Wellington Water

# Prince of Wales/Omāroro Reservoir

## Resource Consent Application: Assessment of Environmental Effects

Our water, our future.

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# 1 Introduction

This resource consent application (see attached GWRC forms), and Assessment of Environmental Effects is made by Wellington Water Limited (WWL) on behalf of the Wellington City Council (WCC) in accordance with section 88 of the Resource Management Act 1991 (RMA) for activities associated with the construction of a water supply reservoir within the Prince of Wales Park, Mount Cook, Wellington.

This application seeks:

- discharge permits for discharge of stormwater and groundwater during construction
- a land use consent for earthworks that may intercept groundwater (bores)
- a water permit for the take and use of groundwater
- a land use consent for cleanfill activities

## 1.1 The Project

The Project relates to the construction, operation, and maintenance of a 35,000 $m^3$ reservoir within the Wellington Belt in the Prince of Wales Park, Mount Cook (Figure 1). The circular concrete reservoir will be completely buried with the exception of two small access hatches on the roof of the reservoir and a 2.5m by 2.5m doorway and 10m wide service access area to the reservoir's buried service and pipe tunnel. These accesses are necessary for the on-going operation and maintenance of the reservoir.

The reservoir is required to service the Wellington Low Level Water Supply Zone, which provides potable water to approximately 70,000 residents and a range of significant commercial, industrial, and critical community facilities.

Further background to the Project, including the need for the Project and the history of the Project, is provided in **Appendix B**.

The Project includes approximately 3.6ha of earthworks and requires clearance of approximately 4ha of land (including approximately 1.7ha of established vegetation). Consent is required for these earthworks as well as the associated discharge of treated sediment-laden stormwater to land and to water. The reservoir excavations are likely to intercept groundwater, requiring dewatering and the associated discharge of treated sediment-laden groundwater to water and to land and the discharge of untreated groundwater to water and to land (where it meets water quality standards). The raising of the upper and lower fields could be defined as meeting the definition of cleanfill, so resource consent for a cleanfill activity is also sought.


*Figure 1: High-level location plan showing Prince of Wales Park and surrounding suburbs and landmarks.*

## 1.2 The applicant

### 1.2.1 Wellington City Council

WCC's vision for the city *Wellington Towards 2040: Smart Capital* sets out our aim to grow and sustain Wellington as an inclusive place where talent wants to live. This vision is supported by the community outcomes that set out long-term goals and guide WCC's activities:

- Connected city
- People-centred city
- Eco-city
- Dynamic central city.

WCC provides core services to meet the needs of Wellington residents including:

- Water, wastewater, stormwater and transport network infrastructure
- Waste collection and disposal

- Libraries, museums, reserves and other recreational facilities and community amenities.

WCC also provides services and initiatives to grow the city's economy and enhance Wellingtonians' quality of life.

A current area of focus for WCC is on making infrastructure more resilient, both in an operational sense and better able to cope with environmental shocks such as earthquakes and the impact of climate change.

WCC has financial responsibility for all water related infrastructure assets and asset development programmes within Wellington City, including the Prince of Wales / Omāroro Reservoir.

### 1.2.2 Wellington Water Limited

WWL is a shared-service council-controlled organization jointly owned by the Wellington, Hutt, Upper Hutt, and Porirua City Councils and the Greater Wellington Regional Council.

Established in 2014, WWL's role is to manage drinking water, wastewater, and stormwater services on behalf of the five councils. Ownership of the assets remains with the councils.

WWL's purpose, as described in its Statement of Intent, is:

> *"To create excellence in regional water services so communities prosper"*

WWL's service related outcomes are:

- **Safe** and healthy water
- **Respectful** of the environment
- **Resilient** networks support the economy.

Although WCC is the consent holder and has overall financial responsibility for this Project (ie funding will be provided for through the Long Term Plan), WCC has delegated to WWL, as a council controlled organisation, the development of the Project including consultation and preparation of this Assessment of Environmental Effects.

WWL will also be responsible for the construction, operation, and maintenance of the Prince of Wales/ Omāroro Reservoir on behalf of WCC.

## 1.3 Purpose and scope of this report

This AEE and supporting appendices have been prepared in support of the application for resource consents that would authorise, under the RMA, the construction of the Project.

This includes all activities associated with the construction, operation, and maintenance of:

- The Omāroro Reservoir structure and pipe tunnel
- Access to the reservoir and pipe tunnel
- Associated connections to the bulk water supply, local water supply, and local stormwater networks

It also includes all construction activities associated with the proposed raising and reinstatement of the upper and lower Prince of Wales playing fields.

This application does not cover any works required beyond the site associated with the upgrade of the bulk water supply network (within Wallace and Hargreaves Street). These works will be subject to separate consenting (if required).

An associated Requirement for a designation for the construction, operation, and maintenance of the reservoir will be notified WCC.

# 2 Site description

## 2.1 Site location

The proposed Prince of Wales/Omāroro Reservoir site is located on a spur within the Prince of Wales Park.

Prince of Wales Park is located in the Wellington Town Belt in the Brooklyn Hills, Wellington (Figure 2). The park is bordered by the suburbs of Mount Cook, Brooklyn, Vogeltown, and Newtown, with the Renouf Tennis Centre to the north and Macalister Park further to the south. The Wellington CBD lies to the north and northeast.


*Figure 2: High-level location plan showing Prince of Wales Park and surrounding suburbs and landmarks.*

The proposed reservoir will sit in a spur that generally slopes down from Dorking Road to a rounded knoll at the reservoir site and down again to the Prince of Wales Park playing fields. The reservoir site has an existing ground level of approximately 95 mRL.

There are two playing fields that have been levelled along the toe of the spur: the upper field (at 69 mRL), which is accessed off Rolleston and Hargreaves Streets, and the lower field (60 mRL), which is accessed from Salisbury Terrace (Figure 3). There are no built facilities on the upper field, but there is an existing pavilion building on the lower field that include changing rooms. In addition, the Scottish Harriers clubrooms and a public car parking area are situated to the south of the lower field.


*Figure 3: Proposed reservoir location within Prince of Wales Park showing surrounding streets.*

## 2.2 Property details

The legal description of the land within the Prince of Wales Park is Part Lot 2 DP 10337.

Prince of Wales Park is within the Wellington Town Belt and is subject to the provisions of the Wellington Town Belt Act 2016 and the Wellington Town Belt Management Plan. The land is owned and administered by WCC.

On 24 August 2017, the WCC City Strategy Committee approved an easement for the proposed reservoir in principle, subject to the reservoir securing all approvals required under the RMA. The approval is documented in the minutes of the City Strategy Committee meeting and approves the granting of:

> *"a) an easement relating to a water reservoir and associated infrastructure in perpetuity over parts of the Wellington Town Belt (subject to final survey) at Prince of Wales Part (part of Lot 2 DP 10337 on CFR 742981) pursuant to the Wellington Town Belt Act 2016 and to the Town Belt Management Plan 2017.*
>
> *b) a licence to accommodate the use of land necessary for the construction of the project."*

## 2.3 Existing environment

### 2.3.1 Wellington Town Belt

The Wellington Town Belt is part of the original area of town belt set aside in 1839. The current Town Belt protects a large, predominantly natural, open-space environment with a huge range of benefits to Wellington City. It is highly valued by the community for its contribution to landscape and amenity values.

The Wellington Town Belt is managed under the Wellington Town Belt Act 2016 and Wellington Town Belt Management Plan 2013. These documents are discussed in more detail in the statutory assessment in Section 8.

The area where the Prince of Wales Park is located is part of the original Town Belt.

### 2.3.2 Landscape and visual

The Brooklyn Hills area of the Town Belt forms a complex series of gullies and spurs, modified in places to provide sports fields and other recreational facilities. The Prince of Wales Park includes an open spur with panoramic views across Wellington Harbour and Mt Victoria. The Prince of Wales Park and surroundings do not form part of any identified outstanding natural feature or landscape.

The park is bounded:

- to the north by the properties of Rolleston and Hargreaves Street that adjoin the upper field, several of which have views across the upper field (Figure 4)
- to the east by the properties of Salisbury Terrace that adjoin and look out over the lower field (Figure 5)
- to the south and northwest by town belt land
- to the southwest by properties along Dorking Road and Asquith Terrace that overlook the reservoir site (Figure 6).

*Figure 4: Looking west from the upper field to dwellings on Rolleston Street. From Landscape and Visual Assessment.*

*Figure 5: Looking north along the lower field with Salisbury Terrace dwellings to the east. From Landscape and Visual Assessment.*

*Figure 6: Elevated residential dwellings along Dorking Road visible from the proposed reservoir site. From Landscape and Visual Assessment.*

### 2.3.3 Ecology

The existing ecological environment is described in more detail in the Ecological Impact Assessment in **Appendix E**.

*Vegetation*

Vegetation surrounding the site includes a combination of gorse and bracken, planted and regenerating native shrubs, and areas of mature pohutukawa, eucalypts and pine. The ecological value of native forest, scrub, and exotic communities is moderate; the ecological value of the planted native communities is low.

*Threatened and at-risk species*

The avifauna is enriched by species released within the Karori Wildlife Sanctuary and by those that have increased in abundance with the aid of WCC's pest control operations. In particular, kaka, bush falcon, bellbird, kereru, red crowned parakeet, and whitehead inhabit the surrounding area.

*Freshwater*

Two streams in the Project area, the Papawai Stream and an unnamed tributary of the Waitangi Stream, have perennial flows and aquatic fauna:

- **Papawai Stream:** flows through the site along the edge of the lower field and exits the site into the stormwater network at the top of Papawai Terrace. The stream is separated from the lower field by an earth bund, constructed some years ago to prevent on-going flooding of the field.
  The stream is subject to flood damage and there is significant scouring near the changing sheds on the lower field. There is also evidence of sediment deposition where the stream runs alongside the field. Downstream residents note that the stream regularly floods adjoining property.

Papawai Stream is perennial; of the two tributaries in the project area, one is dry without flow or pools, the other is intermittent in its lower reaches reducing to ephemeral further up.

- **An unnamed tributary of the Waitangi Stream**: flows down a gully to the west of the site, which exits the site into the stormwater network at the top of Rolleston Road.
  This unnamed tributary is perennial in its lower reaches near the upper playing field, but reduces to intermittent pools upstream and eventually becomes ephemeral close to the southern end of the proposed designation.

These are some of the last remaining fragments of the original Waitangi Stream. The remainder of Waitangi Stream is culverted beneath the city and suburbs. The ultimate receiving environment for these waterways is Wellington Harbour.

The ecological assessment (**Appendix E**) notes that both the Papawai Stream and unnamed tributary provide relatively poor habitat (low Physical Habitat Assessment scores). The Papawai Stream contains only one recorded species of fish – banded kopoku. No fish species were recorded in the unnamed tributary, however, koura were present.

Notwithstanding the low habitat availability and lack of fish species identified, the ecological assessment notes that the Papawai Stream and unnamed tributary of the Waitangi Stream represent two of only a very few fragments of the Waitangi Stream that remain un-piped and therefore have high and moderate ecological values respectively as remnants to the once much larger system.

### 2.3.4 Playing fields and tracks

There are two playing fields in the Prince of Wales Park and a number of paths in the surrounding area (see Figure 7).

The upper playing field was formed by cutting into the ridgeline that runs along the side of Rolleston Street to above Asquith Terrace/Dorking Street. Pedestrian and maintenance access to the field is from the top of Rolleston Street. There is an additional pedestrian access at the top of Hargreaves Street.

The lower playing field was cut into the east facing side of the ridgeline. The lower field is accessed from Salisbury Terrace along the eastern side of the field, which continues south to a carpark and the Wellington Scottish Athletics and Poneke Kyokushin Karate Dojo clubrooms. A sports pavilion at the north end of the field can be accessed by a steep drive off Salisbury Terrace.

There is also a track connecting the upper and lower fields.

The sports fields are used for both organised/formal and casual/informal recreation activities. Both fields are managed by Wellington City Council's Parks, Sports, and Recreation team as tier two fields and are intensively used during the summer months, but have lower use in winter as they do not have lighting.

There are a number of existing pathways providing access to and across the Prince of Wales Park. These range from 'tracks through grass' to more formal gravelled and paved pathways:

- A wide and relatively steep path from the top of Rolleston Street along the side of the spur to a lookout area where the reservoir will sit and on to Asquith Terrace/Dorking Street

- A narrower path that runs up the face of the spur to the lookout area
- Steps from the top of Rolleston Street to Bell Road
- A path from Asquith Terrace/Dorking Street skirts the top of the reservoir site and carries on down to Johns Street via Westland Road with a connection to the lower field

Paths and tracks through the park also form part of the wider track network of Wellington. The City to Sea walkway passes through the park starting at the steps from Bell Road (at the top of Rolleston Street), heading up the ridge to the lookout, and continuing south via the path in front of the Wellington Scottish Athletics and Poneke Kyokushin Karate Dojo clubrooms.


*Figure 7: Prince of Wales Park recreational facilities (white dotted track is the City to Sea Walkway / Te Araroa Trail). From Assessment of Effects on Recreation.*

# 3 Description of the Project

The proposed works that are the subject of this application include the construction of the proposed reservoir, associated access, pipework and tie-ins to the existing network, and the potential for raising the upper and lower Prince of Wales Park playing fields.

This section sets out a description of the physical works involved, the operation and function of the reservoir, and the anticipated construction activities.

All dimensions, areas, and volumes are approximate; details may change as the design and construction methods are finalised. All effects have been assessed on a 'worst-case' scenario. Any refinements that occur during detailed design are not expected to alter the assessment of effects in Section 6 of this report.

## 3.1 Prince of Wales/Omāroro Reservoir design

The reservoir preliminary design is outlined in detail in the Preliminary Design Report in **Appendix C.1** and the addendum to that report in **Appendix C.2**.

In summary, the proposed Prince of Wales/Omāroro Reservoir structure has:

- a capacity of 35,000m$^3$ (35ML)
- a footprint of 3,800m$^2$ (reservoir) / 4,000m$^2$ (reservoir + pipe tunnel)
- an internal diameter of 67.0m
- a wall height of 12.1m and total height of 15.5m.

The reservoir includes high and low pressure inlets, outlets, overflow, scour, and a ducted air vent. Scour and overflow will be connected to the Rolleston Street stormwater network (see Section 3.1.3).

Key reservoir parameters are given in Table 1.

*Table 1: Key reservoir parameters.*

| Element | Characteristic |
|---|---|
| Reservoir | |
| Storage volume | 35,000m$^3$ |
| Nominal water depth | 10.0 m |
| Top water level | 92.0 mRL |
| Overflow level | 92.075 mRL |
| Pipework | |
| Primary inlet | 700 L/s |
| Secondary inlet | 120 L/s |
| Outlet | 800 L/s |
| Overflow | 1,200 L/s |
| Scour | 400 L/s |

The reservoir is designed to be completely buried, with the exception of two small access hatches on the roof of the reservoir and a 2.5m by 2.5m doorway and 10m wide service access area to the reservoir's buried service and pipe tunnel. Cover over the reservoir roof will be 0.5 to 1.0m comprising a minimum of 200mm drainage material and a minimum of 300mm topsoil to allow grassing.

The ground surface beyond the reservoir walls will generally be 2H:1V. Steeper slopes may be adopted where required to tie into existing slopes or avoid filling ecologically sensitive areas. Any steeper slopes must be stable and reinforcement with geogrid or similar may be required for slopes steeper than 1.7H to 1V.

An opportunity to avoid an area of seral forest has been identified (see Section 6.3) and, during detailed design, this may result in a small section of the reservoir sidewall being retained rather than buried with earth. However, the worst-case scenario is assessed through this AEE.

### 3.1.1 Seismic design criteria

The reservoir is designed as an importance level 4 (IL4) structure (see **Appendix B** for an explanation of Importance Level) with a high degree of reliability and serviceability in normal service and after an Ultimate Limit State earthquake event.

It has an operational continuity limit state design seismic return period of 1,000-years – ie it will remain operational following a 1000-year return period earthquake, with no or minimal repairs needed.

Fill beyond the reservoir walls should remain in place after a 1 in 25-year return period earthquake (SLS1), but may slump away from the reservoir walls and require repair following a 1 in 1000-year event (SLS2).

The reservoir is designed to retain water in the Ultimate Limit State event – a 2,500-year return period event. The reservoir may require repairs, but will not collapse or cause harm to people.

### 3.1.2 Pipe tunnel

A pipe tunnel will allow access to pipework and will include electrical switchboards and instrumentation and control equipment. The tunnel structure is a single tunnel with 6.25m internal width and 2.2m internal height located below the floor level of the reservoir. A 2.5m x 2.5m access door on the side of the tunnel will provide access. An access road to the pipe tunnel access door will cross the western edge of the upper playing field to allow both regular maintenance/inspection access and emergency access. This access includes provision for the delivery of heavy values and other components.

### 3.1.3 Connection to existing network

Inlet and outlet connection to the existing water supply network will be from the pipe tunnel and under the upper field to the top of Hargreaves Street.

The overflow/scour drain from the reservoir will connect to an upgraded Rolleston Street drain. The overflow from the reservoir is sized to allow 1200 L/s. The 400 L/s scour flow will discharge into existing stormwater drainage along Rolleston Street.

### 3.1.4 Service relocations

Some modifications to existing services will be required to allow stockpiling of material on the upper and lower fields during construction and to facilitate permanent raising of the upper and lower fields (see Section 3.2). This will include replacement of an existing cast iron water main across the upper field and relocation of an existing wastewater main on the lower field. Two additional water mains and Wellington Electricity 33 kV cables may also require relocation to allow raising of the fields.

Detailed requirements for relocation of services, including confirmation of whether other services require relocation, will be agreed with the relevant service providers during detailed design and construction planning.

### 3.1.5 Reservoir site landscaping

Key proposed features of the reservoir site include:

- Planting of a range of species including natives
- Grassing over the roof of the reservoir to maintain the existing open area
- Reinstatement of the existing tracks through the park
- Reinstatement of the existing memorial bench seat

## 3.2 Use and raising of the upper and lower fields

The Preliminary Design Report in **Appendix C.1** provides for the upper field to be used during construction for material storage and stockpiling. This results in a very large stockpile (up to 8.5 m high) over most of the footprint of the upper field. In addition, the excavation and backfill of the reservoir site will generate over 30,000 $m^3$ of excess material that would have to be removed from the site and disposed of at cleanfill. An opportunity was identified to reduce the amount of material requiring disposal by raising the upper field and early designs were undertaken.

During the further investigations undertaken during preparation of this application and the application to WCC for an easement under the Wellington Town Belt Act 2016, a number of matters became apparent including that:

- an 8.5m stockpile on the upper field would have very high (albeit temporary) visual effects on residents
- a large stockpile on the upper field would not allow much space for storage of machinery and other construction materials, for contractor parking, or for any residents' parking to replace parking removed on Rolleston Street
- reducing the amount of material stockpiled on site would have a direct impact on the amount of material being disposed of at cleanfill, the amount of fill required to be imported, and the effects of the resulting increase

To resolve these issues, it is proposed to use both the upper and lower fields during construction, distributing the stockpiles over both fields, and to spread excess material over both fields to raise their level.

The works described in this section have not yet been confirmed. Whether one or both of the fields will be used for disposal of excess material will be confirmed during detailed design and construction planning and will depend on a range of factors including cost. These works would be described in a Field Raising

Management Plan proposed to be provided as a condition of consent. For the purposes of the resource consent application, the Assessment of Environmental Effects in Section 6 assumes a worst-case scenario (ie maximum raising of both fields).

The attached report, *Prince of Wales/Omāroro Reservoir: Raising of Playing Fields Feasibility Study* (see **Appendix C.3**), outlines the proposal in more detail. In summary, the anticipated works involve:

Upper field:

- Raising the field approximately 1 m against the existing bank on the southern side of the field
- Sloping the field at a 1:70 grade up to the centre of the field and back down towards the northern side of the field
- Installing low retaining along parts of the northern and eastern boundaries
- Installing Stormwater drainage to be concrete or grassed channel/swale with sumps along the northern and southern edges of the field

Lower field:

- Raising the field to 100 mm below the height of the existing flood bund along a central longitudinal ridge
- Sloping the field at a 1:70 grade to the eastern and western edges
- Installing a retaining wall (1 – 4.5 m high) along the eastern boundary adjacent Salisbury Terrace
- Installing stormwater drainage to be concrete or grassed channel/swale with sumps draining to a new stormwater pipe at the northern end of the field and into a new Salisbury Terrace stormwater system

In total, approximately 8,000 $m^3$ of material can be permanently placed on the upper field and 7,800 $m^3$ on the lower field. Some 300 $m^3$ will also be used to upgrade the existing track between the two fields. The proposed landscape strategy outlines landscaping for the upper and lower fields. This includes:

- Proposed planting along the retaining walls
- Fencing
- New vehicle access to both the upper and lower fields

There is also the potential for improving parking on or adjacent to the upper field, but final details have not been confirmed at this stage and would be agreed through a Landscape Management Plan to be provided to WCC as a condition of the designation.

## 3.3 Indicative construction methodology

The construction is expected to be split into five main stages:


### 3.3.1 Temporary material storage

During construction, material excavated from the reservoir site will be stored on the upper and lower fields. Approximately 25,000 $m^3$ (in-situ) of material is expected to be stockpiled for re-use – either for backfilling the reservoir or for raising the upper and/or lower fields. Assuming a bulking factor of 1.2, total required storage is in the order of 30,000 $m^3$.

Material that will not be re-used for reservoir backfill or raising of the fields is expected to be removed from the site shortly after excavation. It may need to be stockpiled for short periods of time until it can be transported off-site.

On the upper field, the main stockpile (excavated greywacke/argillite) will be limited to 4 m high[1], and its northern edge will be offset 25m from the residential property boundary to:

- Reduce the effects of the stockpile on these properties
- Allow space for displaced residents' parking (from Rolleston Street) along the north west edge of the field during construction
- Allow space for the installation and operation of erosion and sediment control measures
- Allow space to stockpile topsoil (no higher than 2m in height) for reuse.

The southern side of the stockpile will be set back approximately 8 m from the toe of the steep bank above the field. This will provide a space for construction vehicle traffic along the southern side of the stockpile. Flexibility exists within this field configuration to accommodate areas that may be needed for vehicle manoeuvring, storage of other equipment and materials, and site offices.

On the lower field, the stockpile will be located towards the western side of the field, away from the nearest houses. The height of the stockpile is expected to be no more than 5.5 m above the raised field level.

Topsoil may be stockpiled on both fields. Topsoil stockpiles will be limited to 2m high to minimise compaction.

Where stockpiles are to remain undisturbed for longer than one month, they should be stabilised as set out in the Draft Construction Erosion and Sediment Control Plan (ESCP) provided in **Appendix I.**

### 3.3.2 Erosion and sediment control

A Draft Construction Erosion and Sediment Control Plan (ESCP) is provided in **Appendix I**, which provides a high level overview of the erosion and sediment control measures to be implemented during construction.

The key controls proposed to manage erosion and sediment are:

- A cleanwater diversion above the reservoir site
- Perimeter controls around the edge of the upper and lower field and above the Papawai Stream and unnamed tributary
- Sediment retention ponds ('SRP') with chemical treatment on both fields to treat water prior to discharge to either stormwater or the Papawai Stream
- Stabilised site entrances, stabilised track to the reservoir site, and upgraded and stabilised track to the lower field
- Progressive stabilisation of the site – hydroseeding, mulching, and/or planting as soon as practicable
- Monitoring of SRP discharges and the Papawai Stream to provide early warning

[1] This 4m will be measured from the height of the ground at the time the stockpile is placed – the top level will vary depending on whether the field is raised before stockpiling occurs.

Phase Specific Erosion and Sediment Control Plans will be produced for each of the five construction phases – site establishment, initial excavation of reservoir site, reservoir tank construction, backfilling, and site completion. Those Plans will identify the specific control measures, and their locations, maintenance and monitoring requirements. It is proposed to include a condition of consent requiring GWRC certification of those plans prior to the commencement of the relevant construction phase.

### 3.3.3 Dewatering

The nominal height for excavation for construction of the reservoir is 81.0 mRL (ie the base of the reservoir excavation is likely to be around this level). Geotechnical investigations in 2013 encountered groundwater at around 86.0 mRL so it is likely that groundwater will be encountered during excavation works.

Some dewatering of the excavation may be required. Any groundwater encountered will be discharged as per stormwater from the site (either to land, water, or to the stormwater network) following treatment. If the groundwater is clean (ie it meets the sediment retention pond discharge triggers set out in the draft Erosion and Sediment Control Plan (**Appendix I**), then it may be discharged without treatment.

### 3.3.4 Vehicle access

Site access for heavy vehicles will be from Rolleston Street. To reduce the volume of vehicle movements on Rolleston Street, light vehicles will generally access the site from Salisbury Terrace. The existing track between the upper and lower fields will be upgraded to allow heavy vehicle movements between the fields.

## 3.4 Earthworks volumes

Earthworks will take place within an area of approximately 2.6-3.6 ha. There are three potential earthworks scenarios[2] (all volumes exclude topsoil and are approximate in-situ values so do not provide for bulking):

**Scenario 1:** The reservoir construction requires excavation of 56,000m$^3$ of material. Of this, 25,000m$^3$ of suitable material will be stockpiled on the upper and/or lower sports field and used as backfill once the reservoir is constructed. The surplus material (30,800 m$^3$) will be disposed of off-site.

**Scenario 2:** The reservoir construction requires excavation of 56,000 m$^3$ of material. Of this, 25,000 m$^3$ of suitable material will be stockpiled on the upper and/or lower sports field and used as backfill once the reservoir is constructed. In addition, the upper sports field will be raised by up to 1.5 m using 8,000 m$^3$ of additional suitable excavated material. The surplus material (22,700 m$^3$) will be disposed of off-site.

**Scenario 3:** The reservoir construction requires excavation of 56,000 m$^3$ of material. Of this, 25,000 m$^3$ of suitable material will be stockpiled on the upper and/or lower sports field and used as backfill once the reservoir is constructed. In addition, both the sports field will be raised by up to 1.5 m using 16,100 m$^3$ of additional suitable excavated material. The surplus material (14,700 m$^3$) will be disposed of off-site.

[2] There is a fourth possible scenario – using both the upper and lower fields for stockpiling, but only raising the lower field; however, this is unlikely and earthworks volumes are similar to scenario 2 so it has not been considered separately.

In addition, approximately 5,500m$^3$ of earth/rock material will be imported for use as fill material under all three of the scenarios. This will include material for reservoir foundations and drainage material.

*Table 2: Approximate earthworks volumes under each of the three potential scenarios (all volumes in-situ).*

| | Volume excavated | Volume stockpiled for backfill | Additional volume utilised | Volume imported fill | Volume surplus material |
|---|---|---|---|---|---|
| Scenario 1 | 56,000 m$^3$ | 25,000 m$^3$ | Nil | 5,500m$^3$ | 30,800m$^3$ |
| Scenario 2 | 56,000 m$^3$ | 25,000 m$^3$ | 8,000 m$^3$ to raise upper sports field | 5,500m$^3$ | 22,700 m$^3$ |
| Scenario 3 | 56,000 m$^3$ | 25,000 m$^3$ | 16,100 m$^3$ to raise both sports fields | 5,500m$^3$ | 14,700 m$^3$ |

The volumes above are based on an assumption that a large percentage of the excavated material will be suitable for reuse either as backfill for the reservoir or for raising of the fields. Should the excavated material not meet fill requirements, the volume required to be imported and disposed of off-site will increase. The same assumption applies for topsoil.

# 4 Approvals sought under the Resource Management Act 1991

## 4.1 Resource consents

The Project includes activities that require resource consents under the Wellington Regional Plans.

*Regional consents*

The Project requires regional land use consents, water permit and discharge permits as outlined in Table 3 below. A ten-year term and lapse period is sought on all consents.

Overall, consent is sought from Greater Wellington Regional Council as a **Discretionary Activity**.

*Table 3: Activities requiring consent under the Wellington Regional Plans.*

| Activity | Assessment | Activity status |
|---|---|---|
| **Operative Regional Freshwater Plan** | | |
| Discharge of sediment and chemical treatment in treated stormwater run-off to water | Stormwater from the site will be treated in erosion and sediment control devices prior to discharge. Where possible, discharge will be to land; however, it may be necessary to discharge directly from treatment devices to the Papawai Stream and an unnamed tributary of the Waitangi Stream or to the local stormwater network.<br>It is likely that the discharge of suspended solids will, at times, exceed 50g/$m^3$ and may contain residual chemical treatment; therefore, the conditions of permitted activity Rule 1 cannot be met and the discharge falls for consideration under the discretionary catch-all Rule 5. | Discretionary activity under Rule 5 |
| Discharge of sediment and chemical treatment in treated and untreated groundwater to water | Groundwater from dewatering activities is likely to meet the conditions of Rule 1.<br>Where these conditions can be met, groundwater may be discharged directly to the local stormwater network or the unnamed tributary of the Waitangi Stream as a permitted activity.<br>Where the conditions of Rule 1 cannot be met, groundwater from dewatering will be treated and discharged with the site stormwater and will fall for consideration under the discretionary catch-all Rule 5. | Permitted activity under Rule 1<br><br>Discretionary activity under Rule 5 |
| Construction of excavations that may intercept groundwater (bores) | The reservoir excavations are expected to intercept groundwater (during geotechnical investigations, groundwater was encountered at 86mRL and the base of the reservoir is around 81mRL). The definition of bore includes any excavation that intercepts groundwater, so | Discretionary activity under Rule 15 |

| Activity | Assessment | Activity status |
|---|---|---|
| | the excavations will fall under discretionary activity Rule 15. | |
| Take and use of groundwater for the dewatering of excavations, dust suppression, and construction purposes | As the excavations will intercept groundwater, dewatering of the excavations will be required. Groundwater from dewatering may be use for construction purposes (including dust suppression).<br>Dewatering will occur at a rate no greater than required to dewater the excavation. It is possible that this will exceed 2.5L/s and/or 20,000L/day; therefore, dewatering cannot comply with permitted activity Rule 7 and falls for consideration under discretionary catch-all Rule 16. | Discretionary activity under Rule 16 |
| **Operative Regional Plan for Discharges to Land** | | |
| Discharge of sediment and chemical treatment in treated stormwater run-off and dewatered groundwater to land, to land where it may enter water, and to the stormwater network | Stormwater from the site will be treated in erosion and sediment control devices prior to discharge to land where it will drain to the Papawai Stream and an unnamed tributary of the Waitangi Stream or to the local stormwater network.<br>As the discharges will include sediment and chemical treatment and will enter water, permitted activity Rule 1 cannot be met and the discharge falls under discretionary catch-all Rule 2. | Discretionary activity under Rule 2 |
| **Operative Regional Soil Plan** | | |
| Earthworks and vegetation clearance on erosion prone land | The site is not identified on GWRC's GIS as being erosion prone so the Regional Soil Plan is not considered to apply. | Not applicable |
| **Proposed Natural Resources Plan** | | |
| Earthworks and the discharge of sediment and chemical treatment in treated stormwater run-off to water and to land where it may enter water from an area of earthworks exceeding 0.3ha | The area of earthworks is approximately 4ha, exceeding the 3ha limit imposed by permitted activity Rule R99 (although all other conditions can be met).<br>The site is not identified on GWRC's GIS as being erosion prone so Rule R100 is not considered to apply.<br>The earthworks fall under discretionary catch-all Rule R101. | Discretionary activity under Rule R101 |
| Discharge of sediment and chemical treatment in treated and untreated dewatered groundwater to water, to land where it may enter water, and to the stormwater network | Groundwater from dewatering activities is likely to meet the conditions of Rule R42.<br>Where these conditions can be met, groundwater may be discharged directly to the local stormwater network or the unnamed tributary of the Waitangi Stream as a permitted activity.<br>Where the conditions of Rule R43 cannot be met, groundwater from dewatering will be treated and discharged with the site stormwater and will fall for | Permitted under Rule R42<br><br>Discretionary under Rule R68 |

| Activity | Assessment | Activity status |
|---|---|---|
| | consideration under the discretionary catch-all Rule R68. | |
| Discharge of cleanfill material to land in excess of 100 $m^3$ | The use of excess material from the reservoir excavation to raise the upper and lower fields could be viewed as a cleanfill activity. The activity will exceed 100$m^3$ and will be closer than 20m to a surface water body; therefore permitted activity rule R70 cannot be met and discretionary activity Rule R93 would apply. | Discretionary activity under Rule R93 |
| Take and use of groundwater for the dewatering of excavations, dust suppression, and construction purposes | Excavations that intercept groundwater do not trigger the requirement for a core consent in the proposed plan; however, groundwater will be intercepted and dewatering will be required.<br>Dewatering will be required for a period of longer than one month so the conditions of permitted activity rule R140 cannot be met and the dewater falls under discretionary catch-all rule R142 | Discretionary under Rule R142 |

*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*

Sports fields are included on the Hazardous Activities and Industries List (HAIL) as there is a risk of persistent use of pesticides for turf management. An initial contaminated land investigation of the upper field was undertaken in 2013, which identified levels of contaminants exceeding background, but below environmental and human health guidelines. No investigations have been undertaken in the lower field.

Resource consents under the NESCS are not being sought at this time, as there has been insufficient certainty on the proposed raising of the upper and lower fields and construction methodologies to determine the extent of works and therefore the extent of testing required. Any consents required will be sought from WCC closer to construction when greater certainty can be provided in relation to the effects and mitigation required in relation to contaminated land and the NES.

## 4.2 Notice of Requirement for Designation

A Notice of Requirements for a designation for the construction, operation, and maintenance of the Omāroro Reservoir has been lodged with WCC. The designation footprint being sought is shown on Figure 8.

*Figure 8: Designation footprint.*

# 5 Consultation and engagement

WWL has engaged with residents, WCC (as landowner responsible for the Town Belt and as operator of the Prince of Wales Park playing fields), iwi, and a wide range of groups and organisations with direct interests in the Wellington Town Belt, Prince of Wales Park, Papawai Stream, and the surrounding residential area.

Two pre-lodgement meetings were held with a GWRC Officer (Doug Fletcher). During this engagement, GWRC requested that the regional consent requirements of the Project were separated from the Notice of Requirement for Designation to allow separate processing.

## 5.1 Iwi

Meetings have been held by WWL on WCC's behalf with both Ngati Toa and Port Nicholson Trust, who have been identified as potentially affected iwi interests.

Ngati Toa confirmed that they do not need to be involved in the process but would like to be kept informed. Port Nicholson Trust has indicated in principle support for the Project.

## 5.2 Wellington City Council - Operations

The Project Team has met with the WCC teams whose operations may be affected by the Project. In particular:

- WCC Roading Team to discuss and agree matters in the Traffic Effects report (27 October 2016 and a number of occasions since)
- WCC Open Space and Parks Team to discuss the Easement Application (16 January 2017 and a number of occasions since)
- WCC Parks, Sports and Recreation Team to discuss impacts on the sports fields during construction and the proposed raising of the sports fields (17 January 2017).

## 5.3 Local community

The Project Team has endeavoured to raise local community awareness of the proposal through the use of flyers, local shop displays, social media, engagement with community groups and residents' groups, several publicly advertised open days, and a BBQ drop-in session.

WWL has actively sought feedback from the community on the key issues that should be addressed by this application and as part of the reservoir development. Feedback has been used to refine the proposal and shape proposed consent conditions.

A summary of key community engagement events held so far is outlined below.

*Open Day 1 - November 2016*

An Open Day was held on 24 November 2016 at the Massey University campus on Wallace Street. The purpose of this Open Day was to raise awareness, re-introduce the Prince of Wales/Omāroro Reservoir

Project to the community, and obtain feedback on the issues of importance to the community prior to commencing an assessment of the effects of the reservoir proposal.

Over 30 people signed an attendance register; however, the total number of attendees was higher as a number of people did not sign in.

Key issues raised by residents included:

- Water security and resilience
- Constructing the reservoir without delay
- Site selection – why was the Prince of Wales Park site the best site option? Why one large reservoir and not several smaller structures?
- Effects on the Papawai Stream, which has high value to the community
- Fixing existing scour issues in the Papawai Stream
- Traffic effects of the development on Rolleston Street, including parking
- Coordinating the WWL's various water supply, waste water and storm water pipe renewal, maintenance and upgrade programme work streams within the area to prevent streets being dug up multiple times, and potentially enable this work to be undertaken in a coordinated and integrated manner
- Noise, vibration and dust effects during construction
- Effects on birds and fish with habitat in the project area
- Ensuring the reservoir was buried
- Ensuring that the Town Belt values were being appropriately looked after
- What will happen to water if there is a rupture in the reservoir?
- The playing fields have insufficient drainage – can that be remedied as part of the Project?

Many people who attended the Open Day thought that the advertising of the Open Day was insufficient. The Open Day was advertised through local papers, on Facebook, and via a letter drop to the surrounding streets. However, it appears that there were some issues with the letter drop; so to ensure that residents were not disadvantaged, a second Open Day was organized and held in December.

### *Open Day 1.1 - December 2016*

A second version of the first Open Day was held on 16 December 2016, also at the Massey University Campus on Wallace Street, in response to concerns that some local residents were not aware of the Open Day held on 24 November.

This Open Day presented the same information as the Open Day on 24 November.

Over 20 people signed the attendance register, but again the total number of attendees was higher as a number of people did not sign in. Similar concerns were raised at this Open Day as at the initial Open Day.

### *BBQ and drop-in session - March 2017*

A community BBQ and drop in session was held at Rolleston Street, on 25 March 2017, to coincide with Neighbour's Day. This event was run in conjunction with Wellington City Council and Housing New Zealand. The purpose of this session was to maintain a community awareness of the reservoir project, and to provide community access to the project team to provide feedback and discuss issues of importance to the community.

This event was informal. Over 50 people attended over the course of the morning. Attendees were not required to sign an attendance sheet.

Similar concerns were raised as at the Open Days. Feedback received strongly focused around community concerns and interests in loss of car parking and traffic implications associated with heavy vehicles on Rolleston Street.

*Open Day 2 – June 2017 and submissions on the Town Belt Easement application*

A second Open Day was held on 17 June 2017 at the Massey University campus on Wallace Street. The purpose of this Open Day was to update the community on the outcome of the technical report investigations, present the Town Belt Act Easement Application, and provide people with enough information that they could make an informed submissions on the TBA application.

The Open Day included presentations for technical experts on structural and seismic stability, landscape effects, ecological effects, and site erosion and sediment control management.

A total of 38 submissions were received on the TBA application. These submissions raised a variety of issues including:

- Whether the site was appropriate for a reservoir and/or if a number of smaller reservoirs should be constructed rather than a single large one
- Disruption to residents from noise, traffic, and dust
- The stability of the fields (in relation to the proposed field raising) and the track between the two fields
- Effects on Papawai Stream
- Whether effects on morepork/owls had been considered
- The potential for community input to planting and educations opportunities
- Access to Scottish Harriers during construction

The technical reports included in Appendix F through J of this NOR have been updated, where possible taking into account feedback received at Open Day 2 and through the TBA submissions process.

## 5.4 Local interest groups

The Project Team has provided information on the Project to a number of local interest groups in person, over the phone, and via email. Groups invited to meet in-person include:

- Friends of Papawai Stream
- Bell Rd Restoration Group
- Action for the Environment
- Friends of the Wellington Town Belt
- Newtown Residents' Association
- Brooklyn Residents' Association
- Mt Cook Mobilised
- Newtown Business Group
- Mount Victoria Residents' Association.

Members of the Project Team attended the regular meetings of Mt Cook Mobilised and the Newtown Residents' Association, met with the Friends of the Town Belt Committee, and met on site with the Papawai Restoration Group.

In general, the local interest groups have raised the same issues as the attendees of the Open Days.

# 6 Assessment of environmental effects

## 6.1 Summary of environmental effects

A detailed assessment of the adverse potential effects is included in Sections 6.3 to 6.6 below and appendices F, G, H, and J.

*Table 4: Summary of environmental effects.*

| Effect | Summary | Level of adverse effect |
|---|---|---|
| **Ecology** | Effects on ecology include the removal of native and non-native vegetation, disturbance, and removal of habitat for avifauna, and potential for discharges to waterways.<br>Discharges: All effects are temporary except for potential effects on the Papawai Stream and unnamed Waitangi Stream tributary; however, the design has been developed to avoid effects on these waterways. Overall, with good erosion and sediment control management, the effect of discharges to land and water is assessed as less than minor.<br>Vegetation clearance: The effects of vegetation clearance, particularly on avifauna are assessed as minor, due to the potential for impacts on breeding kaka and bush falcon. | Minor (effects on avifauna)<br>Less than minor (all other ecological effects) |
| **Erosion and sediment control** | A draft Construction Erosion and Sediment Control Plan sets out methods to minimise discharge of sediment. It is recognised that some discharges will be unavoidable; however, with good erosion and sediment control management, the effects on the receiving environment will be temporary and less than minor. | Less than minor |
| **Cultural** | The site has value to iwi, but this will not be adversely affected by the proposal. The site will be blessed prior to commencement of construction.<br>The site has a low risk of containing archaeological material, but an Accidental Discovery Protocol will be put in place. | Less than minor |
| **Stormwater** | The reservoir and field raising have been design to integrate into the existing stormwater network without adverse effect. Raising of the lower field will result in some benefits. | Less than minor |

## 6.2 Positive effects

The key benefits of the reservoir are:

- Allows Macalister Reservoir to be taken offline for cleaning, inspection, and maintenance
- Will significantly reduce reliance on the Pressure Reducing Valves to supply Thorndon during peak demand times
- Will increase residence time of water in the network giving more time to respond to any contamination issues that could arise (noting that this risk is already low)

- Will significantly increase operational storage and provide additional time to respond to operational network issue such as pipe leaks
- Will significantly increase disaster resilience and allow for provision of minimum water supply to the low level zone from days 8 to 30 after a significant seismic event

The proposed field raising also has benefits including:

- Reducing the number of truck movements on Rolleston Street during construction of the reservoir
- Improve the drainage and playing surface of the two playing fields
- Improve an existing flood issue of the Papawai Stream during large events

## 6.3 Ecology

Ecological effects, including those related discharge of treated sediment-laden water to water, are covered in detail in the Ecological Impact Assessment in **Appendix E**. Although this consent application specifically seeks consent for earthworks and associated discharges to land and water, the effects of vegetation clearance have been included for completeness.

Table 5 summarises the ecological effects identified in that report and assesses the level of effect in RMA terms.

The key mitigation actions to be taken to avoid, remedy, and mitigate ecological effects are:

- During detailed design, consideration will be given to minimising the project footprint and, in particular, maximising the buffer between the toe of the reservoir batter and the two waterways. Consideration will also be given to avoiding fill in an area of seral forest to enable retention of that vegetation.
- A Landscape Management Plan will be prepared that will outline strategies for minimising vegetation loss including the marking out of vegetation to be retained prior to works commencing, processes for removing large trees, and actions taken (if any) to further minimise loss of seral forest.
- Tree clearance will be managed to minimise effects on indigenous birds, specifically cavity breeders. This will include avoiding breeding season (where practicable) and/or surveying trees prior to felling. If felling is likely to occur during breeding season, nesting boxes could be installed away from the work area to encourage nesting outside of the project area,
- A Planting Management Plan will be prepared as part of the Landscape Management Plan for site restoration including an area of seral forest replanting at 3:1 ratio for loss, native planting at a 1:1 ratio, enhancement of riparian planting along the Papawai Stream, and inclusion of winter flowering eucalyptus for seasonal food supply.
- An Erosion and Sediment Control Plan will be implemented to manage erosion and sediment on site and minimise discharges to the environment (see Section 6.4 and **Appendix I**).

Overall, and with appropriate management and mitigation actions as outlined above, the ecological effects of the earthworks and associated discharges resulting from construction of the reservoir are expected to be less than minor. Replanting of the site in native species, including species selected for lizard habitat, will result in an increase in indigenous vegetation and a reduction in weediness.

*Table 5: Summary of ecological effects*

| Effect | Duration | Level |
|---|---|---|
| **Terrestrial habitat** | | |
| *Native forest and scrub:* Although the existing native forest and scrub has moderate value, the extent being removed (approximately 0.18ha) relative to the total area within the Brooklyn Hills area is very small and the effect is considered **very low**. | Temporary | Less than minor |
| *Planted and native communities:* Although the magnitude of the effect of the loss of 0.51ha of planted native vegetation is considered moderate, the value of the vegetation is low and the overall effect is **very low**. | Temporary | Less than minor |
| *Exotic communities:* The small area of exotic trees that provide bird habitat and a seasonal food source have moderate value in terms of ecological context, however, the area being removed (approximately 1ha) is negligible in the context of the Town Belt. Effects will be **very low**. | Temporary | Less than minor |
| **Avifauna** | | |
| *Habitat loss:* The vegetation to be cleared makes up a small percentage of the Town Belt/Brooklyn Hills area and is unlikely to have an adverse effect on local populations of birds. The effect will be low to very low. | Temporary | Less than minor |
| *Disturbance:* Any species present in the Prince of Wales area already experience high levels of human disturbance. There is space adjacent the works and in surrounding areas of the Town Belt where birds can relocate. The effect will be low to very low. | Temporary | Less than minor |
| *Breeding (cavity nesters):* There is a greater risk to some species during vegetation clearance – in particular kaka, parakeet, ruru/morepork, and bush falcon.<br>There is a low risk of any of these species having a nest within the Project footprint. The magnitude of effect if a nest was lost is low (ruru/morepork, kaka) to moderate (bush falcon, parakeet). Proposed mitigation measures will minimise the level of effect. | Temporary | Minor-Less than minor |
| **Freshwater** | | |
| *Papawai Stream (reservoir):* There are no direct effects on the tributary from construction of the reservoir (ie the reservoir footprint does not extend into the waterway). However, consideration should be given to maximising the buffer during detailed design. Effects will be **very low**. | Permanent | Negligible |
| *Papawai Stream (raising the lower field):* Raising the playing field could constrain the stream to a narrow corridor, increase flow volumes and velocities, and thereby increase scour and erosion of the channel. The proposed design considers this and minimises any change in flows. Effects will be **very low**. | Permanent | Less than minor |
| *Papawai Stream (discharges):* With proposed erosion and sediment control management (see Section 6.4), effects related to discharges of sediment to the stream will be **very low**. | Temporary | Less than minor |
| *Unnamed tributary of the Waitangi Stream (reservoir):* There are no direct effects on the tributary although the reservoir fill batter comes close to the waterway and consideration should be given to maximising the buffer during detailed design. Effects will be **very low**. | Permanent | Negligible |

| Effect | Duration | Level |
|---|---|---|
| *Unnamed tributary of the Waitangi Stream (discharges):* With proposed erosion and sediment control management (see Section 6.4), effects related to discharges of sediment to the stream will be **very low**. | Temporary | Less than minor |
| **Marine** | | |
| *Wellington Harbour:* If construction discharges from site are not appropriately managed, the ultimate receiving environment for the discharges is Wellington Harbour. With proposed erosion and sediment control management (see Section 6.4), effects will be **very low**. | Temporary | Less than minor |

## 6.4 Erosion and sediment control

The proposed reservoir is close to two waterbodies: Papawai Stream and an unnamed tributary of the Waitangi Stream. These stream and the stormwater networks in the area eventually drain to the Wellington Harbour. Without appropriate management, the earthworks associated with the reservoir construction have the potential to generate sediment and impact on water quality in the streams and harbour.

The Draft Construction Erosion and Sediment Control Plan (ESCP) in **Appendix I** provides a high level overview of the erosion and sediment control measures to be implemented during construction.

The nine key principles of erosion and sediment control, as outlined in *Erosion and Sediment Control Guidelines for the Wellington Region* will be applied to the construction:

- **Minimise Disturbance** – Only work in those areas required for construction, and be mindful of environmental conditions such as wet or steep land
- **Stage construction** – Carefully plan and stage works to minimise time and area of erosion-prone land exposed at any one time
- **Protect steep slopes** – Protect steep slopes from erosion using erosion controls
- **Protect watercourses** – Map all waterbodies and drainage patterns prior to works commencing
- **Stabilise exposed areas rapidly** – Stabilise disturbed soils using methods including sowing, mulching polymer or geotextiles
- **Install perimeter controls** – Divert clean water away from areas of disturbance, and divert runoff from disturbed areas to sediment control measures
- **Employ detention devices** – Capture and treat runoff to allow sediment to settle out
- **Make sure the ESCP evolves** – Update ESCP as construction progresses, the nature of the land disturbing activities change or in relation to weather events
- **Inspect** – Inspect, monitor and maintain control measures regularly and after weather events

The key controls proposed to manage erosion and sediment are:

- A **cleanwater diversion** above the reservoir site
- **Perimeter controls** around the edge of the upper and lower field and above the Papawai Stream and unnamed tributary
- **Sediment retention ponds** with chemical treatment on both fields to treat water prior to discharge to either stormwater or the Papawai Stream

- **Stabilised site entrances**, stabilised track to the reservoir site, and upgraded and stabilised track to the lower field
- **Progressive stabilisation** of the site – hydroseeding, mulching, and/or planting as soon as practicable
- **Monitoring** of SRP discharges and the Papawai Stream to provide early warning

Phase Specific Erosion and Sediment Control Plans will be produced for each of the five construction phases – site establishment, initial excavation of reservoir site, reservoir tank construction, backfilling, and site completion. Those Plans will identify the specific control measures, and their locations, maintenance and monitoring requirements. It is proposed to include a condition of consent requiring GWRC certification of those plans prior to the commencement of the relevant construction phase.

With the imposition of the types of control measures and the monitoring and maintenance actions outlined in the Draft Erosion and Sediment Control Plan, the potential impacts of the earthworks associated with the reservoir development and raising of the sports fields can be appropriately managed. The proposed monitoring of the sediment retention pond outlets and the Papawai Stream will alert the contractor to discharges that could have an effect on the stream and indicate that changes in on site management are required.

It is considered that the implementation of the CESCP and the required phase-specific ESCPs constitutes good erosion and sediment management and effects on the receiving environment will be less than minor.

## 6.5 Cultural

Potential cultural effects are covered in detail in the Cultural Impact Assessment in **Appendix F**. This CIA was prepared in 2012, but the Port Nicholson Block Settlement Trust and Te Rūnanga o Toa Rangātira have confirmed that it continues to reflect the cultural values of the site.

In summary, there is no need for an archaeological examination of the site prior to the commencement of construction, but an accidental discovery protocol should be put in place and the site should be blessed by Port Nicholson Block Settlement Trust prior to construction commencing.

A condition of consent requiring an Accidental Discovery Protocol is proposed in **Appendix A**.

Overall, cultural effects are considered less than minor.

## 6.6 Stormwater

Potential stormwater effects are covered in detail in the Stormwater Assessment in **Appendix G**. Overall, effects of the Project on stormwater volumes and flows are less than minor.

*Reservoir and upper field*

The only new impervious area at the site is the access to the pipe tunnel, which has an area of approximately 530 m² (0.05 ha), which is minor compared to the 6.6 ha catchment draining to the top of Rolleston Street (i.e. 0.8%).

There will be minor changes to the flow paths from the reservoir spur due to the change in shape and part of the Upper Field will discharge to Rolleston Street rather than Hargreaves Street as a result of the field raising. However, the development will not materially increase the runoff from the catchment.

The reservoir accessway will be used by maintenance vehicles, but will not have regular traffic and will generate minimal contaminant loads, and therefore no stormwater treatment is proposed.

### *Stormwater network*

Primary stormwater runoff from the reservoir access will be piped to Rolleston Street, and secondary flow will be directed to Rolleston Street.

The reservoir overflow and scour pipework will connect to the stormwater system in Rolleston Street. The scour pipework will be sized to match the capacity of the Rolleston Street pipe system. The risk of reservoir overflow will be mitigated through monitoring, controls, and alarms. In the unlikely event that the pumps continue to pump when the reservoir is full, water would flow via the overflow pipework into the Rolleston Street stormwater pipework, and once this reached capacity water would spill from the catchpits and there would be secondary overland flow along Rolleston Street.

### *Lower field*

Currently, an earth bund along the edge of Papawai Stream contains the stream in events up to a 10-year event. In larger events, the bund overtops and flows on to Salisbury Terrace. This is causing a flooding issue on neighbouring properties. In general, the field itself also suffers from poor drainage and surface ponding is evident after rain events.

As part of the proposal to raise the lower field, remedies for this existing issue have been considered. The crown of the playing field will be raised to approximately 100 mm lower than the existing bund. A 1:70 grade to either side of the field will direct playing field stormwater runoff to drainage swales along each side of the field. These will discharge into a new stormwater pipe at the northern end of the field, which in turn discharges into the new Salisbury Terrace stormwater system (not part of this Project).

Under this design, there is no change in flows in the Papawai Stream. No stormwater runoff will drain into the Papawai Stream upstream of the existing access track culvert. The flow in the stream still overflows the bund at the 10-year event level onto the field, but by having the crown level of the field slightly lower than the bund level some attenuation of these higher-level flows is achieved with additional benefits to mitigating flood flows downstream onto adjacent roads and properties.

The volume of Stormwater that can be contained on the playing field for attenuation is approximately 3,500 $m^3$.

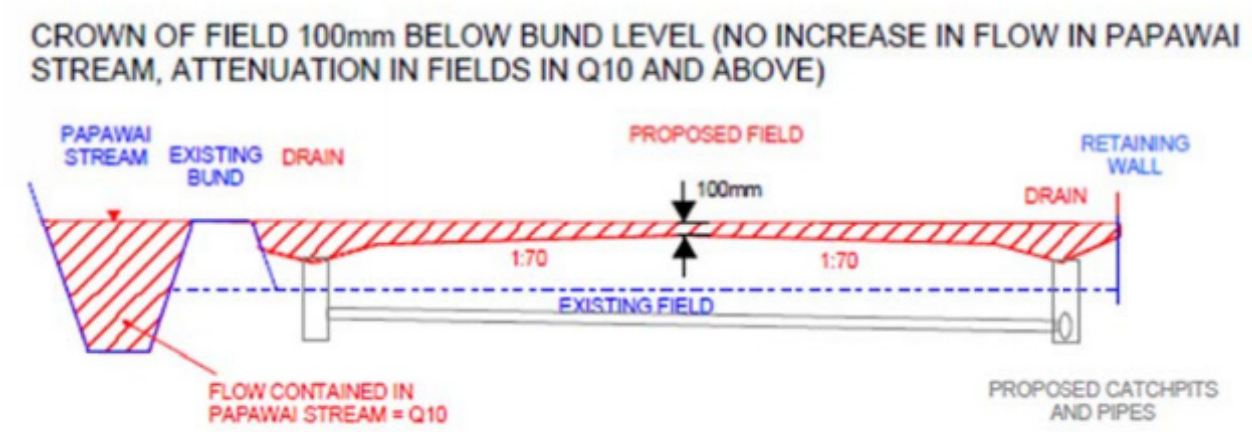


*Figure 9: Sketch of the lower field raising showing proposed drainage.*

# 7 Management of environmental effects

## 7.1 Environmental management and monitoring

The attached technical reports include a number of recommendations for mitigation measures and matters to be further developed during detailed design. The key mitigation action is the preparation of a number of management plans to be certified by WCC and GWRC.

*Table 6: Proposed management plans.*

| Management plan | Propose contents |
|---|---|
| **Construction Management Plans** | |
| Construction Environmental Management Plan | • See draft in **Appendix H** |
| Construction Erosion and Sediment Control Plan | • See draft in **Appendix I** |
| **Design Management Plan** | |
| Landscape Management Plan | • Vegetation clearance/retention plans that clearly identify vegetation that will not be removed<br>• Processes for minimising the effects on vegetation clearance on nesting birds<br>• Planting plans<br>• Planting monitoring and maintenance period requirements including planting success targets<br>• Planting specifications including the use of eco-sourced plants where available |
| Playing field restoration plan (if required) | • Final design details for raising of the upper and/or lower fields including finished levels and drainage layout<br>• Surface specifications (subsoil, top soil, and grassing) |

## 7.2 Proposed conditions

A number of conditions, provided in **Appendix A**, are proposed to be attached to the consent. These draft conditions specify the detail that must be included in the management plans proposed above, and the process for certification of the plans.

# 8 Statutory assessment

In regard to applications for resource consent, section 104 of the Resource Management Act 1991 (RMA) requires a consent authority to have regard to, subject to Part II, any relevant provisions of:

- a national policy statement
- a national environmental standard
- a New Zealand coastal policy statement
- a regional policy statement or proposed regional policy statement
- a plan or proposed plan
- other regulations
- any other relevant matter.

## 8.1 National Policy Statements

There are currently five National Policy Statements (NPS) in effect:

- National Policy Statement on Urban Development Capacity
- National Policy Statement for Freshwater Management
- National Policy Statement for Renewable Electricity Generation
- National Policy Statement on Electricity Transmission
- New Zealand Coastal Policy Statement (NZCPS)

The NPS on Urban Development Capacity recognises the national significance of well-functioning urban environments. The proposed reservoir will improve WCC's water supply network with the network management, operational and hazard resilience, and growth and well-being benefits set out in **Appendix B**. Overall, the proposal is consistent with the objectives and policies of the NPS on Urban Development Capacity.

The NPS for Freshwater Management recognises the national significance of freshwater for all New Zealanders and Te Mana o te Wai. The reservoir design avoids the surrounding waterbodies and a condition has been proposed requiring consideration during detailed design to increasing the buffer to those waterbodies. Implementation of the Construction Erosion and Sediment Control Plan (ESCP) and the phase-specific ESCPs constitutes good erosion and sediment management and effects on the receiving environment will be less than minor. Overall, the proposal is consistent with the objectives and policies of the NPS for Freshwater Management.

The New Zealand Coastal Policy Statement recognises that the coastal environment has characteristics, qualities, and uses that mean there are particular challenges in promoting sustainable management and that the coastal environment is facing a number of key issues. Of particular relevance is Objective 1, which seeks to maintain the quality of coastal water. The proposed erosion and sediment controls will appropriately manage the potential for discharge of sediment from bulk earthworks and effects on coastal water quality are expected to be less than minor. Overall, the proposal is consistent with the objectives and policies of the New Zealand Coastal Policy Statement.

The NPSs for Renewable Electricity Generation and Electricity Transmission are not relevant to this application.

## 8.2 Wellington Regional Policy Statement

The Regional Policy Statement for the Wellington Region (RPS) became operational in 2013. The RPS identifies regionally significant issues related to the management of the region's natural and physical resources and sets out objectives, policies, and methods. Regional and district plans are required to give effect to the RPS.

The relevant objectives and policies are set out in Table 7. Overall, the proposed works are consistent with the RPS.

*Table 7: Assessment against the relevant objectives and policies of the RPS.*

| RPS matter | Assessment |
|---|---|
| **Air quality** | |
| **Objectives 1 & 2** and **Policies 1 & 2** seek to manage potential effects and ensure that discharges of odour, smoke, and dust to air (including fine particulate matter) do not adversely affect amenity values or people's health and well-being. | The Draft Erosion and Sediment Control Plan (**Appendix I**) includes strategies for minimising the production of dust from open earthworks area including progressing stabilisation and dampening with water. Implementation of these strategies as required will avoid dust generation and minimise potential effects. |
| **Coastal environment** | |
| **Objective 6** and **Policies 5 & 40** seek to maintain and enhance the quality of coastal water for the health and vitality of coastal and marine ecosystems. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore to coastal water. Effects on the coastal environment are expected to be very low. |
| **Energy, infrastructure, and waste** | |
| **Objective 10** and **Policies 7 & 39** seek to recognise and protect the social, economic, cultural, and environmental, benefits of regionally significant infrastructure. | The Wellington Water Supply Network is regionally significant and the proposed reservoir will be a key component in ensuring the on-going operation and resilience of that network.<br>The social benefits of the proposed reservoir are significant, and are considered to outweigh the potential effects of its development, which are largely short-term in nature. |
| **Objective 11** and **Policy 65** seek to minimise the quantity of waste disposed of and promote the efficient use and conservation of resources. | Using excess material from excavation of the reservoir to raise the upper and lower playing fields is an efficient use of resources. It will divert up to 16,000 $m^3$ of material from cleanfill and reduce traffic effects on the surrounding area. |
| **Fresh water** | |
| **Objectives 12 & 13** and **Policies 15, 16, 18, 40, 41, & 43** seek to safeguard the life supporting capacity of water and aquatic ecosystem function and health. The effects of earthworks and vegetation clearance should be minimised including by promoting discharges to land. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges. |

| RPS matter | Assessment |
|---|---|
| | Where possible, treatment devices will discharge to land. |
| **Indigenous ecosystems** | |
| **Objective 16** and **Policies 23, 24 & 47** seek to identify, protect, maintain, and restore indigenous ecosystems and habitats with significant biodiversity values. | Policy 23 determines that any indigenous vegetation that occurs on a Land Environment classified as 'At-Risk' (20-30% indigenous cover remaining) is significant. The areas of seral native forest and scrub within the Prince of Wales Park are therefore "*areas of significant indigenous vegetation and significant habitats of indigenous fauna*" as outlined in the Ecological Impact Assessment (**Appendix E**).<br>Neither the native planted communities nor the introduced exotic communities (including pohutukawa) are considered significant under Policy 23.<br>Areas of vegetation that are significant under Policy 23 must be assessed against Policy 47. This assessment is provided in Section 10 of the Ecological Impact Assessment (**Appendix E**), which concludes that the reservoir construction will have low to very low effects in the short term and will have mid to long term benefits. |
| **Landscape** | |
| **Objective 17** seeks to identify and protect outstanding natural features and landscapes. | The site does not include any outstanding natural features or landscapes |
| **Objective 18** and **Policies 27 & 28** seek to identify, maintain, and enhance those landscape values that contribute to amenity and the quality of the environment. | The Prince of Wales Park forms an important area of open space with recognised landscape and amenity values (although is not currently recognised as a special amenity landscape). Although there will be landscape and visual effects (including effects on amenity) during construction, the restoration of the site post-completion will reinstate the key characteristics and special qualities recognised within this area of the Town Belt. Permanent effects will be no more than minor. |
| **Natural hazards** | |
| **Objectives 19 & 21** and **Policy 52** seek to make communities more resilient and minimise the adverse effects of natural hazards. | The proposed reservoir will improve the operational and hazard resilience of Wellington City's Low Level water supply network. |
| **Tangata whenua** | |
| **Objectives 23-28** and **Policies 48, 49 & 66** recognise and provide for matters of significance to tangata whenua including kaitiakitanga, the mauri of coastal and freshwater, and the cultural relationship of Maori with their ancestral land. | The area where the Prince of Wales Park is located was used by early Maori for cultivation until the 1860s/1870s. This is recognised through the adoption of the name Omāroro as suggested by representatives of the Port Nicholson Trust.<br>An Accidental Discovery Protocol will be implemented in the case of any archaeological finds.<br>The proposed mitigation measures, including the Draft Erosion and Sediment Control Plan, will manage potential effects on the mauri of coastal and fresh water. |
| **Soils and minerals** | |

| RPS matter | Assessment |
|---|---|
| **Objective 29** and **Policies 15, 41 & 68** seek to minimise the effects of earthworks and vegetation clearance in relation to soil erosion. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise soil erosion within the site. |

## 8.3 Operative Regional Plans

There are five operative regional plans:

- The Regional Coastal Plan (RCP)
- The Regional Air Quality Management Plan (RAQMP)
- The Regional Soil Plan (RSP)
- The Regional Freshwater Plan (RFP)
- The Regional Plan for Discharges to Land (RPDL)

The proposed works do not include any activities regulated by the RCP, RAQMP, or RSP.

### 8.3.1 Wellington Regional Freshwater Plan

The Wellington Regional Freshwater Plan (RFP) became operational in 1999. The RFP applies to all fresh water in the Wellington region, including water in rivers, lakes, streams, ponds, aquifers and artificial watercourses, but excluding freshwater in the coastal marine area. It also applies to all land in river and lakebeds.

The relevant objectives and policies are set out in Table 8. Overall, the proposed works are consistent with the RFP.

*Table 8: Assessment against the relevant objectives and policies of the RFP.*

| RFP matter | Assessment |
|---|---|
| **Chapter 4: General objectives and policies** | |
| **Tangata whenua**<br>**Objectives 4.1.1 – 4.1.3:** The relationship of tangata whenua with freshwater, the principles of the Treaty of Waitangi, and the protection of the mauri of waterbodies. | The area where the Prince of Wales Park is located was used by early Maori for cultivation until the 1860s/1870s. This is recognised through the adoption of the name Omāroro as suggested by representatives of the Port Nicholson Trust.<br>An Accidental Discovery Protocol will be implemented in the case of any archaeological finds. The proposed mitigation measures, including the Draft Erosion and Sediment Control Plan, will manage potential effects on the mauri of coastal and fresh water. |
| **Natural values**<br>**Objective 4.1.5:** The life-supporting capacity of water and aquatic ecosystems is safeguarded from the adverse effects of any subdivision, use and development. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges. Where possible, treatment devices will discharge to land. |

| RFP matter | Assessment |
|---|---|
| **Policy 4.2.9:** To have regard to the characteristics of rivers and their margins when considering the protection of their natural character from the adverse effects of development.<br>**Policy 4.2.12:** To promote the maintenance and enhancement of aquatic habitats and ecosystems when considering the adverse effects of the use of land outside river beds. | The implementation of the Erosion and Sediment Control Plan will minimise effects on life-supporting capacity of water and aquatic ecosystems resulting from discharges from earthworks associated with construction of the Project.<br>During detailed design of the Project, consideration will be given to maximising the setback from all waterways to minimise effects on their margins. |
| **Flood mitigation**<br>**Objective 4.1.10:** The adverse effects of flooding on natural values and physical resources, including people's property, are at an acceptable level.<br>**Policy 4.2.18:** To promote avoidance or mitigation of the potential adverse effects associated with flooding. | The design of the proposed raising of the lower field has taken into account existing flooding issues on the lower field and Salisbury Terrace. Section 6.6 outlines how the design will help to reduce the existing issue. |
| **Use and development**<br>**Policies 4.2.34-36:** To avoid, remedy or mitigate adverse effects which are associated with or are a consequence of an activity by placing conditions on resource consents. | The proposed mitigation measures and conditions set out in Section 7 will appropriately avoid, remedy, or mitigate adverse effects. It is expected that these proposed conditions will evolve through the processing of this application. |
| **Chapter 5: Water quality and discharges to freshwater** | |
| **Objective 5.1.1:** The quality of freshwater meets the range of uses and values for which it is required while the life supporting capacity of water and aquatic ecosystems is safeguarded. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges.<br>Where possible, treatment devices will discharge to land. |
| **Policy 5.2.8:** To have regard to the relevant guidelines in Appendix 8. | The relevant guidelines are A8.1 (the minimum water quality standards established in sections 70 and 107 of the RMA). These standards can be met and a condition is proposed to apply these standards to the discharge. |
| **Policy 5.2.11:** To ensure that any zones allowed on a discharge permit for reasonable mixing are suitable. | The Draft Erosion and Sediment Control Plan (**Appendix I**) proposes a 20m mixing zone. |
| **Policy 5.2.13:** To encourage users to discharge to land as an alternative to surface water | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls and, where possible, treatment devices will discharge to land. |

### 8.3.2 Wellington Regional Plan for Discharges to Land

The Wellington Regional Plan for Discharges to Land (RPDL) became operational in 1999. The RPDL applies to the whole of the region, except the Coastal Marine Area. It aims to manged the discharge of contaminants to land, whether or not the discharge enters water, in order for the receiving environment to be sustainably managed.

The relevant objectives and policies are set out in Table 9. Overall, the proposed works are consistent with the RPDL.

*Table 9: Assessment against the relevant objectives and policies of the RPDL.*

| RDLP matter | Assessment |
|---|---|
| **Solid contaminants** | |
| **Objective 4.1.1:** The quantity of wastes discharged to land in the Region is significantly reduced | The proposed raising of the upper and lower fields will avoid the placement of a large amount of material into landfill.<br>Using excess material from excavation of the reservoir to raise the upper and lower playing fields is an efficient use of resources. It will divert up to 16,000 $m^3$ of material from cleanfill and reduce traffic effects on the surrounding area. |
| **Objective 4.1.3:** Any adverse effects from discharging solid contaminants to land are avoided, remedied or mitigated | |
| **Policy 4.2.1** To encourage all organisations and individuals who generate or manage waste to implement the waste management hierarchy, to the greatest extent practicable, in relation to their own operations, by:<br>(1) reducing the amount and/or toxicity of material entering the waste stream;<br>(2) re-using materials… | |
| **Policy 4.2.3:** To promote waste management strategies which take into account the true costs of managing residual solid wastes… | |
| **Policy 4.2.8:** To ensure that discharges of residual solid wastes to land in the Region occur only by way of… disposal in any other situation where the discharge consists only of household or farm wastes generated on the property, or inert solids, provided that any adverse effects are avoided, remedied or mitigated. | |
| **Liquid contaminants** | |
| **Objective 4.1.5:** The adverse environmental effects of discharges of liquid contaminants from point sources into or onto land are avoided, remedied or mitigated. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on soil and water quality. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges.<br>Discharges to land will be limited to sediment and no adverse effects on soil are expected. Any accidental spills of contaminants other than sediment will be cleaned up immediately and spilled material disposed of appropriately. |
| **Policy 4.2.19:** To allow discharges of liquid contaminants to land which are not likely to have adverse effects on soil, water quality and amenity values, particularly where the effects of the contaminants would be greater if they were discharged directly into water. | |

| RDLP matter | Assessment |
|---|---|
| | No amenity effects are expected to arise from the temporary discharge of sediment-laden water to land. |

## 8.4 Proposed Natural Resources Plan for the Wellington Region

The Proposed Natural Resources Plan for the Wellington Region (PNRP) was notified on 31 July 2015 and is currently going through the hearings process. The plan will replace the existing operative plans and combines the five operative plans into a single plan.

The relevant objectives and policies are set out in Table 10. Overall, the proposed works are consistent with the PNRP.

*Table 10: Assessment against the relevant objectives and policies of the PNRP.*

| PNRP matter | Assessment |
|---|---|
| Ki uta ki tai: Mountains to the sea | |
| **Objective O2:** The importance and contribution of land and water to the social, economic, and cultural well-being of the community are recognised. | The Prince of Wales/Omāroro Reservoir will contribute to the social and economic well-being of Wellington as described in **Appendix B**.<br>Section 6 and the specialist reports in the appendices outline potential environmental effects and how these can be appropriately managed and mitigated. |
| **Objective O5:** Fresh water bodies and the coastal marine area, as a minimum, are managed to… safeguard aquatic ecosystem health and mahinga kai | |
| **Beneficial use and development** | |
| **Objective O12:** The social, economic, cultural and environmental benefits of regionally significant infrastructure and renewable energy generation activities are recognised. | The Wellington Water Supply Network is regionally significant and the proposed reservoir is a key component in ensuring the on-going operation and resilience of that network as set out in **Appendix B**.<br>The social and economic benefits of the proposed reservoir are considered to outweigh the potential effects of its development, which are largely short-term in nature.<br>The Prince of Wales site has been chosen for the reservoir as it best meets the operational requirements of the water supply network – see **Appendix B**. The site is close to the CBD (which reduces demand on the Thorndon Pressure Reducing Valves) and will allow other reservoirs to be taken off-line temporarily for maintenance activities (eg Macalister Reservoir). |
| **Policy P7:** The cultural, social and economic benefits of using land and water for… community and domestic water supply… shall be recognised. | |
| **Policy P12:** The benefits of regionally significant infrastructure and renewable energy generation activities are recognised by having regard to:<br>(a) the strategic integration of infrastructure and land use, and<br>(b) the location of existing infrastructure and structures, and<br>…<br>(e) operational requirements associated with developing, operating, maintaining and upgrading regionally significant infrastructure and renewable energy generation activities. | |
| **Maori relationships** | |

| PNRP matter | Assessment |
|---|---|
| **Objective O15:** Kaitiakitanga is recognised and mana whenua actively participate in planning and decision-making. | The area where the Prince of Wales Park is located was used by early Maori for cultivation until the 1860s/1870s. This is recognised through the adoption of the name Omāroro as suggested by representatives of the Port Nicholson Trust.<br>The proposed mitigation measures, including the Draft Erosion and Sediment Control Plan, will manage potential effects on the mauri of coastal and fresh water. |
| **Policy P17:** The mauri of fresh and coastal waters shall be recognised as being important to Māori | |
| **Policy P19:** The cultural relationship of Māori with air, land and water shall be recognised and the adverse effects on this relationship and their values shall be minimised. | |
| **Natural character, form and function, biodiversity, aquatic ecosystem health, and mahinga kai** | |
| **Objective O17:** The natural character of the coastal marine area, rivers, lakes and their margins and natural wetlands is preserved and protected from inappropriate use and development. | The proposed reservoir has been designed to avoid directly affecting the Papawai Stream. Consideration shall be given during detailed design to increasing the buffer between the earthworks and the stream, if practicable.<br>The proposed mitigation measures will manage potential effects on the Papawai Stream.<br>In particular, the Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges.<br>Where possible, treatment devices will discharge to land. |
| **Objective O25:** To safeguard aquatic ecosystem health and mahinga kai in fresh water bodies and coastal marine area… water quality, flows, water levels and aquatic and coastal habitats are managed to maintain aquatic ecosystem health and mahinga kai | |
| **Policy P32:** Significant adverse effects on aquatic ecosystem health and mahinga kai shall be managed by:<br>(a) avoiding significant adverse effects, and<br>(b) where significant adverse effects cannot be avoided, remedying them and<br>(c) where significant adverse effects cannot be remedied, mitigating them, and<br>(d) where residual adverse effects remain, it is appropriate to consider the use of biodiversity offsets. | |
| **Land use** | |
| **Objective O44:** The adverse effects on soil and water from land use activities are minimised. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges.<br>Where possible, treatment devices will discharge to land. It is not considered that any off-setting is required. |
| **Policy P97:** The discharge of sediment to surface water bodies and coastal water from earthworks activities shall be minimised by using a source control approach.<br>Good management practices shall be used in site management, erosion and sediment control design operation and maintenance in order to minimise the adverse effects of sediment-laden stormwater discharges.<br>Effects that cannot be minimised may be appropriately offset. | |
| **Discharges to water** | |
| **Objective O23:** The quality of water in the region's rivers, lakes, natural wetlands, groundwater, and the coastal marine area is maintained or improved. | The Draft Erosion and Sediment Control Plan (**Appendix I**) sets out proposed controls that, when implemented, will minimise the discharge |

| PNRP matter | Assessment |
|---|---|
| **Objective O47:** The amount of sediment-laden runoff entering water is reduced.<br><br>**Policy P67:** The adverse effects of discharges of contaminants to land and water will be minimised by:<br>(a) avoiding the production of the contaminant, and/or<br>(b) reusing, recovering or recycling the contaminant, and/or<br>(c) minimising the volume or amount of the discharge, and/or<br>(d) using land-based treatment, constructed wetlands or other systems to treat contaminants prior to discharge where appropriate, and<br>(e) irrespective of actions taken in accordance (a) to (d) above, where a discharge is a point source discharge to a river or stream, the discharge achieves the water quality standards in Policy P71 after reasonable mixing. | of sediment to fresh water and therefore minimise the potential effects on aquatic ecosystems. Monitoring of outlets from sediment control devices will provide early warning of sediment discharges.<br>Where possible, treatment devices will discharge to land. |
| **Policy P68:** Discharges to fresh and coastal water of:<br>(a) untreated wastewater, except as a result of extreme weather-related overflows or wastewater system failures or from recreational boating activities, and<br>(b) animal effluent from an animal effluent storage facility or from an area where animals are confined, and<br>(c) untreated industrial or trade waste, and<br>(d) untreated organic waste or leachate from storage of organic material<br>shall be avoided. | The Draft Erosion and Sediment Control Plan (**Appendix I**) includes a Chemical Treatment Plan. Discharges from Sediment Retention Ponds are proposed to be treated prior to discharge. |
| **Policy P71:** The adverse effects of point source discharges to rivers shall be minimised by the use of measures that result in the discharge meeting the following water quality standards in the receiving water after the zone of reasonable mixing:<br>(a) below the discharge point compared to above the discharge point:<br>(i) a decrease in the Quantitative Macroinvertebrate Community Index of no more than 20%, and<br>(ii) a change in pH of no more than ±0.5, and<br>(iii) a decrease in water clarity of no more than 20% in River class 1, or 33% in River classes 2 to 6, and<br>(iv) a change in temperature of no more than: 2°C in River classes 1 or 2, or 2°C in any river identified as having high macroinvertebrate community health in Schedule F1 (rivers/lakes), or 3°C in any other river, and<br>(b) a 7-day mean minimum dissolved oxygen concentration of no lower than 5mg/L, and<br>(c) a daily minimum dissolved oxygen concentration of no lower than 4mg/L. | Any discharges from the site will be limited to sediment and any residual chemical treatment.<br>The Draft Erosion and Sediment Control Plan (**Appendix I**) outlines proposed monitoring of sediment retention ponds outlets and in the Papawai Stream including pH and Macroinvertebrates (only if certain triggers are met). The works and associated discharges are not expect to impact temperature or dissolved oxygen. |

| PNRP matter | Assessment |
|---|---|
| All water quality standards apply at all flows except (a)(iii) which applies at less than median flows, (a) applies at all times of the year, (b) and (c) apply only between 1 November and 30 April each year. | |
| **Policy P72:** Where not otherwise permitted by a rule, the zone of reasonable mixing shall be minimised and will be determined on a case-by-case basis. | The Draft Erosion and Sediment Control Plan (**Appendix I**) proposes a 20m mixing zone. |
| **Discharges to land** | |
| **Objective O46:** Discharges to land are managed to reduce the runoff or leaching of contaminants to water. | Discharges to land will be promoted over discharges to water through the Draft Erosion and Sediment Control Plan (**Appendix I**).<br>Discharges of sediment to land are not expected to result in any of the effects in Policy P95. |
| **Policy P62:** The discharge of contaminants to land is promoted over direct discharges to water, particularly where there are adverse effects on… aquatic ecosystem health and mahinga kai | |
| **Policy P95:** The discharge of contaminants to land shall be managed by:<br>(a) ensuring the discharge does not result in more than minor adverse effects to soil health, and<br>(b) avoiding discharges that would create contaminated land, and<br>(c) not exceeding the natural capacity of the soil to treat, use or remove the contaminant, and<br>(d) not exceeding the available capacity of the soil to absorb and infiltrate the discharge, and<br>(e) minimising effects on public health and amenity, and<br>(f) not resulting in a discharge that enters water. | |

## 8.5 Other relevant matters

The reservoir site is part of the Brooklyn Hills Town Belt Management Sector within the Wellington Town Belt. The site is subject to the Wellington Town Belt Act 2016 and the Wellington Town Belt Management Plan 2013.

A more complete assessment of the reservoir against the Wellington Town Belt Act and the provisions of the Wellington Town Belt Management Plan is included in WWL's easement application[3].

On 24 August 2017, the WCC City Strategy Committee approved an easement for the proposed reservoir in principle, subject to the reservoir securing all approvals required under the RMA. The approval is documented in the minutes of the City Strategy Committee meeting and approves the granting of:

> *"a) an easement relating to a water reservoir and associated infrastructure in perpetuity over parts of the Wellington Town Belt (subject to final survey) at Prince of Wales Part (part of Lot 2 DP*

[3] WWL (2017). Prince of Wales/Omāroro Reservoir: Application for Town Belt Easement

*10337 on CFR 742981) pursuant to the Wellington Town Belt Act 2016 and to the Town Belt Management Plan 2017.*

*b) a licence to accommodate the use of land necessary for the construction of the project."*

### 8.5.1 Wellington Town Belt Act

The Wellington Town Belt Act 2016 (WTBA) came into force on 9 May 2016, replacing the provisions of the Reserves Act that previously applied.

The WTBA recognises the history of the original town belt and its significance to mana whenua and Wellington's residents. It sets out a statutory basis for WCC's trusteeship and management of the Town Belt, imposes responsibilities, and provides WCC with powers to protect, manage, and enhance the town belt.

Under the WTBA, WCC is the Trustee of the Town belt and must:

*(a) recognise and provide for the protection and enhancement of the Wellington Town Belt for future generations; and*

*(b) have particular regard to the following principles:*

*(i) the Wellington Town Belt should be managed in partnership with mana whenua:*

*(ii) the landscape character of the Wellington Town Belt should be protected and enhanced, including by recognising that it was the New Zealand Company's intention that the original Town Belt not be built on:*

*(iii) the Wellington Town Belt should support healthy indigenous ecosystems:*

*(iv) the Wellington Town Belt should be accessible to all and for all to enjoy:*

*(v) the Wellington Town Belt should be available for a wide range of recreational activities:*

*(vi) community participation in the management of the Wellington Town Belt should be encouraged and supported:*

*(vii) the historic and cultural heritage of the Wellington Town Belt should be recognised and protected.*

Under section 20 of the WTBA, WCC can, on any conditions, "*grant easements, leases, and licences, and authorise business activities on respect of the Wellington Town Belt for public services*".

Many of the matters listed above are relevant under the RMA assessments, but have also been specifically considered in the context of the WTBA application. The WTBA process is separate to the RMA process, and essentially relates to the property rights or landowner approval necessary to undertake the work.

### 8.5.2 Wellington Town Belt Management Plan

Section 11 of the WTBA requires that WCC adopt a management plan for the Town Belt. The current Wellington Town Belt Management Plan (WTBMP) became operative in 2013.

The proposed reservoir is consistent with the objectives and policies outlined in the WTBMA including the general and utilities decision-making guidelines and the policies specific to the Brooklyn Hills sector.

### 8.5.3 Civil Defence Emergency Management Act 2002

The Civil Defence Emergency Management Act 2002 seeks to:

- improve and promote the sustainable management of hazards in a way that contributes to the social, economic, cultural and environmental well-being and safety of the public and the protection of property
- encourage and enable communities to achieve acceptable levels of risk by identifying risks and applying risk reduction management practices
- provide for planning and preparation for emergencies and for response and recovery in the event of an emergency
- require local authorities to coordinate Civil Defence Emergency Management (CDEM) through regional groups across the "4Rs" (reduction, readiness, response and recovery) and encourage cooperation and joint action between those groups
- integrate local and national CDEM planning and activity through the alignment of local planning with a national plan and strategy
- encourage the coordination of emergency management across the range of agencies and organisations with responsibilities for preventing or managing emergencies.

The Act in particular sets out functions and responsibilities for local authorities including that they must, in their role as lifeline utility providers, ensure that they can continue to function to the fullest possible extent during and after an emergency, and have plans available for this. The proposed reservoir will improve the extent to which WCC can provide water, a lifeline utility, following a Civil Defence emergency.

## 8.6 Assessment of section 105 matters

Under the RMA, a consideration of alternative routes, sites, and methods is required for resource consent applications in certain circumstances:

- Schedule 4 requires an AEE to include a description of possible alternative locations or methods for undertaking the activity where it is likely that the activity will have a significant adverse effect on the environment (Schedule 4 clause 1(b))
- In relation to applications for discharge permits, section 105 requires decision makers to have regard to various matters including "any possible alternative methods of discharge, including discharge into any other receiving environment"

The effects of the Project are not considered to be significantly adverse to trigger Schedule 4 clause 1(b).

Section 105(1) sets out the matters that a consent authority must have regard to when considering a resource consent application for a discharge permit. In particular, consideration needs to be given to the nature of the discharge and the sensitivity of the receiving environment to adverse effects, the applicant's reasons for the proposed choice, and any possible alternative methods of discharge. These matters are addressed in Table 11 below.

*Table 11: Assessment against RMA section 105(1).*

| Section 105(1) | Assessment |
|---|---|
| The nature of the discharge and the sensitivity of the receiving environment to adverse effects | The reservoir requires significant earthworks over a period of several years. During construction, stormwater runoff from the site has the potential to erode unstabilised earth and increase the discharge of sediment to nearby waterways.<br>Sections 6.3 and 6.4 (and **Appendix E** and **I**) outline the potential discharges and sensitivity of the receiving environment. |
| The applicant's reasons for the proposed choice | Section 6.4 (and **Appendix I**) outlines in detail the proposed discharge locations and the erosion and sediment control principles that will inform selection of the best options for the specific erosion and sediment control measures that will be included in the Phase-Specific Erosion and Sediment Control Plans. There are few, if any, practical alternatives for discharges from this site – any discharge to land will eventually enter one of the two watercourses or the stormwater network.<br>Discharges will be appropriately managed such that effects on the receiving environment will be very low. |
| Any possible alternative methods of discharge, including discharge into any other receiving environment | |

## 8.7 Assessment of section 107 matters

Section 107 sets out further restrictions on the granting of discharge permits for the discharge of contaminants to water.

> *A consent authority shall not grant a discharge permit… if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:*
>
> *(c) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:*
>
> *(d) any conspicuous change in the colour or visual clarity:*
>
> *(e) any emission of objectionable odour:*
>
> *(f) the rendering of fresh water unsuitable for consumption by farm animals:*
>
> *(g) any significant adverse effects on aquatic life.*
>
> [unless]*… the discharge is of a temporary nature*

Earthworks associated with the construction of the reservoir are not expected to result in any of the effects described above, except during heavy rainfall events or where there are issues with sediment retention pond treatment when there may be some temporary change in colour or visual clarity; however, this is expected to be minimal following reasonable mixing.

The draft Erosion and Sediment Control Plan in **Appendix I** sets out monitoring requirements for turbidity of sediment retention pond discharges and includes triggers for monitoring of the Papawai Stream. Where turbidity triggers are exceeded in the Papawai Stream, the plan includes requirements for deposited sediment and macroinvertebrate sampling.

# 9 Conclusion

This resource consent application and Assessment of Environmental Effects is made by Wellington Water Limited (WWL) on behalf of the Wellington City Council (WCC) for activities associated with the construction of a water supply reservoir within the Prince of Wales Park, Mount Cook, Wellington including:

- discharge permits for discharge of stormwater and groundwater during construction
- a land use consent for earthworks that may intercept groundwater (bores)
- a water permit for the take and use of groundwater
- a land use permit for cleanfill activities

This AEE and the attached technical reports conclude that the effects on the environment associated with construction of the reservoir and raising of the upper and lower sports fields are temporary and no more than minor. The potential for effects on cavity nesters can be managed through timing of vegetation clearance, surveys prior to clearance, and provision of nesting boxes to encourage nesting outside of the Project area.

The proposed conditions would require the preparation of management plans that would set out actions to be undertaken to further avoid, remedy and mitigate potential effects, including through suitable erosion and sediment control measures, careful management of vegetation removal, and re-planting post construction.

The works are consistent with the relevant National Policy Statements, the Regional Policy Statement, and the operative and proposed regional plans.