drought Conditions[19]
Supply Arrangements are based on reservoir fill effective storage volume of 740,000 m^3

[19] *The population figures are for the supplied population and differ from those discussed in Section 3.1.4 which relate to the overall District projected populations. Water demand projections have assumed the District wide population growth rate is applied to the current Levin Water Supply connected population.*

4.1.5 Water Demand Management Plan

The existing consent requires that the system be managed in accordance with a Water Demand Management Plan (WDMP) which is required to be updated every three years.

The proposal represents an opportunity for HDC to shift its WDMP to match the new regulatory framework for water services and to ensure that it is implemented in a way which gives effect to Te Mana o te Wai.

The context in which HDC delivers its drinking water services has changed dramatically since the existing consent was granted. At that time, the primary driver for demand management was Policies 5-12 and 5-18 of the One Plan (now policies LF-FW-P15 and LF-FW-P21). Policy LF-FW-P15 requires that municipal water supplies be managed within the reasonable use calculation defined in that policy, largely based on 300 L/person/day for domestic use, a reasonable use assessment for non-domestic uses, and ensuring network leakage is less than 15% of water demand. Policy LF-FW-P21 requires that, when the river is at minimum flow, water demand is reduced, with the domestic use reducing to 250 L/person/day. Council's existing WDMP was developed to give effect to these policies. As a result, and as directed by Condition 12 of the existing consent, it is a WDMP which is predominantly reactive in that it seeks to impose restrictions in response to river flows and to address leakage within the network.

HDC is now required to deliver its drinking water services in a significantly different, but more integrated, statutory framework that recognises the intrinsic value of wai and the awa. The primary statutory driver has been the introduction of the Water Services Act 2021 and establishment of a new water services regulator – Taumata Arowai. The outcome is that the statutory expectations and requirements of HDC as a water services provider have changed fundamentally and there is increased regulatory oversight to ensure that obligations are met. This will be further strengthened through the planned introduction of an economic regulator for the water services industry.

The statutory framework now includes:

- The National Policy Statement for Freshwater Management 2020 (as amended in 2024) ('NPSFM') which has the objective of managing freshwater in a way which prioritises **first, the health and well-being of water bodies and freshwater ecosystems and second, the health needs of people**. It introduces the concept of Te Mana o te Wai as a fundamental concept that is relevant to all freshwater management (and not just specific to the NPSFM) and defines six principles encompassed in Te Mana o te Wai.
- **Water Services Act**, Section 14 which requires HDC to, when exercising or performing any function as a water service provider, give effect to Te Mana o te Wai (to the extent that it applies to that function). This means that, **in all activities that HDC undertakes as a water service provider, it needs to give first priority to the health and wellbeing of the awa.**
- Water Services Act, Section 25 which requires the water supplier to ensure that a sufficient quantity of drinking water is provided to each point of supply. It is important to note that the requirement is for the quantity of water to be "sufficient" and it does not mean that it is unfettered. The Act defines sufficient as:
  - "the quantity of drinking water that is sufficient to support the ordinary drinking water needs of consumers at the point of supply; or
  - If compliance rules have been made that prescribe the quantity of drinking water or a formula for determining the quantity of drinking water that is sufficient to support the ordinary needs of consumers at a point of supply, the amount specified in, or calculated according to the formulae set out in, those rules".

  To date no compliance rules have been set and there has been no numerical determination as to what is considered a "sufficient quantity". Section 25 also states that the obligation to provide sufficient quantity of water does not prevent a drinking water supplier from restricting supply, if

necessary, because of (amongst other items) "environmental factors affecting a source of a drinking water supply" or "cultural factors affecting a source of a drinking water supply."

- **Network Environment Performance Measures** under the Water Services Act which requires HDC to report, on an annual basis, to the regulator Taumata Arowai on a range of performance measures regarding water demand and efficiency. This information is made publicly available and therefore brings increased regulatory oversight, performance assessment and transparency to the way in which Council is using the water which it is allocated for abstraction from the awa. The Network Environment Performance Measures required to be reported include:
  - Amount of water supplied in total as well as the amount supplied to non-residential water use.
  - Response times to breaks and faults. This is because breaks and faults can be a large contributor to the amount of water lost from the network if not responded to in a timely manner.
  - Percentage of pipes in poor or very poor condition; and average age of pipelines. This is because the age and condition of pipework is an indicator as to the potential for leakage to occur. A "poor" condition means that renewal should be considered, and a "very poor" condition means that the asset is approaching being unserviceable[20].
  - Average system pressure and whether or not a reference level for pressure has been set. This is because pressure within the pipe network is a key factor in the amount of leakage which may occur. In this measure, there is a balance required to be achieved by network operators in maintaining high enough pressures within the network to avoid backflow of contaminants into the network and to meet customer levels of service for pressure (eg for shower usage, but also to meet firefighting requirements), whilst reducing pressure to avoid excessive and unnecessary leakage.
  - Number of days of water restrictions applied.
  - Estimated total losses (m^3/year) of water from the network.
  - Current annual real loss and Infrastructure Leakage Index. These are two principal measures used to assess the performance of a water supply network in terms of leakage management. They are discussed further below.
  - Median residential water consumption (l/day/connection).
  - Whether or not there is a water conservation education programme in place.
  - The number of residential and non-residential connections with water meters.

The above measures, which are required to be reported to Taumata Arowai annually and then assessed and published by Taumata Arowai, provide a high level of regulatory oversight as to how the network is operated and whether or not appropriate benchmarks are met. The Network Environmental Performance Measures also mean that there is commonality of reporting systems and measures for all networks across the region as well as nationally allowing comparison across communities.

Given the extent of reporting and benchmarking required under the Water Services Act, is it proposed that consenting conditions relating to efficiency, demand management and network losses rely on this reporting. A condition is proposed that will require HDC to provide the consent authority with a copy of Network Environmental Performance Measures reported to Taumata Arowai as well as a copy of any feedback received from Taumata Arowai on the Council's performance.

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[20] *Classification is to be in accordance with the IPWEA International Infrastructure Management Manual. There is also a network environmental performance measures as to the percentage of pipes with a condition grading. This will ensure that any councils reporting low percentages of poor / very poor condition pipework is an accurate representation and not skewing the outcome by not undertaking condition assessments.*

The outcome of all of the above, is that HDC is now required to manage its water supply in a way which gives first priority to wai and the awa. This means that water must be managed in a way which recognises the value and importance of the water and ensures efficient and reasonable use of the water at all times, and is not limited to water restrictions at times when the river is low.

The introduction of the off-storage reservoir has the ability to decouple the community water demand from the river flow, and there is the risk that this will then be seen by some members of the community as a way in which restrictions can be avoided and water can be used as-and-when desired. Such a mindset is inconsistent with Te Mana o te Wai. The WDMP therefore needs to emphasise the need to conserve and use water appropriately at all times, as well as measures required to minimise leakage and increased measures to be used during drought conditions.

It is proposed that the WDMP be updated within six months of commissioning of the reservoir to include, as a minimum, consideration and assessment of the following measures:

- Measures to ensure, on an ongoing basis, that the water supply network is managed in accordance with best practice measures with respect to leakage and demand management including target performance standards and monitoring and reporting to be undertaken to track progress towards those performance standards.
- Measures to encourage valuing of water and reduce use / achieve efficient use year-round ensuring transparency and may include information as to how the supply system works and where Levin's water comes from; interpretative displays and information along the river corridor and at or adjacent to the reservoir site. It should include measures to increase understanding of the overall water cycle, ie that water use also contributes to the wastewater system and any capture and use of rainwater reduces impacts of stormwater discharges.
- Measures to encourage or require use of rainwater for non-potable use at a property level (eg rainwater tanks which are required under the Council's Taraika Plan Change) and adoption of water sensitive design.
- A refreshed and updated water conservation / restriction framework to be implemented during dry periods including development of trigger levels based on a combination of community demand, reservoir levels and river flows.
- A review of the effectiveness of the introduction of universal water metering throughout the district and how the information obtained can be used to improve consumer engagement and understanding of individual water consumption. [Council commenced a roll-out of universal metering in March 2024 and expects to have completed installation of meters on all connections in 2025].
- Metering of industrial users and water use audits for high quantity water consumers.
- Alignment of measures in the WDMP with Council policies and bylaws including any amendments required to these instruments to ensure the effectiveness of the WDMP and timeframe for those amendments (eg review and update of Water Supply Bylaw if necessary).

Network Leakage and the Infrastructure Leakage Index

The primary industry measure for assessing the efficiency of the network, and the effectiveness by which the water supplier is managing the network to minimise losses, is determined by the Infrastructure Leakage Index (ILI). The ILI has been developed through international experience (International Water Association, IWA) and is identified in the New Zealand Water Loss guidelines as "the best performance indicator for metric benchmarking (comparison between systems) of real losses management performance"[21]. The ILI at any point in time is determined by:

[21] *https://www.waternz.org.nz/Folder?Action=View%20File&Folder_id=101&File=100503_waterloss_guidelines.pdf.*

1. Firstly, calculating the "Unavoidable Annual Real Losses" (UARL) which is the best possible performance that can be achieved - with maximum effort and costs - taking into the specific characteristics of the system (ie number of connections, length of pipework, average network pressure). This is a theoretical calculation based on the network characteristics.
2. Secondly, using a water balance model to calculate the "Current Annual Real Losses" (CARL), ie how much water is actually being lost. The water balance is done by taking the total amount of water supplied (as measured at the exit of the treatment plant) and subtracting known uses (ie, all metered uses), and best estimations of unknown uses such as unmetered connections, network leakage and losses through faults and bursts. The NZ Water Loss Guidelines provide the methodologies for estimating these values.
3. Thirdly, calculating the ILI by calculation the ratio of CARL:UARL. An ILI of 1.0 would mean that the actual losses are the same as the best that could be achieved for that particular system. An ILI of 2.0 would mean that the actual losses are twice what could theoretically be achieved.

As noted in NZ Water Loss Guidelines, the CARL "is continually tending to increase as the system gets older, and new leaks and bursts occur" and, by definition, this means that the ILI will be continually trending upwards as a network ages unless management intervention is undertaken. The NZ Water Loss Guidelines state (from the IWA guidelines) the four complementary leakage management activities which are required to be adopted to constrain this increase in losses and ILI as the network ages. These four complementary leakage management activities are shown in Figure 4.5.

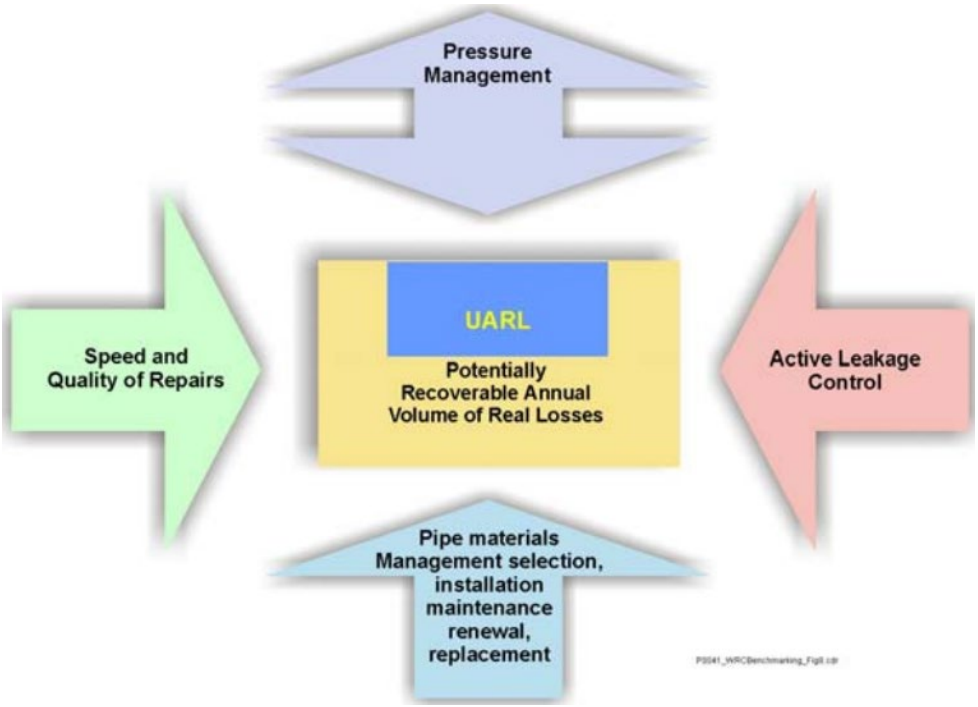

Figure 4.5: The Four Complementary Leakage Management Activities Required to Address Leakage
Source: NZ Water Loss Guidelines

HDC's Current and Proposed Activities to Manage Leakage

The Council's Water Supply Leakage Report (March 2022) previously provided to Regional Council as a compliance requirement of the existing water permit details what Council is currently doing to manage leakage. This includes:

- Network reconfiguration and significant investment in meters and monitoring and control equipment to establish fifteen District Metered Areas (DMAs) and four Pressure Management Zones (PMZs) complete with pressure reducing valves to optimise supply zone pressure.
- Ongoing and active monitoring of the system using the i2O Advanced Pressure Management Solution. This includes a network of 3G connected loggers to enable real time monitoring. The system optimises the pressures within the supply network to achieve both a reduction in leakage and "open-tap" consumption. The long-term benefits of pressure optimisation are the extension of the remaining asset life, a reduction in operating costs due to lower burst rates and sustainable water use. Alarms are set to notify operators of any significant changes that would indicate increased leakage and trigger further investigation and, if necessary, remedial works.
- Use of acoustic leak detection equipment (such as ground microphone and leak noise correlator) to identify invisible leaks that do not surface and are unlikely to be reported. While such leaks normally have a very minor flow, they can go undetected for long periods which can add up to significant losses. In the 2020-2021 water year, this work identified 156 leaks across the Council network and private connections which were able to be rectified resulting in a reduction in losses of 384 m^3/day or approximately 4% reduction in total water usage.
- Asset Management and Planned Water Main renewals. This is a programme of planned water main renewals to renew pipework which is of poor condition or at the end of its useful life. Over the last five years, just under 5% of the total water mains length has been renewed.

The Leakage Report also identifies the following actions (in addition to continuing the above) will be implemented to further improve leakage management:

- An Advanced Meter Reading trial which uses smart meters with built in leak alarming and flow logging capability. This will determine if the extent of private side leakage (i.e. leaks within private property) compared to what has been estimated in the water balance and enable these estimates to be improved.
- Review of the criteria for pipeline renewal selection in order to place more emphasis on leakage in the relevant areas now that permanent DMA flow monitoring is being carried out.
- Consumer awareness campaigns to gather more momentum with fixing leaks on private property.

Since the above actions were identified, Council made the decision to invest approximately $6.1 million in universal metering and leakage detection across the district (ie water meters on each connection). Digital smart meters are being installed to provide high quality data on water consumption and to assist to identify and address leakage throughout the network and on private property. As noted above, Council is currently in the process of installing these meters with the installation programme commencing in March 2024 and expected to be completed in 2025.

Levin Network's Performance: Infrastructure Leakage Index (ILI)

The investment in metering and pressure management discussed above means that the Council is able to track ILI on a monthly basis. The trend for the recent years has been shown above in Figure 3.6.

Council has adopted, in its Long-Term Plan, a performance target of ILI in Band B (being an ILI of between 2 and 4). This target has not been achieved and the measures discussed above have been identified to reduce leakage further and to achieve the Band B target. Figure 3.6 does show an increasing trend between October 2021 and May 2022 when resourcing for leakage management was reduced. The marked change towards a decreasing trend from May 2022 occurred through reinstatement of resourcing and commitment to the pressure management system. Figure 3.6 therefore demonstrates the need for ongoing investment in, and commitment to, leakage and pressure management.

Once the universal smart meter roll-out has been completed, HDC will be able to identify, assess and respond to leaks in a far more timely manner which is expected to assist greatly to achieving and maintaining the target ILI.

4.2 Proposed Reservoir Intake

The proposed reservoir intake will be a sub-surface infiltration gallery installed beneath the bed of the river. It will consist of a series of perforated pipes laid horizontally across the river (nominally six) within gabion baskets and then overlain with river gravel. The existing river gravels / stones / boulders will be stockpiled at the commencement of construction and used to cover the infiltration gallery upon completion.

The size of the intake is approximately 45 m lengthwise along the river and 27 m across the river bed. These dimensions are subject to detailed design and may vary by up to 50% in total area. Within the gabion basket array is a series of backwash diffuser air pipes to provide for routine clearing of the fine material from the intake structure and to prevent blockages.

Intake works will also be constructed on the true left bank. This includes removal of vegetation and terracing of the riverbank to provide a stable platform for access and installation of the pump and sedimentation chamber. This is shown in the cross section below (Figure 4.7). The terracing is required to ensure that the top of the pump and sedimentation chambers are above the 100-year flood level and that they are structurally stable. That is, terracing to lower than the proposed height would make the structure susceptible to overtopping in flooding, while keeping the existing bank profile would result in very tall chambers which are less stable.

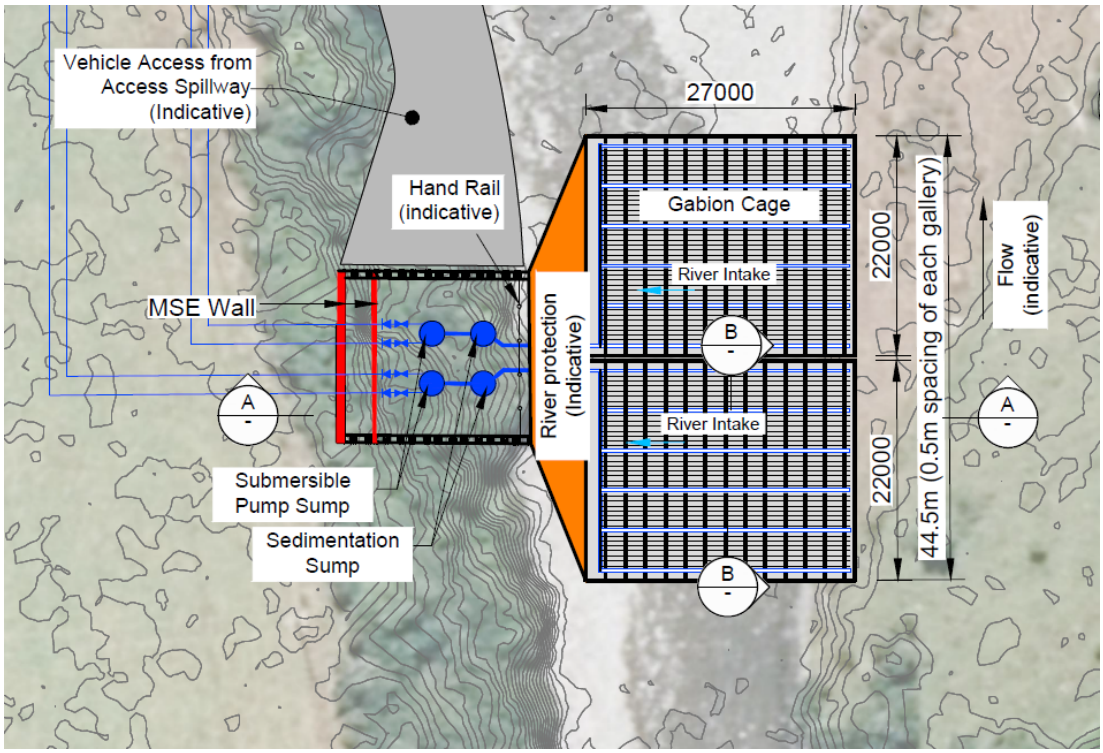

Figure 4.6: Plan Showing Size of Intake Structure

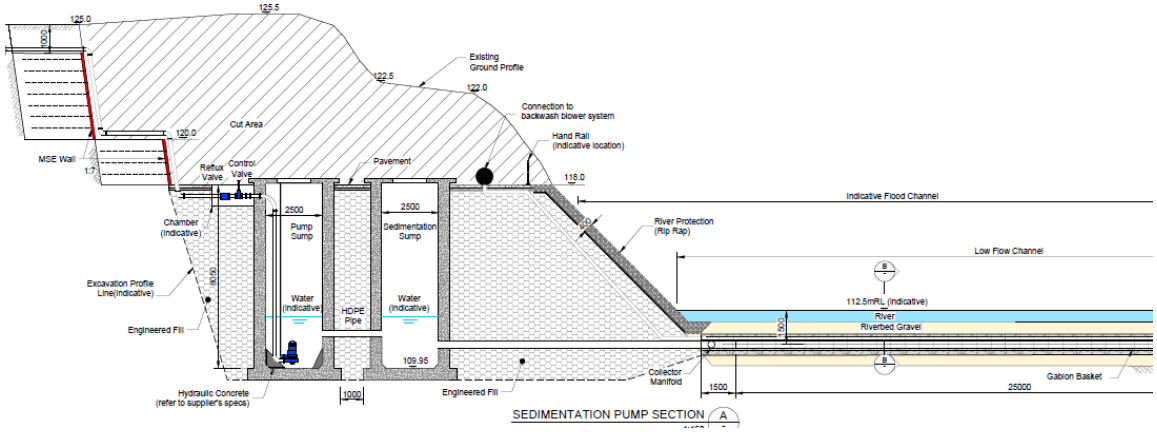

Figure 4.7: Cross Section of Proposed Intake Structure

A vehicle access track will also be constructed to enable maintenance and operations access. This includes access to remove sediment within the sedimentation sump which will be extracted via a sucker tank or similar and taken to an approved off-site disposal location.

The excavation height to create the terrace is in the order of 8 metres.

The infiltration gallery is described in detail in section 8 of the Feasibility Design report (Appendix B). As described in that report, encasing the intake pipework within the gabion baskets arrangements has the following advantages:

- It is more likely to resist the effects of high energy river flows.
- The collection pipes and backflushing pipes have a greater degree of protection from being swept out in high river flows.
- The gabion baskets can be filled with relatively open gravel and cobbles to maximise the potential yield from the infiltration cells.
- It reduces the construction effects in terms of length of construction and disturbance as the infiltration gallery does not need to be as deep as alternative arrangements.

Backwash System

Over time, and depending on the sediments within the source water, infiltration galleries can become blinded with sediment and the abstraction rates decline. Often this is managed by backwashing with water which has been abstracted, however, this is relatively ineffective and may also require works in the river bed to maintain infiltration gallery performance.

For this intake, an air backwash system is proposed to reduce maintenance requirements and minimise bed disturbance. Air and water will be used simultaneously and is considered the most effective and efficient method as its necessary water flow is less than that required for full bed fluidisation (as is required with water backwash alone).

The intent is to use the backwash system relatively frequently as standard operations. This ensures that there is not a lot of sediment build up between backwashes and thereby prevents sedimentation effects occurring if more sediment were able to build up before backwashing. The required frequency will be determined through operational practice during the first few years of the reservoir intake and will be documented through the proposed Water Supply & Reservoir Operational Plan.

Construction Methodology

The greatest effects of the proposed activity are likely to occur during the construction of the infiltration gallery and intake works. This is because it requires the riverbed to be excavated in order to lay the infiltration gallery below bed level.

The construction will be undertaken in accordance with all best practice standards and guidelines for working in waterways, including the "National Works in Waterways Guideline - Bet Practice Guide for Civil Infrastructure Works and Maintenance" published by the Ministry for the Environment. This includes, but is not limited to, diversion of the flowing channel around the construction site including fish capture and relocation, in order for the works to be undertaken "in the dry".

Appendix I details the construction methodology proposed and measures to be taken to minimise the effects of the construction. In summary, the construction will be undertaken as follows (refer Appendix I for more details):

1. Construction of a channel to divert the river flow away from and around the construction footprint. Fish capture and relocation will also be undertaken to ensure fish are not stranded in the section of the river bed which will become dry. The methodology notes that works will need to be aligned with non-critical times for fish spawning and migration. This will be determined in consultation with Department of Conservation, iwi/hapū and Fish and Game during the detailed design stage. Table 15 of the One Plan identifies certain times of the year when river bed works are excluded for specific values (eg whitebait migration, inanga spawning, etc). None of these values or exclusion periods apply to the site.
2. Depending on anticipated river flows and natural groundwater levels, construction of further barriers such as Aquabarrier, bunds and temporary pumping may be required. These will be installed, as necessary. If pumping is used, appropriately sized fish screens will be included to prevent entrainment. Sediment control measures such as silt fences or other will be installed.
3. The infiltration galley will be excavated to the design level below the river bed. Riverbed material to be re-used (e.g. to cover the infiltration gallery) will be stockpiled. The gabion mattress array will be placed and then overlain by the natural river bed materials.
4. Remaining earthworks will be completed; pipework will be laid to the sedimentation sump and pump sump; sedimentation sump and pump chambers will be constructed and intake structure completed.
5. Upon completion, all equipment and the river diversion will be removed and flow reinstated to the normal river flow path. This includes fish capture and relocation from the temporary flow diversion path before reinstating the river flow to the permanent channel.

4.3 Reservoir, Spillway and Ancillary Infrastructure

The proposal is to construct a large scale off-river reservoir of 855,000m^3 total volume and an effective storage volume in the order of 740,000 m^3. Associated infrastructure will also be constructed and operated on the site, including access ramp for operational access to the reservoir, spillway and discharge structures, power supply, fencing and landscape planting, access road and parking for light vehicles, and buildings for housing of pumps, diesel back-up generator and aeration equipment.

Note: the access ramp into the reservoir is for operational and monitoring access by authorised persons only. There is no proposal for public access or recreational use of the storage reservoir.

The feasibility report included in Appendix B describes the proposed activities on the site in detail.

Of relevance to this application is the large-scale earthworks that are required to construct the reservoir, spillway and associated infrastructure.

Bulk fill for the reservoir embankments will generally be sourced from excavations onsite. Geotechnical investigations to date have found that the site material is expected to be suitable for the embankment construction and to meet the compaction and design standards for dam safety. This is discussed in the feasibility report in Appendix B.

The earthworks construction activities have been described in the Erosion and Sediment Control Plan (Appendix J) for this activity as follows:

> *The reservoir embankment includes broad upstream and downstream shoulders of bulk fill, a central filter and chimney drain. The crest width is six metres, providing suitable access to the crest. The upstream slope is overlain by a geomembrane liner system. The surface of the geomembrane liner is protected by riprap across the base of the reservoir and near the embankment crest.*
>
> *The process involves topsoil materials to be stripped from beneath the footprint during construction. The design assumes that the embankment bulk fill will be sourced from excavation within the reservoir site itself consisting of alluvium terrace and older alluvium. Excavation depths increase towards the reservoir's southern end, which follows two sloped terraces. The potential excavation depths vary between 3 m to 12 m within the reservoir's footprint.*
>
> *Some processing of granular materials may be required and would likely require an area in the land immediately to the north of site. This would include some potential stockpile storage.*
>
> *Most of the construction is likely to occur in summer periods which will minimise sediment generation however dust management will remain a key consideration. The earthwork activity involves the removal of approximately 800,000m^3 of surplus material which will be removed from the site to another approved infrastructure project and/or to an approved cleanfill site. This volume is the maximum / conservative volume that would be taken off site through the Project duration with some of the material to be used within the Project embankments and footprint.*
>
> *On completion of earthworks the liner system is to be installed across the full extent of the reservoir. This consists of an HDPE low permeability geomembrane with adequate protection by geosynthetic geotextiles. In addition, across the base (under the liner) there is a groundwater collection layer of granular drainage materials and HDPE collection pipes embedded within it.*

A draft Erosion and Sediment Control Plan (ESCP) has been developed as part of this application to ensure that the earthworks can be undertaken in a way which avoids or minimises sediment discharges to water bodies. Refer to the draft ESCP in Appendix J for details.

4.4 Proposed Discharges and Diversion

Discharge permits are sought for two types of discharges, one which includes a diversion:

1. Discharge of diverted groundwater to the Ohau River during construction (dewatering) and operation of the reservoir.
2. Discharge of stored water and rainfall to the Ohau River in event of reservoir levels exceeding full height or as necessary for reservoir and water quality maintenance purposes.

The location of these discharges is shown in Figure 4.8.

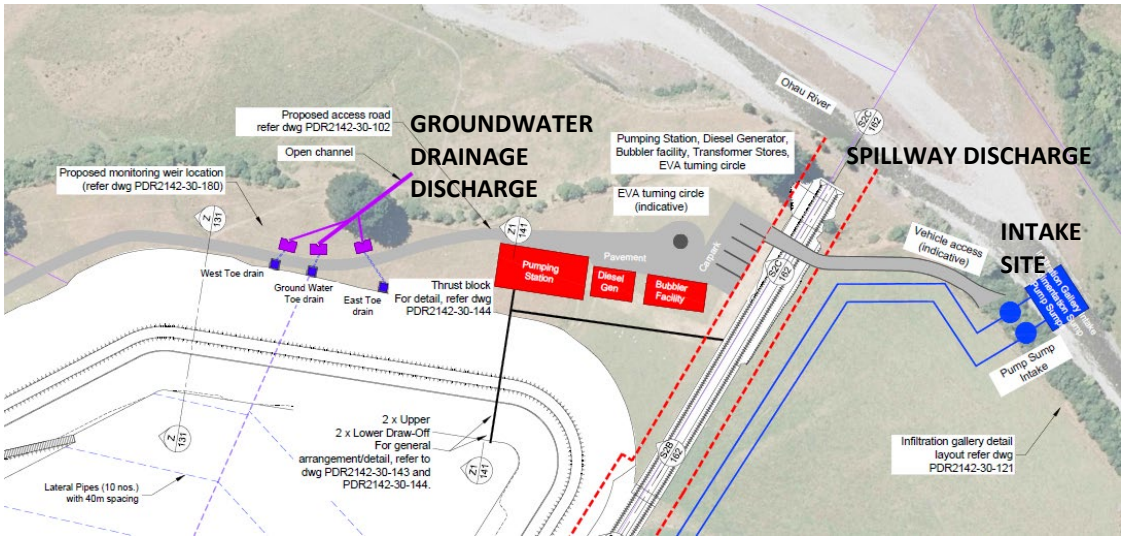

Figure 4.8: Location of Discharges on Reservoir Site (extract of drawing PDR2142/30/104 in Appendix B)

4.4.1 Groundwater Diversion and Discharge

A groundwater diversion system will be installed under the reservoir and will collect any intercepted shallow groundwater, with monitoring weirs installed to be able to measure the amount of groundwater intercepted. The groundwater will be discharged to land on the lower river terrace approximately 180 m downstream of the intake and spillway (refer drawing PDF2142/30/104 in Appendix B).

Actual discharge volumes will vary depending on climatic conditions and groundwater levels. An assessment of the groundwater volumes likely to be intercepted and discharged has been undertaken as part of the feasibility design process taking into account the current understanding of groundwater across the site and a synthesised rainfall record for the site. This has estimated the following discharge volumes:

- Annual average discharge volume: 27 m^3/day
- Typical winter discharge volumes: 42 m^3/day
- Typical summer discharge volumes: 14 m^3/day

The discharge will be to ground but may result in some overland flow to the river.

During detailed design, the use of this water to support and restore natural wetlands and flow paths within the lower river terrace will be considered and restoration use sought where practicable. For example, it may be appropriate to direct some of this diverted water to the water course which runs at the base of the terrace and / or to undertake wetland restoration in this area. Such use would be for the purpose of restoration as well as to offset any potential effects arising from changes to groundwater seeps in this area due to the reservoir construction. This design will be undertaken in consultation with iwi/hapū and with the advice of a specialist ecologist with experience in restoration.

During construction, groundwater dewatering is likely to be required. The diversion system under the reservoir will be one of the first elements constructed and dewatering water will be discharged at the same location and via the groundwater diversion system as soon as that is installed. Volumes are likely to be similar to those estimated above. Sediment control measures will be put in place to ensure that sediment laden water is not discharged to the river, as per the Erosion and Sediment Control Plan included in Appendix J.

4.4.2 Reservoir Discharge of Stored Water & Rainfall

A discharge permit to discharge stored water from the reservoir to the Ohau River is also sought. The reservoir design includes a spillway from the reservoir in the event of overtopping (eg if the reservoir is fill when heavy rainfall occurs), noting that this should be a very rare occurrence subject to appropriate operating regime of the reservoir levels and given freeboard allowance. Discharge of stored water may also be required if the reservoir is required to be drawn down for maintenance, including for maintaining water quality albeit that the reservoir will be operated to achieve sufficient turn-over via supply of water to the water treatment plant, or other purposes.

The location for water discharge back to the Ohau River is from the toe of the spillway chute immediately downstream of the intake (refer Figure 4.8).

The spillway can discharge water from the surface of the reservoir when the water level exceeds the normal operating levels in the reservoir, and in extreme emergencies or times of maintenance from the lower profile of the reservoir through the low-level outlet which discharges to the lower portion of the spillway chute.

The spillway alignment runs along the eastern embankment, outside toe and discharges directly into the Ohau River downstream of the proposed intake.

Under normal conditions the reservoir water will be directed through pipework from the reservoir to the water treatment plant (WTP). Therefore, only in very rare circumstances will there be discharges in the spillway chute allowing water to return to the Ohau River. Such events include:

- Reservoir levels raising above the maximum level (and thereby entering the spillway) due to extreme rainfall events. The catchment area for the reservoir is essentially the reservoir surface area and embankment with a minor upgradient catchment that could run on to the spillway in heavy rainfall events. Normally, rainfall on the reservoir would be captured within the stored water and would not initiate a spillway discharge. However, if the reservoir level is at or near full prior to the rainfall event, then a spillway discharge could occur. In this instance the discharge water quality would consist of a mixture of stored river water and rainfall.
- Overflowing of the reservoir level in the event of a failure of the pumping and control system resulting in over-abstraction of the river water (ie reservoir is full but abstraction system continues to operate). This scenario would be very infrequent and would be intercepted and ceased via appropriate alarming to the operator and subsequent operator initiated corrective action. Any discharge would be river water returned direct to the river.
- Water levels in the reservoir can be lowered through the low-level outlet and discharged to the lower portion of the spillway. This low-level discharge is only likely to the used for the irregular and rare maintenance of the internal faces of the reservoir; to ensure adequate turn-over of the stored water (although this will normally be achieved by supplying water to the water treatment plant); or to allow for inspection following a large earthquake. In general, when routine or planned maintenance is required and sufficient lead-time is available, drawdown would be achieved by use of water from the reservoir to supply the community, rather than via discharge to the river.

The quality of the water discharged into the Ohau River is unlikely to differ greatly from the original Ohau River source water. Measures to mitigate adverse changes in the water quality include sediment control sumps at the river intake which are intended to minimise sediment intake and operational procedures to promote mixing of the water throughout the water column and reduce the possibility of dead water and oxygen depletion. During detailed design of the reservoir, measures to protect the quality of the stored water will be considered further. Note that it is the applicant's best interests, as water supplier, to ensure that the reservoir is designed and operated in a way which does result in significant deterioration of water quality within the reservoir.

4.5 Pipeline Bridge

The proposed pipe bridge will be a single span bridge and there will be no piers in the river. It will be located immediately upstream of the existing road bridge and at the same level (or slightly higher) as the bridge deck to ensure that it does not have any effect on the flood carrying capacity of the river. The bridge will be designed for appropriate seismic loading and to be flexible in the event of an earthquake given that it needs to span the Northern Ōhāriu Fault. As described in the feasibility design report, the fault in this location is a right lateral strike slip fault which suggests that movement is expected to be along the line of the fault with little vertical displacement.

On each abutment, reinforced concrete piles will be required to be installed. The bridge options being considered are shown in Figure 4.9.

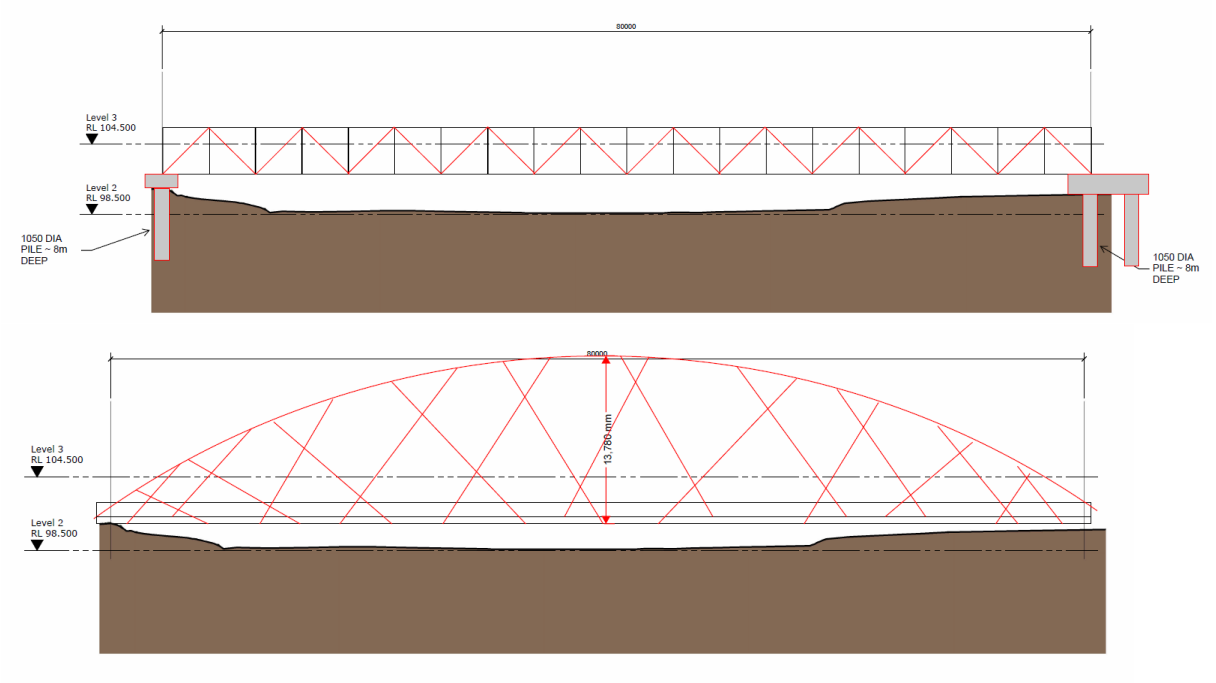

Figure 4.9: Pipe Bridge Options
Source: Figure 31 of Feasibility Design Report, Appendix B

4.6 Cultural and Ecological Restoration Area

Cultural and ecological restoration of the lower floodplain terrace is included in the proposal. As discussed in Section 7, Muaūpoko Tribal Authority's Cultural Impact Assessment identified that *"the proposed quantum of water taken from the Ohau Awa, especially at low flow will affect the mauri of the awa, other waterbodies and groundwater that are hydraulically connected to it. The impact on mauri will have adverse effects on Muaūpoko values which must be managed, positive actions must be undertaken to enhance the mauri of the Ohau Awa to offset for the effects the water take will have."* MTA recommended that a Cultural Offsetting Management Plan (COMP) be prepared and implemented, the objective of which would be to demonstrate how no net loss, and preferably a net gain, of mauri in the Ohau Awa and habitat availability are achieved through the implementation of offset activities.

MTA advisors and HDC have since worked together to assess and identify potential areas for offsetting activities and identified the lower floodplain terrace at the reservoir site provided "the greatest opportunity for net gain in mauri and habitat". A draft COMP has been prepared and included in this application in Appendix L. This identifies the following cultural offsetting and restoration activities to be undertaken on the lower floodplain terrace of the site.

- **Management Area 1: Stream Enhancement**. This is the stream at the base of the embankment. Restoration approach should include early / immediate removal of stock from the stream (to prevent further siltation of bed) and removal of litter; development and implementation of a planting and restoration plan, ensuring good connectivity to Ohau awa main stem is maintained.
- **Management Area 2: Wetland Creation / Restoration**. This area currently includes a straight, artificial drainage channel which connects with the upper portion of the stream from Management Area 1. The channel here is eroded, primarily as a consequence of stock access. This is the area where the under-drainage from the proposed reservoir is intended to discharge diverted groundwater to land. There is an opportunity here to create a restored wetland area through stock exclusion, contouring of the eroded banks, utilisation of the diverted groundwater to maintain desired hydrology, and planting of wetland species. Development of the restoration plan for this area should be undertaken in parallel with the detailed design of the under-drainage system for the reservoir.
- **Management Area 3: Weed Control, Stock Removal and Passive Restoration.** This area is the majority of the floodplain terrace which is currently grazed pastureland. This area provides an opportunity for passive restoration through weed control to manage invasive weed species; stock removal and manuka planting to establish vegetation cover and provide suitable conditions for passive restoration utilising the in-situ soil seed bank and natural transfer of seeds by birds. There are several log piles across this area. It is recommended that these be left in place to provide habitat (eg for lizards).
- **Management Area 4: Gravel Bed Habitat & Passive Restoration.** This is the lower floodplain terrace and active riverbed. A passive restoration approach is likely to be most suitable in this area and further assessment and advice is required as to the habitat type and restoration objective. Consent conditions are proposed to enable this approach. On the vegetated areas, a restoration approach using species such as manuka and harakeke may be appropriate. On gravel bed areas, weed control is required to prevent loss of the gravel bed habitat. As this is within the active river corridor, consultation with Horizons Rivers Management Team is required for activities in this area.

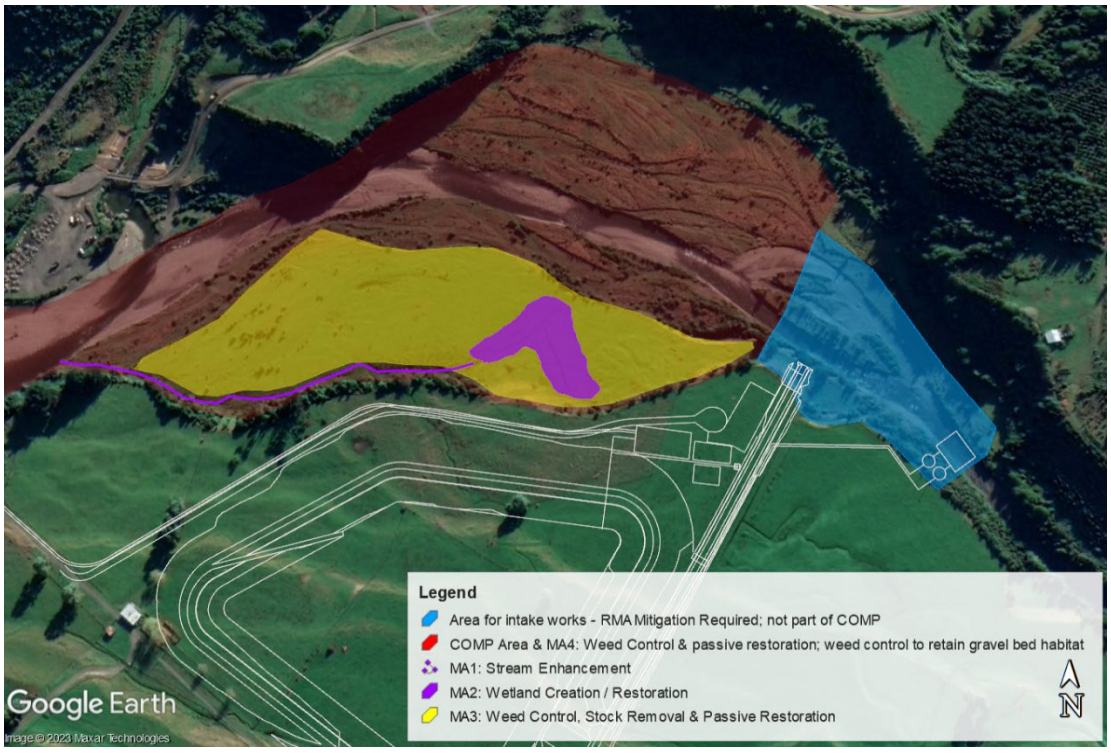

Figure 4.10: COMP Management Areas
Source: Figure 6 of draft COMP

HDC is continuing to engage with Raukawa hapū to seek their input into the cultural restoration proposal, and to further develop and refine the suite of conditions currently offered (refer section 10) and will continue to do so during the consenting process.

4.7 Proposed Intake for Ō2NL Project Construction Purposes

The location of the proposed intake for the abstraction of water to support the Ō2NL Project's construction is the stretch of river immediately upstream and downstream of the proposed bridge across the Ohau, as shown in Figure 4.11. The water abstraction limits sought have been detailed above. The following describes the physical intake arrangements proposed.

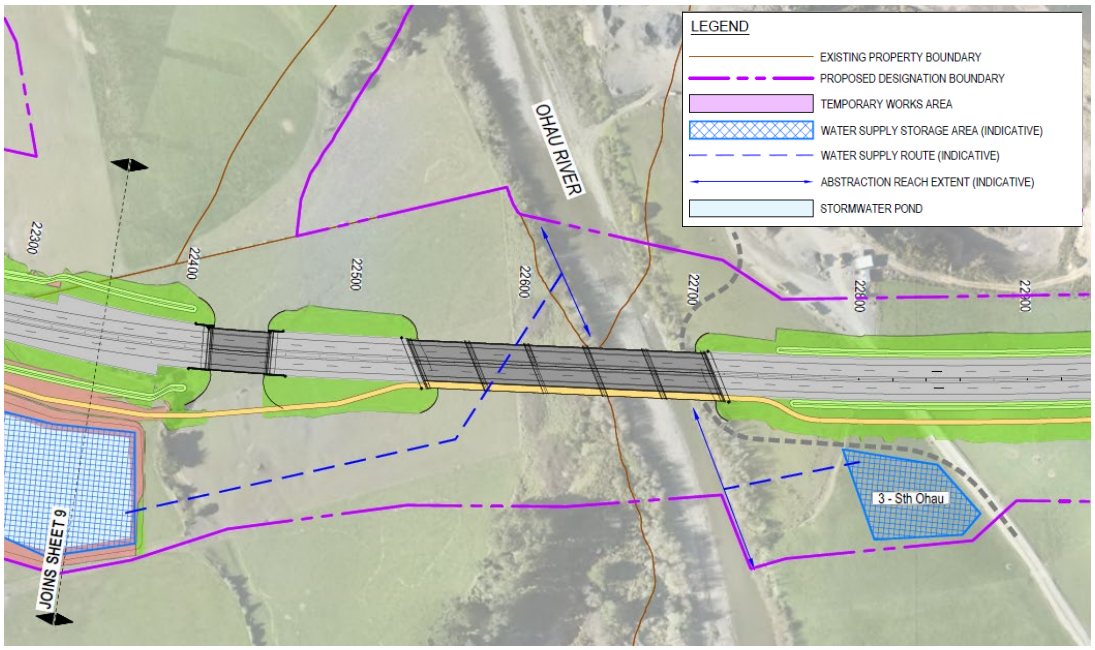

Figure 4.11: Abstraction Location for Ō2NL Project Construction Water

Water will either be abstracted by way of a screened surface intake pipe laid in the flowing water, or via a shallow bore located outside of the active river channel but within the riverbed as defined under the RMA. The final selection of the intake arrangements will be determined closer to the commencement of construction works and depending on construction methodology. For the purpose of this application, both potential intake arrangements are discussed as follows.

- **Option A: Surface Intake Pipe**
  This would be a pipe laid on the surface and with the intake within the flowing channel. The intake pipework would not need to be fixed to the riverbed and would be laid across the surface with a screened intake at the end which will be submerged within the flowing channel. The location of the intake would likely need to be adjusted during the construction period in response to changes in water course conditions, albeit any adjustment would be within the abstraction reaches shown in Figure 4.11. The intake screen will have a mesh aperture size not exceeding 3mm in diameter and an intake velocity of less than 0.3 m/s.

- **Option B: Shallow Bores**
  If the shallow bore option is used, this would be generally as shown in Figure 4.12 below. Two bores would be installed: one on the true right side of the river immediately upstream of the proposed Ō2NL Project's Ohau bridge to feed water to the northern storage pond, and one on the true left side of the river immediately downstream of the proposed Ō2NL Project's Ohau bridge to feed water to the southern storage pond (refer Figure 4.11). They would be located at least 10 m from the active channel area and would be installed such that they are not susceptible to overtopping in the 10-year flood event. The bore depth will be shallow (<10m) in order to abstract

water from the gravels below the riverbed, noting that this is still classified as a surface water abstraction. This form of abstraction avoids the need for any infrastructure in the channel and therefore no pipe or intake screen with mesh will be required.

Figure 4.12: Shallow Bore Typical Arrangement

In addition to the intake arrangements themselves, both options require surface pumps, generators and associated infrastructure (pipes) to be located within the riverbed, albeit outside of the active channel. Pumping equipment will be installed outside of the live channel of the river, and at locations that minimise effects on vegetation. Some minor earthworks and ground stabilising / concrete works may be required to create platforms for pumps and generators. The pumps will be located so that they are able to withstand up to a 10-year flood event and will be located at least 10m (horizontally) from the river. There are no wetlands in the vicinity of the intake sites. Generators will be located at least 20 metres from the water course and will be located within a containment bund. Pipes from the pump to the water course will be laid above ground and so that effects on vegetation are generally anticipated to be avoided but, in some instances, trimming of vegetation may be required.

5 KEY STATUTORY POLICY DRIVERS

The proposal has been developed using the key policy direction relevant to the activity as drivers. This approach recognises that there is significant statutory and policy direction provided to the Applicant across a range of legislation. The overall proposal, the abstraction regime sought and the mitigation measures offered have been shaped via consideration of these drivers. This section summaries these key statutory and policy drivers.

Horowhenua District Council has legislative obligations relating to the provision of safe drinking water as follows:

- Local Government Act 2002, which requires the Council to continue to provide water services and maintain its capacity to do so (s130).
- Water Services Act 2021 which places a duty on the Council to ensure safe drinking water is provided, and that sufficient quantity of drinking water is provided. The Water Services Act also requires the Council to give effect to Te Mana o te Wai.

These obligations are the primary drivers for the Levin Water Supply project and the need for this consent application. There are also a number of key national, regional and local statutory policy

provisions that have been considered and provided for in the development of the proposal. These include the requirements of the National Policy Statement for Freshwater Management and particularly the requirement to give effect to te mana o te wai; the National Policy Statement on Urban Development 2020 (NPSUD20) and the need to provide sufficient development to meet expected demand for housing and business land; requirements under the One Plan (Regional Policy Statement) for strategically planned infrastructure; and the 'reasonable and justifiable need for water' requirement as set out in the One Plan (Regional Policy Statement).

Additional specific policy considerations and assessments are included in a later section of the application to inform the section 104 RMA assessment of the proposal. The section 104D 'gateway test' assessment is included in this early section of the Application in order to provide assurance to the decision maker that there is no impediment to granting consent to the application in this regard.

5.1 Climate Change Resilience

Section 7 of the RMA requires particular regard to be had to, amongst other things, the effects of climate change. The National Climate Change Risk Assessment for New Zealand (Ministry for the Environment, August 2020) provides a national overview of how New Zealand may be affected by climate change related hazards and identifies the most significant risk and opportunities. It identified that "risks to potable water supplies (availability and quality) due to change in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise" were 'Extreme' and these risks to potable water supplies had the highest urgency rating of all identified risks in terms of the urgency to take action to address the risk.

Horizons Regional Council's Regional Climate Change Risk Assessment (September 2021) was undertaken following on from the national risk assessment. The regional risk assessment identified that risks to water supplies from drought range from high at present to extreme by 2100, with risks from inland flooding and higher temperatures increasing from low at present to high by 2100. For the Horowhenua District, the regional risk assessment identifies that the district is "dependent on surface water takes for water supply and is particularly vulnerable to drought" and that districts that rely solely on one water supply source such as Horowhenua have an increased sensitivity to drought.

The regional risk assessment identifies that the *"adaptive capacity of water supply sources within the region will rely on the maintenance / enhancement of storage and the ability to manage water demand levels - particularly in areas such as … Levin where development and growth is occurring"*. The proposed reservoir and the ability to harvest water for storage (as will be enabled by grant of the reservoir and intake construction and abstraction framework sought) is therefore a critical step in addressing the high-extreme risks of climate change faced by the District and is consistent with, and gives effect to, the adaptive approach identified in the regional risk assessment.

5.2 Giving Effect to Te Mana o Te Wai

Te Mana o te Wai has been introduced into national regulation and policy as a fundamental concept for the management of freshwater in Aotearoa New Zealand. The National Policy Statement for Freshwater Management (NSPFM) requires that freshwater is managed in a way that gives effect to Te Mana o te Wai. The Water Services Act 2021 requires the Council, as a water supplier, to give effect to Te Mana o te Wai when it exercises its powers and performs its duties under the Water Services Act. Te Mana o te Wai is defined in NPSFM as follows:

> *"(1) Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.*

(2) Te Mana o te Wai is relevant to all freshwater management and not just to the specific aspects of freshwater management referred to in this National Policy Statement"

Further, the NPSFM states that Te Mana o te Wai encompasses six principles relating to the roles of iwi / hapū and other New Zealanders in the management of freshwater:

Figure 5.1: Te Mana o te Wai Principles

One aspect of giving effect to Te Mana o te Wai is giving it practical definition at a regional level and accordingly incorporating and providing for it within regional plans by way of the Freshwater Planning Process. But in addition to this, there are clear rights (power and authority) given to iwi/hapū, along with responsibilities and obligations placed on decision makers and all New Zealanders, by way of the principles above. Hence, it is important that individual proposals that affect freshwater give effect to these principles.

Table 5.1: Giving Effect to Te Mana o te Wai

Principle	How is this principle given effect to within the Levin Water Supply Project?
Mana whakahaere	Clear recognition of Council's Tiriti partners; iterative process of engagement with iwi/hapū throughout development of proposal.
Kaitiakitanga	Undertaking of cultural values and impact assessment where desired and provision of input into the proposal, with opportunity for on-going input throughout the term of consent sought via the proposed conditions which require engagement with iwi and hapū in the construction and operation of the system.
Manaakitanga	Recognition of this process by the Applicant in ensuring that iwi/hapū are able to express manaakitanga where and when desired.
Governance	Council as Applicant and drinking water supplier recognising its role in making decisions about a new water supply source for Levin - optioneering to find a source and methods of extraction, treatment and delivery that prioritise the health and well being of the Ohau River now and over the life of the consents sought.
Stewardship	Council as Applicant and drinking water supplier ensuring, in conjunction with developing a robust and environmentally sensitive new supply for Levin, that its water conservation and demand management strategies and actions are also reviewed and developed further.
Care and respect	Council recognises its role in helping to educate and support its community in treating public water supplies and source waters with respect and managing their own use of water responsibly and with future generations in mind. Council as Applicant also recognises that in developing this proposal, it has a particular obligation to care and respect for source waters and freshwater resources.

The proposal has also been developed with particular regard to the hierarchy of obligations set out in the objective of the NPSFM. In the first instance, a source has been identified that is possible to take from without having more than minor adverse effects, and thus prioritising the health and well being of water bodies and freshwater ecosystems and recognising and providing for the intrinsic values of water. Further, the operating framework for the new supply minimises adverse environmental effects whilst also providing primarily for the 'second tier' of Te Mana o te Wai, being the health needs of people. The Applicant recognises that the times of extreme drought are also when the effect of the take on the Ohau River would be most significant and hence the times when that take is needed are minimised as far as possible. Council recognises that the supply also contributes to the third tier/priority, being the ability of people and communities to provide for their social, economic and cultural well-being, now and into the future. The proposal has been developed to reflect and give effect to the cascade or hierarchy of priorities within the NPSFM and to give effect to Te Mana o te Wai.

5.3 Regional Water Take Provisions and Allocation Regime

The Regional Plan water quantity framework provides a core allocation regime which is the primary regime under which the Levin Water Supply take is enabled and operates. There is no new core allocation being sought by way of this Application. Additionally, the Regional Policy Statement, at Policy LF-FW-P20 provides for supplementary allocation and Policy LF-TUD-P14 of the Regional Plan requires the consideration of opportunities for water storage and water harvesting. This policy pathway has been a key consideration in the development of the proposal and ensuring that the proposed option to increase resilience within the network and reduce effects on the River is one that is consistent with, and in fact enabled by, the Regional Planning framework for water management.

5.4 Regionally Significant Infrastructure and Strategic Integration of Infrastructure with Land Use

There are two key infrastructure objectives of the One Plan (Regional Policy Statement) that have been considered in the development of this proposal, including the need to develop the proposal and seek consent at this time, given the extent of residentially zoned land now available for development within the supply area. These objectives are considered to require the Applicant and consent authority to enable the activities proposed (Emphasis added):

> *RPS Objective EIT-01: Have regard to the benefits of infrastructure and other physical resources of regional or national importance by recognising and providing for their establishment, operation, maintenance and upgrading.*
>
> *RPS Objective UFD-01: Strategic Planning and Urban development*
>
> *Strategic planning for urban development ensures that:*
>
> *(1) sufficient development capacity and land supply for housing and business uses is provided to support growth,*
>
> ***(2) new development, development infrastructure and additional infrastructure are provided in a coordinated, integrated and efficient manner,***
>
> *(3) the diverse and changing needs of people, communities, and future generations are provided for through quality, sustainable urban form, and*
>
> *(4) competitive land and development markets are supported in ways which improve housing affordability.*

The activities proposed within this application are for the purpose of providing drinking water supply to Levin and for providing resilience within the existing network, to support strategic growth initiatives that have been or are being undertaken by Horowhenua District Council. Levin is the largest urban

centre within the Horowhenua District, and is the 10th fastest growing district in the country[22]. As per RPS Policy EIT-P1(1)(i), its water supply is infrastructure of regional or national importance. Hence, subject to the relevant assessment of effects, as addressed in another section of this application, including the 'reasonable and justifiable need' test required by the RPS, it is considered that the proposal is one that accords with the intent and policy provisions of the RPS for infrastructure and urban development.

5.5 National Policy Statement on Urban Development 2020

The urban environment in Levin is classified as a tier 3 urban environment under the NPSUD20. With the exception of removing car parking requirements from the district plan, the other requirements for a tier 3 urban environment are less prescriptive than for tier 1 and 2 environments. However, Clause 1.5 of the NPSUD states that tier 3 local authorities are:

> *"strongly encouraged to do the things that tier 1 or 2 local authorities are obliged to do under Parts 2 and 3 of this National Policy Statement, adopting whatever modifications to the National Policy Statement are necessary or helpful to enable them to do so"*

Horowhenua District Council has undertaken a number of strategic growth and development initiatives within Levin, including for example the Taraika plan change which rezones 420 hectares of land for approximately 3,500 new houses to be built and is based on the Taraika master plan and feeds into the Horowhenua Growth Strategy 2040. This work accords with the objectives of the NPSUD.

Further and more specifically, the Applicant is obliged under Policy 2 of the NPSUD20 to:

> *"at all times, provide at least sufficient development capacity to meet expected demand for housing and for business land over the short term, medium term, and long term".*

The NPSUD (clause 3.2) defines "sufficient development capacity" to include being "infrastructure-ready". As discussed earlier in this AEE (section 3.1.1), being 'infrastructure ready' is defined in clause 3.4(3) of the NPSUD to mean that there must be infrastructure in place to meet short term needs; infrastructure to meet medium term needs must have adequate funding in the Long-Term Plan if it is not already built; and infrastructure to meet long term needs must, as a minimum, be identified in the Council's Infrastructure Strategy. Further, clause 3.5 requires the Council to *"be satisfied that the additional infrastructure to service the development capacity is likely to be available"*.

The consents sought by way of this application are a critical component to Horowhenua District Council being able to meet its obligations under the NPSUD. They are necessary for Council to be satisfied that the additional infrastructure required to provide for sufficient development capacity will be available and that it will be able to provide municipal water supply to support well-planned growth in Levin.

5.6 Reasonable and Justifiable Need for Water

The Regional Policy Statement (Part 1 of the One Plan) includes policy LF-FW-P15 which defines what, for the purposes of allocation under the RMA, is considered to be "reasonable and justifiable" use of water. For public water supplies such as the Levin Water supply, this is defined as follows:

> *"a. an allocation of 300 litres per person per day for domestic needs, plus*
>
> *b. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus*

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[22] *https://www.horowhenua.govt.nz/News-Events/News/Horowhenua-now-the-10th-Fastest-Growing-District-in-New-Zealand#:~:text=The%20latest%20Census%20results%20for,Horizons%20and%20Greater%20Wellington%20regions.*

c. an allocation for industrial use calculated, where possible, in accordance with best management practices for water efficiency for that particular industry, plus

d. an allocation necessary for hospitals, other facilities providing medical treatment, marae, schools or other education facilities, New Zealand Defence Force facilities or correction facilities, plus

e. an allocation necessary for public amenity and recreational facilities such as gardens, parks, sports fields and swimming pools, plus

f. an allocation necessary to cater for the reasonable needs of animals or agricultural uses that are supplied by the public water supply system, plus

g. an allocation necessary to cater for growth, where urban growth of the municipality is provided for in an operative district plan for the area and is reasonably forecast, plus

h. an allocation for leakage equal to 15% of the total of (i) to (vii) above."

To support this application, an assessment of the current community use against Policy LF-FW-P15 has been undertaken and is included in Appendix C. The following provides a summary of that assessment.

In undertaking this assessment, it is important to note that the community has not yet been subject to individual metering of properties and connections and therefore there is no accurate metered data to characterise each of the separate elements of the Policy LF-FW-P15 assessment. The approach taken for this application has been to use the most accurate and representative data available, supplemented by industry standard measures where necessary, and to err on the side of under-estimation and to estimate the likely range of each of the elements. The assumptions made are detailed in the assessment included in Appendix C.

The Policy LF-FW-P15 assessment has found that:

- The present day 'reasonable and justifiable use' water assessment for the Levin public water supply under Policy LF-FW-P15 is estimated to be between 9,400 m^3/day and 9,700 m^3/day. As stated above, this estimate has been made using assumptions which are at the lower end of what uses may reasonably be considered to be connected to the supply in order to ensure that the policy LF-FW-P15 assessment is not over-stated[23].
- Since the existing consent was granted in 2017, the annual average water use for the supply has been between approximately 9,600 m^3/day. This is within the Policy LF-FW-P15 assessment stated above.
- Therefore, it is considered that the current use of water within the Levin Water supply scheme must be considered reasonable and justifiable under Policy LF-FW-P15 of the One Plan.

Given the current use is within the conservatively low estimate of policy LF-FW-P15 assessment of reasonable and justifiable use, it follows that the amount of water currently used by the community is reasonable and justifiable.

The ability to come to this conclusion has been a key driver in the development of the proposal, and particularly in terms of ensuring that the activities described in section 4.1 support and ensure that the take is reasonable and justifiable.

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[23] *For comparison purposes, evidence presented at the hearing for the existing water take consent assessed the policy 5-12 (now Policy LF-FW-P15) allowance as being 11,630 m^3/day. As stated, the assessment undertaken for this application has been to assume conservative low estimates so that there is a high degree of confidence that the policy LF-FW-P15 assessment is not overstated. Given that the current assessment is less than that previously assessed, this confirms that the policy LF-FW-P15 assessment is at least that of what has been estimated for this application.*

As noted above, the current community demand/water use is considered to be a reasonable and justifiable use of water as defined by the Regional Policy Statement. The Policy LF-FW-P15 methodology for assessing if a municipal public water supply use is reasonable and justifiable is driven by the number of persons served by the supply. Future water demands (as detailed in Appendix A) for the Levin water supply have been determined based on current use and current population and applying projected population growth rates. Given that the projection assumes, at worst, the same overall per capita water use for the system, and the current per capita water use is reasonable, it follows that the projected future water demand would also be reasonable and justifiable in accordance with Policy LF-FW-P15.

5.7 Section 104D RMA Gateway Test Assessment

The Application falls to be considered as a non-complying activity under the One Plan, and therefore the consent authority must not grant consent unless it is satisfied that either the adverse effects of the activity on the environment (other than any effect on a person who has given written approval to the application) will be minor or the application will not be contrary to the objectives and policies of the One Plan.

A complete s104D assessment is provided in section 12.1 of this AEE. The overall findings of the S104D assessment are summarised here in order to provide context and introduction to the subsequent sections of this AEE:

- The Applicant considers that the adverse effects on the environment will be minor, for reasons as set out in Section 9 of this AEE.
- The Applicant further considers that the Application very clearly is not contrary to the objectives and policies of the One Plan. Rather, it is considered that the proposal is one that the One Plan seeks to enable, particularly through the ability to provide supplementary allocation as per Policy LF-FW-P20 of the Regional Policy Statement and encouragement of the use of alternative sources of water including water harvesting and water storage as per Policy LF-TUD-P14 of the Regional Plan. This is in addition to the provisions discussed above relating to climate change resilience, giving effect to Te Mana o te Wai and regionally significant infrastructure and reasonable and justifiable use of water. A fulsome detailed assessment of all relevant objectives and policies of both the Regional Policy Statement and the Regional Plan is included in a later section of this Application, demonstrating that there are no provisions with which the proposal is contrary.

It is considered that there is no section 104D RMA reason that consent to the application cannot be granted and that the Application clearly meets both 'gateway tests' for non-complying activities.

6 ALTERNATIVES AND OPTIONS CONSIDERED

This section sets out the alternatives which have been considered in arriving at the proposal for which consent is now sought. It is structured in two parts. Firstly, alternatives are presented at a macro level being options to supplement the existing Levin Water supply to reduce effects on the river, provide for growth and improve scheme resilience. That alternative consideration determined that water harvesting and off-river storage was the best option for achieving the project objectives.

The second part considers the design options which have been considered in arriving at the proposal in this application, including options for intake location and design configuration as well as options for reservoir layout and configuration.

6.1 Water Supply Alternatives

The Applicant has undertaken detailed consideration and analysis of options for how to provide Levin with increased water supply given growth projections, as well as supply system options. This work is

set out in the Levin Water Supply - Water Supply Augmentation Operational Framework report dated March 2023, R3 and included at Appendix A. Consideration of the ability to provide drinking water supply to the townships of Ohau and Waitārere Beach is also provided therein and the Applicant seeks to be able to do so within the lifetime of the water take permit sought.

The options considered are shown in Figure 6.1.

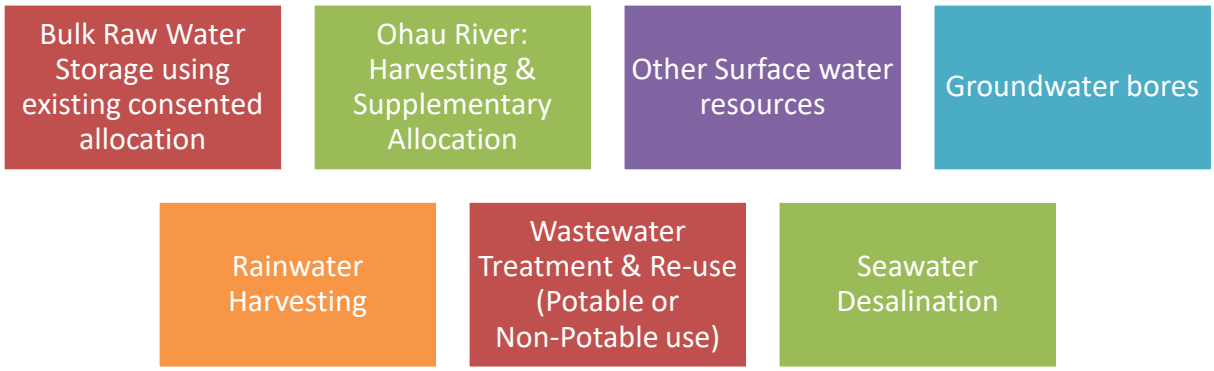

Figure 6.1: Options Identified for Assessment

These options are described and assessed in the report in Appendix A.

Each of the options was assessed using a multi-criteria traffic light assessment approach, with the assessment criteria and scoring approach as set out in Table 6.1.

Table 6.1: Assessment Criteria

Criteria	Assessment Guidance		
	Green	**Orange**	**Red**
Availability of Water: Is there sufficient water to meet projected needs for Levin?	Sufficient to meet demand to 50 or more years	Meets demand in the 10-50 year range	Does not meet demand in 10 year range
Cultural Values: Ability of the option to meet expectations of iwi / hapū and to give effect to Te Mana o te Wai.	Considered to give effect to Te Mana o te Wai and may be acceptable.	Contrary to tikanga and Te Ao Māori but may be acceptable with significant mitigations.	Considered to be culturally unacceptable.
Supply Resilience: Does it provide an alternative source of water not subject to the same risks as the Ohau River source? Does it provide storage for emergency purposes?	Significant improvement in supply resilience.	Improves resilience but some key risks remain.	Does not improve supply resilience.
Environmental: Is there potential for significant adverse effects?	Expected to be able to design and implement option such that effects will be less than minor; potential for enhancements to occur.	Potential for some adverse effects, but these are likely able to be mitigated.	Significant adverse effects likely

Criteria	Assessment Guidance		
	Green	**Orange**	**Red**
Source Water Suitability: Does the option change the risk profile associated with the source water (in terms of obligations for source water risk management under the Water Services Act)	Potential reduction in source water risks.	Similar to existing.	Significance increase in source water risks and / or complexity of source water risk management.
Economics: Capital and Operating Costs relative to other options.	Low costs - similar to existing system.	Options with mid-range of costs, when compared to other options.	Option with the highest capital and operating costs compared to others.

The key points from the assessment of each of the options were:

- **Bulk Water Storage using Existing Consented Allocation:** This option is similar to the proposal in this application but did not include seeking any additional water allocation. That is, it did not include the supplementary allocation that is now sought. It was found that a reservoir reliant on the existing consented allocation can only assist in meeting the community's needs through to between 2030 and 2036. After this, the annual demand would exceed that which is available under the existing consent and additional consented water source would be needed to fill the reservoir.
- **Ohau River: Harvesting & Supplementary Allocation:** This was found to be the preferred option and is as set out in this application. It was found to be the preferred option as it scored highest in the MCA analysis described above, being assessed as 'green' for all assessment criteria except for economic criteria in which it scored in the orange range. No options scored green in the economics category. That is, the preferred option scored in the highest range for all assessment criteria. The determination of this option was confirmed in the peer review of the options report as discussed at the end of this section.
- **Other Surface Water Resources:** There are only four other surface water resources in the area that could possibly provide sufficient water to assist to meet the community's future water demands. These are the Waikawa, Upper Mangahao, Tokomaru and Manawatū Rivers. The Upper Mangahao is not considered feasible as it would transfer water from the eastern catchment to the western catchment of the Tararua Ranges. This is likely to be culturally and environmentally unacceptable. The Tokomaru River could provide good quality water that is known to be suitable for drinking water (given the Tokomaru water supply comes from the same source) but would require 30+ km of new supply pipeline. Further, it was understood by the Applicant that there are significant cultural concerns with transfer of water between catchments that would need to be understood and addressed before this option was considered further. The Manawatū River is not recommended because of water quality concerns as well as significant conveyance costs (30+ km of pipeline). There are also similar concerns regarding the transfer of water between catchments. The Waikawa Stream may be a viable source. If it were to be pursued, bulk storage would also need to be developed to meet community needs beyond 2034. Conveyance routes are 15-20km. Likely cultural concerns regarding transfer of water between catchments, as well as water quality issues, would need to be assessed in the first instance to determine if this is a viable option.

  Further, these rivers are likely to be subject to the same climatic variability as the Ohau River and potential periods where abstraction would be restricted are likely to be experienced more frequently and more persistently compared to the Ohau River.

- **Groundwater Bores:** This was not pursued due to likely adverse effects on Lake Horowhenua. While groundwater could provide an alternative source of water, further investigation of groundwater quantity and, in particular, the interaction with and effect on Lake Horowhenua would need to be fully investigated and assessed. **Based on the information currently available indicating existing groundwater abstraction is having an adverse effect on the Lake, and noting that the shortfall in water supply required to meet Levin's demands would require abstraction an order of magnitude greater than the existing groundwater allocation, it is likely that this option would have an adverse effect on Lake Horowhenua.**
- **Rainwater Harvesting:** Rainwater tanks, if widely adopted, could reduce the overall annual demand on the water supply scheme, and their use is to be encouraged. **Council is doing this by requiring rainwater tanks in new houses in growth areas such as the Taraika Area.** However, rainwater stored on individual properties is expected to be used within the initial stages of an extended dry weather / peak demand period. Therefore, they do not provide meaningful storage to reduce peak community demand. This means that, irrespective of their adoption, the community supply scheme, including treatment plant capacity, will need to meet the projected peak day demand. **Rainwater tanks therefore assist in ensuring sustainable use of water and reducing demand. They are being encouraged and in some places mandated by Council, but they are not, by themselves, a solution to meeting the community's needs.**
- **Wastewater Treatment & Re-Use (Potable or Non-Potable Use):**
  - Wastewater treatment and re-use for drinking water purposes is generally considered unacceptable by iwi/hapū and by the general community. Potable re-use may be considered a viable option in the future, however, at this stage it is considered that it should not be pursued in recognition of likely opposition to the concept, costs and timeframes required to progress such an option.
  - For non-potable re-use, the option would either involve reuse of treated wastewater by large water users who do not need potable water quality and / or reticulation of treated wastewater to households for non-potable uses via a new reticulation network dedicated for this purpose.

    In terms of large water users, these are typically open spaces such as reserves, parks or golf course irrigation or industrial uses which do not need drinking water quality water. This may have a benefit in reducing wastewater volume discharges, but from a water supply perspective, this option only has benefits if these users currently source their water from the community water supply which, in the case of Levin, they do not. Further, large industrial uses connected to the supply are involved in the food sector and require drinking water quality water supply.
  - Treated wastewater to a level sufficient for outdoor non-potable use and making this available to the community would require a new reticulation system dedicated to this purpose. If made available to the entire community, this would likely mirror the existing water reticulation network with significant capital and operational costs. Operational and risk management practices would also need to be in place to prevent the treated wastewater being used for potable purposes.
- **Seawater Desalination:** This option was not considered in detail due to the likely significant capital and operating costs, likely long-lead timeframes for implementation, and that this technology is not currently adopted in New Zealand.

Table 6.2 shows how these options were assessed in accordance with the criteria set out in Table 6.1. Refer to the options report in Appendix A for more details.

Table 6.2: Assessment of Options and Overall Ranking. (Assumes all criteria have equal weighting)

	Availability of Water	Cultural Values	Supply Resilience	Environmental Considerations	Source Water Suitability	Economics: Capital and operating costs	Score	Ranking
Bulk Raw Water Storage Using Existing Consented Allocation							22	3
Ohau River Water Harvesting (Reservoir) + Supplementary Allocation							28	1
Other Surface Water Resource: Waikawa Stream							16	5
Other Surface Water Resource: Upper Mangahao							14	8
Other Surface Water Resource: Tokomaru River							14	8
Other Surface Water Resource: Manawatu River							14	8
Groundwater Bores							14	8
Rainwater Harvesting							24	2
Wastewater Treatment & Re-use: Potable Reuse							14	8
Wastewater Treatment & Re-use: Bulk non-potable							16	5
Wastewater Treatment & Re-use: Reticulated non-potable							14	8
Seawater Desalination							16	5

The options assessment found that:

- **The preferred option is water harvesting when the Ohau River is above median flow (under the Supplementary Allocation provisions of the One Plan) and a Bulk Raw Water Storage Reservoir.**

Peer Review of Options Assessment

The Options Assessment has been peer reviewed by SLR Consulting Ltd (refer Appendix A). The peer review found that:

> *"The option of utilising additional water from the Ohau River, and off-river storage, allows all the risks and opportunities to be clearly identified and quantified to an acceptable level. This option is also likely to be the most cost effective and efficient solution to meeting increasing demand for potable water to support the Levin community.*
>
> *…*
>
> *The Levin community is going to need additional water supply in the future. While there is some uncertainty as to when this might occur, it will occur and therefore HDC need to be proactive. There is a considerable delay between planning, consenting, and commissioning a new or additional water supply. Therefore, proactive management of this issue is essential.*
>
> *The use of an off-river bulk raw water storage reservoir, and water harvesting when flow in the Ohau River exceeds the median, is in my opinion the most cost-effective, practical, and realistic option. These developments will be required irrespective of any leakage, pressure, or demand management. These additional strategies are likely to only delay the need for additional water supply and not avoid the need for additional water supply at some stage in the medium term."*

The peer review confirmed the findings of the options assessment that the option of water harvesting and off-river storage reservoir is the preferred option for reducing the effects on the river, meeting the community's needs and increasing the resilience of the scheme.

6.2 Alternatives & Options Within the Project

Having established the preferred option of water harvesting and off-river reservoir, there were a number of options within the overall proposal that are described in the Options Report (Appendix A) and the Feasibility Design Report (Appendix B). These are summarised below.

6.2.1 Reservoir Location

The options report considered options for where the reservoir could be located via a constraints mapping exercise (refer section 4.3, Appendix A). The constraints mapping identified sites large enough for the required reservoir volume that were upstream of the existing water intake to ensure appropriate source water quality and the reservoir intake remained within the reach of river valued for Water Supply purposes under the One Plan, as well as for efficiency of conveyance of water from the reservoir to the Treatment Plant. It then excluded areas which were subject to any Outstanding Natural Features, Landscape Areas or Important Ridgeline overlays in the District Plan. The constraints mapping also sought to avoid any known sties of cultural significance, known fault lines, floodplain areas and the National Grid Transmission Line.

The proposed site was one of the sites identified in the constraints mapping exercise and was purchased by Council on a willing buyer-willing seller basis.

In developing this application, a potential natural inland wetland of marginal classification was identified on the reservoir site. This required a reassessment of the other sites identified in the Options report to ensure that there is a functional need for the reservoir to be located on the proposed site. This assessment is detailed in the technical memo included in Appendix K which found that:

> *Of the three potential reservoir sites identified in the WSAOF, the proposed site is the only one which has sufficient land for the reservoir; has access to a suitable reservoir intake site on the Ohau River at the exit of the Conservation Estate which can provide sufficient water to fill the reservoir; and includes a suitable and sufficient area to enable mauri and habitat enhancement to offset the cultural effects of the abstraction.*

6.2.2 Intake Options

The existing intake is not of sufficient capacity to meet the required water abstraction rates, and therefore a new or upgraded intake is required. Three options were identified and assessed via a multi criteria analysis to identify the preferred intake location and configuration. These option and the multi criteria analysis are discussed in Section 8.2 of the Feasibility Design Report in Appendix B. In summary, the options were:

a. **A new intake upstream of the proposed reservoir, near the historic intake location.** The Levin water supply was first installed in the early 1900s with water sourced from a weir across the Ohau River approximately 1.2 km upstream of the reservoir site, where the river exits the Conservation Estate. The benefit of this site was that it would have high quality of source water due to its location in relation to the Conservation Estate (particularly given the One Plan requires the river in this area to be managed to meet its 'Natural State'), and would enable gravity conveyance of water from the river to the reservoir site. However, bedrock beneath the river meant that a sub-surface infiltration gallery would not be possible at this site and an above bed structure involving a weir, Coanda screen and fish passage structure would be required. Such a structure is obviously not ideal for fish passage considerations. Further, this option would require significant disturbance to vegetation (including areas of indigenous vegetation and riparian areas) for construction and operation access. The abstraction capacity of this option was also limited by the size of pipework required to convey the water to the reservoir.

Figure 6.2: Historic water supply weir across the Ohau River generally in location of Intake Option A (circa 1908, since decommissioned and removed)
Photo credit: Horowhenua Historical Society Inc. Photo looking downstream towards the weir

b. **Sub-surface infiltration gallery at or near the reservoir site. This is the preferred intake** option as detailed in Section 4.2. This site enables the use of a sub-surface infiltration gallery option so that, after construction, there are no impacts on fish passage. The river corridor in this area enables the river to be easily diverted around the construction site while remaining within the river corridor such that construction effects can be managed. Further, its close proximity to the reservoir site enables efficient pumping from the river to the storage reservoir.

c. **Upgrade the Existing Intake Site.** To achieve the capacity required, the existing intake (subsurface infiltration pipe) would need to be rebuilt and expanded significantly. This would require major disturbance to the river bed and cannot be done in the dry unless the river is diverted to a new temporary channel outside of the river corridor and on private land. Further, an additional temporary intake would be required to maintain water supply to the community during the construction period. This option also involves significant additional pumping costs, which has implications in terms of power usage and greenhouse gas emissions of the scheme, due to the need to pump the water for storage up to the reservoir site before pumping it back down to the treatment plant when needed.

6.2.3 Reservoir Configuration & Staging Consideration

A feasibility assessment for the proposed reservoir considered the option of one large reservoir or two smaller reservoirs at the site. This is discussed in Section 2 of the Feasibility Design Report in Appendix B.

Two smaller reservoirs on the site were considered as it was thought that this could provide some operational flexibility and may also allow for staging of the capital investment required (with one reservoir being constructed immediately, and the second at a later date). However, on analysis, it was found that the timeframe possible for staging was not sufficient to warrant a staged construction (i.e. the Council would need to start stage 2 very shortly after stage 1 was completed) and that the two reservoir option had more maintenance costs requirements without any commensurate benefit. Further, the two-reservoir option resulted in a significant reduction in the effective capacity of the storage. A single reservoir on the site will achieve in excess of 700,000 m^3 of effective storage, whereas two smaller reservoirs can only achieve a combined capacity of 462,000 m^3 due to the volume lost by the embankment between the two reservoirs.

Ultimately, it was found that "the single reservoir arrangement uses resources most efficiently in both the short and long-term".

6.3 Summary

In summary, the options assessment and its subsequent peer review found that the best option for meeting the Levin community's current and future needs, reducing effects on the river and improving scheme resilience was a water harvesting and storage scheme as proposed in this application.

The feasibility and preliminary design process has also confirmed through a series of multi-criteria analyses that the water harvesting scheme is most appropriately delivered through via the construction and use of a sub-surface infiltration gallery at the proposed reservoir intake site and a single large reservoir at the proposed Poads Road site.

7 TE TIRITI AND SECTION 8 RMA - PRE-LODGEMENT IWI ENGAGEMENT

Council has undertaken pre-lodgement engagement with Muaūpoko Tribal Authority and Ngāti Raukawa iwi and hapū. The following provides a brief summary of this engagement process. HDC will continue to engage with iwi and hapū throughout the consent process, design, construction and operation of the proposal.

Muaūpoko Tribal Authority

The Council has engaged with Muaūpoko Tribal Authority (MTA) throughout the development of the proposal and this assessment of environmental effects. HDC has in place a Memorandum of Partnership with MTA. In agreement with MTA, a Cultural Impact Assessment (CIA) was commissioned in 2022 and was developed based on a draft version of this AEE and site visits alongside HDC representatives. The CIA is included in Appendix F.

The CIA acknowledged "the partnership we [MTA] are creating with HDC and the journey ahead to fulfilling our agreement as Te Tiriti Partners".

The CIA identified that there is an adverse effect of the proposal, particularly the abstraction below minimum flow, on the mauri of the awa, and sought cultural effects offsetting proposals be developed and committed via consent conditions for a Cultural Offsetting Management Plan (COMP). HDC has worked with MTA to develop a COMP and has included that proposal within this application (refer Appendix L). HDC is committed to the implementation of the COMP noting its primary objective of ensuring no net loss, and preferably a net gain of mauri of the Ohau awa and habitat. While there are many ecological benefits of the proposed COMP initiatives, the COMP is first and foremost a means of addressing cultural effects of the proposal.

Te Rūnanga o Raukawa & hapū: Ngāti Tukorehe, Ngāti Kikopiri, Ngāti Hikitanga

At the commencement of the project (December 2021), HDC engaged with Te Rūnanga o Raukawa and sought guidance as to how best to engage including whether or not to engage via the Runanga or direct with hapū of the rohe. It was agreed that HDC would resource technical support for iwi / hapū to support this engagement and that the engagement may occur via hapū. At the request of Te Tūmatakahuki, HDC resourced Catalyst Group to support Te Tūmatakahuki (including Ngāti Kikopiri, Ngāti Hikitanga) in considering the project. HDC has also met with representatives of Ngati Tūkorehe and it has been agreed that the work being undertaken by Catalyst Group will also be shared with Ngati Tūkorehe to support their assessment of the proposal and understanding of cultural impacts.

HDC's project team has met on several occasions with Catalyst Group, including undertaking a site visit and a draft version of this AEE was provided to support the completion of a CIA. Catalyst provided a planning assessment of the draft application which identified some technical matters regarding the hydrology, planning and wetland assessment, all of which have been addressed in the final AEE. The Catalyst report was silent in terms of cultural values or effects except to note that "HDC has extended

an invitation to Te Tūmatakahuki to visit the site to assess its cultural significance. Any places of significance to Te Tūmatakahuki can be reflected in the hapū position on the proposed reservoir site".

HDC has held further hui with representatives of Ngāti Tūkorehe, Ngāti Kikopiri and Ngāti Hikitanga from August 2022 through to current date including a detailed project briefing hui and site visit in December 2023. HDC will continue to engage with Ngāti Tūkorehe, Ngāti Kikopiri, Ngāti Hikitanga as the project is developed post lodgement.

In addition to the above, representatives from MTA and Raukawa hapū have also been involved in several hui involving NZTA and HDC regarding the provision of water to enable construction of the Ō2NL Project via this consent application.

8 RULE FRAMEWORK ASSESSMENT

A summary of the resource consents sought for the proposed activities and the activity status of each component of the proposal is set out in section 2.3. The following sections provide the detailed assessment of relevant rules from which that summary has been derived.

Water take permit to abstract 16,159m^3/day from the Ohau River (being 15,409 m^3/day of consumptive take and 750 m^3/day of non-consumptive take) (Core Allocation)

The abstraction significantly exceeds the threshold for a minor take (being 15 m^3/property/day) of the One Plan and cannot be considered as a Permitted Activity under Rule LF-TUD-R39.

Rule LUF-TUD-R43 of the One Plan provides for 'Takes and Uses of Surface Water Complying with Core Allocations' as a Controlled Activity, however, this rule requires that there be no abstraction when the river is at or below its minimum flow. As the proposed activity includes abstraction below minimum flow prior to the reservoir construction; an exceptional circumstance abstraction when the river is at or below its minimum flow after the reservoir is operational; and a 750 m^3/day non-consumptive take which is required to continue below minimum flow, it cannot be considered as a Controlled Activity under Rule LUF-TUD-R43.

Rule LUF-TUD-43 provides for 'Existing essential takes and uses of surface water complying with core allocations taken at or below the minimum flow" as a Discretionary Activity provided that the amount of water taken does not exceed 250 L/person/day. The amount of water sought to be taken below minimum flow exceeds 250 L/person/day and therefore cannot be considered a Discretionary Activity under Rule LUF-TUD-43.

The Core Allocation component of the requested abstraction therefore falls to be considered as a **Non-Complying Activity under Rule LF-TUD-R47,** 'Takes and uses of surface water not complying with core allocations or takes and uses of water taken at or below minimum flow.'

Water take permit to abstract supplementary allocation to enable water harvesting at times when the Ohau River is above median flow and which, in total is not to exceed 10% of the actual flow in the river at the time of abstraction. (Supplementary Allocation)

Despite being provided for via the allocation framework and policies within the Regional Policy Statement (Part I of the One Plan), there are no rules within the Regional Plan specifically related to applications for supplementary allocation. By definition, the supplementary allocation is outside of the core allocation, and therefore the taking of water as supplementary allocation falls to be considered as a **Non-Complying Activity under Rule LF-TUD-R47**, 'Takes and uses of surface water not complying with core allocations or takes and uses of water taken at or below minimum flow.'

Land use (bed of river) consent to construct, operate and maintain a new water intake structure (infiltration gallery) for drinking water supply purposes including intermittent air backwash of the system

Rule LUF-AWBD-R54 of the One Plan provides for 'Structures and Disturbances involving a reach of river or its bed with RP-SCHED2 Values of Natural State, Sites of Significance - Aquatic and Sites of Significance - Cultural' as a Discretionary Activity. None of these values apply to the stretch of the river bed where the reservoir intake and riparian works will be undertaken. The activity is therefore not encompassed by Rule LUF-AWBD-R54.

Rule LF-AWBD-R64 provides for 'Other Structures including bridges, fords and other access structures' as a Permitted Activity. The infiltration gallery and associated riparian works is considered to be an 'other structure'. Criteria (3) of Rule LF-AWBD-R64 requires that all structures, whether in, on, under or over the bed of a river must occupy no more than 20 m^2. The proposed infiltration gallery will occupy over 1,200 m^2 of the river bed, albeit constructed under the river bed, and therefore cannot be undertaken as a Permitted Activity under Rule LF-AWBD-R64.

Rule LF-AWBD-R68 provides for 'Activities Affecting RP-SCHED2 Values of Flood Control and Drainage' as a Discretionary Activity. This value does not apply to the reach of the river in which the infiltration gallery will be constructed and therefore the activity is not encompassed by Rule LF-AWBD-R68.

The reservoir intake therefore falls to be considered as a **Discretionary Activity under Rule LF-AWBD-R76**, 'Activities that do not comply with permitted activity, controlled activity or restricted discretionary activity rules and all other s13(1) RMA activities not covered by this chapter'. The activities covered by this rule are activities requiring consent under s13(1) of the RMA and any ancillary excavation, drilling, tunnelling or other disturbance of the bed pursuant to s13(1) RMA and damming or diversion of water pursuant to s14(2) RMA; discharge of water or sediment into water or onto land pursuant to section 15(1) or 15(2A) RMA, and deposition of substances in or on the bed of the river pursuant to s13(1) RMA.

In terms of the vegetation clearance and earthworks required on the true left bank of the river in association with the construction of the new intake structure, the area affected is less than 2,500 m^2 and the activity is therefore encompassed by Rule LF-LAND-R1 which applies to 'small scale land disturbance'. The proposed activity cannot meet the requirement of that Rule that the land disturbance must not be within 5 metres of a river that is permanently flowing. Likewise, the activity cannot meet the same permitted activity standard for vegetation clearance as required by Rule LF-LAND-R5.

The ecological assessment undertaken for the proposed works at and near the reservoir intake site has confirmed that the affected area does not include any areas of at-risk, rare or threatened habitats and therefore it is not encompassed by Rules ECO-R1 or ECO-R2.

The vegetation clearance and earthworks adjacent to the river therefore fall to be considered as a **Discretionary Activity under Rule LF-LAND-R8** 'Vegetation clearance, land disturbance, cultivation or forestry that does not comply with Rules RP-LF-LAND-R1 to RP-LF-LAND-R7' and which are not regulated under Rules ECO-R1 or ECO-R2.

It is noted that in terms of the avoidance, remediation or mitigation of effects, the proposed disturbance of the river bed and the proposed land disturbance and vegetation clearance required for the intake structure are included in the Erosion and Sediment Control Plan required for the large scale earthworks for the reservoir construction, which is discussed below in relation to that activity.

Land use (bed of a river) consent to construct, operate and maintain a water pipe bridge over the Ohau River to convey water from the water storage reservoir to the drinking water treatment plant

Rule LUF-AWBD-R54 of the One Plan provides for 'Structures and Disturbances involving a reach of river or its bed with RP-SCHED2 Values of Natural State, Sites of Significance - Aquatic and Sites of Significance - Cultural' as a Discretionary Activity. The river is valued for Site of Significance - Aquatic at this location and an assessment of this rule is required. The Activity description of this rule for activities in Sites of Significance - Aquatic states:

(a) *The erection, placement or extension of any structure in, on, under or over the bed, except for lines, cables and ropeways that are suspended above the water and do not require a support structure in, on, over or under the bed and except for those activities regulated by Rule RP-LF-AWBD-R67.*

The proposed pipe bridge is to be constructed over the bed and does not require support structure in, on, over or under the bed. The proposed activity is therefore not encompassed by Rule LUF-AWBD-R54.

The activity is within a reach of the river with a RP-SCHED2 value of Flood Control and Drainage and assessment against Rules LF-AWBD-R67 and LF-AWBD-R68 is required. Rule LF-AWBD-R67 provides for activities to be undertaken as a Permitted Activity if they are undertaken by or on behalf of the Regional Council. This is not the case and therefore the activity cannot be undertaken as a Permitted Activity under rule LF-AWBD-R67.

Rule LF-AWBD-R68 provides for 'Activities affecting RP-SCHED2 Value of Flood Control and Drainage' as a Discretionary Activity and includes '(2) the erection, placement or extension of any building or other structure' where the activities are undertaken within the bed of a river and / or for areas without stopbanks, anywhere within 10 m of the bed of the river. The proposed pipe bridge activity is located in an area without stopbanks and is within 10 metres of the bed of the River and therefore falls to be considered as **Discretionary Activity under Rule LF-AWBD-R68**.

Land Use Consent for Large-Scale Land Disturbance (Earthworks) to construct the reservoir, spillway, access road and ancillary infrastructure at the reservoir site.

Rule LF-LAND-R1 provides for small-scale land disturbance of less than 2,500 m^2 per property per year as a Permitted Activity. The earthworks and land disturbance required to construct the reservoir covers an area of approximately 10 ha and therefore cannot be considered as a small-scale land disturbance activity under Rule LF-LAND-R1.

Rule LF-LAND-R6 provides for large-scale land disturbance, including earthworks, as a Controlled Activity. The Controlled Activity criteria are:

1. *The activity must not take place on land that is within a coastal foredune*
2. *The activity must be undertaken in accordance with an Erosion and Sediment Control Plan.*
3. *Any discharge of sediment must not, after reasonable mixing, cause the receiving water body to breach the water quality standard for visual clarity set out in RP-SCHED5 for that waterbody.*
4. *The activity must not occur on land that is in, or within 5 m of:*
    a. *The bed of a river that is permanently flowing*
    b. *The bed of a river that is not permanently flowing and has an active bed width greater than 1 m*
    c. *the bed of a lake.*
5. *The activity must not occur on land that is in, or within 10 m of:*

a. A wetland as identified in RP-SCHED6

b. Sites valued for Trout Spawning as identified in RP-SCHED2

c. Site of Significance - Aquatic as identified in RP-SCHED2

The proposed activity is not within a coastal foredune area. Except for the intake construction activities (assessed above) the reservoir earthworks are not within 5 m of a river or lake, nor are they in an area identified for trout spawning or site of significance-aquatic. The activity will be undertaken in accordance with an Erosion and Sediment Control Plan as described in Section 4.3, and provided in Appendix J. The erosion and sediment control measures proposed will ensure that the earthworks do not cause the visual clarify standards to be breached in the Ohau River. The ecological assessment has identified that there is a potential natural inland wetland of marginal classification within the earthworks footprint, however, that assessment (Appendix H) found that the potential wetland did not meet the criteria of RP-SCHED6.

Therefore, all of the criteria of Rule LF-LAND-R6 are met and the large-scale earthworks to construct the reservoir and associated infrastructure fall to be considered as a **Controlled Activity.**

National Environmental Standards for Freshwater(NES-FW) - Natural Inland Wetland Regulations Earthworks and Land Disturbance for Specified Infrastructure, within and within 100 m of a Natural Inland Wetland that will result in complete drainage of the Natural Inland Wetland

The ecological assessment has identified that there is a site within the reservoir footprint that could be classified as a natural inland wetland. As discussed above, this is considered to be a very marginal classification. Adopting a precautionary approach, this application has been prepared on the basis of this site being a Natural Inland Wetland under the NES-FW.

Regulation 45 of the NES-DW provides for the following activities:

(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.

(3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland is a discretionary activity if it—

(a) is for the purpose of constructing specified infrastructure; and

(b) results, or is likely to result, in the complete or partial drainage of all or part of the natural inland wetland.

The proposed reservoir construction involves earthworks which are both within a natural inland wetland area and within a 100 m setback from a natural inland wetland and will result in the complete drainage of that natural inland wetland.

'Specified Infrastructure' in the NES-FW has the meaning given by the National Policy Statement for Freshwater Management. The NPSFM defines 'specified infrastructure' as follows:

Specified Infrastructure means any of the following: …

(c) any water storage infrastructure.

The reservoir clearly meets the definition of specified infrastructure and the earthworks and associated drainage of the possible natural inland wetland can be considered under Regulation 45 as a Discretionary Activity.

Clause (6) of Regulation 45 further states:

> *A resource consent for a discretionary activity under this regulation must not be granted unless the consent authority has first—*
>
> *(a) satisfied itself that the specified infrastructure will provide significant national or regional benefits; and*
>
> *(b) satisfied itself that there is a functional need for the specified infrastructure in that location; and*
>
> *(c) applied the effects management hierarchy.*

Under RPS Policy EIT-P1, the Levin water supply system is recognised as a physical resource of regional or national importance, and Regional Council is required to have regard to the benefits of the activity. Notwithstanding that the regional benefits of the proposal are self-evident under RPS Policy EIT-P1, the options assessment report has clearly identified that the reservoir is necessary to reduce adverse effects on the Ohau River; provide for the community growth; and to improve the resilience of the scheme, including to address climate change risks identified in national and regional risk assessment. The Regional Council can therefore be satisfied that the specified infrastructure will provide significant regional, if not national, benefits.

The Applicant has assessed the functional need for the reservoir to be constructed in the location proposed (refer Appendix K), and concluded as follows:

> *It has been demonstrated that there is a functional need for the 740,000 m^3 reservoir at Poads Road (Lot 9 DP 555714), as proposed by HDC and designed on a preliminary basis by Damwatch, as specified infrastructure in that location. This is because:*
>
> - *Of the three potential reservoir sites identified in the WSAOF, the proposed site is the only one which has sufficient land for the reservoir; has access to a suitable reservoir intake site on the Ohau River at the exit of the Conservation Estate which can provide sufficient water to fill the reservoir; and includes a suitable and sufficient area to enable mauri and habitat enhancement to offset the cultural effects of the abstraction.*
> - *If a smaller reservoir was to be constructed, such that the marginal natural inland wetland was avoided, there would still be a need to abstract from the river below minimum flow during drought events, and the reservoir would have a significantly reduced timeframe in which it could meet council's sought level of service of 30-days storage following emergency.*

The Regional Council can therefore be satisfied that there is a functional need for the specified infrastructure in that location.

The Effects Management Hierarchy has been applied as described in Section 9.5.3 and it is concluded that the proposed approach "would very substantially outweigh the minor adverse effects associated with the loss or modification of this small, highly modified 'marginal' wetland." (Wildlands report, Appendix H).

There is therefore no impediment to grant of consent under Regulation 54(6) of the NES-FW.

Planting and Restoration in and around a Rare Habitat

The proposed cultural effects offsetting measures include weed and litter removal and restoration planting in and around a rare habitat, being the watercourse on the lower floodplain terrace (Site 3 in the ecological assessment report). Planting and restoration are not regulated under the One Plan rules. However, there may be some associated vegetation clearance, land disturbance and other activities associated with the restoration works which are regulated under Rule ECO-R2 which provides

for "some activities within rare habitats and threatened habitats" as a Non-Complying Activity. Consent is therefore sought to be able to implement the proposed cultural offsetting management plan under Rule ECO-R2.

Discharges to, and Restoration of, Natural Inland Wetland Areas on the Lower Terrace (Cultural Offsetting Management Plan Area), National Environmental Standards for Freshwater

The ecological assessment report has identified three areas on the lower terrace within the proposed Cultural Offsetting Management Plan area which are classified as Natural Inland Wetlands under the NES-FW. Restoration works are proposed in and close to these areas as detailed in the COMP in Appendix L and described in Section 4.6 above. These works are being done for the purposes of natural inland wetland restoration and wetland maintenance and are required to mitigate and offset the cultural effects of the proposal including the water take from the Ohau River.

Regulation 38 of the NES-FW provides for the following activities as a Permitted Activity, where they are being undertaken for wetland restoration and maintenance purposes:

- Vegetation clearance within, or within 10 m setback of a natural inland wetland
- Earthworks or land disturbance within, or within 10 m setback of a natural inland wetland
- The taking, use, damming, diversion or discharge of water within or within 100 m setback from a natural inland wetland.

The above activities can only be undertaken as a Permitted Activity under Regulation 38 if they meet the relevant conditions of Regulation 38(4). An assessment of these conditions is set out below:

a. the activity must comply with the general conditions on natural inland wetland activities in regulation 55. The general conditions in regulation 55 are all able to be met, and the Applicant proposes a consent condition that requires that the final COMP include sufficient details to confirm to the Regional Council that the general conditions are met, and that this be provided to Regional Council prior to commencement of the COMP implementation works.

b. Vegetation clearance, earthworks and land disturbance must not exceed the lesser of 500 m^2 or 10% of the natural inland wetland area. No significant vegetation clearance, earthworks or land disturbance are proposed on the lower terrace, although some minor amounts may be required to implement the COMP. Any such activities will be for the purpose of planting or wetland restoration, or clearance of exotic species and are therefore exempted from the area restriction in accordance with regulation 38(5).

c. If the activity is the discharge of water, it must not be a restricted discretionary activity as described in regulation 39(3A). A discharge of water is proposed in this area, being the groundwater from under the reservoir footprint. Regulation 39(3A) is applicable if the discharge will enter the wetland. The discharge is proposed to enter the wetland area, as it will be used to ensure an appropriate hydrological regime for wetlands 3 and 4 identified in the ecological assessment report.

The above assessment has shown that any vegetation clearance, land disturbance and earthworks as well as any associated damming or diversion of water within the natural inland wetlands on the lower terrace, undertaken to implement the COMP is a Permitted Activity under Regulation 38. **The discharge of groundwater from under the reservoir into the natural inland wetland areas on the lower terrace is a Restricted Discretionary Activity under Regulation 39(3A) of the NES-FW.**

Diversion permit for the interception and discharge of groundwater from adjacent to and below the proposed reservoir

Rule LF-TUD-R50 of the One Plan provides for new diversions, including ancillary discharges and disturbances. It is considered that the proposed diversion of groundwater from under the proposed

reservoir is provided for under this rule as a 'new diversion'. The activity is able to meet all of the permitted activity conditions/standards/terms, with the exception of (i) which states that the diversion cannot be undertaken where any infrastructure is located within the river bed 1 km downstream or upstream of the diversion. The new intake structure will be in the bed of the river within this 1km delineation, albeit that this activity forms part of this application. Because the diversion cannot meet the permitted activity standards, it becomes a **Discretionary Activity under Rule LF-TUD-R51**, noting that this Rule does not provide for associated discharges.

Discharge permit for the discharge of groundwater from under the water storage reservoir to water or to land which may result in some overland flow to the Ohau River

The permitted activity rule for discharges to land where the discharge may enter water is Rule LF-LW-R36. The proposed diverted groundwater discharge can meet the permitted activity conditions / standards / terms with the exception of compliance with Rule LF-LW-R35 [compliance with Rule LF-LW-R35 except subclause (a) of that rule is a condition of Rule LF-LW-R36] because the discharge is potentially to a rare habitat (wetland 3) and because it may not be 600mm above the seasonally highest water table; and it is not located at least 20 metres from the nearest surface water body. It therefore falls to be considered as a **discretionary activity under Rule LF-LW-R38**.

Discharge permit for the intermittent discharge of stored water from the reservoir via spillway to the Ohau River if overtopping occurs or if maintenance draw down is required

The permitted activity rule for this activity is Rule LF-LW-R20 and the discharge of stored reservoir water is very likely able to meet all the conditions/standards/terms. For the avoidance of doubt and to ensure long term certainty for the Applicant, consent is however sought under the 'default' **discretionary** rule for discharges of water to water, being **LF-LW-R38.**

Land Use Consent for Riverbed Disturbance to Construct Shallow Bore Intake for Abstraction for Ō2NL Project Construction Water

Rule LF-TUD-R52 provides for the drilling, construction or alteration of any bore pursuant to s9(2) RMA as a Controlled Activity. In this instance, the proposal is to construct the shallow bore (if that is the adopted intake arrangement as per discussion in Section 4.7) within the riverbed of the Ohau River, albeit outside of the active channel area. The construction of the bore is therefore subject to s13 of the RMA and the activity is not provided for under Rule LF-TUD-52.

Water management values of Sites of Significance - Aquatic, and Flood Control and Drainage apply at this location.

Rule LF-AWBD-R54 provides for any excavation, drilling, tunnelling or other disturbance of the bed (including any associated discharge of water or sediment) in reaches of river with a Site of Significance -Aquatic value except for those activities regulated by Rules RP-LF-AWBD-R58 and RP-LF-AWBD-R67 as a Discretionary Activity. Rule RP-LF-AWBD-R58 provides for maintenance and upgrade of structures, and Rule RP-LF-AWBD-R67 provides for activities undertaken by or on behalf of Regional Council in reaches with a Flood Control and Drainage Value. The proposed intake is therefore not regulated under either of these rules, and **consent under Rule-LF-AWBD-R54 as a Discretionary Activity is required.**

Rule LF-AWBD-R68 provides for specified activities in reaches assigned Flood Control and Drainage Value as a Discretionary Activity, where those activities are undertaken, amongst other things, within the bed of the river. The specified bed disturbance activities regulated under Rule LF-AWBD-R68 are:

- any excavation, drilling, tunnelling or other disturbance likely to undermine the functional integrity of a stop bank or river control structure.
- any land disturbance that impedes access required for maintenance of a river or drainage scheme

The construction of the shallow bores, surface intake pipework and any associated infrastructure will not undermine the functional integrity of a stopbank or river control structure, not will they impede access required for maintenance of a river or drainage scheme. The activity is therefore not regulated under Rule LF-AWBD-R68.

8.1 Permitted Activities Included in this Application

The above assessment has identified wetland restoration planting and associated activities as being able to be undertaken as a Permitted Activity.

Further, the taking of water from the reservoir does not require consent, as per the rule guide within section RP-LF of the Regional Plan at page 3-119 which states:

> *"Takes or uses of water from water storage facilities that are not within a water body do not require resource consent"*

'Water body' is defined in the RMA as:

> *"Water body means fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area".*

It is considered that the reservoir is not a 'water body' under the RMA, and hence the taking of water from it is a permitted activity.

8.2 Overall Activity Status

In accordance with the bundling principle, the activity status for this application is Non-Complying.

9 ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS OF THE PROPOSED ACTIVITIES ON THE ENVIRONMENT

This section of the AEE assesses the actual and potential effects of the proposal on the environment. In making this assessment it is noted that there are several positive effects associated with this proposal, namely:

- The ability to provide for the health and wellbeing of current and future Levin community via the provision of safe drinking water.
- The ability to improve the resilience of the scheme to climate variations, climate change and natural disasters through the provision of storage, consistent with the direction of the Regional Policy Statement and Regional Climate Risk Assessment.
- The ability to reduce the effect of the abstraction on the River at times of minimum flow, being an effect that is currently authorised by the existing resource consent.
- The proposed restoration and enhancement that will occur on the lower terrace of the reservoir site.

9.1 Cultural Effects

In developing the proposed water storage reservoir and this application, HDC has engaged with Muaūpoko Tribal Authority and with Ngāti Raukawa hapū, namely Ngāti Tukorehe, Ngāti Kikopiri, and Ngāti Hikitanga. The consultation and engagement process is summarised in Section 7. The following sets out the Applicant's understanding of the cultural effects of the proposal as identified through this engagement process.

Muaūpoko Tribal Authority requested that they be engaged to prepare a cultural impact assessment to ensure the values of Muaūpoko are identified and addressed. The CIA prepared by MTA is included in Appendix F.

The CIA findings are summarised (from the Executive Summary of the CIA) as follows:

> *The proposed quantum of water taken from the Ohau Awa, especially at low flow will affect the mauri of the awa, other waterbodies and groundwater that are hydraulically connected to it. The impact on mauri will have adverse effects on Muaūpoko values which must be managed, positive actions must be undertaken to enhance the mauri of the Ohau Awa to offset for the effects the water take will have. The necessity of the project is recognised and Muaūpoko is supportive of a more resilient water supply for Taitoko and the surrounding communities. Our concerns around Horizons Regional Council allocation framework in the Ohau catchment will not be alleviated through this project. However, holding an active role in the continual improvement of the environment will ensure our values, such as mana whakahaere and manaakitanga, can be provided for in a positive way that uplifts our mātauranga and our people. We are looking to create pathways and provide opportunities for decision-making and mahi for our people, whether that be in the planning, construction, kaitiakitanga or kaupapa taiao spaces.*

Tables within the CIA assess the magnitude of the effect of the proposal firstly without management / mitigation and secondly with management / mitigation measures identified by MTA in the CIA. The Applicant has accepted all of the proposed management / mitigation measures proposed by MTA in the CIA and has incorporated these into the proposal and proposed conditions. The effect assessment provided by MTA is summarised as follows (extracted from Section 5 of the CIA). The reader is encouraged to refer to the full text of the CIA in Appendix F for more information on this assessment.

Value	Activity / Effect	Cultural value	Magnitude WITH management	Overall effect
Our worldview				
Growth and knowledge during construction.	Inability to pursue our growth and knowledge as an iwi in the construction phase.	Very high	Positive	Net Gain
Connections with and between our atua during construction	Disrupts the relationships between atua, kaitiaki and the environment in the construction phase.	Very high	Negligible	Low
Growth and knowledge during operation.	The inability to pursue our growth and knowledge as an iwi in the operational phase due to capacity constraints.	Very high	Positive	Net Gain
Connections with and between our atua during operation	Disrupts the relationships between atua, kaitiaki and the environment in the operational phase.	Very high	Low	Moderate
Our whakapapa				
The discovery by our people and their naming in the landscape during construction	Risk of rewriting narratives during construction.	Very high	Positive	Net Gain
The discovery by our people and their naming in the landscape during operation	Severing connections ki uta ki tai during construction.	Very High	Positive	Net gain
Accidental discovery of archaeological materials related to our ancestors during construction.	Disturbing our ancestors' resting places during construction.	High	Negligible	Very Low
Impacts on our terrestrial and aquatic taonga – ngārara and ngata, ika and manu;	The accidental death of our ngārara, ngata, manu or ika and tune associated with Ohau	High	Negligible	Very Low
Te Mana o te Wai				
Mana whakahaere.	Exclusion of our people from decision-making in the project during construction and operational phases.	Very high	Positive	Net gain

Figure 9.1: Summary of Muaūpoko Cultural Effects Assessment
Source: Section 5 of CIA, included in Appendix F.

The above summary shows that the effects of the proposal on Muaūpoko values ranges from positive / net gain to moderate. The CIA concludes:

Offsetting the adverse impact of the project on Muaūpoko values would involve uplifting our position and role as tangata whenua in the Horowhenua and wider landscape as part of the drinking water scheme project. We would be supported to have the capacity and capability to fully participate as a Tiriti partner. This means being empowered to manage our whenua, wai and significant sites in line with our tikanga. In this CIA, we have identified how we wish this to be undertaken, how our values of kaitiakitanga, manaakitanga and mana whakahaere are critical to our success in protecting our interests. We would like to lead the development of a riparian and floodplain restoration plan and its implementation as a way of uplifting Te Mana o te Wai, our rights and responsibilities to manage the Horowhenua Block.

We will continue to work alongside HDC to ensure we deliver the best outcomes for our people, te taiao and the wider Taitoko community in a way that is responsive to our worldview and our whakapapa. Most critically, HDC must respect the way in which we are able to engage because of historic Treaty breaches, exclusion and marginalisation of our people.

We have genuinely applied and held ourselves accountable to the collective vision of the scheme and we will continue to do so.

The CIA includes discussion as to an applicant proposed representative group. This was initially proposed by the applicant as a means of giving effect to Te Mana o te Wai and recognising the respective iwi and hapū across the rohe. In relation to the proposed group, the MTA CIA states that this group "will need to recognise our mana whakahaere and reflect Muaūpoko engagement structure and leadership role as past owners of the whenua for hundreds of years. This is necessary due to past processes of exclusion of our people". To date, a framework and representation for such a group has not yet been able to be agreed between HDC and the iwi and hapū with which it is engaging. Therefore, the proposed conditions do not include a representative group or similar, but do require engagement with each iwi and hapū respectively. Should a representative group be developed in the future, this will provide the same engagement as is required via the proposed conditions.

HDC has, over the last 3 years, engaged with Raukawa hapū and has had several hui with hapū representatives as outlined in Section 7. HDC is currently working with Raukawa hapū as to the specific cultural values or the effects of the proposal on those values. HDC intends to continue to engage with Raukawa iwi and hapū throughout the consenting process to ensure that effects on cultural values are taken into account. HDC also intends that the conditions of consent appropriately provide for the role of iwi and hapū and will further develop such conditions with iwi and hapū through the consent process.

9.2 Construction Effects

9.2.1 Reservoir Intake & Associated Riparian Vegetation Removal

The construction of the reservoir intake and the associated riparian vegetation removal, earthworks and infrastructure construction has the potential to have a significant effect on the river during the construction period. The nature of the proposed activity requires disturbance of the riverbed for construction which has the potential to cause sedimentation at and downstream of the site, introduce contaminants, affect habitat and impact fish passage. As discussed below, with the implementation of the proposed mitigation measures, the effects of construction are considered to be no more than minor.

Appendix I details the proposed construction methodology from the Feasibility Design Report and assesses this against national best practice guidance for undertaking infrastructure construction works in waterbodies. The key guidance document in this regard is the National Works in Waterways Guideline- Best Practice Guide for Civil Infrastructure Works and Maintenance, published by the Ministry for the Environment, July 2021. That document "forms part of the National Works in Waterways toolbox, and sets out the legislative framework, environmental risks, management

objectives and principles, and current best practice" and "provides a framework of best practice to support decision-making and management of activities in and adjacent to waterways."

The best practice measures proposed are detailed in Appendix I, and repeated in Table 9.1 below. Further, an Erosion and Sediment Control Plan which details how sedimentation associated with the in-river and riparian works will be managed is included in Appendix J.

Table 9.1: Best Practice Methods to be Used to Minimise Effects of Construction in Accordance with the National Works in Waterways Guideline Best Practice Guide for Civil Infrastructure Works and Maintenance

Best practice principles for works in waterways	How this principle may be implemented on-site following best practice methodology.
Avoid in-stream works as a first principle	Due to the nature of the proposed activity, in-stream works must occur. Best practice principles will be implemented to reduce the effects of the proposed works. Following best practice, the construction works will be undertaken in the dry to minimise sediment discharges to the river, and in accordance with the Erosion and Sediment Control Plan prepared for this work. This will be carried out by installing a temporary diversion of the active channel within the bed of the river following best practice principles specified in the National Works in Waterways Guideline and regionally specific Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Wellington Region with particular regard for section G4.0. The temporary diversion channel will be constructed as per G4.2.3 of the regional guidance and will minimise sediment generation and discharge from works within the watercourse, following the methodology detailed in the Erosion and Sediment Control Plan. The length of the watercourse to be diverted will be kept to the minimum necessary to enable safe and efficient construction. This also reduces the affected riverbed area which is required for the diversion.
Critically assess the operational methodology	As the works are undertaken, the operational methodology will continue to be critically assessed to ensure that the activity is completed in a way which minimises environmental effects. Qualified and competent contractors will be engaged for the duration of the project and this will be a matter that is taken into account in the procurement process for the contract.
Maintain the streambed profile	The proposed construction works will ensure that any riverbank zones not required for permanent access will be reinstated to their previous contours and revegetated, or rip-rap river protection will be installed. The streambed profile will be maintained after the construction of the intake. Survey will be undertaken prior to the works commencing to confirm the current profile. Once works commence, the existing streambed material will be removed and stockpiled for later use. Following the completion of the works, the stockpiled material will be re-laid generally in accordance with the same bed profile as prior to the works commencing in order to restore the run-riffle-pool sequence of the river bed. Overall, the proposed works will not reduce habitat quality and will not create ongoing erosion issues post-construction.
Retain vegetation on the bank	Vegetation on the bank will be retained wherever possible, and as per the above, riverbank zones not required for permanent access will be revegetated. This includes affected areas as part of the river diversion. Where riparian vegetation must be cleared, disturbance to the river will be minimised by felling vegetation away from the river. Felled vegetation is to be left in-place on the ground for 2-3 days to allow for passive dispersal of terrestrial fauna from the felled vegetation.

Best practice principles for works in waterways	How this principle may be implemented on-site following best practice methodology.
Stabilise exposed areas as soon as possible	The banks will be stabilised to avoid erosion and sediment discharge into water as soon as reasonably practicable. Immediate stabilisation methods such as using geotextile products will be utilised, and follow all relevant protocols and procedures specified in the Erosion and Sediment Control Plan.
Avoid using synthetic materials for in-stream and riparian applications	Biodegradable stabilisation and plant protection options (e.g., entirely biodegradable hessian matting, Combi plant guards) will be utilised for bank stabilisation. This will ensure plastic remnants from synthetic materials cannot enter the environment.
Avoid discharge of sediment into water	The proposed work will be carried out using best practice for works within a watercourse outlined in the National Works in Waterways Guideline and regionally specific Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Wellington Region with particular regard for section G4.0. An Erosion and Sediment Control Plan has been developed as a draft for the purposes of the consent application, and will be updated and finalised prior to construction taking place and provided to the Regional Council for technical certification.
Avoid sediment release downstream	The construction of the stream diversion and required bank works is an area that has the highest potential for sediment release downstream. These works will be carried out using best practice principles and operating under a robust erosion and sediment control plan to avoid sediment release. As part of this, all construction activities will be closely monitored (as detailed in the Erosion and Sediment Control Plan) during construction, before and after every rainfall event, to ensure devices are operating as anticipated, and to ensure sediment release downstream is avoided.
Implement robust erosion and sediment control measures	Appropriate erosion and sediment control measures will be in place to avoid fine sediment entering waterways during works in or adjacent to waterways. An Erosion and Sediment Control Plan has been developed as a draft for the purposes of the consent application, and will be updated and finalised prior to construction taking place and provided to the Regional Council for technical certification.
Avoid discharge of contaminants onto riverbeds or into waterways	A spill response plan will be developed prior to construction works taking place. This will address the potential impacts of the construction of the proposed works, which will ensure the following procedures are in place: • All refuelling of machinery will occur outside of the waterway and in a place where no fuel can enter the waterway if it is spilled. • Ensuring fuels and other chemicals are stored safely away from waterways, and spill kits are available for immediate use for any chemical fuel or other spill. • Store all machinery and equipment above the anticipated flood level at the end of each working day and/or when the site is unattended.
Avoid impediments to free passage	As part of the construction works, fish passage will be maintained or only temporarily disrupted during activities (eg during the creation of the diversion channel and fish relocation processes both prior to and following the construction works). The diversion channel will be constructed to allow for fish passage.

Best practice principles for works in waterways	How this principle may be implemented on-site following best practice methodology.
Avoid disturbance and mortality of freshwater fauna	Due to the proposed works, the excavation of the riverbed will result in some short term disturbance to freshwater fauna. This area will be minimised as far as reasonably practicable. The Wildlands Ecological Assessment for the proposed intake works dated January 2023 notes that once the diversion channel is decommissioned and flow resumes within the main river channel, it is expected that the river will return to its natural form due to the bed movement during flood events. Fish relocation will be undertaken prior to the works commencing with a Fish Management Plan prepared in consultation with iwi / hapū and all necessary approvals obtained prior to commencing. Fish relocation from the temporary diversion channel will also be undertaken prior to the flow being rediverted back into the permanent channel. It is acknowledged that while fish relocation will be carried out, it is not practical or possible to relocate macroinvertebrate species from the construction area. The effects on macroinvertebrate species will be minimised as far as possible by ensuring the disturbed area is kept to the minimum necessary to safely undertake the works. Given the short duration of the construction period, the effects of this disturbance are expected to be similar to a large flood flow which disturbs such species and the resultant time for macroinvertebrate species to re-establish. Any water take pumps which may be necessary (eg for dewatering) will be screened with appropriately 2–3-millimetre mesh to avoid fish mortality due to being drawn into the pumps. The Guideline outlines best practice protocols for fauna relocation and salvage protocols which will be included in a Fish Management Plan prior to construction.
Avoid in-stream works during critical spawning and migration periods	The works will be undertaken at a time to avoid critical spawning and migration periods. The area of the proposed works is not identified as being valued for trout or inanga spawning under the One Plan, nor is it identified as a site of significance - riparian and therefore the exclusion periods specified in Table 15 of the One Plan do not apply.
Avoid the spread of freshwater plant and animal pests	All appropriate biosecurity measures including requirements of the Biosecurity Act and most recent guidance from Ministry of Primary Industries will be followed for any machinery working in the river. In accordance with approved method statements, machinery will be sprayed down and washed prior to river entry in a suitable bunded location, to minimise and avoid the spread of freshwater plant and animal pests, and discharge of contaminants.
Avoid archaeological or wāhi tapu (sacred) sites	The proposed site location does not include any known archaeological or wāhi tapu sites. Conditions of consent and contract will be imposed requiring an accidental discovery protocol to be followed. If any artefacts, taonga or similar are identified, works will cease immediately and the relevant hapū, Regional Council and Heritage New Zealand Pouhere Taonga will be informed.

The construction period for the intake works is expected to take up to two months subject to favourable weather conditions. A key part of minimising disturbance during river works is to minimise the amount of time that the works are undertaken and the bed and natural flow of the river is disturbed. The physical works contract will include, along with all of the consent requirements for these works, a requirement that the contractor confirm all available plant, machinery and equipment is in place to complete the works prior to the works commencing (except for some equipment such as pumps, controls etc which can be installed at a later date as they will be able to be installed once the civil works are completed and without further riverbed or riparian disturbance).

Wildland Consultants Ltd were engaged to undertake an assessment of the effects of the proposed works on the instream and riparian ecology. This is included in Appendix G. This work involved a site visit which was attended by Damwatch as consultants responsible for the preliminary design. The proposed river diversion to enable the construction and construction methodology was discussed in detail at that site visit to inform the ecological assessment.

The ecological assessment recommended a series of standard construction effects management plans including sediment control plan, spill response plan, fish management plan and riparian planting. The Applicant has agreed to implement these recommendations and the content of these Plans is discussed in Appendix I. Further, it is proposed that these management plans be prepared in consultation with iwi/hapū.

A consent condition is offered requiring these plans to be prepared prior to construction commencing. The proposed conditions have been drafted to require an "In-River and Riparian Works Integrated Construction Management Plan" be prepared. This integrated Construction Management Plan (CMP) will include sub-plans for erosion and sediment control, biosecurity risks, spill response, fish management, riparian planting and flood contingency. Often consent conditions are written that require these to be submitted as separate plans. The consent conditions offered by the Applicant propose to have a single integrated CMP for the in-river works. This is expected to avoid duplication of information (eg roles and responsibilities) across multiple plans, require integrated planning and coordination to manage potential effects and make it easier for the contractor, operators, and consent authority to manage implementation and oversight. As a consequence, the integrated CMP is expected to be more effective at managing potential effects than a series of separate management plans.

In terms of the existing riparian vegetation, the ecological assessment found that removal of the riparian vegetation will have minimal ecological effects due to the vegetation being composed of common plant species and extensive amounts of similar habitat being present within the immediate area. This notwithstanding, a riparian planting programme to replace some of the vegetation removed with suitable indigenous species was recommended. The applicant has accepted this recommendation and proposes to undertake such planting upon completion of the civil construction works.

The assessment found that:

> *"While extensive earthworks and a large amount of riverbed excavation will be required to construct the proposed intake structure and its accompanying infrastructure, the ecological effects of this work can be managed effectively through careful planning, particularly in relation to sediment control and the capture and relocation of fish from within the impact reach.*
>
> *Once constructed, the ongoing operation of the intake structure is expected to have minimal ecological effects due to the infiltration gallery being designed to be located below the level of the existing riverbed. Excavation of the riverbed to install the intake structure will result in some short-term disturbance to aquatic fauna in the area and will require extensive recontouring of the riverbed. However, once the diversion channel is decommissioned and flow resumes within the main river channel it is expected that the riverbed will return to its natural form due to bed movement during flood events.*
>
> *Overall, construction and operation of the proposed intake structure will have relatively minor ecological impacts on the Ohau River and its surrounding environment subject to appropriate mitigation measures being implemented."*

9.2.2 Pipe Bridge

The construction of the pipe bridge has the potential to have temporary effects, given that it is to be installed within and nearby to the bed of the river. The scale of these effects is significantly lesser than

those of the construction of the intake structure and these are able to be managed appropriately by way of construction methodology and management plan that follows the best practice principles for works in and near waterways as set out in detail above, and particularly avoiding works in the bed where possible and avoiding any unnecessary discharge of sediment during construction. The proposed consent conditions require an Integrated Catchment Management Plan for this aspect of the project in a similar manner to that described above (noting that the scale of effects to be managed will be significantly less than the intake in-river works).

9.2.3 Reservoir Construction including Associated Infrastructure

The earthworks required to construct the reservoir and its associated infrastructure (access road, spillway, building platforms) are a Controlled Activity under the One Plan, meaning that the effects are already considered to be acceptable and able to be adequately managed through the setting of appropriate consent conditions. The matters of control specified in the One Plan relate to managing the potential for erosion and sediment run-off from the site and subsequent sedimentation of waterbodies, and require that the works be undertaken in accordance with an approved Erosion and Sediment Control Plan (ESCP).

A draft ESCP has been prepared to support this application and is included in Appendix J. As required by the One Plan, it has been developed in accordance with the Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region and taking into account the proposed construction methodology as specified in the Feasibility Report (Appendix B) and approach to construction management as set out in the memo in Appendix I.

The draft ESCP has identified the following key points for the project:

- It is clear that those works associated with the intake structure and Ohau River are of a high risk and need careful and pro-active management and monitoring to ensure that the construction effects are minor.
- A range of ESC measures are proposed on the Project. ESCs will be based on both structural and non-structural measures with an emphasis placed on the non-structural management techniques.
- The Project will rely on specific ESCPs to be submitted to Horizons at a later date, before any construction activity takes place, to allow for contractor input.
- An adaptive monitoring programme will be implemented which will allow for ongoing continuous improvement of the construction water methodologies.

The draft ESCP addresses all of the above matters and concludes that "the effects of the construction aspect of the project, in particular the discharge of sediment, are minor".

The Applicant accepts that a high degree of erosion and sediment control will be required during the construction, and this is standard practice for any construction activity or project of this magnitude and nature. The conditions proposed by the Applicant require the draft ESCP to be updated and finalised prior to construction and for all activities, including any winter earthworks, to be undertaken in accordance with the final ESCP.

In addition to the management of sedimentation, the appointed contractor will be required to prepare and undertake works in accordance with a Construction Management Plan which addresses construction effects such as noise, dust, vibration and traffic management.

Subject to appropriate ESC measures as proposed, and the management of construction effects through an appropriate Construction Management Plan, it is considered that construction effects of the reservoir and associated infrastructure will be no more than minor.

9.3 Hydrology Assessment & Associated Effects

The hydrology assessment considers the effects of the proposed abstraction on the river hydrology and, by extension, on its life supporting capacity. The abstraction scenarios which are required to be assessed are:

- The effect of the core allocation abstraction including the proposed distribution of the core allocation across the intake sites. This assessment is undertaken within the context of the core allocation framework of the One Plan including the determination via the One Plan process that the core allocation volume can be allocated without having significant adverse effects on the life supporting capacity of the river. Further, **it takes into account that the core allocation sought under this consent is already allocated to the Council with the significant majority of that allocation being available until 2042.**
- The effect of the new supplementary allocation sought on the hydrology and life supporting capacity of the river.
- The effect of abstractions at times when the river is at or below minimum flow.

It is noted that the above allocations cannot be easily separated into these three components and therefore an overall assessment is provided to consider the effects of the overall abstraction regime on the river and its life supporting capacity.

The following assessment draws from the hydrology assessment undertaken by Keane Associated Ltd, included in Appendix D.

Horizons Regional Council's technical report[24] to support the One Plan sets out the hydrology and ecological assessment underpinning the establishment of the minimum flow and core allocation framework in general, and for the Ohau River specifically. In Volume 1 of that report, it describes the theoretical framework of establishing minimum flows and core allocation and states that:

> *In this way water is allocated "in a way, or at a rate, which enables people and communities to provide for their social and cultural well being" while the definition of the minimum flow will safeguard "the life-supporting capacity of air, water, soil and ecosystems" as required by the Resource Management Act 1991.*

With respect to the Ohau River, the report references an IFIM (Instream Flow Incremental Methodology)[25] study carried out by NIWA and Horizons on the Ohau River which found that flows of between 700 L/s and 800 L/s provides approximately 80% of optimal habitat for trout rearing and spawning. The minimum flow which has been set in the One Plan is above these estimates (820 L/s). The report also noted that maintaining flow variability is an important consideration in determining the core allocation for the Ohau River and that the number of days between significant freshes was a key factor. It found that allocating more than 280 L/s (as core allocation) from the river would increase the period between freshes to more than 50 days which could affect the ecological balance and water quality of the stream. The core allocation which has been set for the river is 24,192 m^3/day which equates to the 280 L/s quoted.

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[24] *Horizons Regional Council, May 2007, Regional Water Allocation Framework: Technical Report to Support Policy Development - Volume 1.*

[25] *"Instream Flow Incremental Methodology (IFIM) is a habitat assessment method used where the instream management objective is the protection of particular aquatic species, making retention of appropriate habitat a key consideration. It uses models of the hydraulic and morphological characteristics of a stream to determine the amount of habitat available for various species at a range of flows. IFIM is well suited to the physical and ecological characteristics of New Zealand rivers (Ministry for the Environment, 1998).", as per Horizons, May 2007 - Regional Water Allocation Framework: Technical Report to Support Policy Development – Volume 1.*

The core allocation sought is 15,409 m^3/day which is the same as the core allocation already provided to the District Council via its existing consents. **No increase in core allocation is sought.**

What is sought in this application is a redistribution as to where this allocation is to be abstracted within the river, and an extension (by way of the new consent sought) of the timeframe of the existing allocation. The majority of the existing allocation (15,000 m^3/day or 97% of HDC's allocation) is consented through to July 2042. HDC seeks a 35-year consent term in this application, which would essentially extend this allocation timeframe a further 17 years.

In terms of the One Plan policies and rules, there is no distinction as to where, within the overall management area, the core allocation can be taken. However, this is not necessarily the case with the actual effects on the river. Of note, this application seeks to 'move' some of the existing allocation further upstream than the existing point of take which may have an effect given that the abstraction will now be from a smaller watercourse (ie prior to the Makakahi and Makaretu tributaries joining the Ohau River).

Hydrology Assessment Effects Model

The hydrology assessment included in Appendix D details the derivation, for modelling and assessment purposes, of a naturalised flow record for the Ohau River at Rongomatane and understanding of the relationship between the flow in the upper Ohau and Makahika Rivers in order to be able to estimate the naturalised flow regime at the proposed reservoir intake site.

The hydrology effects assessment was then undertaken by modelling the proposed abstraction regime under a worst-case effects scenario. That is, the maximum 15,409 m^3/day is abstracted, with as much of that water taken at the furthest upstream intake (the reservoir intake) as would be provided for in the consent (7,500 m^3/day)[26].

The hydrology water balance model also provided for abstraction of up to 10% of the estimated flow in the Ohau River at the proposed reservoir intake site in order to model the effects of the requested supplementary allocation.

Assessment of Effects of Modelled Abstraction Regime

The hydrology assessment has found that:

- The effect of abstracting up to 7,500 m^3/day of core allocation from the reservoir intake site is a less than 10% reduction in minimum flow, mean flow, upper and lower quartile flows, median flow and FRE3 (FRE3 represents the annual frequency of flushing flow events being flow events greater than three times the median flow).
- The change in FRE3 due to the core allocation abstraction is <1% and the cumulative effect including the supplementary allocation is 7%.
- The confluence with the Makahika Stream is about 800 m downstream from the reservoir intake site and contributes approximately 25% of the natural flow at Rongomatane compared with 45% from the upper Ohau River. The addition of natural flow from the Makahika reduces the effect of abstraction at the reservoir intake on Ohau River flow from this point downstream.
- Downstream from the existing intake, the effect on flow change below median flow is the same as under the current consent. Above median flow, including the effect of the supplementary allocation, the abstraction affect's the flow by up to 8%.

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[26] *Note: For simplicity, these figures have been rounded up in the hydrology assessment. The water balance model has actually modelled a total of 15,500 m^3/day being abstracted, of which 7,500 m^3/day is abstracted at the reservoir intake and the remaining 8,000 m^3/day abstracted at the existing intake. This means that effects will be overstated, albeit by a small margin.*

In terms of the core allocation component, the amount sought is within the overall core allocation of the River and provided for under the One Plan. The key effect for consideration is the impact of shifting some of this allocation upstream such that the abstraction is a greater percentage of the river flow at the point of take. The hydrology assessment has found that the effect of the 7,500 m^3/day core allocation abstraction from the reservoir site is less than 10% change in flow statistics and the scale of these changes is consistent with the flow regime change at the existing intake under the current consent. It is considered that the effects of this abstraction are provided for, and anticipated in, the One Plan allocation framework.

The effect of the core allocation abstraction at the reservoir site is reduced approximately 800 m downstream of the intake with the addition of flows from the Makahika Stream. The stretch of river which is affected is also not subject to the Site of Significance - Aquatic value in the One Plan. The proposal does not seek any abstraction below minimum flow at the reservoir intake site and therefore there is no change to the minimum flow in the river at or downstream of the reservoir intake site.

The effect of the supplementary allocation abstraction, in combination with the core allocation abstraction, results in approximately 7% change in FRE3.

Regional Policy Statement Policy LF-FW-P20 directs the matters that need to be considered in terms of a supplementary allocation. These are:

- The supplementary allocation cannot increase the frequency or duration of minimum flows. The supplementary allocation will only be taken when the river is above median flow and does not have any effect on either the frequency or duration of minimum flows.
- The supplementary allocation cannot lead to a significant departure from the natural flow regime, including the magnitude of the median flow and the frequency of flushing flows. The proposed abstraction does not lead to a significant departure from the natural flow regime as evidenced in the hydrology assessment and summarised in Figure 9.2 below. That shows the combined effect of the reservoir intake abstraction (which is the only location where supplementary allocation is to be taken) on the Ohau River at the point of the abstraction. This has been derived from applying the abstraction to the derived naturalised flow regime at the point of abstraction. It shows that, below the median flow the abstraction (being the core allocation component) does not cause significant change in the natural flow regime. Between the median and 25th percentile, the abstraction affects the natural flow regime by 10% in accordance with the supplementary allocation policy. Above the 25th percentile, the amount of water abstracted as a percentage of the natural flow reduces (as it is not possible with the proposed pump capacity to abstract the full 10% of the supplementary allocation).

  In terms of flushing flows, the FRE3 (being 3 times the median flow) is normally used to assess flushing flows. The proposed abstraction influences the flushing flow at the intake site by less than 5% and does not impact on its frequency.
- The supplementary allocation shall not cause any adverse effects that are more than minor on the RP-SCHED2 values of the water body or its bed. The effect of the abstraction on RP-SCHED2 values is assessed in Section 9.7 below and is found to be no more than minor.
- The supplementary allocation shall not limit the ability of anyone to take water under a core allocation. The supplementary allocation regime is separate from the core allocation regime and the proposed abstraction does not impact on any other person's ability to take water under the core allocation regime.
- The supplementary allocation shall not derogate from water allocation to hydroelectricity generation. There is no such water use on the Ohau River and therefore the supplementary allocation does not impact on water allocation to hydroelectricity generation.

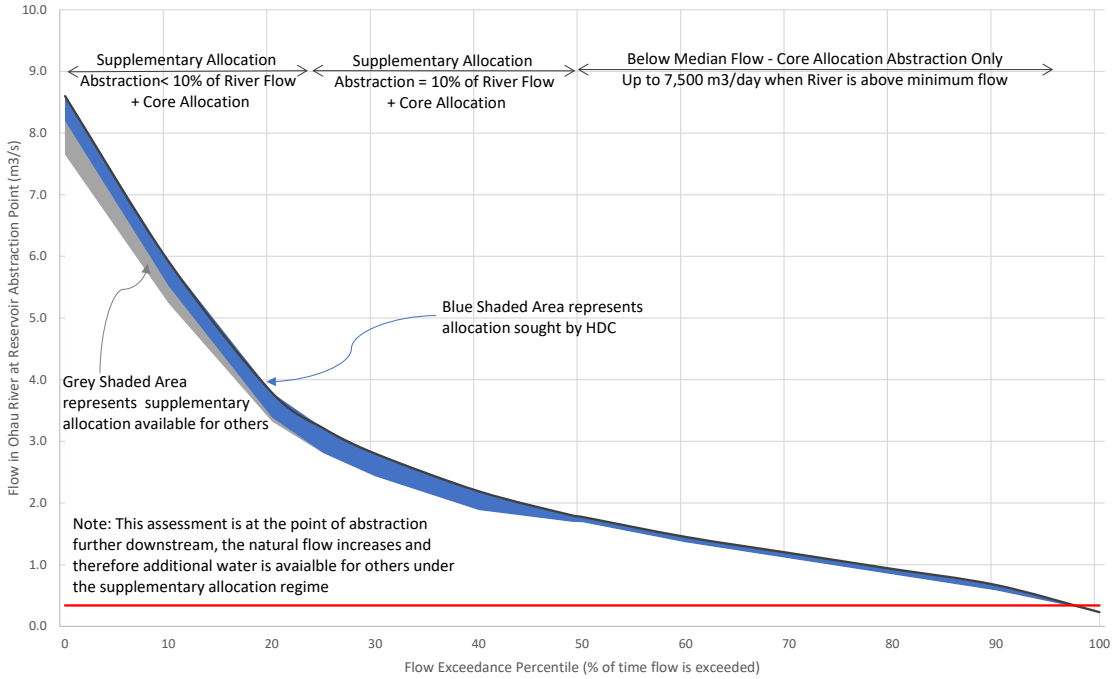

Figure 9.2: Effect of Reservoir Abstraction (supplementary allocation) on Naturalised Flow Regime of the Ohau River at the Reservoir Intake Site

The above demonstrates that, in terms of the effects determined relevant in the Regional Policy Statement for grant of supplementary allocation, the effects of the proposed abstraction are less than minor.

9.3.1 Effects of the Abstraction Below Minimum Flow

The effects of the proposal will be a reduction from the existing consented effects of the abstraction below minimum flow. As described throughout this AEE, the Council is currently authorised to abstract up to 13,000 m^3/day when the river is below minimum flow. The only criteria that needs to be satisfied for Council to exercise this abstraction is for the trigger level 4 water restrictions to be imposed. With the current infrastructure and lack of bulk storage, Council must abstract from the river at all times when it is below minimum flow in order to maintain supply to the community. This will continue – as is provided for under the current consent – until the reservoir is built and operational.

The reservoir, including the ability to fill the reservoir by way of the supplementary allocation sought, enables the Council to avoid abstraction from the river below minimum flow in all but exceptional circumstances or extended drought. Further, it enables the Council to significantly reduce the amount of water abstracted below minimum flow in such circumstances.

For the flow record available, the maximum number of days per year that the river has been below minimum flow is 50 days. This occurred in the 2003/2004 summer. This summer period also had the maximum number of consecutive days below minimum flow, being 25 days. A statistical analysis[27] also found that 26 consecutive days below minimum flow would be considered a 100-year return period event.

Rather than abstract consistently at 13,000 m^3/day in this event as is currently required, the proposed reservoir enables supply to be maintained during such periods via a mixture of supply from the reservoir and supply from the river. The analysis in section 4.1 shows that this could be met by a

[27] *As reported in section 2.5.1 of the Options Report, Appendix A.*

mixture of days with no abstraction from the river and a mixture of days with a combined river-reservoir supply. The amount of water which would need to be abstracted from the reservoir is highly dependent on the reservoir levels leading into the drought period, community demand and the extent to which there are freshes during the summer period to enable the reservoir to be refilled.

The overarching principle will be to avoid or minimise abstractions from the river below minimum flow as far as possible, to minimise effects on the river and to give effect to the first priority objective of Te Mana o te Wai. Section 4.1 has proposed a series of criteria that are required to be met in order to exercise the abstraction below minimum flow. These criteria reduce the potential for the minimum flow abstraction to be exercised unnecessarily following the construction of the reservoir.

It is acknowledged that abstractions below minimum flow in exceptional circumstances or extended drought will have an effect on the river. This effect will, after the reservoir has been built, be extremely infrequent (eg only required in drought periods of 50 – 100 year return periods or less frequent) and will be less than the effect which is authorised via the current consent. The proposal to reduce and avoid such abstractions as far as possible and to provide a consent condition framework that requires engagement with iwi/hapū and post-event reviews and improvements to be undertaken is considered appropriate to minimise these effects as far as practicable whilst also providing for the second-tier priority of Te Mana o te Wai being the needs of people.

9.3.2 Effects of Climate Change on Hydrology and Projected Abstraction Effects

To ensure the robustness of the proposed water harvesting scheme, the effects of climate change on the flow regime in the river have been assessed. HDC, via its design consultants, engaged Williamson Water & Land Advisory to develop a catchment model to assess the impacts of nine climate change scenarios on the flow regime of the Ohau River catchment upstream of Rongomatane (refer Appendix E).

That assessment found that by 2030 – 2050, climate change effects are predicted to have little impact on key flow statistics. By 2081 – 2100, climate change effects are predicted to result in a small reduction in low flow statistics for the higher order RCP climate scenarios.

In the medium term, flow in the Ohau River is most likely to be controlled by the weather patterns experienced and not gradual climate change. Risks associated with drought are expected to be similar risks to the existing situation through until about 2050 (this has been assessed as "high" risk in the regional risk assessment discussed in Section 5.1). After 2050, risks associated with drought are considered to increase to extreme by 2100 on a regional scale.

Therefore, within the term of consent sought, there is not expected to be a significant change in the Ohau River flow regime on which the allocation framework and effects assessment has been based. The proposal is consistent with the recommended approach in the Regional Climate Change Risk Assessment for managing risks to water supply in the short to long term, being the addition and enhancement of storage, combined with an improved water demand management approach, in order to enhance the adaptive capacity of the water supply system.

It is therefore considered that the effects of climate change do not materially affect the assessment of effects included in this application and the proposal is consistent with the recommended regional approach for managing drought risks associated with climate change in the longer term.

9.3.3 Effects of Water Take and Associated Intakes for Provision of Construction Water for Ōtaki to North Levin State Highway 1 Project

The proposal includes enabling the abstraction of some of the allocation provided to HDC under this consent to be abstracted immediately upstream and downstream of the SH1 bridge in order to provide construction water for the Ōtaki to North Levin (Ō2NL Project) State Highway 1 project. It is

considered that this use is consistent with the general purpose of the use of water to support the community's social and economic wellbeing as it will enable the construction of a key infrastructure project in the district.

As discussed in Section 4.1.3, HDC recognises that it will have compliance responsibility for any such take. It proposes to enter into a formal agreement with NZTA for the use of this allocation, with that agreement being founded on the principle of Te Mana o te Wai. A high degree of communication between HDC and NZTA will be implemented with the amount of water which NZTA may be able to use varying on a day-to-day basis during peak periods to ensure compliance. NZTA proposes to abstract water into stormwater ponds which, for the purpose of the Ō2NL Project's construction period, are being re-purposed as water storage ponds. This means that abstraction not being available will not impede the Ō2NL Project's construction programme and also means that abstraction from the awa can be at average demand levels and does not need to meet peak demand for construction water.

As detailed in NZTA's Ō2NL Project consent application:

> *A strategy has been adopted for the abstraction of water to support construction of the Project that will minimise the overall construction water requirements, re-use water collected through construction, utilise existing sources (for example, boreholes), only take water from the existing Core Allocation of a catchment (unless water in streams and rivers is above median levels), only abstract water above minimum flow, and make extensive use of water storage to meet demand during any extended period of low flow. Water will be abstracted from a combination of sources to minimise any potential effect on the environment.*

This strategy will apply to any water used by NZTA under the consent sought by way of this application.

The proposed abstraction from the Ō2NL intake site is within the core allocation limit as prescribed in the One Plan. The One Plan allocation framework does not consider where within a water management area the allocation is abstracted. The proposal will mean that some of the allocation will be taken at a point further downstream than the current Levin water supply intake during the Ō2NL Project's construction period. By abstracting water further downstream where the river has received inflows from other tributaries, the effects will be no more than what is currently authorised at the WTP intake site.

The use of the water for this purpose is considered to be an example of efficient allocation of water as it enables some of the Council's existing allocation to be used for a short period of time for a specific infrastructure project that will support the social and economic wellbeing of the community in a way which avoids over-allocation of the river. If this water were not able to be made available for this use, the Ō2NL Project would need to source construction water from other water courses across the Ō2NL Project reach. This would increase the risk that there is insufficient water for construction purposes, requiring a slowing down of the construction of the Ō2NL Project, or resulting in significant cost increases as water will need to be sourced from watercourses further afield, and also generating additional greenhouse gas emissions costs of the project.

The proposed intake arrangements have been discussed in Section 4.7. If the surface intake option is adopted, no riverbed disturbance will be required and therefore there will be no bed disturbance effects. The intake screen will have a mesh aperture size not exceeding 3mm in diameter and an intake velocity of less than 0.3 m/s, consistent with the permitted activity criteria of Rule LF-TUD-R39. These screening details will ensure that fish and aquatic organisms are not entrained or captured. The use of the storage ponds also enables the water abstraction to be kept to average, rather than peak, rates therefore reducing the rate of take and impacts of the abstraction on the flow velocities in the immediate vicinity of the intake.

If the shallow bore intake option is adopted, some riverbed disturbance to construct the bores will be required and consent is sought for this activity. The riverbed disturbance is during the construction of the bores itself (i.e. not ongoing throughout the period of abstraction) and this is likely to be able to

be undertaken within a few days. The shallow bores will be located outside of the active channel and there is no requirement for any disturbance or machinery within the flowing water channel. Any disturbance from this construction is less than would be expected when a small fresh occurs (ie any short duration flood event that submerges the lower parts of the river channel).

The River in this area is assigned a value of Sites of Significance - Riparian for the purposes of protecting gravel and sand habitat for dotterels and mud/silt habitat and estuarine roosts for waders. The relevant habitat to be protected at this site is gravel and sand habitat, and there is potential that there may be nesting dotterels in the area. It is therefore proposed that a bird survey be conducted no earlier than 3 days prior to the bores being constructed and that the bore construction only proceed if that bird survey does not identify any active dotterel nests within 50m of the proposed work.

Overall, given the allocation sought at this intake is within the allocation framework authorised in the One Plan; that it provides for efficient allocation of water; and that bed disturbance activities are limited to a very small timeframe, scale and outside of the active channel, it is considered that the effects of this aspect of the proposal are no more than minor.

9.4 Water Quality Effects

In addition to the construction effects discussed above, the proposed activities have the potential to affect the water quality of the Ohau River through the routine maintenance of the infiltration gallery (in particular the activation of the air backwash system), and through the discharges from the groundwater drainage underneath the reservoir and from the reservoir spillway.

9.4.1 Effects of Infiltration Gallery Air Backwash System

This system has been discussed in Section 4.2 and will include intermittent backwash of an air / water mix (water sourced directly from the river via the infiltration gallery abstraction) through the gabion basket array beneath the river bed in order to remove silts or sediment build up in the gallery.

The ecological assessment in Appendix G assessed this activity and noted that this activity could potentially release sediment into the Ohau River and cause localised disturbance of the resident fish population during periods when it is in operation. However, the assessment found that:

> *"Operation of the air backwash system for routine maintenance is unlikely to have anything other than a minor effect on the aquatic environment. Any disturbance to aquatic fauna will be temporary, and the discharge of sediment is likely to be similar to that which occurs during natural events."*

A key principle underpinning the air backwash system is the ability to undertake more frequent, but less disturbing backwash cleaning of the intake gallery. The current intake at the water treatment plant requires significant, but less frequent bed disturbance which requires machinery to be used in the riverbed to undertake scarification and other activities (authorised under a resource consent specifically for this activity). In comparison, the air backwash system at the reservoir intake site will enable a much more frequent backwash operation so that there is not significant build-up of sediment in between backwashes. This means that there is less sediment to be dislodged when backwashing occurs. Further, the River in this location has a generally better water quality than at the existing WTP intake site given that it is upstream of, and on a separate tributary to, the slips in the catchment which are a large source of sediment in the river water. This means that there is less sediment to become entrained in the intake gallery that will require backwash. Operational practice during the commissioning period will determine how frequently the backwash system will need to operate.

Overall, and for the reasons set out above, it is considered that the effects of the backwash system will be no more than minor.

9.4.2 Effects of Groundwater Diversion and Discharge

The proposed reservoir includes a groundwater diversion and discharge system which will collect groundwater from below the reservoir and discharge it to ground on the river terrace. This system is critical for the integrity of the reservoir liner as it avoids groundwater pressure building up below the reservoir if groundwater levels were to naturally be above the base of the reservoir.

Discharge volumes from the groundwater system will vary depending on natural groundwater levels and seasonal variations. It is estimated that the discharge volumes will be in the order of 14-42 m^3/day. This will be discharged to ground on the river terrace in a way which will seep into the ground and / or may flow overland to reach the Ohau River. The quality of this discharge will be groundwater with no contaminants introduced.

At its maximum anticipated discharge rate of 42 m^3/day, the discharge - if it were to all reach the Ohau River - represents only 0.06% of the minimum flow for the River (820 L/s). Given the extremely low contribution of the discharge to the river flow; that this scenario of maximum groundwater discharge coinciding with minimum river flow is highly unlikely to occur but is a worst case estimate; and that the discharge is clean groundwater with no contaminants, it is considered that any effects from the discharge of groundwater will be less than minor.

The above has considered the effects of the discharge to the extent that it may enter the River flows. This is a conservative assessment of the effects of the discharge on the River. The discharge will not enter the River via a direct point source discharge. It is proposed to utilise the diverted groundwater in the proposed cultural effects offsetting works and wetland restoration to be carried out on the lower terrace. At present, some of the groundwater that will be diverted is likely to be appearing as surface water on the lower terrace via seeps and springs at the base of the terrace and contributing to the water in the wetland 2 site (refer Figure 3.12). The diverted groundwater will be directed to feed into the wetland restoration areas of sites 3-5 identified on the lower terrace to ensure an appropriate hydrological environment for the wetlands. The quality of water discharged will be the same as the groundwater that is currently entering these areas. It is therefore considered that the adverse effects of the diversion and discharge will be no more than minor.

During construction, sediment controls will be put in place to avoid sediment discharges as set out in the Erosion and Sediment Control Plan and discussed in section 4.3 above to ensure that the effects of any construction discharges are no more than minor.

With regard to the matters set out in Regulation 56 of the NES-FW to which discretion is restricted in relation to the assessment of the discharge of diverted groundwater to the wetland restoration areas at sites 3-5, it is considered that the key matter is (g), being the "social, economic, environmental and cultural benefits (if any) that are likely to result from the proposed activity (including the extent to which the activity may protect, maintain or enhance ecosystems)."

The purpose of this aspect of the proposal is to help ensure that there is an overall environmental and cultural benefit as a result of the project. The purpose of the discharge to the wetland areas is to increase their values and improve the hydrological regime. With the exception of the risk of sedimentation during construction, which has been addressed at length elsewhere, the discharge does not require particular offsetting or other management measures given its purpose and will result in a net benefit for those wetland areas.

9.4.3 Effects of Spillway Discharge

The spillway discharge will occur only under vary rare circumstances. The primary mechanism for a spillway discharge is when the reservoir is at its fullest level and there is heavy rainfall at the reservoir site. This may cause the reservoir level to rise above its maximum operating level and flows to be

discharged via the spillway. This is a design feature required to prevent overtopping of the embankments and subsequent potential failure of the reservoir.

In this event, it will be a mixture of stored reservoir water (being water previously abstracted from the Ohau River) and rainwater being discharged back to the Ohau River. The quality of the discharge water and the receiving environment is therefore considered to be the same. Given this scenario is initiated by heavy rainfall, the river is also expected to be well above its minimum flow levels and therefore less vulnerable to any discharge effects. The effects of the spillway discharge in this event are considered to be less than minor.

The other scenario for spillway discharge is a failure of the abstraction control system which results in the abstraction pumps continuing to operate when the reservoir level is full. In this case, the discharge would essentially be the return of water to the river immediately after its abstraction. The effects of this discharge are considered de minimus as it is return of river water to the river without any temporal delay. Any such discharge would also be temporary as the control system will include a series of back up alarms to advise the operator of the malfunction and, failing that, would be detected upon routine operational visits.

The final discharge scenario is in the event that the reservoir needs to be drawdown quickly for operational reasons. Routine operations and maintenance activities would not require this to be activated as the maintenance would be programmed at times when the reservoir level was low and /or the reservoir levels would be manipulated to be drawn down by preferential use of stored water to supply the community, and reduction in river abstraction. However, there may be times when the reservoir level would need to be dropped via discharge to the river, for example for inspection purposes following an earthquake to check on the structural integrity of the reservoir or to undertake repairs or to ensure adequate turn-over within the reservoir. In this event the discharge would be of stored water of similar quality to the River. The discharge rate would be limited by pump capacity to pump from the reservoir into the spillway and any such pump rate would not be sufficient to cause downstream flooding or similar effects.

The effects of the spillway discharge, under all of the scenarios where such a discharge may occur, are considered to be less than minor.

9.5 Ecological Effects

The potential ecological effects of the proposed activities that need to be considered include the potential disturbance and loss of habitat during the construction phase of the new intake; and the potential effects on the life supporting capacity and habitat for freshwater species arising from the water abstraction; and effects on natural inland wetlands.

9.5.1 Reservoir Intake

In terms of the construction phase, the potential effects include loss of habitat due to the riparian vegetation clearance, earthworks and intake infrastructure as well as disturbance and realignment of the riverbed to construct the infiltration gallery. These construction effects have been separately assessed in section 9.2 above. The ecological assessment (Appendix G) found that the riparian vegetation in this area was composed of tutu, toetoe and exotic pampas grass, with the understorey being a mixture of indigenous species including coprosma, mahoe and wheki. It states that “no rare or threatened indigenous vegetation was observed during the site visit, with all indigenous species being widespread and common”. The vegetation and habitat that will be disturbed therefore is not considered a rare, threatened or at-risk habitat in terms of RP-SCHED6 of the One Plan. It is noted that RP-SCHED6 states that any riparian margin not classified elsewhere in RP-SCHED6 as a rare or threatened habitat which is within 20 m landwards from a river with RP-SCHED2 value of Site of Significance – Aquatic must be considered to be at-risk whether it is indigenous or exotic. In this instance, the area where vegetation disturbance will occur is not a stretch of the river which has

RP-SCHED2 value of Site of Significance – Aquatic and therefore the riparian habitat is not considered "at risk". The ecological assessment states that the removal of riparian vegetation "will have minimal ecological effects". This notwithstanding, it also recommended a riparian planting programme to replace some of the vegetation removed with suitable indigenous species. This recommendation has been accepted by the Applicant and a condition is proposed to require the recommended riparian planting programme be developed and implemented thereby ensuring no net loss of riparian habitat quality. The effect of the proposed works on the riparian habitat and its ecological value is therefore considered to be less than minor.

The impact of the construction phase on the in-river habitat and fish species has also been assessed in section 9.2. This includes a series of mitigation measures including diversion of the flowing channel within the river bed to enable the works to be undertaken in the dry and prevent downstream sedimentation of the water and also to prevent effects on in-stream species from construction machinery in the active channel. It is noted that there will be some unavoidable effects of this diversion on macroinvertebrate species that are within the channel when it is diverted. These effects are limited to a length of the river of approximately 300 m. Given the small stretch of river affected and the short duration of the construction period, the effects of this disturbance are expected to be similar to a large flood flow which disturbs such species and the resultant time for macroinvertebrate species to re-establish.

A Fish Management Plan will be prepared to capture and relocate fish within the affected area prior to the works being undertaken, as well as from the temporary diversion channel prior to flow being reinstated to the permanent channel after completion of works. Further, the methodology involves temporary removal and stockpiling of the riverbed material and then reinstatement of the same at the same grade as the existing river bed after completion. This will ensure that the riverbed strata and the riffle, run, pool environment is maintained post construction. Following construction, the riverbed habitat will be the same as prior to construction. The effects of the intake construction on the in-river habitat and fish species are therefore considered to be less than minor.

9.5.2 Water Abstraction

The effects of the water abstraction, including on the life supporting capacity of the river, have been assessed in Section 9.3. The proposed abstraction regime is entirely within the allocation framework provided within the One Plan. The development of that allocation framework by Horizons Regional Council was informed by IFIM studies (Instream Flow Incremental Methodology) which found that between 700 and 800 L/s needed to be maintained in the Ohau River to provide for 80% of optimal habitat for most species. The minimum flow for the river has been set at 820 L/s (ie above the flow required to maintain 80% optimal trout habitat) and the proposal is not to abstract below minimum flow except in exceptional circumstances as described above. It therefore follows that the effects of the abstraction on trout rearing and spawning are within that anticipated in the setting of the allocation framework within the Regional Plan and are less than minor. Refer also to the discussion in Section 9.3.

9.5.3 Natural Inland Wetlands

The proposed reservoir will result in the loss of a small area of approximately 400 m^2 which has been assessed as having a "marginal classification" as a natural inland wetland. This is Site 2 in the Wildlands ecological assessment report in Appendix H and Figure 3.12 above. This wetland has been assessed by Wildlands as "highly modified" and with vegetation that is "predominantly exotic, and .. not ecologically significant". Wildlands have assessed Site 2 has having "little potential for ecological restoration".

The NES-FW requires that the Effects Management Hierarchy be applied to consideration of effects on natural inland wetlands. The Effects Management Hierarchy is defined in the NPSFM as follows:

***effects management hierarchy**, in relation to natural inland wetlands and rivers, means an approach to managing the adverse effects of an activity on the extent or values of a wetland or river (including cumulative effects and loss of potential value) that requires that:*

(a) adverse effects are avoided where practicable; then

(b) where adverse effects cannot be avoided, they are minimised where practicable; then

(c) where adverse effects cannot be minimised, they are remedied where practicable; then

(d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, aquatic offsetting is provided where possible; then

(e) if aquatic offsetting of more than minor residual adverse effects is not possible, aquatic compensation is provided; then if

(f) aquatic compensation is not appropriate, the activity itself is avoided

The adverse effects on Site 2 are not avoidable given the functional need to construct the proposed reservoir in a way which requires drainage and construction over the wetland (refer Appendix H). Nor can the effects on Site 2 be minimised given that the site is entirely within the reservoir footprint and that it has been assessed as being of "limited ecological value" (ie, it is difficult to minimise effects on values which are already considered to be of limited value). It is also not possible to remedy the effects of the proposed reservoir, as that would require mitigation to be carried out in the same location as Site 2. Application of the effects management hierarchy therefore requires aquatic offsetting to be provided. The ecological assessment report has identified that the loss of Site 2 "can be offset by the restoration of the degraded wetlands on the lower terrace".

Wildlands has identified that, while sites 3 to 5 on the lower terrace will not be directly affected, there is potential - although unlikely - for indirect effects due to sedimentation inputs during construction activity on the upper terrace are possible due to changes in surface and subsurface flows. The ecological assessment has identified that these effects can be avoided by implementing the following:

- Appropriate controls on sediment management during construction phase
- Maintaining the opportunity for surface flow from the upper terrace to travel to the lower terrace.

These avoidance methods will be implemented by the Applicant. All of the proposed earthworks will be undertaken in accordance with an Erosion and Sediment Control Plan consistent with the relevant guidelines, and a draft has been included in this application. Following construction there will still be conveyance of surface flows (albeit from a small catchment area given the reservoir will capture rainfall within the reservoir) to the lower terrace, as well as additional flows from the groundwater beneath the reservoir. Adverse effects on sites 3 to 5 will therefore be avoided, as required by the first tier of the Effects Management Hierarchy.

Wildlands have recommended ecological restoration of the lower terrace as this "would easily outweigh the adverse effects of very minor 'losses' on the upper terrace". An Ecological Restoration Plan has been recommended to guide this and should include:

- Definition of the area subject to the plan
- Stock exclusion
- Wetland planting
- Wetland riparian planting
- Terrestrial planting
- River riparian planting
- Monitoring and maintenance of plantings

- Pest animal monitoring and control
- Restoration / planting targets
- Reporting

The Cultural Offsetting Management Plan (Appendix L) which has been prepared to address cultural effects of the abstraction involves significant restoration of the lower terrace. The draft COMP includes all of the above elements and is considered to meet the purpose and content details of the recommended Ecological Restoration Plan. The Applicant has proposed conditions required the draft COMP to be finalised prior to implementation and that this include review by a suitably qualified ecologist to confirm that there will be no net loss of wetland extent or values.

Wildlands have therefore concluded that:

> *Restoration of the wetland areas on the lower floodplain of the Ohau River would easily mitigate the loss of Site 2, and this approach would very substantially outweigh the minor adverse effects associated with the loss or modification of this small, highly modified 'marginal' wetland.*

Therefore, it is considered that the effects of the proposal on natural inland wetlands will be positive as it will result in a net gain in wetland extent and values. Further, it will bring the restoration area into a consent condition framework that requires ongoing monitoring and maintenance of the restoration area to maintain the net gain in extent and values throughout the consent duration.

9.6 Flood Hazards

There are two aspects to flood hazards which need to be considered. Firstly, the impact of the proposed activities on the flood carrying capacity of the Ohau River in general and the Ohau Flood Control and Drainage Scheme in particular. Secondly, potential effects arising from the extremely unlikely event of a failure of the reservoir structure and subsequent quick release of the stored water into the Ohau River.

9.6.1 Effects on Flood Control and Drainage Scheme

In terms of flood carrying capacity of the river, the abstraction element of the proposal obviously does not have an adverse effect on flood carrying capacity.

The proposed reservoir intake is a sub-surface intake and there will be no structures within the riverbed after construction. Therefore, after construction it has no effect on the River's flood carrying capacity. During construction, the main channel will be diverted to a temporary channel within the river corridor which will be designed to ensure it has sufficient capacity to manage expected diverted flows. However, if a large flood event occurs during the construction period, it is expected that this will be conveyed via the diversion channel and the area where construction is occurring. Construction does not require significant material and equipment to be located within the riverbed works area while the site is being actively worked on. A Flood Contingency Plan will be developed as part of the integrated construction management plan and will include provisions for monitoring long term weather forecasts and for exiting the construction area and removal of all machinery in the event of anticipated or forecast flood flows. This will include making use of the Horizons Regional Council River Alert System and regular communications with the Horizons River Management Team. The Flood Contingency Plan will ensure that materials which may be in the riverbed which could pose a potential downstream risk will be removed from the riverbed prior to the flood event. The construction period for the in-river works is relatively short (approximately 2 months) and therefore these measures will be able to be easily implemented and reflect standard best practice construction methodology.

The proposed pipe bridge presents a potential constraint in terms of flood carrying capacity. However, the effect of this is considered less than minor as the proposed bridge will not result in any structures within the flood channel (ie no piers or structures in the river) and will be at the same height as the

existing road bridge. It therefore does not present any constraint or change the existing flood carrying capacity of the river.

The Ohau River is valued for Flood Control and Drainage Values in respect of the Ohau Manakau Scheme under the One Plan. This value applies from approximately 250 m downstream of the proposed reservoir intake site to the coastal marine area. In preparing this application, HDC has engaged with Horizons Regional Council's Area Engineer responsible for this scheme who advised verbally that they do not consider that the proposal will impact on the scheme and that there are no flood protection assets in the vicinity of the proposed works. They further advised that the Flood Control and Drainage Value has been applied in the upper Ohau in order to be able to undertake catchment improvement measures that may contribute to flood protection. The proposed activities do not impact on the ability to undertake such measures and do not impact on the Flood Control and Drainage Value.

9.6.2 Potential Effects in Event of Reservoir Embankment Breach

The proposed reservoir, when full, will hold 740,000 – 855,000 m^3, the larger volume being at the embankment crest level and therefore assumes that the freeboard height in the reservoir is fill. Such a scenario cannot occur, given the spillway level to allow for controlled overflows back into the river has a level set at lower than the embankment crest height and the spillway discharge at this level occurs via gravity and does not rely on operator intervention. Nonetheless, to assess the worst-case effects scenario, the total reservoir volume of 855,000 m^3 has been used in the analysis of effects of a potential reservoir embankment breach. This assessment is described in Section 3 and Appendix B of the Feasibility Design Report in Appendix B.

The reservoir is considered a large dam under New Zealand's Dam Safety Guidelines (NZDSG) and a dam break assessment is required to be undertaken in accordance with the procedures set out in those guidelines and under the Building (Dam Safety) Regulations 2022. Part of this process is a Potential Impact Classification, or PIC, which assesses the potential embankment failure mechanisms, assumes a worst case (ie dam full) breach occurs and assesses the potential impact of that breach. It includes modelling the area that would be inundated in this event and assesses the likely number of persons, property and significant sites affected. This then informs the level of design, construction and ongoing monitoring required to prevent such a breach scenario occurring. That is, the dam breach analysis is not one which is used to assess likely effects that may or may not be acceptable but is used to inform the design requirements to avoid adverse effects occurring.

Given the proposed reservoir is off-river and not affected by potential flood flows, and because of the proposed reservoir spillway, an embankment breach due to overtopping is not a credible failure mechanism and therefore has not been assessed. The only credible failure mechanisms for the reservoir (refer Table 20 of the Feasibility Design Report) are a liner failure resulting in concentrated seepage through the embankment; or a seismic event which would also cause a concentrated seepage through the embankment. Identifying the credible failure mechanisms informs the design and monitoring requirements to avoid such failures.

In terms of infrastructure at risk, the embankment breach scenario represents a flow generally equivalent to the 1:100 year flood at the reservoir site and dissipates (ie reduces) as it progresses further downstream. Assuming the existing Poads Road bridge over the Ohau River is capable of conveying the 100 year flood flow, this will not be affected by a breach of the reservoir. By the time the breach flows have reached the State Highway 1 bridge, the peak has reduced to be less than the mean annual flood and does not present a risk to the State Highway or other infrastructure. As above, this is a theoretical breach event, and the assessment informs the design and monitoring required to prevent such a breach occurring.

Based on the assessed population at risk in a breach scenario of 15 persons, the reservoir has been assessed as Potential Impact Classification of "Medium". It is noted that even if the assumptions made

in the assessment raised the population at risk significantly to any number up to 100, it would still be assessed as a Medium Potential Impact Classification under the Dam Safety Guidelines. Therefore, the reservoir will be designed, monitored and maintained to meet the design standard for a medium PIC dam.

A PIC assessment has been undertaken in accordance with the Building (Dam Safety) Regulations 2022. This assessment considers the hypothetical event of dam failure and does not take into account the likelihood of that failure. However, modern water retaining structures, such as the Poads Road Water Storage Reservoir, have an extremely low likelihood of failure. As such, the likelihood of Potential Loss of Life from dam failure is also considered extremely low. This high level of dam safety is achieved by specification of appropriate performance criteria used in the design and construction of a dam (regulated by the Building Code 2004) and by close monitoring and management throughout the operational life of a dam by means of a comprehensive Dam Safety Management System, as regulated by the Building (Dam Safety) Regulations 2022 for Medium and High PIC structures.

9.7 Effects on RP-SCHED2 Values

The One Plan RP-SCHED2 values for which the Ohau River is to be managed have been identified in Section 3.2.1. The values which have potential to be affected by the proposed activity have been assessed in detail above. For completeness, the following assesses the effects of the proposed activity on all of the RP-SCHED2 values relevant to this application and as identified in Section 3.2.1. RP-SCHED2 Values identified in Section 3.2.1 as not relevant to the proposed activity are not discussed.

- Life supporting capacity: As discussed above, the proposed activity will not affect the life supporting capacity of the river. The effects of the construction activities have been determined to be less than minor and the proposed abstraction is within the allocation framework determined as appropriate for supporting the life supporting capacity of the river during the development of the One Plan. The proposal will also significantly reduce the need for the Council to abstract when the river is at or below minimum flow.
- Aesthetics: The activities will not change the aesthetics of the river. The in-river works will be undertaken in the dry and will be undertaken in accordance with management plans and a construction methodology which is consistent with national best practice guidelines for such works. There are no discharges other than occasional discharges of water of the same quality as the source water and no chemicals or other contaminants will be discharged.
- Contact Recreation: The activities do not affect the ability for contact recreation activities to be undertaken and enjoyed. The abstraction is provided for within the allocation framework and will not affect the availability of water for contact recreation and the activities will not discharge any contaminants which may affect people's enjoyment of the river or its riparian areas for contact recreation purposes.
- Mauri: the applicant has engaged with iwi/hapū to understand the cultural values and impacts of the proposed activities, and a Cultural Offset Management Plan has been prepared to address effects of the abstraction on the mauri and habitat of the Ohau. The COMP requires offsetting to ensure that there is no net loss of mauri or habitat as a result of the proposed activities.
- Industrial Abstraction: There are no known industrial abstractions from the Ohau River. The proposed abstraction is sought within the allocation framework provided for in the One Plan and does not adversely affect the rights or abilities of any other users.
- Irrigation: There are some abstractions in the lower Ohau which are used for food production including likely irrigation activities. The proposed abstraction is within the allocation framework and does not prevent any other users from exercising any existing water permits. As discussed in Section 9.3, supplementary allocation above that sought by the Applicant, but within the One Plan allocation framework remains available for other users.

- Stockwater: As with other consumptive uses described above, the proposed abstraction does not affect any other users' ability to exercise existing legal rights to abstract water for this use.
- Existing Infrastructure: The proposal is enabled by consideration of this value, as it provides for the ongoing use and improved resilience of the Levin Water supply infrastructure. The assessment in Section 9.6 has also demonstrated that the proposal does not impact on the existing flood carrying capacity of the river and therefore does not impact on the roading or other infrastructure in, or near, the river corridor.
- Site of Significance – Aquatic. This value does not apply at the proposed reservoir intake site. As discussed in Section 9.3, the proposed abstraction does not adversely affect the hydrological or instream conditions and habitat and the effects on significant aquatic species are considered less than minor.
- Trout Fishery – Other. The allocation sought is within the allocation framework which includes establishment of a minimum flow to protect habitat for trout and other species. The effects of the proposal on trout fishery are therefore considered less than minor.
- Trout Spawning. The allocation sought is within the allocation framework which includes establishment of a minimum flow to protect habitat for trout spawning. The effects of the proposal on trout spawning are therefore considered less than minor.
- Water Supply. The proposed activities are consistent with and enabled by this value. The proposed activities enable a significant improvement to the management of the Levin Water supply which is the only water supply which is provided for via the application of this value to the Ohau River.
- Domestic Food Supply. There are some abstractions in the lower Ohau which are used for food production. The proposed abstraction is within the allocation framework and does not prevent any other users from exercising any existing water permits. As discussed in Section 9.3, supplementary allocation above that sought by the Applicant, but within the One Plan allocation framework remains available for other users. The proposal does not include the discharge of any contaminants and therefore it does not affect the quality of water within the Ohau river for this use.
- Flood Control and Drainage. As assessed in section 9.6, the proposal does not affect any of the Flood Control and Drainage assets on the Ohau River nor does it impact on the flood carrying capacity of the River.

The proposal therefore provides for, and does not adversely affect, any of the values identified in the One Plan for which the Ohau River and its tributaries are to be managed. The effects of the proposal on these values are considered to be less than minor.

10 PROPOSED CONDITIONS OF CONSENT

Throughout this AEE several measures have been identified as consent conditions proposed by the Applicant in order to ensure that there are appropriate controls and oversight of the proposed activities and that measures offered to manage environmental effects are adhered to throughout the implementation of the project and the term of consent. These have been developed into a suite of proposed consent conditions which are included in Appendix M.

The following diagrams summarise the proposed consent conditions.

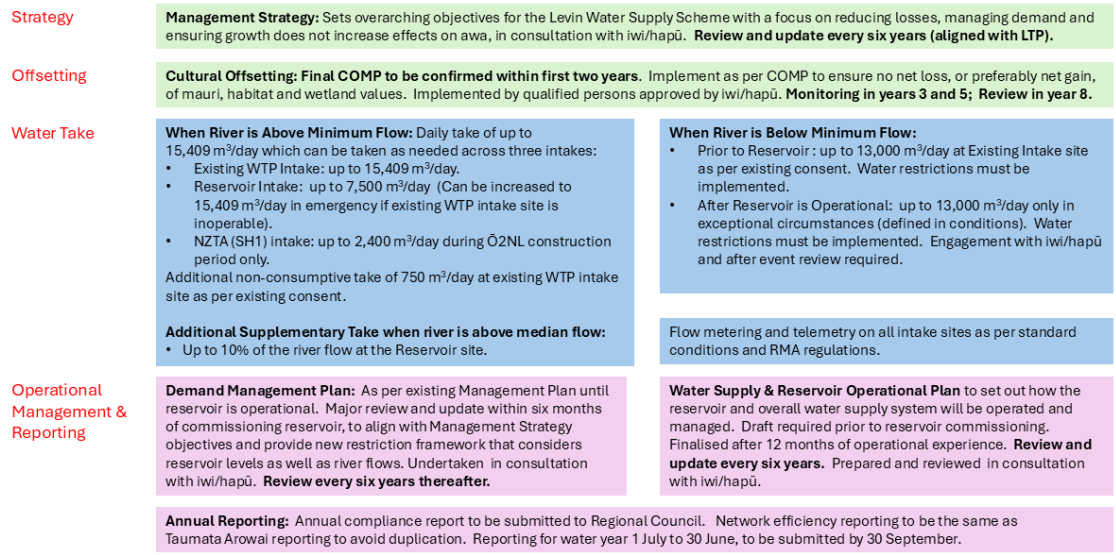

Figure 10.1: Proposed Consent Conditions for Operation of the Scheme

It is proposed to prepare a "Management Strategy for the Levin Drinking Water Scheme" (Management Strategy) which will provide the over-arching guidance and direction for the operation of the Levin water supply scheme. The proposed consent condition requires that the Council, as consent holder, adopt the following Management Objectives for the scheme and requires the Management Strategy to detail how these will be achieved during the term of the consent:

- The amount of treated drinking water lost to leakage from the Levin water supply system will be reduced.
- Existing and new households will be supported to invest in and construct rainwater tanks.
- Beneficial uses for treated wastewater will be identified, investigated and where proven feasible adopted to minimise freshwater takes.
- Sustainable outcomes for resource management including minimising energy use must be achieved.
- Freshwater takes during low flow will be minimised through ongoing review and implementation of best management practice.
- The effects of the drinking water take will not grow over time in response to urban growth as a result of the Management Strategy.

The proposed condition requires the consent holder consult with iwi and hapū during the preparation of the Management Strategy and that the Management Strategy be updated no less frequently than every six years. This will allow the update of the Management Strategy to be aligned with alternate Long Term Plan (LTP) cycles enabling any funding implications from the review and update of the Management Strategy to be provided for in the Council's LTP budget.

The proposed consent conditions require operational plans for the system (ie the Demand Management Plan and Water Supply and Reservoir Operational Plan) to give effect to the Management Strategy. Similarly, their review is required no less frequently than every six years, again enabling alignment with alternative LTP cycles so that any funding implications arising from the review can be provided for in the Council's LTP budget.

The preparation and review of the Management Strategy and operational plans is required to be undertaken in consultation with iwi and hapū.

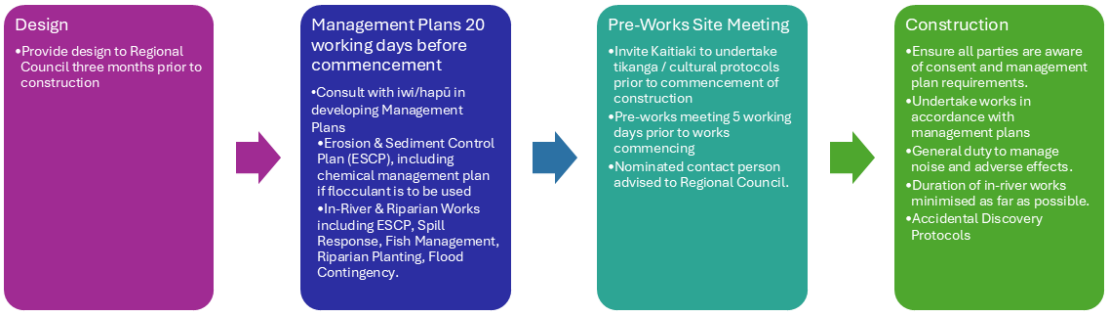

Figure 10.2: Summary of Construction Conditions

The construction conditions offered are summarised in Figure 10.2 above. These are standard construction conditions for projects of this nature and scale and require construction management plans, including erosion and sediment control, spill response fish management, riparian planting and flood contingency management plans to be prepared and provided to Regional Council prior to commencement of works. The proposed conditions require that these be developed in consultation with iwi/hapū and that iwi/hapū be invited to undertake tikanga and cultural protocols prior to commencement of works.

The use of Construction Management Plans (CMP) facilitates innovative and adaptive construction methods to be utilised and provides for flexibility in response to matters encountered during construction while ensuring that potential environmental effects are appropriately managed. As discussed above, a single integrated CMP is proposed for the in-river works. This is expected to avoid duplication of information (eg roles and responsibilities) across multiple plans, require integrated planning and coordination to manage potential effects and make it easier for the contractor, operators, and consent authority to manage implementation and oversight. As a consequence, the integrated CMP is expected to be more effective at managing potential effects than a series of separate management plans.

11 RMA AFFECTED PARTIES AND CONSULTATION

This section details the consultation and engagement which has been undertaken with parties considered to be potentially affected by the proposed activities in terms of section 95 of the RMA. It must be noted that the decision to proceed with this project, the way in which the Levin Water supply is managed and operated, and the funding decision to implement the project is subject to the Local Government Act consultative procedures and are outside of the scope of this application.

Muaūpoko Tribal Authority (MTA)

Council has engaged actively with in the development of this proposal, as has been described earlier.

The Applicant recognises that the engagement and consultation undertaken with MTA as discussed in an earlier section does not necessarily preclude MTA from being considered as a section 95 RMA affected party and that, in accordance with both natural justice as part of the principle of self-determination, it is for MTA to decide if it considers itself to be so affected. HDC will continue to actively engage with MTA via the consenting, design, construction and operational phases of the project.

Te Runanga o Raukawa & hapū - Ngāti Tūkorehe, Ngāti Kikopiri, Ngāti Hikitanga

Council has actively engaged with Raukawa iwi and hapū in the development of this proposal, as has been described earlier.

The Applicant recognises that the engagement and consultation undertaken with Raukawa iwi and hapū as discussed in an earlier section does not necessarily preclude these parties from being considered as affected in terms of section 95 RMA and that, in accordance with both natural justice as part of the principle of self-determination, it is for Raukawa iwi and hapū to decide if it they consider themselves to be so affected. HDC will continue to actively engage with Raukawa iwi and hapū via the consenting, design, construction and operational phases of the project.

Landowner of Intake Site Works

While the reservoir and new pipeline will be constructed on land owned by the applicant, HDC and / or road reserve under HDC's control as Road Controlling Authority, the new reservoir intake and associated infrastructure is located on the adjacent landowner's property. This property, being Lot 1 DP 12594, extends across the river bed and the intake is required to be constructed on this property. There is little scope to move the intake location as any further upstream the bed substrate becomes bedrock and an infiltration gallery option is not possible, and any further downstream (ie further downstream such that the intake could be located on land owned by HDC) the alluvial terrace is lower than the indicative flood level and siting the intake downstream would mean that associated structures such as sumps and backwash air pumps would be at risk during flooding.

HDC is currently engaging with this landowner with respect to an easement/property rights over this area and associated mitigation.

Department of Conservation

Detail of the proposal have been provided to the Department of Conservation along with an offer to meet to discuss the project and / or undertake a site visit in the early stages of the project development (2022). The Department of Conservation has advised that they have received the information and will be in contact with any feedback (January 2023). To date, no feedback has been received.

Fish and Game Council

Details of the proposal have been provided to the Wellington Fish and Game Council in the early stages of the project, along with a copy of the draft ecological assessment report, and HDC's consultant planner has met with the Fish and Game Council's Resource Officer to provide background information and discuss the project.

Horizons Regional Council – Rivers Management Team

Details of the proposal have been provided to the Horizons Regional Council – Rivers Management Team and HDC's consultant planner has met with the Area Engineer responsible for the Ohau-Manakau River and Drainage Scheme. The Area Engineer advised that there were no scheme assets which would be affected by the proposal and agreed that the proposed pipe bridge (being a single span at the same height as the existing road bridge) would not affect the flood carrying capacity of the river.

New Zealand Transport Agency Waka Kotahi (NZTA)

The applicant has actively engaged with NZTA in the preparation of this application as far as it relates to the use of water to support the construction of the Ōtaki to North Levin (Ō2NL) road. This engagement has been to ensure that there is efficient use and allocation of water by enabling the council to seek appropriate consents to secure the medium to long term supply for the community whilst also ensuring that allocated water is able to be used efficiently in the short term via use for the construction of the Ō2NL Project, being infrastructure of regional or national importance under Policy EIT-P1 of the One Plan.

Neighbouring Properties

The properties directly adjacent to the sites of works that are not owned by the Applicant, include Lot 3 DP 555714 which is adjacent to the pipe bridge site on the downstream side. This property was sold via a subdivision process undertaken by HDC in 2021, and is subject to a no objection clause (by way of a covenant on the title) regarding HDC establishing a water storage facility on the adjacent land. The pipe bridge is an associated activity and is one that is permitted by the network utility provisions of the District Plan. Any effects on the adjacent property associated with the pipe bridge will be temporary in nature and construction related and it is considered that any such effects will be minor or less than minor.

The site adjacent to the property on which the intake structure will be located is Lot 1 DP 63053. Again, the effects of the intake structure on this property will be temporary and construction related and are considered to be minor or less than minor.

12 POLICY AND PLANNING ASSESSMENT

Section 5 of this AEE presented a summary of the statutory and policy drivers that have been determinative in establishing the need for the reservoir and this application, and in shaping how the overall proposal has been developed. In summary:

- The Applicant has obligations under the Water Services Act and the Local Government Act to provide safe drinking water supply of sufficient quantity to its community, and to do so in a way which gives effect to Te Mana o te Wai.
- The Levin water supply has been identified as one which has high to extreme climate change risks, as determined by the Regional Council's Regional Climate Change Risk Assessment. That Risk Assessment further identifies that responding to this risk will require the "enhancement of storage and ability to manage water demand levels - particularly in areas such as … Levin where development and growth is occurring." The proposal is consistent with this recommended response to climate change risks to water supply.
- The Levin water supply is required to be recognised as regionally significant infrastructure under the Regional Policy Statement, which also requires that infrastructure be provided in a coordinated, integrated and efficient manner to provide for sufficient development capacity for housing and business uses.
- The community's water demand has been assessed as being reasonable and justifiable in accordance with the provisions of the Regional Policy Statement and the projected growth demands (which are based on the same per-capita demand as existing) are therefore also considered to be reasonable and justifiable. Further, the Council has invested, and continues to invest, significant expenditure in addressing leakage throughout the network and installing universal metering to enable effective and efficient demand management.
- The National Policy Statement on Urban Development requires that sufficient development capacity to meet expected demand for housing and for business land over the short, medium and long term. It also specifies that "sufficient development capacity" requires the land to be infrastructure ready. The significant increase in growth that has occurred since the current Levin water supply consent was granted, and the projected growth that has been zoned and is yet to occur, requires that the Council ensure that it has sufficient capacity within its water supply system to meet these growth demands. This is not the case with the current consent, and the water harvesting and storage proposal enables sufficient capacity to be met whilst also giving effect to Te Mana o te Wai by avoiding and reducing the effects of the abstraction at minimum flow.

The following sets out a detailed assessment of the proposal against the matters specified in Section 104 and Part 2 of the RMA.

12.1 Section 104 Matters

Section 104 of the RMA sets out the matters which the consent authority must have regard to, subject to Part 2 and Section 77 of the Act, when considering an application for resource consent. An assessment against Part of the RMA is provided in Section 12.2 below. Section 77M of the Act relating to Medium Density Residential Standards is not relevant to the proposed activities.

The following sections provide consideration of the relevant matters set out in section 104 RMA, to assist in the consideration and determination of the Application.

Section 104(1)(a) Any actual and potential effects on the environment of allowing the activity

The actual and potential effects of the proposed activities are addressed in detail in section 9 of this Application. All actual and potential adverse effects are assessed as being minor or less than minor, but not more than minor. The project also provides for positive effects in terms of providing for urban development and growth while improving resilience of the scheme; reducing the need for abstraction below minimum flow thereby reducing the effects of the current consented abstraction on the river; and enabling cultural offsetting and habitat and wetland restoration.

Section 104(1)(ab) Any measure proposed or agreed by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity

The Applicant acknowledges that the proposed taking of water from the Ohau River will have an effect on the River in the sense that it does not enable the River to be retained in its natural state, albeit that takes of the volumes proposed are already consented (ie the River is already not in its natural state). Additionally, the proposed intake structure will have an effect on the bed of the River, especially during construction and likewise the Reservoir will have an effect on the existing environment in the sense that it is large scale infrastructure being introduced into an environment where this does not currently exist.

However, as set out in section 9 of this Application, it is considered that the proposed operational framework for the water take and the scope of the proposed physical works have been set out in such a way so as to avoid more than minor adverse environmental effects and that effects that do arise will be remedied or mitigated to the extent possible such that they are minor or, less than minor. Further, the overall effects of the project will be significantly beneficial in terms of reducing existing effects on the Ohau River and providing resilience improvements for the water supply network.

Irrespective that the effects of the proposal will either be positive, minor or less than minor, the Applicant recognises that effects of the abstraction on the mauri of the awa and ground disturbance to construct the reservoir have been identified as a concern by iwi and has therefore agreed to undertake offsetting activities to not only address these effects but, provide a positive outcome.

The Cultural Offsetting Management Plan (COMP) has been developed in order to guide and direct the offsetting activities. The proposed conditions require the COMP to be developed and implemented on a timeframe that is independent from the reservoir construction and thereby ensure that there is no delay in undertaking offsetting activities. The proposed COMP has also been assessed as providing offsetting that will more than outweigh the effects of the reservoir construction on the natural inland wetland (of marginal classification) currently within the proposed reservoir footprint.

It is considered that COMP will assist in ensuring overall positive effects on the environment as a result of the proposed new large scale infrastructure.

Section 104(1)(b)(i) Any Relevant Provisions of a National Environmental Standard

There are three National Environmental Standards (NES) that are potentially relevant to this application.

National Environmental Standard for Sources of Drinking Water 2007 **(NES Drinking Water)**

The NES Drinking water sets requirements for protecting sources of human drinking water from becoming contaminated. Although, the activities will occur upstream and in close proximity to a drinking water source, they are not barred by regulations 7, 8, 10 or 12 of the NES Drinking Water because the activities will not breach the health quality criteria and guideline values set out in the NES Drinking Water. There are no other drinking water supply takes downstream of the proposed activities that trigger the regulations of the NES Drinking Water.

It is noted that the Applicant is the same entity as the Water Services Provider for the Levin water supply. The Levin water supply is the only registered drinking water supply sourcing water from the Ohau River which services no fewer than 501 people for not less than 60 days each calendar year. Regulations 7, 8, and 10 only apply to activities which may affect registered drinking water supplies meeting this population threshold. Further there are no registered drinking water supplies sourcing water from the Ohau River that service no fewer than 25 persons, and therefore regulation 12 also does not apply.

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (NESCS)

The NESCS provides a nationally consistent set of planning controls and soil values to ensure that land that has been affected by contaminants is appropriately identified and assessed before land disturbance and/or development occurs and, if necessary, remediate, or the contaminants contained to make the land safe for human use. The NESCS applies if an activity or industry described in the Hazardous Activities and Industries List ("HAIL") is undertaken, has been undertaken, or more likely than not, is being or has been undertaken on the land. The areas where the intake is proposed, the reservoir, and the pipe bridge are not included in the HAIL and there is no indication that these areas are contaminated making it very unlikely that the NESCS is relevant to the construction (land use) aspects of the proposal. However, if any evidence of contamination were to be discovered as part of the detailed design and preparatory works for the construction of the Reservoir, consent from the District Council could and would be sought under the NESCS at that time.

National Environmental Standard for Freshwater 2020 **(NES Freshwater)**

The proposal includes activities that require consent under the NES Freshwater in relation to wetlands. The regulations that are relevant have been identified in Section 8 of this AEE and the matters requiring consideration have been assessed in detail in Section 9.4.2 and 9.5.3 and are summarised and discussed as follows.

Natural Inland Wetland within Reservoir Footprint
In summary, there is an area within the reservoir footprint that has been assessed as a Natural Inland Wetland of marginal classification. Taking a precautionary approach, it has been assumed that this area does meet the Natural Inland Wetland definition of the NES Freshwater and consent is required to undertake earthworks within and within 100 m of the wetland, and to drain the wetland.

The reservoir is 'specified infrastructure' as it meets the NPSFM definition of specified infrastructure which includes "any water storage infrastructure". There is therefore a consenting pathway for the works affecting the Natural Inland Wetland as a Discretionary Activity under Regulation 45 of the NES Freshwater. For consent to be granted under Regulation 45, the consent authority must:

a. Be satisfied that the specified infrastructure will provide significant national or regional benefits. In this case, the proposal is for infrastructure which is recognised as nationally or regionally significant in the Regional Policy Statement; provides for projected community growth; improves the resilience of the water supply system; and addresses a high-extreme climate change risk identified in the Regional Climate Change Risk Assessment. It therefore provides significant regional, if not national, benefits.

b. Be satisfied that there is a functional need for the specified infrastructure in that location. A functional need assessment (Appendix K) has found that there is a functional need for the reservoir to be in the proposed location as it is the only site which has sufficient land; access to a suitable intake site on the Ohau River where there is sufficient and good quality source water; and has suitable and sufficient area to enable mauri and habitat enhancement to offset cultural effects of the abstraction. In addition, it was found that a smaller reservoir on the site (such that the Natural Inland Wetland would not be impacted), would not provide sufficient storage to avoid the need to abstract from the Ohau River below minimum flow.

c. Apply the Effects Management Hierarchy. The effects management hierarchy has been applied and discussed in detail in section 9.5.3. This has found that the effects on the Natural Inland Wetland are not avoidable or able to be minimised given the functional need to construct the reservoir in that location. Nor can they be remedied at the same location as the existing wetland. The ecological assessment has confirmed that the effects "can be offset by the restoration of the degraded wetlands on the lower terrace" as is proposed through the Cultural Offsetting Management Plan. It has also found that ecological restoration of the lower terrace "would easily outweigh the adverse effects of very minor 'losses' on the upper terrace." The ecological assessment also found that any potential adverse effects on the wetlands on the lower terrace can be avoided. Therefore, the effects management hierarchy has been applied.

The tests of Regulation 45(a) to (c) have been met and consent is therefore able to be granted as a Discretionary Activity for the works impacting the Natural Inland Wetland.

Natural Inland Wetlands on Lower Terrace (Restoration / Enhancement Area)
Consent is also sought for the discharge of groundwater from under the reservoir into the natural inland wetland areas on the lower terrace. This has been assessed as a Restricted Discretionary under Regulation 39(3A) of the NES Freshwater. The matters to which discretion has been restricted are specified in Regulation 56 of the NES Freshwater. These are assessed as follows:

a. *The extent to which the nature, scale, timing, intensity and location of the activity may have adverse effects on the existing and potential values and extent of the natural inland wetland; the seasonal and annual hydrological regime and the passage of fish in the natural inland wetland.*
The proposed works will have an overall positive effect on the natural inland wetlands of the lower terrace and will result in an increase in values and extent. The ecological assessment has found that any adverse effects can be avoided by implementation of appropriate controls on sediment management and maintaining the opportunity for flows from the upper terrace to travel to the lower terrace, as proposed in the application.

b. *Whether there are practicable alternatives to undertaking the activity.*
As discussed above, and in the Functional Need memo in Appendix K, there are no practicable alternatives to undertaking the proposed activity.

c. *The extent to which those adverse effects will be managed to avoid the loss of extent to the natural inland wetland and its values*.
As stated above, the ecological assessment has found that any adverse effects can be avoided by implementation of appropriate controls on sediment management and maintaining the opportunity for flows from the upper terrace to travel to the lower terrace, as proposed in the application. The proposed restoration / enhancement will more than likely result in an increase in the wetland extent and values and conditions are proposed to ensure no net loss on wetland extent or values.

d. *Other measures to minimise or remedy those adverse effects.*
Other measures are not necessary as any potential adverse effects are able to be avoided.

e. *how any of those adverse effects that are more than minor may be offset or compensated for if they cannot be avoided, minimised, or remedied.*
Ther are no adverse effects that are more than minor, and therefore there is no requirement for offsetting or compensation.

the extent to which the effects of the activity will be managed through applying the effects management hierarchy:
Any potential effects are able to be avoided, in accordance with the first priority under the effects management hierarchy.

f. *the risk of flooding upstream or downstream of the natural inland wetland, and the measures to avoid, minimise, or remedy that risk.*
The natural inland wetlands are located on a floodplain terrace which is expected to receive floodwaters during larger events as part of the natural hydrological regime. The proposal does not affect, in any way, the flooding risks or frequency that naturally occurs.

g. *the social, economic, environmental, and cultural benefits (if any) that are likely to result from the proposed activity (including the extent to which the activity may protect, maintain, or enhance ecosystems).*
The overall project has positive social and economic effects as it enables the provision of safe and sufficient water supply to the community for current and future needs. It has environmental benefits in that it will avoid, in all but exceptional circumstances, the need to abstract from the river below minimum flow, and implementation of the Cultural Offsetting Management Plan will ensure that there is no net loss, and likely a net gain, in terms of mauri and habitat values.

The assessment against the matters of discretion listed in Regulation 56 demonstrates that any effects of the proposed activity as it relates to the natural inland wetlands on the lower terrace will be less than minor, if not positive, and that there are no matters which would preclude grant of consent.

There are no other consenting requirements under the NES Freshwater, noting that one of the reasons that a subsurface intake was chosen for the proposal was to avoid on-going effects on fish passage. There are potential temporary impacts on fish passage during construction, which will be managed via a diversion channel and fish relocation as described in detail previously.

Section 104(1)(b)(ii) Any Relevant Provisions of Other Regulations

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 are relevant to the proposed water take given that the proposal is for fresh water to be taken at a rate of more than 5 litres/second. Section 4.1.3 has discussed how the applicant proposes to meter and report on the amount of water taken at each intake and across the system. The Applicant would expect that the standard conditions relating to measurements, records and reporting would be imposed on any grant of consent, with the requirement for metering, records and reporting to apply at each of the intake sites such that the proposal would comply with the Water Take regulations.

There are no other regulations that are relevant to the assessment and determination of the Application.

Section 104(1)(b)(iii) Any Relevant Provisions of a National Policy Statement

National Policy Statement for Freshwater Management 2023

The NPSFM supports improved freshwater management in New Zealand and establishes Te Mana o te Wai as a fundamental concept relevant to all freshwater management. It directs regional councils to establish objectives and set limits for freshwater in their regional plans.

The NPSFM requirement to give effect to Te Mana o te Wai is a key driver for the project, as set out in detail in section 5 of this Application. It is considered that the proposal clearly gives effect to the Te Mana o te Wai by avoiding and reducing effects on the river as far as possible while also providing for the wellbeing of the Levin community.

The proposal is considered to be consistent with the policies of the NPSFM as set out below.

Table 12.1: NPSFM23 Policy Assessment

NPSFM23 Policy	Assessment
Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai	Refer section 5 of this application, and the analysis provided in Table 5.1. The proposal will reduce the environmental effects of the drinking water supply on the Ohau River by enabling the Council to avoid, in all but exceptional circumstances, the abstraction of water from the Ohau River during times of minimum flow.
Policy 2: Tangata whenua are actively involved in freshwater management (including decision making processes), and Māori freshwater values are identified and provided for.	This policy is being met by way of on-going engagement with iwi / hapū and treaty partners in relation to the project and the development of this application. Further, the Applicant proposes a suite of consent conditions which require the ongoing consultation, engagement and involvement of iwi / hapū through the development of the Management Strategy for the scheme; operational management plans for the reservoir and network demand management and through active involvement in the management of construction effects.
Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.	This policy is met through the robust options assessment included in this application, the integration of the proposal with land use planning initiatives and strategies and the hydrology and effects assessments included herein.
Policy 4: Freshwater is managed as part of New Zealand's integrated response to climate change.	One of the key drivers for the project is to increase resilience to climate change, as set out in section 5.
Policy 5: Freshwater is managed (including through a National Objectives Framework) to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.	The health and well being of the Ohau River is maintained if not improved, through the proposed activities for example, by enabling the Council to avoid, in all but exceptional circumstances, the abstraction of water from the Ohau River during times of minimum flow.
Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.	There will be no overall loss of natural inland wetlands as a result of the proposed activities rather, there will be a net gain in wetland biodiversity values. A small area which may be classified (albeit marginally) as a natural inland wetland and which has been assessed as being of low ecological value will be lost as a result of the proposal. However, the Applicant has agreed to the proposed cultural and wetland offsetting and restoration activities which will deliver a net gain of natural inland wetland extent and values substantially outweighing the loss of this area.

NPSFM23 Policy	Assessment
Policy 7: The loss of river extent and values is avoided to the extent practicable.	It is considered that there will be no loss of river extent and values as a result of the proposed activities.
Policy 8: The significant values of outstanding water bodies are protected.	Whilst the Ohau River is not an 'outstanding water body' in terms of the Regional Plan, its significance to iwi / hapū and communities in the area is recognised. It is considered that the intrinsic values of the River will continue to be able to be expressed and that its significance will not be compromised by the proposed activities.
Policy 9: The habitats of indigenous freshwater species are protected.	Adverse effects on freshwater habitats are able to be avoided through use of a subsurface intake rather than an alternative arrangement; construction effects are able to be appropriately mitigated including, replacement of removed vegetation with indigenous species; and the proposed water take is within the core allocation framework for the water body, other than in exceptional circumstances. It is considered that the habitats of indigenous freshwater species are able to be protected in carrying out the proposed activities, in accordance with this policy. Implementation of the proposed COMP will ensure not net loss, and preferably a net gain, with respect to mauri and habitat values.
Policy 10: The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.	Effects of the proposed activities on these habitats will be less than minor and the application is consistent with this policy.
Policy 11: Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.	As set out in detail within this Application, the Regional water management framework has been a key driver for this application, and particularly the core allocation and supplementary allocation provisions. The proposal does not include an activity that would constitute over allocation and is considered to be an efficient use of water and therefore consistency with this policy is achieved.
Policy 12: The national target (as set out in Appendix 3) for water quality improvement is achieved.	The proposed discharges will have less than minor effects that will not affect the national target for water quality improvement. Likewise, the proposed takes will not contribute to an inability to achieve this target.
Policy 13: The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.	This proposal is not of specific relevance to the proposed activities. This notwithstanding, implementation of the COMP introduces a framework for monitoring the cultural health of the awa in this area.
Policy 14: Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.	This proposal is not of specific relevance to the proposed activities.
Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.	It is considered that the proposal contributes to the ability for this policy to be carried out by allowing individuals and businesses to access fresh drinking water.

National Policy Statement for Urban Development 2020 **(NPSUD20)**

The NPSUD20 is relevant as a key policy driver in terms of the need to be able to supply Levin and surrounds with additional water, as discussed within section 5 of this Application. As explained above, the NPSUD obliges the Applicant to provide sufficient development capacity to meet expected demand for housing and business land and requires the Applicant to be satisfied that the additional infrastructure to service the development capacity is likely to be available. The growth rate that has occurred since the existing consent was granted, and the projected growth rates over the term of consent sought - including through the development of housing areas which have recently been zoned via the Taraika plan change - are such that the current consent does not provide sufficient water for the housing and business land needs to be met. The proposal will enable the council to implement a water harvesting and storage regime that will provide sufficient water to meet projected growth needs and enable council to fulfil its obligation to provide infrastructure ready land for housing and business development.

The consents sought by way of this application are a critical component to the Applicant being able to meet its obligations under the NPSUD so that it can provide municipal water supply to support well-planned growth in Levin.

There are no specific considerations in terms of the proposed physical works under this NPS.

National Policy Statement for Highly Productive Land 2022 **(NPS Highly Productive Land)**

The NPS Highly Productive Land seeks to protect highly productive land for use in land based primary production. This NPS is not of specific relevance to the proposal because the proposed activities are not located on land that is classified as 'highly productive' for the purpose of this NPS. The Regional Council has not yet mapped highly productive land in its Regional Policy Statement. Clause 3.5(7) of the NPS Highly Productive Land states that until maps of highly productive land are operative in a regional policy statement, highly productive land (for the purpose of the NPS) is defined as land that:

- is zoned general rural or rural production land AND is Land Use Capability (LUC) class 1, 2 or 3; but
- is not land identified for future urban development or subject to a Council initiated or an adopted, notified plan change to rezone it from general rural or rural production to urban or rural lifestyle.

The site is zoned rural and is not identified for future urban development or subject to a plan change. The LUC Class for the reservoir site is LUC 4 and the lower floodplain terrace is LUC6. As the site is not LUC Class 1, 2, or 3 it is not Highly Productive Land and the NPS Highly Productive Land does not apply.

Section 104(1)(b)(iv) Any Relevant Provisions of the New Zealand Coastal Policy Statement

The NZCPS is not relevant to the consideration of this Application.

Section 104(1)(b)(v) Any Relevant Provisions of a Regional Policy Statement or Proposed Regional Policy Statement

The Regional Policy Statement of the One Plan (RPS) includes a significant number of issues, objectives and policies that are relevant to this application. The most relevant aspects of the RPS are the provisions that relate to the management of freshwater, biodiversity and cultural values. The Proposal's consistency with the RPS is discussed in the table below.

Table 12.2: Regional Policy Statement Assessment

RPS Provision	Comment/Assessment
Resource Management Issues of Significance to Iwi Authorities	
Objective RMIA-O1: Resource Management 1. To have regard to the mauri of natural and physical resources to enable hapū and iwi to provide for their social, economic and cultural wellbeing. 2. Kaitiakitanga must be given particular regard and the relationship of hapū and iwi with their ancestral lands, water, sites, wāhi tapu and other taonga (including wāhi tūpuna) must be recognised and provided for through resource management processes.	The Applicant has given effect to this objective by engaging with iwi and hapū throughout the development of the proposal and offering conditions which provide for the active involvement of iwi and hapū throughout the term of consent. For example, iwi / hapū must be provided with an opportunity to input into the draft management plans as well as their review. Further, the Applicant has accepted MTA's recommendations for cultural offsetting and has worked with MTA to develop a draft COMP to be finalised and implemented as conditions of consent. The objective of the COMP is to ensure that there is no net loss of mauri and habitat availability as a result of the proposed activities. It is therefore considered that the proposal is consistent with Policy RMIA-O1.
Policy RMIA-P1: Hapū and iwi involvement in resource management The Regional Council must enable and foster kaitiakitanga and the relationship between hapū and iwi and their ancestral lands, water, sites, wāhi tapu and other taonga (including wāhi tūpuna) through increased involvement of hapū and iwi in resource management processes including: 1. … 2. recognition of existing arrangements and agreements between resource users, local authorities and hapū or iwi. 3. … 4. … 5. … 6. … 7. the Regional Council having regard to iwi management plans lodged with Council. 8. involvement of hapū or iwi in resource consent decision-making and planning processes in the ways agreed in the memoranda of partnership and joint management.	As detailed in Section 7, the Applicant has involved hapū and iwi in the development of the proposal, and is offering consent conditions which enable their ongoing involvement throughout the term of the consent. For example, in addition to providing input into management plans, iwi are afforded an opportunity to comment on any issues as part of the annual report of compliance. It is considered that the proposal is consistent with Policy RMIA-P1
Policy RMIA-P2: Wāhi tapu, wāhi tūpuna and other sites of significance 1 Wāhi tapu, wāhi tūpuna and other sites of significance to Māori identified: a. In the Regional Coastal Plan and district plans, b. as historic reserves under the Reserves Act 1977, c. as Māori reserves under the Te Ture Whenua Māori Act 1993, d. as sites recorded in the New Zealand Archaeological Association's Site Recording Scheme, and e. as registered sites under the Historic Places Act 1993.	There are no wāhi tapu, wāhi tūpuna and other sites of significance to Māori identified via any of the mechanisms recognises in this policy that are affected by the proposed activities. The Applicant has commissioned an Archaeological Assessment for the reservoir area and no such sites were identified through this study. Accidental Discovery Protocols, as recommended in the Archaeological Assessment, are proposed for the construction phase of the project. It is considered that the proposal is consistent with Policy RMIA-P2

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must be protected from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites. 3. Potential damage or disturbance (including that caused by inappropriate subdivision, use or development) to wāhi tapu, wāhi tūpuna and other sites of significance to Māori not identified (for confidentiality and sensitivity reasons) by hapū or iwi under (a), above, must be minimised by the Regional Council facilitating the compilation of databases by hapū and iwi to record locations which need to remain confidential. 4. The Regional Council must ensure that resource users and contractors have clear procedures in the event wāhi tapu or wāhi tūpuna are discovered.	
Policy RMIA--P3: The mauri of water 1. The Regional Council must have regard to the mauri of water by implementing RPS-RMIA-P1(1) to (9) and by restricting and suspending water takes in times of minimum flow consistent with Policy LF-FW-P21.	The proposal enables the Council to significantly reduce, if not avoid, the abstraction of water from the Ohau River during times of minimum flow. This is consistent with Policy LF-FW-P21. The Applicant recognises that the abstraction has been identified, via CIA, to have an adverse effect on the mauri of the awa. The Applicant has accepted recommendations for cultural offsetting, via the COMP which, will ensure there is no net loss of mauri as a result of the proposed activities. It is considered that the proposal is consistent with Policy RMIA-P3.
Mauri *Wai Māori (pure water) is essential to hapū and iwi in the Region to ensure activities conducted for cultural purposes, such as spiritual cleansing, baptismal rituals and food gathering, are achievable. He mea nui te Wai-Māori ki ngā hapū me ngā iwi o te Rohe kia hua ai ka taea te whakatutuki i ngā mahi tikanga Māori pērā i te whakanoa, te tohi, me te kohikohi kai.* *Mauri acts as a balancing agent to ensure the lifesupporting qualities within the water are maintained. Ko tā te Mauri he whakatautika kia hua ai ka puritia tonutia ngā āhuatanga tuku oranga o te wai.* *Human activities, application of impure agents, loss of water capacity, and contaminants all affect the ability of the mauri to perform its role effectively, therefore resulting in a standard of water not suitable for hapū and iwi to perform their relevant tikanga Māori or cultural activities associated with its use. Ka pāngia kinotia te mauri me tōna āhei ki te whakatutuki pai i tōna kaupapa e te mahi a te tangata me te whakamahi mea paruparu, te mimiti o te wai hoki, me te uru mai o ngā paru kino. Ko te hua he wai kāore i te pai ki ngā hapū me ngā iwi hei whakatutuki i ō rātou tikanga e pā ana ki te whakamahi i te wai.*	
Policy RMIA-P4 Other Resource Management Issues 1. Management of water quality and quantity throughout the Region does not provide for the special qualities significant to Māori. 2. Access to and availability of clean water to exercise cultural activities such as food gathering and baptismal rituals have diminished.	The proposed water take is consistent with the allocation framework of the One Plan and will avoid, in all but exceptional circumstances, abstraction when the river is below minimum flow. The proposed water take does not affect the quality of the Ohau River. Enhancement and restoration of the lower terrace via the COMP will ensure no net loss, and potentially a net gain of the mauri of the awa and may assist to provide for food gathering and other tikanga in this area.

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	It is considered that the proposal is consistent with Policy RMIA-P4.
Energy, Infrastructure, and Transport	
Objective EIT-O1: Infrastructure and other physical resources of regional or national importance Have regard to the benefits of infrastructure and other physical resources of regional or national importance by recognising and providing for their establishment, operation, maintenance and upgrading.	The Levin Water Supply System and Network is identified as being regionally or nationally important under Policy EIT-P1 ((1)(i) of the RPS. The benefits of the proposal include the ability to provide safe and reliable access to clean drinking water including for a growing population and service area, whilst reducing effects on the Ohau River. It is considered that this objective is an important aspect of the decision making framework for the Application and that the benefits of the proposal need to be afforded due weight in the assessment and determination of the Application.
Policy EIT-P1: Benefits of infrastructure and other physical resources of regional or national importance 1. The Regional Council and Territorial Authorities must recognise the following infrastructure as being physical resources of regional or national importance: i. public water supply intakes, treatment plants and distribution systems 2. The Regional Council and Territorial Authorities must recognise the following facilities and assets as being physical resources of regional or national importance: (b) existing flood protection schemes 3. The Regional Council and Territorial Authorities must, in relation to the establishment, operation, maintenance, or upgrading of infrastructure and other physical resources of regional or national importance, listed in (1) and (2), have regard to the benefits derived from those activities.	As above, the Levin Water Supply is regionally significant and must be recognised as such in this consenting process. The purpose of the proposed activities is to increase the resilience of the drinking water supply and significantly reduce effects on the Ohau River. It is considered that these objectives and policies clearly seek to enable this type of project. It is noted that the subject area is within a flood control and drainage scheme as per RP-SCHED2, and the potential effects of the proposal on this value have therefore been addressed, in consultation with Horizons Rivers Group.
Policy EIT-P2: Adverse effects of other activities on infrastructure and other physical resources of regional or national importance The Regional Council and Territorial Authorities must ensure that adverse effects on infrastructure and other physical resources of regional or national importance from other activities are avoided as far as reasonably practicable, including by using the following mechanisms: 1. ensuring that current infrastructure, infrastructure corridors and other physical resources of regional or national importance, are identified and had regard to in all resource management decision-making, and any development that would adversely affect the operation, maintenance or upgrading of those activities is avoided as far as reasonably practicable, 2. ensuring that any new activities that would adversely affect the operation, maintenance or upgrading of infrastructure and other physical resources of regional or national importance are not located near existing such resources or such resources allowed by unimplemented resource consents or other RMA authorisations, …	It is considered that the consenting approach, as detailed in the introductory sections of this application, is well aligned with the intention of this policy in that there is certainty being sought by the Applicant to ensure that activities are undertaken in a way that is not at risk from other activities, particularly through the use of a designation and appropriate agreements with landowners. Additionally, this is an important policy for implementation by the Regional Council in terms of ensuring that this Regionally Significant Infrastructure is not unduly restricted or affected by surrounding activities.

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4. notifying the owners or managers of infrastructure and other physical resources of regional or national importance of consent applications that may adversely affect the resources that they own or manage.	
Policy EIT-P3: Adverse effects of infrastructure and other physical resources of regional or national importance on the environment In managing any adverse environmental effects arising from the establishment, operation, maintenance and upgrading of infrastructure or other physical resources of regional or national importance, the Regional Council and Territorial Authorities must: 1. recognise and provide for the operation, maintenance and upgrading of all such activities once they have been established, 2. allow minor adverse effects arising from the establishment of new infrastructure and physical resources of regional or national importance, and 3. avoid, remedy or mitigate more than minor adverse effects arising from the establishment of new infrastructure and other physical resources of regional or national importance, taking into account: a. the need for the infrastructure or other physical resources of regional or national importance, b. any functional, operational or technical constraints that require infrastructure or other physical resources of regional or national importance to be located or designed in the manner proposed, c. whether there are any reasonably practicable alternative locations or designs, and d. whether any more than minor adverse effects that cannot be adequately avoided, remedied or mitigated by services or works can be appropriately offset, including through the use of financial contributions.	This Application demonstrates that the adverse effects on the environment of the proposal are no more than minor, and that these have been avoided, remedied or mitigated to the extent reasonably practicable with a significant offsetting package also offered to achieve a net gain with respect to cultural and wetland values. It is considered that the overall effects on the environment of the proposal will be positive. The matters set out in (3), where relevant, have been taken into account and are addressed within the application. It is considered that the proposal is consistent with Policy EIT-P3.
Urban Form and Development	
Objective UFD-O1: The strategic integration of infrastructure with land use Urban development occurs in a strategically planned manner which allows for the adequate and timely supply of land and associated infrastructure.	One of the key drivers for the proposal is to ensure that adequate water supply quantity is available for Levin in accordance with projected growth, and to support residential zoning and housing supply initiatives by the Council. The project clearly contributes to the strategic and well planned delivery of infrastructure and is therefore consistent with this Objective.

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Policy UFD-P1: The strategic integration of infrastructure with land use Territorial Authorities must proactively develop and implement appropriate land use strategies to manage urban growth, and they should align their infrastructure asset management planning with those strategies, to ensure the efficient and effective provision of associated infrastructure.	One of the key drivers for the proposal is to ensure that adequate water supply quantity is available for Levin in accordance with projected growth, and to support residential zoning and housing supply initiatives by the Council. The project clearly contributes to the strategic and well planned delivery of infrastructure. A robust alternatives assessment has been undertaken, and the proposal is considered to be consistent with this Policy.
Land and Freshwater	
Objective LF-FW-O3: Water management Values Surface water bodies and their beds are managed in a manner which safe guards their life supporting capacity and recognises and provides for the Values in RP-SCHED2.	The effects of the proposal on RP-SCHED2 values are specifically addressed in section 9.7 of the application. As detailed therein, it is considered that the proposal ensures that the life supporting capacity of the awa is safe guarded, and that the proposal recognises and provides for those values. The proposal will significantly reduce the impacts of the existing take on the health of the awa and overall will not have a more than minor effect on the Ohau River. It is therefore considered that the application achieves this objective.
Objective LF-FW-O4 Water quality 1. Surface water quality is managed to ensure that: a. water quality is maintained in those rivers and lakes where the existing water quality is at a level sufficient to support the Values in RP-SCHED2 b. water quality is enhanced in those rivers and lakes where the existing water quality is not at a level sufficient to support the Values in RP-SCHED2 c. accelerated eutrophication and sedimentation of lakes in the Region is prevented or minimised (iv) the special values of rivers protected by water conservation orders are maintained. 2. Groundwater quality is managed to ensure that existing groundwater quality is maintained or where it is degraded/over allocated as a result of human activity, groundwater quality is enhanced.	There are potential effects of the proposed construction activities, the diversion and discharge of groundwater and the on-going effect of removing water from the Ohau River by abstraction. However construction effects will be temporary in nature, and along with groundwater diversion and discharge effects, are able to be appropriately managed by way of management plans and conditions of consent. The proposed new take regime is designed to avoid, in all but exceptional circumstances, the need to take water at times of minimum flow and to reduce the effects of the take on the awa overall. For these reasons it is considered that the proposal achieves the water quality objectives including LF-FW-O2 and the policies set out below. In terms of groundwater, the proposal has, at worst, a very local and less than minor effect by diverting groundwater immediately below the reservoir footprint and discharging this to land on the lower terrace. This will be done in a way that utilises this water, which currently enters the lower terrace area as shallow groundwater and / or seeps at the terrace face, to improve the wetland and habitat environment of the lower terrace.
Policy LF-FW-P4: Water Management Areas and Values For the purposes of managing water quality, water quantity, and activities in the beds of rivers and lakes, the catchments in the Region have been divided into Water Management Areas and Water Management Sub-areas in RP-SCHED1. Groundwater has been divided into Groundwater Management Areas in RP-SCHED4. The rivers and lakes and their beds must be managed in a manner which safeguards their life supporting capacity and recognises and provides for the RP-SCHED2 Values when decisions are made on avoiding, remedying or mitigating the adverse effects of activities or in relation to any other function under the Resource Management Act 1991 exercised by the Regional Council or Territorial Authorities. The individual	

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Values and their associated management objectives are set out in the RP-SCHED2 Surface Water Management Values Key and repeated in Table 7.	
Policy LF-FW-P5: Ongoing compliance where water quality targets are met 1. Where the existing water quality meets the relevant RP-SCHED5 water quality targets within a Water Management Sub-area, water quality must be managed in a manner which ensures that the water quality targets continue to be met beyond the zone of reasonable mixing (where mixing is applicable). 2. For the avoidance of doubt: a. in circumstances where the existing water quality of a Water Management Sub-area meets all of the water quality targets for the Sub-area (1) applies to every water quality target for the Sub-area b. in circumstances where the existing water quality of a Water Management Sub-area meets some of the water quality targets for the Sub-area (1) applies only to those water quality targets that are met c. for the purpose of (1) reasonable mixing is only applicable to a discharge from an identifiable location.	
Policy LF-FW-P9: Maintenance of groundwater quality 1. Discharges and land use activities must be managed in a manner which maintains the existing groundwater quality, or where groundwater quality is degraded/over allocated as a result of human activity, it is enhanced. 2. An exception may be made under (1) where a discharge onto or into land better meets the purpose of the RMA than a discharge to water, provided that the best practicable option is adopted for the treatment and discharge system.	
Objective LF-FW-05: Water quantity and allocation Water quantity is managed to enable people, industry and agriculture to take and use water to meet their reasonable needs while ensuring that: 1. For surface water: a. minimum flows and allocation regimes are set for the purpose of maintaining or enhancing (where degraded) the existing life-supporting capacity of rivers and their beds and providing for the other Values in RP-SCHED2 as appropriate b. takes and flow regimes for existing hydroelectricity are provided for before setting minimum flow and allocation regimes for other uses c. in times of water shortage, takes are restricted to those that are essential to the health or safety of people and communities, or drinking water for animals, and other takes are ceased d. the amount of water taken from lakes does not compromise their existing life-supporting capacity e. the requirements of water conservation orders are upheld	This Application contains a comprehensive assessment of alternatives for supply (section 6) and of the reasonable and justifiable need test (section 5.6) including, water efficiency measures. Water harvesting from the Ohau River above median flows and an off-river storage reservoir has been identified as the preferred option. There is no new core allocation being sought by way of this Application, and the new take regime is designed to lessen effects on the Ohau River enhancing the life-supporting capacity of the River. As discussed above in section 9.7 the proposal will also provide for the SCHED2 values. The proposal would also meet the community's needs and increase the resilience of the scheme all while managing the adverse effects such that they are no more than minor, and in the case of wetlands there is a positive outcome.

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f. the instream geomorphological components of natural character are provided for. For the avoidance of doubt this list is not hierarchical. 2. For groundwater…. 3. In all cases, water is used efficiently.	Despite the fact that the supplementary take is classified as a non-complying activity, it is an activity that is enabled under the RPS in terms of the directives to consider alternative sources including water storage and that supplementary allocation can be made available at times of high flow. Further, while the core allocation sought to be able to be abstracted below minimum flow is a non-complying activity as it exceeds the 250 L/person/day limit to be assessed as a Discretionary Activity, it is consistent with the Policy-LF-FW-P21 provision for Essential takes for public water supplies at times of minimum flow. Additionally, the provision of short term abstraction of water for construction of the NZTA Waka Kotahi Otaki to North Levin project contributes to efficiency in the allocation of water. It is considered that the Application serves to achieve this Objective of the RPS in regard to the management of water quantity and serves to give effect to the intent of the RPS.
LF-FW-P15: Reasonable and justifiable need for water Subject to LF-FW-P21, the amount of water taken by resource users must be reasonable and justifiable for the intended use. In addition, the following specific measures for ensuring reasonable and justifiable use of water must be taken into account when considering consent applications to take water for irrigation, public water supply, animal drinking water, dairy shed washdown or industrial use, and during reviews of consent conditions for these activities. … 4. For public water supplies, the following must generally be considered to be reasonable: a. an allocation of 300 litres per person per day for domestic needs, plus b. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus c. an allocation for industrial use calculated, where possible, in accordance with best management practices for water efficiency for that particular industry, plus d. an allocation necessary for hospitals, other facilities providing medical treatment, marae, schools or other education facilities, New Zealand Defence Force facilities or correction facilities, plus e. an allocation necessary for public amenity and recreational facilities such as gardens, parks, sports fields and swimming pools, plus f. an allocation necessary to cater for the reasonable needs of animals or agricultural uses that are supplied by the public water supply system, plus	As discussed above in section 9.7 this Policy has been recognised as a key part of the planning framework for the Application. Appendix C includes a detailed Technical Memo that sets out an assessment of the proposal against this policy. As concluded therein, it is considered that the proposed water take regime constitutes a reasonable and justifiable use of water, taking into account all factors in Policy LF-FW-P15. It is considered that the project, and this Application, are consistent with this Policy.

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g. an allocation necessary to cater for growth, where urban growth of the municipality is provided for in an operative district plan for the area and is reasonably forecast, plus h. an allocation for leakage equal to 15% of the total of (a) to (h) above.	
Policy LF-FW-P16: Efficient use of water Water must be used efficiently, including by the following measures: 1. requiring water audits and water budgets to check for leakages and water-use efficiency as appropriate 2. requiring the use of, or progressive upgrade to, infrastructure for water distribution that minimises the loss of water and restricts the use of water to the amounts determined in accordance with LF-FW-P15 3. enabling the transfer of water permits 4. promoting water storage 5. raising awareness about water efficiency issues and techniques 6. requiring monitoring of water takes, including by installing water metering and telemetry.	This Application in sections 3.1.3, 4.1.2 and 4.1.5 addresses the matter of the efficient use of water in detail, including improvements to the network and the Demand Management Plan, and also providing short term supply for construction of nationally important infrastructure, so that over-abstraction of nearby water sources can be avoided. It is considered that the Applicant has and is addressing all matters set out in this Policy and it is noted with emphasis that this Policy promotes the use of water storage. The Application is therefore clearly consistent with and enabled by this Policy.
Policy LF-FW-P18: Core allocations and minimum flow 1. The taking of water^ from rivers^ must be managed in accordance with the minimum flows and cumulative core allocations set out in RP-SCHED3. 2. The minimum flows and cumulative core allocations set out in RP-SCHED3 must be set after providing for any takes and flow regimes lawfully established for hydroelectricity generation as at 31 May 2007.	There is no new core allocation being sought by way of this application and the proposed activities continue to be consistent with the core allocation policies of the RPS.
Policy LF-FW-P20: Supplementary water allocation In addition to the core allocations set out in LF-FW-P18, a supplementary allocation from rivers may be provided: 1. in circumstances where water is only taken when the river flow is greater than the median flow, and the total amount of water taken by way of a supplementary allocation does not exceed 10% of the actual flow in the river at the time of abstraction, and 2. in circumstances where it can be shown that the supplementary allocation will not: a. increase the frequency or duration of minimum flows b. lead to a significant departure from the natural flow regime, including the magnitude of the median flow and the frequency of flushing flows c. cause any adverse effects that are more than minor on the RP-SCHED2 Values of the water body or its bed d. limit the ability of anyone to take water under a core allocation e. derogate from water allocated to hydroelectricity generation.	Section 9.3 of this Application sets out a detailed consideration of this Policy in the context of the hydrological assessment of the proposed take regime. The proposed supplementary allocation is enabled by this Policy, despite the fact that it falls to be considered as a non-complying activity under the Regional Plan. For reasons discussed in section 9, including that supplementary allocation will only be taken when the river is above median flow, the supplementary abstraction will not create a significant departure from the natural flow regime, including flushing flows, nor impact the RP-SCHED2 values to a more than minor degree. It will not impact on other persons' ability to take core allocation and will not derogate from water allocation for hydro-electricity - there is no such use on the Ohau River. Therefore, the effects of the proposed abstraction on matters relevant in this Policy are less than minor.

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Policy LF-FW-P21: Apportioning, restricting and suspending takes in times of minimum flow When a river is at or below its minimum flow, takes from it must be managed in the following manner: … 3. Supplementary takes - must cease at a flow specified in their consent conditions and that cessation flow must be higher than the RP-SCHED3 minimum flow such that the requirements of Lf-FW-P20(2)(a) are met. 4. Essential takes - The following core water allocation takes are deemed essential and must be managed in the manner described: b. takes required to meet the reasonable needs of hospitals, other facilities providing medical treatment, marae, schools or other educational facilities, New Zealand Defence Force facilities or correction facilities must be allowed to continue regardless of river flow, but must be required to minimise the amount of water taken to the extent reasonably practicable. c. takes which were lawfully established at the time of Plan notification (31 May 2007) required for industries which, if their take were to cease, would significantly compromise a community's ability to provide for its social, economic or cultural wellbeing or for its health or safety (including the hygienic production and processing of perishable food), must be allowed to continue regardless of river flow, but must be required to minimise the amount of water taken to the extent reasonably practicable d. public water supply takes must be restricted to a total public water consumption calculated as follows: (i) an allocation of 250 litres per person per day for domestic needs, plus (ii) an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus (iii) an allocation which meets the reasonable needs of those facilities and industries listed under (4)(b) and (4)(c) where such facilities and industries are connected to the public water supply system, plus (iv) any allocation necessary to cater for the reasonable needs of animals that are supplied by the public water supply system, plus (v) an allocation for leakage equal to 15% of the total of (i) to (iv) above.	The existing Levin Water supply consent enables abstraction to occur at a reduced rate of 13,000 m^3/day when the river is below minimum flow. One of the key drivers for this Application is to enable the Council to avoid, in all but exceptional circumstances, the need to abstract at times of minimum flow. It is therefore considered that the proposal is consistent with Policy LF-FW-P21 of the RPS. The abstraction amount sought below minimum flow (only to be exercised under exceptional circumstances once the reservoir is constructed) is the same as was determined appropriate at the time the existing consent was granted in accordance with part 4(d) of this policy and therefore is considered to be consistent with this policy.
Objective LF-FW-O6: Beds of rivers and lakes The beds of rivers and lakes will be managed in a manner which: 1. sustains their life supporting capacity 2. provides for the instream morphological components of natural character 3. recognises and provides for the RP-SCHED2 Values 4. provides for infrastructure and flood mitigation purposes.	The proposed activities will enable the life supporting capacity of the bed of the river to be sustained. This is because the potential adverse effects of the proposed activities on the bed of the river and on the Flood Control and Drainage scheme will not be more than minor. The proposed reservoir intake has been designed to ensure that, following construction, there

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The land adjacent to the bed of reaches with a RP-SCHED2 Value of Flood Control and Drainage will be managed in a manner which provides for flood mitigation purposes.	is no change to the morphological components of the natural character. There are no other works directly in the river bed. It is therefore considered that this Objective and related Policies can be achieved in any granting of consent to the applications for activities within the river bed.
Policy LF-FW-P25: General management of the beds of rivers and lakes Activities in, on, under or over the beds of rivers and lakes must generally be managed in a manner which: 1. recognises and provides for the RP-SCHED2 Values for the Water Management Sub-area(s) in which the activity takes place, in the manner described in Policies RPS-LF-FW-P26, RPS-LF-FW-P27 and RPS-LF-FW-P28. 2. avoids any significant reduction in the ability of a river and its bed to convey flood flows, or significant impedance to the passage of floating debris 3. avoids, remedies or mitigates any significant adverse effects on the stability and function of the beds of rivers and lakes, and existing structures including flood and erosion control structures 4. avoids, remedies or mitigates any significant reduction in the habitat diversity, including the morphological diversity, of the river or lake or its bed 5. manages effects on natural character and public access in accordance with the relevant policies in RPS-ECO. Natural character can include the natural style and dynamic processes of the river, such as bed style and width and the quality and quantity of bed habitat 6. provides for the safe passage of fish both upstream and downstream 7. ensures that the existing nature and extent of navigation of the river or lake are not obstructed 8. ensures that access required for the operation, maintenance, and upgrade of infrastructure and other physical resources of regional or national importance is not obstructed 9. provides for continued public access in accordance with RPS-NATC-P3.	
Policy LF-FW-P27: Activities in rivers or lakes and their beds with a Value of Flood Control and Drainage In reaches of rivers or lakes and their beds with a RP-SCHED2 Value of Flood Control and Drainage, activities in, on, under or over the beds of rivers and lakes and on land adjacent to the bed where the Value is located must be managed in a manner which: 1. enables the degree of flood hazard and erosion protection existing at the time of Plan notification (31 May 2007) to be maintained or enhanced 2. addresses adverse effects by: a. in the first instance, avoiding, remedying or mitigating adverse effects on the instream morphological components of natural character and other RP-SCHED2 Values b. providing consent applicants with the option of making an offset	

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c. allowing compensation by way of a financial contribution in accordance with the policies in RP-FC.	
Policy LF-FW-P28: Activities in rivers or lakes and their beds with other RP-SCHED2 Values In sites with RP-SCHED2 Values other than Natural State, Sites of Significance - Cultural, Sites of Significance - Aquatic, or Flood Control and Drainage, activities in, on, under or over the beds of rivers and lakes must be managed in a manner which: 1. in the first instance avoids, remedies or mitigates significant adverse effects on the instream morphological components of natural character and RP-SCHED2 Values 2. provides consent applicants with the option of making an offset 3. allows compensation by way of a financial contribution in accordance with the policies in RPS-FC.	
Policy LF-FW-P29: Essential and beneficial activities Activities in, on, under or over the beds of rivers and lakes that are essential or result in an environmental benefit must generally be allowed, including: 1. the use, maintenance and upgrading of existing infrastructure and other existing physical resources of regional or national importance 2. works designed to maintain or improve the stability and functionality of existing structures 3. the removal of derelict, unlawful or non-functional structures 4. the restoration or enhancement of natural habitats.	
Hazards and Risks	
HAZ-NH-O2: Effects of natural hazard events The adverse effects of natural hazard events on people, property, infrastructure and the wellbeing of communities are avoided or mitigated.	Both the effects of the proposal on the flood hazard within the Ohau River and the effects of potential hazards on the reservoir have been considered in the development of the proposal and assessed within the application (section 9.6). The abstraction will not have an adverse effect on flood carrying capacity and mitigation measures. A Flood Contingency Plan will be developed to mitigate the risks of flooding during construction. The proposed pipe bridge will not result in any structures within the flood channel so does not present any constraint or change to the existing flood carrying capacity of the river. In the case of a credible worst case-scenario breach of the reservoir, the risk of which is assessed as being extremely low, there is no risk to infrastructure and the risk to life is also considered to be extremely low. It is therefore considered that effects in this regard are acceptable. More importantly in terms of the overall effects of the proposed activities is that the

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	proposed storage will add resilience within the Levin Water Supply network. This will assist the Council in being able to provide a lifeline service to its community during and after natural hazards events. The sensitivity of water networks to natural hazards has been an extremely significant factor in the recent cyclone and flooding events in Aotearoa New Zealand and the ability to draw on reserves and stored supply increases resilience significantly. It is therefore considered that the proposal achieves this important objective.

Section 104(1)(b) Any Relevant Provisions of -- (vi) a Plan or Proposed Plan - Regional Plan

The Regional Plan addresses the same topics as those covered by the RPS discussed above. Where relevant (and to avoid repetition), the analysis below refers back to the analysis of the same subject matter in relation to objectives and policies in the RPS discussed above. The proposal's consistency with the RPS is discussed in the table below.

Table 12.3: Regional Plan Objective and Policy Assessment

Regional Plan Provision	Comment/Assessment
LF-WETL-Wetlands	
The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where: 1. the loss of extent or values arises from any of the following f. the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020) 2. the Regional Council is satisfied that: a. the activity is necessary for the construction or upgrade of specified infrastructure; and b. the specified infrastructure will provide significant national or regional benefits; and c. there is a functional need for the specified infrastructure in that location; and d. the effects of the activity are managed through applying the effects management hierarchy;	The proposal will result in the loss of a small marginal wetland of low ecological value, as well as the restoration and enhancement of a large area of wetland on the lower terrace. As detailed in Section 8, the proposal is for specified infrastructure that will provide significant regional benefits. It has been demonstrated (Appendix K) that there is a functional need for the specified infrastructure in that location and the effects management hierarchy has been applied as detailed in Section 9.5.3. Importantly, although the proposal will result in the loss of a small marginal wetland of low ecological value, the proposal includes substantial offsetting involving the restoration and enhancement of a large area of wetland on the lower terrace which will deliver a net gain in wetland biodiversity. The Regional Council can therefore be satisfied that there will be no net loss of extent of natural inland wetlands and the matters that need to be satisfied for grant of consent have been met in accordance with this Policy.
LF-LW - Discharges to Land and Water	
Objective LF-LWO2: Management of discharges to land and water and land uses affecting groundwater and surface water quality The management of discharges onto or into land (including those that enter water) or directly into water and land use activities affecting groundwater and surface water quality in a manner that:	The potential effects of the proposed discharges during construction, such as the diversion and discharge of groundwater, will be temporary and are able to be appropriately managed by way of management plans and conditions of consent. The proposed operational discharges will have minimal environmental effects, and the effects

Regional Plan Provision	Comment/Assessment
1. safeguards the life supporting capacity of water and recognises and provides for the Values and management objectives in RP-SCHED2, 2. provides for the objectives and policies of RPF-LF as they relate to surface water and groundwater quality, and 3. where a discharge is onto or into land, avoids, remedies or mitigates adverse effects on surface water or groundwater.	associated with discharge of sediment are well understood and can and will be managed appropriately by way of conditions of consent and management plans such that they will be no more than minor. As discussed above in relation to the RPS it is considered that the proposal will safeguard the life supporting capacity of the Ohau River and recognises and provides for the values in RP-SCHED2 which, are specifically addressed in section 9.7. As set out above it is also considered that the proposal provides for the objectives and policies of the RPF-LF. The discharges do not introduce new contaminants into the environment, and are necessary to enable the proposal which is consistent with other objectives and policies of the RPS. As discussed above, this Application contains a comprehensive assessment of alternatives for supply (section 6) and it is considered that this proposal has adopted the Best Practicable Option. Further, the proposal has been developed so as to, as far as reasonably practicable, avoid effects on sensitive environments, and to remedy or mitigate any on-going effects in the river. An assessment of the Application with regard to the NPSFM is included in section 12.1 of the Application. In summary it is considered that the Proposal is consistent with the objective and policies of the NPSFM, particularly since the proposal will significantly reduce if not avoid the need to take water at times of low flow and to reduce the effects of the take on the awa overall. For these reasons it is considered that the proposal achieves the objectives and the policies of the NPSFM20. It is therefore considered that the proposed discharges are consistent with the water quality provisions of the regional plan.
Policy LF-LW-PF: Consent decision making for discharge to water When making decisions on resource consent applications, and setting consent conditions, for discharges of water or contaminants into water, the Regional Council must specifically consider: 1. the objectives and RPS-LF-FW-P5 to RPS-LF-FW-P9 and RPS-LF-FW-P13 of RPS-LF, and have regard to: 2. avoiding discharges which contain any persistent contaminants that are likely to accumulate in a waterbody or its bed, 3. the appropriateness of adopting the best practicable option to prevent or minimise adverse effects in circumstances where: a. it is difficult to establish discharge parameters for a particular discharge that give effect to the management approaches for water quality and discharges set out in RPS-LF, or b. the potential adverse effects are likely to be minor, and the costs associated with adopting the best practicable option are small in comparison to the costs of investigating the likely effects on land and water, and 4. the objectives and policies of RPS-RMIA, RPS-EIT, RPS-ECO, RPS-HCV, RPS-NATC, RPS-NFL, RPS-HAZ, and RP-IP to the extent that they are relevant to the discharge*.	
Policy LF-LW-P5: Consent decision-making for discharges to land When making decisions on resource consent applications, and setting consent conditions, for discharges of contaminants onto or into land the Regional Council must have regard to: 1. the objectives and policies of RPS-LF regarding the management of groundwater quality and discharges, 2. where the discharge may enter surface water or have an adverse effect on surface water quality, the degree of compliance with the approach for managing surface water quality set out in RPS-LF, 3. avoiding as far as reasonably practicable any adverse effects on any sensitive receiving environment or potentially incompatible land	

Regional Plan Provision	Comment/Assessment
uses, in particular any residential buildings, educational facilities, churches, marae, public areas, infrastructure and other physical resources of regional or national importance identified in RPS-EIT-P1, wetlands, surface water bodies and the coastal marine area, 4. the appropriateness of adopting the best practicable option to prevent or minimise adverse effects in circumstances where: a it is difficult to establish discharge parameters for a particular discharge that give effect to the management approaches for water quality and discharges set out in RPS-LF, b the potential adverse effects are likely to be minor, and the costs associated with adopting the best practicable option are small in comparison to the costs of investigating the likely effects on land and water, 5. avoiding discharges which contain any persistent contaminants that are likely to accumulate in the soil or groundwater, and 6. the objectives and policies of RPS-RMIA, RPS-EIT, RPS-ECO, RPS-HCV, RPS-NATC, RPS-NFL, RPS-HAZ, and RP-IP to the extent that they are relevant to the discharge.	
Policy LF-LW-P7: Options for discharges to surface water and land When applying for consents and making decisions on consent applications for discharges of contaminants into water or onto or into land, the opportunity to utilise alternative discharge options, or a mix of discharge regimes, for the purpose of mitigating adverse effects, applying the best practicable option, must be considered, including but not limited to: 1. discharging contaminants onto or into land as an alternative to discharging contaminants into water, 2. withholding from discharging contaminants into surface water at times of low flow, 3. adopting different treatment and discharge options for different receiving environments or at different times (including different flow regimes or levels in surface water bodies).	
Policy LF-FW-P12: Consent decision making requirements from the National Policy Statement for Freshwater Management 1. This policy applies to any application for the following discharges (including a diffuse discharge by any person or animal): a. a new discharge;– b. a change or increase in any discharge of any contaminant into fresh water, or onto or into land in circumstances that may result in that	

Regional Plan Provision	Comment/Assessment
contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water. 2. When considering any application for a discharge the Regional Council must have regard to the following matters: a. the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water; and b. the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided. This clause of the policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2011 took effect on 1 July 2011. 3. When considering any application for a discharge the Regional Council must have regard to the following matters: a. the extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their secondary contact with fresh water; and b. the extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their secondary contact with fresh water resulting from the discharge would be avoided. This clause of the policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2014 took effect on 4 July 2014.	
Takes, Uses and Diversions of Water and Bores	
LF-TUD: Regulation of takes, uses and diversions of water The regulation of takes, uses and diversions of water in a manner that: a. recognises and provides for the Values and management objectives in RP-SCHED2, and b. provides for the objectives and policies of RPS-LF-FW as they relate to surface water and groundwater use and allocation	The water management framework set out in the Regional Plan has been a key policy driver in the development of the proposal. All of the relevant matters addressed within these provisions are considered in detail within this Application and for the reasons discussed above as well as in relation to the RPS it is considered that the proposal achieves the objective and is consistent with the policies.

Regional Plan Provision	Comment/Assessment
LF-TUD-P13: Consent decision-making for takes and uses of surface water and groundwater When making decisions on resource consent applications under s104-104D RMA, and setting consent conditions, for takes and uses of surface water or groundwater the Regional Council must: (a) seek to avoid any adverse effects on other lawful activities, particularly on other surface water takes, including takes allowed by s14(3)(b) of the RMA, and groundwater takes from properly-constructed, efficient and fully-functioning bores (as described in RP-LF-TUD-P16 and RP-LF-TUD-P17), (b) enable non-consumptive uses of water including the use and recycling of water, and (c) have regard to the objectives and policies of RPS-RMIA, RPS-EIT, RPS-LF, RPS-ECO, RPS-HCB, RPS-NATC, PRS-NFL, RPS-HAZ and RP-IP to the extent that they are relevant to the activity.	
LF-TUD-P14: Consideration of alternative water sources When making decisions on consent applications to take surface water, the opportunity to utilise alternative sources such as groundwater, water storage, water harvesting (including during periods of high flow in a river) and the recycling of water must be considered.	
LF-TUD-P20: Monitoring requirements of consent holders **Water takes must generally be subject to the following monitoring requirements:** 1. the installation of a pulse-count capable water meter on all water takes that are allowed by way of a resource consent, in order to monitor the amount of water taken (b) the installation of a Regional Council compatible telemetry system on surface water takes greater than 750 m^3 /d, and on groundwater takes greater than 750 m^3 /d where the groundwater is highly interconnected with surface water 2. the installation of a Regional Council compatible telemetry system on other groundwater takes greater than 4,000 m^3 /d 3. Appropriate water quality monitoring, including conductivity monitoring on groundwater takes located within 5 km of the coast, or on a nearby monitoring bore 4. the installation of a Regional Council compatible telemetry system on consented surface water takes where: a. the amount of water taken, when assessed in combination with all other water takes upstream, exceeds 15% of the estimated one-day mean annual low flow, or	These matters have been discussed in section 4.1.3 and are to be addressed as appropriate by way of conditions imposed by the consent authority on any grant of consent.

Regional Plan Provision	Comment/Assessment
b. the amount of water taken from a Water Management Sub-area as identified in RP-SCHED1 exceeds 15% of the one-day mean annual low flow for that Sub-area.	
LF-AWBD: Activities in Artificial Watercourses, Beds of Rivers and Lakes, and Damming	
LF-AWBD-O5: Regulation of structures and activities in artificial watercourses and in the beds of rivers and lakes, and damming. The regulation of structures and activities in artificial watercourses and in the beds of rivers and lakes, and damming, in a manner that: 1. safeguards life supporting capacity, and recognises and provides for the Values and management objectives in RP-SCHED2, and 2. has regard to the objectives and policies of Chapter 5 that relate to structures and activities in artificial watercourses and in the beds of rivers and lakes, and damming.	As has been discussed above, the proposed activities will enable the life supporting capacity of the bed of the river to be safeguarded, particularly in the context of the purpose of the in-river activities being for human health and drinking water purposes. The potential effects of the proposed activities on the bed of the river and on the Flood Control and Drainage scheme will not be more than minor, nor will there be any effects on fish passage. Potential temporary effects on fish passage during construction will be managed by providing an alternate channel around the construction area and undertaking fish relocation at the commencement and completion of works. It is therefore considered that this objective can be achieved in any granting of consent to the applications for activities within the river bed.
LB-AWBD-O6: Fish Passage The passage of fish is maintained, or is improved, by instream structures, except where it is desirable to prevent the passage of some fish species in order to protect desired fish species, their life stages, or their habitats.	
Policy LF-AWBD-P22: Consent decision-making for activities in, on, under or over the beds of rivers and lakes (including modified watercourses but excluding artificial watercourses) When making decisions on resource consent^ applications, and setting consent conditions, for activities in, on, under or over the bed of a river or lake (including modified watercourses but excluding artificial watercourses) the Regional Council must have regard to the extent to which the activity is consistent with best management practices, 1. seek to avoid where reasonably practicable any adverse effects on any other lawful activity in, on, under or over the bed of the river or lake, including existing structures, 2. have regard to whether the activity is of a temporary nature or is associated with necessary maintenance work, 3. have regard to the objectives and policies of RPS-RMIA, RPS-EIT, RPS-LF, RPS-ECO, RPS-HCB, RPS-NATC, PRS-NFL, RPS-HAZ and RP-IP to the extent that they are relevant to the activity, and 4. have regard to the matters in RP-LF-LW-P12.	

Section 104(1)(b) Any Relevant Provisions of -- (vi) a Plan or Proposed Plan - District Plan

As already described, the district council planning approvals for the project will be sought separately. The activities proposed for the Levin Water Supply Water Harvesting and Resilience Project are generally enabled under the Horowhenua District Plan network utility provisions, and not otherwise restricted due to the nature of and zoning for the site (being part of the reason for choosing the site

as a first step in avoiding significant adverse effects on the environment). It is considered that there are no particular matters arising in relation to the District Plan provisions in terms of the assessment and determination of this regional consent application, and that the proposal is consistent with and achieves the intent of the objectives and policies of the District Plan.

For reference, the particular District Plan provisions considered relevant to the project are:

Table 12.4: Relevant Objectives and Policies of the District Plan

District Plan Provisions
Matters of Importance to Tangata Whenua
Objective 1.1.1 Active Participation
To provide Tāngata Whenua with opportunities to actively participate in resource management processes (including decision making) on matters that have the potential to affect their cultural values and well-being.
Policy 1.1.3
Ensure that where relevant, the interests of Tāngata Whenua are taken into account when considering the sustainable use and development of the land, waterways, coastal areas, resources and other taonga.
Policy 1.1.5
Recognise the authorised and mandated Iwi representatives for the purpose of resource management engagement.
Objective 1.2.1 Relationship of Tāngata Whenua
To recognise and provide for the relationship of the Tāngata Whenua of Horowhenua, and their culture and traditions (including mauri), with their ancestral lands, coastal areas, waterways, heritage landscapes and cultural sites, wāhi tapu, wāhi tūpuna and other taonga.
Policy 1.2.3
Recognise the spiritual and cultural values held by Māori and their traditional practices in the management of natural and physical resources.
Policy 1.2.5
Recognise the desire of Tāngata Whenua to maintain and enhance their traditional relationship with the natural environment.
Objective 1.3.1
Sites of Cultural Significance
To protect areas and sites of cultural significance, wāhi tapu, wāhi tūpuna and other taonga from the adverse effects of inappropriate subdivision, use, and development of resources.
Natural Hazards
Objective 8.1.1 Risks and Adverse Effects of Natural Hazards
The adverse effects of natural hazards on people, property, the environment and the wellbeing of communities are avoided or mitigated.
Policy 8.1.6
Flood hazard avoidance must be preferred to flood hazard mitigation.
Policy 8.1.8
Avoid, where practicable, the siting of new critical infrastructure and services within areas of significant risk from natural hazard events.

District Plan Provisions
Utilities and Energy
Objective 12.1.1 Network Utilities
To protect and provide for the establishment, operation, maintenance and upgrading of network utilities, while avoiding, remedying or mitigating adverse effects on the environment.
Policy 12.1.2
Enable the establishment, operation, maintenance and upgrading of essential network utilities.
Policy 12.1.3
Avoid, remedy or mitigate the adverse environmental effects arising from the establishment, construction, operation, maintenance and upgrading of network utilities.
Policy 12.1.5
Ensure the establishment, operation, maintenance and upgrading of network utilities does not compromise the health and safety of the community.
Policy 12.1.6
Consider the locational, technical and operational requirements of network utilities and the contribution they make to the functioning and well-being of the community in assessing their location, design and appearance.

Section 104(1)(c) any other matter the consent authority considers relevant and reasonably necessary to determine the application

There are no other matters which are considered relevant and reasonably necessary to determine the application. There are no iwi environmental management plans that are relevant to the site, awa or project location.

Section 104(3)(a)(ii) A consent authority must not, when considering an application, have regard to any effect on a person who has given written approval to the application.

Affected party approvals have not been sought.

The Applicant requests that this application be publicly notified.

Section 104D RMA Gateway Test Assessment

The Application falls to be considered as a non-complying activity under the One Plan. Specifically, the proposed abstraction of water above core allocation and abstraction of supplementary allocation as well as the proposed planting and restoration in and around wetlands are non-complying activities under the One Plan and NESFW.

Therefore, the consent authority must not grant consent unless it is satisfied that either the adverse effects of the activity on the environment (other than any effect on a person who has given written approval to the application) will be minor or the application will not be contrary to the objectives and policies of the One Plan.

The two limbs of s104D above are often referred to a 'gateway' or 'threshold' tests. Importantly, only one of these tests needs to be satisfied for a consent authority to be able to grant consent having subsequently considered the application(s) in accordance with the matters set out in s.104 of the RMA.

On the basis of the conclusions reached in section 9 of this AEE, when the environmental improvements set out in the proposed offsetting conditions are taken into account, the Applicant considers that the adverse effects on the environment will be minor and therefore no more than minor thus meeting the first section 104D gateway test. In particular:

- The abstraction of water is within the regional allocation framework and provided for in the RPS and Regional Plan and therefore has effects which are no more than minor. Once the reservoir is

constructed, abstraction below minimum flow will be avoided, except in exceptional circumstances and conditions are offered to mitigate effects as far as possible.

- The effect on natural inland wetlands will be no more than minor. While one natural inland wetland of marginal classification will be affected, it has been assessed as being of limited ecological value. The ecological assessment has found that restoration of the wetland areas on the lower floodplain (as proposed) will easily mitigate the loss of the affected wetland and will "very substantially outweigh" the minor adverse effects associated with the loss of the small, highly modified "marginal" wetland.
- The discharges which form part of the proposal are essentially for clean, river water or groundwater to be returned to the river under very infrequent circumstances. Given this, and that there are no contaminants that will be introduced to the system, the effect of any discharges is less than minor.
- Temporary construction effects are able to be avoided, remedied or mitigated through the development and implementation of construction management plans incorporating measures to manage erosion and sediment control; spill prevention and response; fish management and relocation; riparian planting; and flood contingency.
- The constructed infrastructure within the river corridor will not impact fish passage or the natural character of the river and will not impact passage of flood flows.

The Applicant further considers that the Application is not contrary to the objectives and policies of the One Plan. Rather, the proposal is one that the One Plan seeks to enable, particularly through the ability to provide supplementary allocation as per Policy LF-FW-P20 of the RPS and encouragement of the use of alternative sources of water including water harvesting and water storage as per Policy LF-TUD-P14 of the Regional Plan. This is in addition to the provisions discussed above relating to climate change resilience, giving effect to Te Mana o te Wai and regionally significant infrastructure and reasonable and justifiable use of water. A fulsome detailed assessment of all relevant objectives and policies of both the RPS and the Regional Plan is included in section 12.1 of this Application, demonstrating that there are no provisions with which the proposal is contrary.

It is considered that there is no section 104D RMA reason that consent to the application cannot be granted and that the Application meets both 'gateway tests' for non-complying activities.

In relation to section 105 of the RMA, the conclusions reached is that the proposed discharges will have a minor or less than minor impact. As discussed in section 6 the Applicant has thoroughly assessed the alternative options to achieve the key drivers of this project and concluded that this proposal is the best option to meet the community's current and future needs, reduce the effect of the abstraction on the river, and improve the resilience of the water supply scheme.

In relation to section 107 of the RMA, the proposed discharges to the environment do not give rise to the type and/or level of adverse effects set out in section 107 of the RMA (noting that the assessment is to be undertaken “after reasonable mixing”). On that basis, section 107 of the RMA does not create any impediment to granting the consents applied for.

12.2 Particular Part 2 RMA Considerations

All of the matters specified in section 104 of the RMA to which the consent authority must ‘have regard to’ are subject to Part 2 of the RMA which sets out the purpose and principles of the RMA and which are central to the determination of this application.

However, recent case law has altered the role of Part 2 in assessing resource consents applications under section 104 of the RMA28. Now, decision-makers should usually only consider Part 2 when making decisions on resource consents, particularly if the decision-maker considers that the relevant plan has not been competently prepared. If however, the relevant plan provisions have clearly given effect to Part 2, there may be no need to refer back to Part 2 to exercise an overall broad judgment on the application.

It is considered that the provisions of the One Plan do not contain deficiencies that would suggest a misalignment with Part 2, such that Part 2 should be considered in this instance.

However, for completeness, an analysis of the in relation to the Part 2 of the RMA is set out below. It concludes that the proposal is consistent with the overall sustainable management purpose of the RMA.

Section 5 of the RMA – Purpose of the Act

The cornerstone of Part 2 is the Purpose of the RMA as set out in section 5(1), which is: "*To promote the sustainable management of natural and physical resources*."

Section 5(2) of the RMA defines sustainable management as:

> *Managing the use, development and protection of natural and physical resources in a way or at a rate which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
>
> *(c) Avoiding, remedying or mitigating any adverse effects of activities on the environment.*

The overarching intention of the resource consent application process is to ensure that the proposed activities are consistent with the purpose of the RMA.

In terms of section 5 of the RMA, the Application will enable people and communities to provide for their social, economic, and cultural well-being and for their health and safety by providing drinking water. The positive effects of the proposal are detailed throughout this AEE and in summary include:

- The ability to provide for the health and wellbeing of current and future Levin community via the provision of safe drinking water.
- The ability to improve the resilience of the scheme to climate variations, climate change and natural disasters through the provision of storage, consistent with the direction of the Regional Policy Statement and Regional Climate Risk Assessment.
- The ability to reduce the effect of the abstraction on the River at times of minimum flow, being an effect that is currently authorised by the existing resource consent.
- The proposed restoration and enhancement that will occur on the lower terrace of the reservoir site.

Sustainable management enables the use and development of resources while ensuring that the circumstances in section 5(2)(a)-(c) are able to be satisfied.

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[28] *Environmental Defence Society Incorporated v The New Zealand King Salmon Company Limited & Ors [2014] NZSC 38 and RJ Davidson Family Trust v Marlborough District Council [2018] NZCA 316*

In terms of sustaining the potential of the water resources to meet the needs of future generations, the project is intended to meet the increasing demand for drinking water by present and future generations and can be achieved in a manner that is not only sustainable but will also reduce the effects on the Ohau River.

Based on the conclusions reached in this AEE, the life supporting capacity of air, water, soil and ecosystems will be safeguarded. The proposal will reduce the existing impacts on the Ohau River and any adverse effect on the river environment will be no more than minor. The impacts on the wetlands are also assessed as being no more than minor but irrespective, the Applicant has offered a cultural and biodiversity offsetting package to restore and enhance the quality and extent of wetlands in the area to provide a net gain in wetland values. The life supporting capacity of air and soils will not be impacted by this project.

The Applicant has sought in the first instance to avoid adverse effects in the design of the project, particularly where adverse effects have been raised by iwi / hapū and other stakeholders during consultation. The Applicant has sought to remedy and mitigate all other effects or otherwise offset any residual effects.

Section 6 of the RMA – Matters of National Importance

Section 6 of the RMA sets out the matters of national importance that must be recognised and provided for in managing the use, development and protection of natural and physical resources as follows:

- *(a) The preservation of the natural character of the coastal environment (including coastal marine area) wetlands and lakes and rivers and their margins and the protection of them from inappropriate subdivision, use and development:*
- *(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development:*
- *(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- *(d) The maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers:*
- *(e) The relationship of Māori and their culture and traditions with their ancestral lands, water, waahi tapu, and other tāonga;*
- *(f) The protection of historic heritage from inappropriate subdivision, use and development;*
- *(g) The protection of protected customary rights;*
- *(h) The management of significant risks from natural hazards*

Most aspects of section 6 of the RMA are relevant to the Application.

In terms of section 6(a), the proposal is located within the Ohau River and wetlands however, the proposal is not considered to inappropriately impact the natural character of these environs. This is particularly so given the abstraction of drinking water has been occurring for many years, the objectives and policies in the relevant lower order statutory instruments (discussed above) recognise and provide for the type of activities proposed and the project will reduce the current impacts of abstraction on the Ohau River during low flows and also provide a net gain in terms of wetland values.

In terms of section 6(b), no 'outstanding natural features and landscapes' are proximate to the application site, and none will be impacted by the proposal.

In terms of section 6(c), no areas of significant indigenous vegetation will be affected by the project and the effect of the project on the surrounding wetlands is assessed as being minor. Irrespective of this conclusion, the Applicant has offered a cultural and biodiversity offsetting package to restore and enhance the quality and extent of wetlands in the area to provide a net gain in wetland values.

In terms of section 6(d), there will be no impacts on public access to waterbodies as a result of the proposal.

In terms of sections 6(e), (f) and (g), as detailed in sections 7 and 9.1 the Applicant has sought to provide for the relationship of Māori and their culture and traditions with their ancestral lands, water, waahi tapu, and other taonga by engaging with iwi throughout this project. The Applicant resourced Muaūpoko to prepare the March 2023 CIA and resourced Raukawa hapū to engage the Catalyst Group to provide technical support in considering the project.

This engagement will continue with Muaūpoko and Raukawa hapū to ensure that these sections of the RMA are appropriately addressed in relation to the ongoing operation of the project.

The Applicant has designed and developed the project, including the mitigation and offsetting proposed, to address the issues and concerns raised in feedback and kōrero received during engagement with iwi and hapū as well as in the March 2023 CIA prepared by Muaūpoko.

The Applicant has accepted all of the proposed management and mitigation measures proposed by Muaūpoko in the CIA and incorporated these into the proposal.

HDC has worked with MTA to develop a Cultural Offsetting Management Plan (COMP). The primary objective of the COMP is ensuring no net loss, and preferably a net gain of mauri of the Ohau awa and habitat including, wetlands, is achieved. While there are many ecological benefits of the proposed COMP initiatives, the COMP is first and foremost a means of addressing cultural effects of the proposal.

The Applicant proposes consent conditions as a means to support iwi and hapū roles as kaitiaki. For instance, through providing opportunities for input into management plans and their reviews, the further development and implementation of the COMP and providing opportunities to comment on annual compliance reports. Conditions requiring transparency of this feedback and how it has been incorporated into relevant documents and the management of the system are also included. Further, iwi and hapū are to be notified in the event of an emergency or exceptional water take and must be kept informed throughout.

To the extent any additional cultural effects are identified by Muaūpoko or Raukawa hapū during this consenting process the Applicant will work with iwi and hapū to develop mitigation measures to address those effects and ensure that the requirements in sections 6(e) – (g) of the RMA are appropriately addressed in relation to the project.

In terms of section 6(h), the activities can be designed to avoid any potential adverse effects arising. The abstraction will not have an adverse effect on flood carrying capacity of the Ohau River and mitigation measures including, A Flood Contingency Plan will be developed to mitigate the risks of flooding during construction. With respect to the reservoir, in the case of a credible worst case-scenario breach of the reservoir, the risk of which is assessed as being extremely low, there is no risk to infrastructure and the risk to life is also considered to be extremely low. The proposal will add resilience within the Levin Water Supply network allowing the Council to provide a lifeline service to its community during and after natural hazards events.

Based on the above, the project is not contrary to any of the matters of national importance set out in section 6 of the RMA.

Section 7 of the RMA – Other Matters

Section 7 of the RMA sets out the matters that particular regard must be had to in managing the use, development and protection of natural and physical resources as follows:

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(ba) the efficiency of the end use of energy:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(e) [Repealed]

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

(g) any finite characteristics of natural and physical resources:

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

(i) the effects of climate change:

(j) the benefits to be derived from the use and development of renewable energy.

Most aspects of section 7 of the RMA are relevant to the Application.

With respect to section 7(a), as discussed in Section 7 and 9.1, the Applicant has sought to provide a role for iwi and hapū as kaitiaki by undertaking extensive consultation with iwi / hapū, the feedback from which has shaped the design of the project in terms of both the key elements of the project (such as significantly reducing takes below low flows) as well as proposed mitigation (such as the enhancement and restoration of wetlands).

The Applicant proposes to support iwi and hapū in exercising their role as kaitiaki through conditions which, for example, enable iwi and hapū to prepare the final COMP which, will detail the programme of actions required to achieve the offsetting, approve suitably qualified persons in relation to the COMP, for example those reviewing the COMP undertaking tikanga and cultural protocols at the site, contribute to the preparation of the Management Strategy, receive notification of emergency and exceptional abstractions and provide input on the Water Supply and Reservoir Operational plan, Water Demand Management Plan and In-River and Riparian Works Integrated Construction Management Plan and other Construction Management Plans.

The matters listed in section 7 (aa), (b), and (g) form part of the Applicant's proposed management of the ongoing operation of the Ohau drinking water scheme. This includes the short-term supply of water to NZTA Waka Kotahi to assist with the construction of the Ō2NL project.

The Applicant seeks to manage resources in accordance with the ethic of stewardship. It is in the Applicant's interests to manage and use resources in an efficient manner, all of which recognises the finite characteristics of natural and physical resources and the potential for unsustainable resource use if not managed and controlled appropriately. As detailed in section 3.1.3 the Applicant is required to assess and report on drinking water network efficiencies under the Water Services Act and currently (and will continue to) operate the system in accordance with the Water Demand Management Plan (updated as part of this application) which seeks to drive efficiency of use. Further, the Council has a programme of actions planned for addressing water efficiency and water demand and ensuring that water is used efficiently and effectively.

In relation to section 7(d) and (f), the Applicant has proposed measures to ensure the intrinsic values of ecosystems are not compromised, and its activities will improve the quality of the environment as a result of significantly reducing the takes during low flows and restoring and enhancing wetland areas to provide a net gain in wetland values.

Finally, section 7(i) is particularly relevant to the current application. As discussed in sections 3.1.1 and 5.1, the proposed reservoir and the ability to harvest water for storage is a critical step in addressing the high-extreme risks of the impact of climate change on the availability of drinking water faced by the district.

Section 8 of the RMA – Treaty of Waitangi

Section 8 of the RMA states:

> *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 take into account the principles of the Treaty of Waitangi (Te Tiriti ō Waitangi).*

The requirement to take into account the principles of the Treaty of Waitangi is an obligation on those exercising functions and powers under the RMA, including in this case the Manawatū-Wanganui Regional Council making a decision on this application.

The Applicant acknowledges the special status of iwi and hapū and the relationship they have with their taonga tuku iho (inherited treasures). The Applicant also recognises that the proposal is dependent on the use of resources that have spiritual and cultural significance to iwi and hapū.

The Applicant continues to work with iwi and hapū in a manner that is intended to be consistent with the principles of the Treaty of Waitangi. The particular steps that the Applicant has taken to work with iwi / hapū have been discussed in Section 7 of this AEE and as summarised above.

13 SUMMARY AND CONCLUSION

The reasons for this application are:

- To reduce the need to take from the river when it is below minimum flow thereby reducing the effects of the take on the River;
- To provide long term supply to Levin to meet growth projections which are significantly greater than when the existing Levin water supply consent was granted;
- To provide resilience within the Levin drinking water supply network by introducing large scale water storage and reducing risk associated with drought/low flow, high flow and highly turbid source water and emergency supply;
- To reduce the need to abstract large volumes of water from the existing intake structure, given sedimentation issues and the need to periodically scarify the river bed;
- To enable the construction, maintenance and operation of a new intake on the Ohau River and large off-river reservoir to be able to harvest and store water for later supply to the community;
- To provide flexibility and optionality within the water take permit structure to ensure security of supply and efficient use of resources and existing infrastructure by:
  - Providing flexibility between the two intake sites (being the existing intake site and a new reservoir intake site).
  - Ability to take the full consented volume from the new reservoir intake in emergency situations.

- Providing for a short term abstraction of water for construction of the Waka Kotahi Otaki to North Levin project in order to enable efficient allocation of water.

This proposal represents a significant investment by Council (in both water metering and leakage management within the network, and in bulk off-river water storage) to ensure that it is able to provide for the water supply needs for its community while reducing, as far as practicable, the effects of abstraction on the awa; and to provide for growth and improve the resilience of the supply. The proposal has been developed by Council through engagement with its Te Tiriti Partners and stakeholders to ensure that an affordable and sustainable water supply is developed which gives effect to the fundamental principle of Te Mana o te Wai.

Resource consent is required for the Levin Water Supply Water Harvesting & Resilience Project as a non-complying activity for a suite of activities necessary to enable the construction, operation and maintenance of the water supply scheme. The Applicant has requested public notification recognising the public interest in the Ohau Awa and the scale and significance of the proposal. As demonstrated within this Application, the potential adverse effects of the proposal are considered to be no more than minor, and the proposal is considered to be consistent with, and give effect to, all relevant objectives and policies of national and regional planning instruments. There are considered to be significant positive social/community and environmental benefits associated with the proposal. It is therefore considered that the proposal is consistent with the sustainable management purpose of the Resource Management Act.