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Report

Prince of Wales / Omāroro Reservoir: Draft Construction Environmental Management Plan

Prepared for Wellington Water Ltd

Prepared by CH2M Beca Ltd

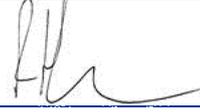
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Preface

This Construction Environmental Management Plan (CEMP) is provided in draft form to demonstrate the structure and content that should be included in the final CEMP.

This version of the CEMP has been prepared to support the Notice of Requirement lodged with Wellington City Council (WCC) and resource consent applications lodged with Greater Wellington Regional Council (GWRC).

It demonstrates how WCC, WWL, and their appointed contractor will manage construction of the Prince of Wales/Omāroro Reservoir to ensure that the works meet all regulatory requirements. The Construction Noise and Vibration, Construction Traffic, Landscape Management and Playing Fields Management Plans will be certified by WCC and the Erosion and Sediment Control Plan will be certified by GWRC.

The final CEMP will be completed prior to commencement of construction of the reservoir and will be provided to WCC and GWRC for information.

1 Introduction

This Construction Environmental Management Plan (CEMP) provides a high-level overview, framework, methods, and tools for the management of environmental effects associated with construction of the Prince of Wales/Omāroro Reservoir development works.

The purpose of this plan is to assist the Wellington City Council (WCC), Wellington Water Limited (WWL), and the selected contractor to manage, remedy, and mitigate environmental effects in order to meet resource consent and designation conditions, relevant legislation, and WCC and WWL's environmental objectives.

This CEMP will:

- Provide a brief overview of the Project
- Outline proposed staging and methodologies
- Provide a planned programme for the works
- Detail operational procedures for the management of erosion and sediment, noise and vibration, construction traffic, and general operation of the site to minimise adverse effects of the Project on the environment and surrounding residents
- Outline processes for responding to environmental incidents
- Outline processes for responding to complaints
- Detail roles, responsibilities, and contact details

The appendices to this CEMP will address specific construction effects including:

- Construction erosion and sediment control (CESCP)
- Construction traffic management (CTMP)
- Construction noise and vibration management (CNVMP)
- Accidental archaeological discovery (ADP)
- Landscape management and planting (LMP)

A copy of this CEMP should be held on site at all times during construction.

2 Description of works

2.1 Site description

The Prince of Wales Park is located in Mount Cook, Wellington (refer to Figure 1), within the Wellington City Council Inner Town Belt. It is used for sports and recreation purposes, with two sport fields (upper and lower), the Wellington Harriers Club building, and a number of bush walk paths.



Figure 1: Aerial view of Prince of Wales Park

The park topography is that of a rounded spur landform sloping downhill from Dorking Road to the reservoir site on the open grassed and vegetated rounded knoll. The knoll slopes down to a small, vegetated gully with an unnamed tributary of the Waitangi Stream to the north-west. To the north, the tree and grass vegetated bank slopes down to the flat, grassed upper playing field. To the west, the knoll slopes down a vegetated slope to the lower playing field to the east.

The Papawai Stream runs through the park site and along the western side of the lower playing field. There are a number of existing pathways providing access through the Park, ranging from 'tracks through grass' to gravelled or paved pathways.

The underlying geology is Rakaia terrane, described as sandstone with mudstone conglomerate basalt chert limestone¹.

2.2 Project description

The works covered by this CEMP 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 and the anticipated construction activities.

All dimensions, areas, and volumes are approximate; details may change as the design and construction methods are finalised.

2.2.1 Reservoir structure

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

- a capacity of 35,000m³ (35ML)
- a footprint of 3,800m² (reservoir) / 4,000m² (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.

The 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. 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.

2.2.2 Raising of the playing fields

Excess material from excavation of the reservoir site may be used to raise either one or both of the playing fields.

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

¹ Heron D. W. (custodian) 2014. Geological Map of New Zealand 1:250 000. Institute of Geological & Nuclear Sciences.

depend on a range of factors including cost. These works would be described in an Outline Plan under section 176 of the RMA, to be provided to WCC at the appropriate time.

In summary, the works would involve:

Upper field:

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

Lower field:

- Raise the field to 100 mm below the height of the existing flood bund along a central longitudinal ridge
- Slope the field at a 1:70 grade to the eastern and western edges
- Install a retaining wall (1 – 4.5 m high) along the eastern boundary adjacent Salisbury Terrace
- 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 m³ of material can be placed on the upper field and 7,800 m³ on the lower field. Some 300 m³ will also be used to upgrade the existing track between the two fields.

2.2.3 Stockpiling

During construction, material excavated from the reservoir site will be stored on the upper and lower fields. Approximately 25,000 m³ (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 m³.

On the upper field, the stockpile will be limited to 4 m high, 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 setback 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.

2.2.4 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 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, then it may be discharged without treatment.

2.2.5 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. This will include replacement of an existing cast iron water main across 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.

2.3 Construction staging and programme of works

The construction is expected to be split five main stages:

- Site establishment
 - Site accommodation set-up (site offices, site parking, changes to Rolleston Street parking)
 - Site fencing
 - Construction of erosion and sediment control measures (see **Appendix C**)
 - Construction of access tracks
 - Clearance of vegetation and top soil (with suitable top soil stockpiled for reuse)
 - Service relocation
- Reservoir excavation
 - Excavation of material from reservoir site
 - Stockpiling of excavated material on upper and/or lower fields
 - Removal of excess material from the site
 - Raising of the upper and/or lower fields may be done at this time to avoid double handling of material
- Reservoir construction
 - Construction of the reservoir and pipe tunnel including in-situ and precast concrete as required
 - Connection of services
 - Import of required material and components to the site
 - Testing
- Backfill
 - Bury reservoir using stockpiled material where possible
- Site restoration
 - Reinstatement and landscaping of the reservoir site including planting and reinstatement of tracks and pathways
 - Raising of the upper and/or lower fields (may be undertaken earlier in the construction process to reduce double handling of material) including construction of retaining walls and terramesh walls and installation of subsurface drainage where required

- Reinstatement of the upper and/or lower fields including reshaping/levelling, installation of surface drainage, topsoiling, grassing, and marking

Actual staging and a high-level construction programme will be confirmed by the selected contractor prior to commencement of construction.

2.4 Hours of work

Hours of work of the Project will typically be 7.30am to 6pm Monday to Saturday. Generally no works will be undertaken on Sundays or Public Holiday Weekends.

Heavy vehicle movements to and from the site associated with the export of excess fill material will generally be restricted to 9am to 3pm Monday to Friday and 7:30am to 6pm Saturday. Other heavy vehicle movements are likely to occur outside of this time to allow appropriate traffic management measures to be put in place.

Bulk earthworks will generally be restricted to the earthworks season from 1 September to 31 May, unless otherwise agreed with WCC and GWRC. All bulk earthworks will be stabilised outside of these times unless otherwise approved except areas required for the maintenance of erosion and sediment control measures.

3 Project approvals

The Project has approvals under different pieces of legislation, including:

- An easement under the Wellington Town Belt Act 2016
- A designation under the Resource Management Act 1991 and the Wellington City District Plan
- Resource Consents under the Resource Management Act 1991, the operative Greater Wellington Regional Plans, and the proposed Natural Resources Plan
- District Consents under National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (TBC)

The conditions associated with these approvals are attached in **Appendix A**.

Table 1 records where the content of this CEMP and its appendices meet these conditions:

Relevant condition	Corresponding element of this CEMP
TBC	

4 Operating procedures

4.1 Erosion and sediment control

During construction, there is the potential for sediment-laden discharges to occur from exposed surfaces. If not appropriately managed, these discharges can have a negative impact on receiving environments.

A Construction Erosion and Sediment Control Plan (CESCP, to be attached as **Appendix C**) will set out the erosion and sediment control principles and methodologies that will be adopted during construction to minimise the adverse effects associated with land disturbing activities.

A draft CESCP is provided with the Assessment of Environmental Effects for the Project. The final version of the CESCP will be developed by WCC, WWL, or their appointed contractor following award of the physical works contract and prior to commencement of construction. This final CESCP should be prepared in general accordance with the draft CESCP and must be certified by GWRC prior to commencement of construction.

The principles set out in the CESCP will be used by the contractor to prepare phase-specific erosion and sediment control plans (phase-specific ESCPs), which will detail the actual controls, practices, and mitigation to be implemented for the various construction stages. The phase-specific ESCPs must be certified by GWRC prior to commencement of the relevant phase.

4.2 Dust

Dust can affect human health and can be a nuisance to surrounding residents and members of the public using nearby walkways and open space areas. Dust can also affect plant life and contribute to sediment load in nearby waterbodies.

The biggest contributing factor to dust generation is the area of unstabilised land within the construction footprint. In terms of meteorological conditions, rainfall and wind speed are the two key factors that influence dust mobilisation.

Key mitigation measures to manage the generation of dust, as set out in the draft CESCP, are:

- Minimising soil exposed through staging of works and by stabilising completed areas as soon as possible
- Wetting of exposed surfaces with water spray
- Consolidating loose surface material
- Minimising drop heights when loading and unloading vehicles

4.3 Noise and vibration

Construction noise and vibration can be very emotive issues for residents living close to the Project. The key to mitigating these nuisance issues is keeping residents well informed of the construction programme and minimising the creation of noise and vibration as far as practicable.

A Construction Noise and Vibration Management Plan (CNVMP, to be attached as **Appendix D**) will set out predicted noise and vibration levels, mitigation measures, monitoring requirements and communication processes that will be adopted during construction.

A draft CNVMP has not been prepared, so the CNVMP will be prepared by a suitably qualified person on behalf of WCC, WWL, or their appointed contractor following award of the physical works contract and prior to commencement of construction.

The CNVMP should include those matters identified in Sections 5 and 6 of the Construction Noise Assessment included in the Assessment of Environmental Effects for the Project, including:

- Noise and vibration mitigation measures, eg:
 - Guidance on loading of trucks – selection of loading and unloading locations where possible away from sensitive receivers and avoiding dumping material from height
 - Maintenance of construction equipment to minimise noise
 - Maintenance of the surface of Rolleston Street to minimise vibration
 - Consideration of alternatives to tonal reversing alarms
 - Consideration of use of noise barriers where they may be effective
 - Guidance on minimising construction traffic noise such as limited speed and prohibiting engine braking
 - Means to address vibration concerns such as vibration monitoring and the potential for pre-construction surveys of the closest buildings
- Procedures for any works required outside of typical working hours
- Monitoring
- Contingency measures
- Community liaison
- Staff training

The CNVMP must be certified by WCC prior to commencement of construction.

4.4 Construction traffic

A Construction Traffic Management Plan (CTMP, to be attached as **Appendix E**) will set out the procedures, requirements, and standards that will be adopted during construction to minimise the traffic effects associated with Project, especially related to the removal of excess material from the site.

A draft CTMP is provided with the Assessment of Environmental Effects for the Project. The final version of the CTMP will be developed by WCC, WWL, or their appointed contractor following award of the physical works contract and prior to commencement of construction. This final CTMP should be prepared in general accordance with the draft CTMP and must be certified by WCC prior to commencement of construction.

The principles set out in the CTMP will be used by the contractor to prepare site specific traffic management plans (SSTMPs), which will detail the actual controls and measures to be implemented for the various activities associated with construction. The SSTMPs must be certified by WCC prior to commencement of the relevant works.

4.5 Accidental discovery protocol

An Accidental Discovery Protocol (ADP, to be attached as **Appendix F**), to be implemented in the event of an unexpected cultural or archaeological find, will be developed for the Project. The ADP will be prepared in consultation with the Port Nicholson Trust and Ngati Toa and shall provide for tikanga protocols if discoveries are made.

The ADP will be developed by WCC, WWL, or their appointed contractor following award of the physical works contract and prior to commencement of construction.

4.6 Landscape management

A Landscape Management Plan (LMP, to be attached as **Appendix G**) will set out the landscape strategy for remediation of the site as well as methods, procedures and outcomes.

The LMP will be developed by a suitable qualified person on behalf of WCC, WWL, or their appointed contractor following award of the physical works contract and prior to commencement of construction.

The LMP should include those matters identified in the Landscape and Visual Assessment included in the Assessment of Environmental Effects, including:

- A final landscape strategy
- Vegetation clearance/retention plans that clearly identify vegetation that will not be removed
- Methods for identifying and marking vegetation to be retained
- Planting plans
- Planting monitoring and maintenance period requirements including planting success targets
- Planting specifications including the use of eco-sourced plants where available

The LMP must be certified by WCC prior to commencement of construction.

5 Incident management

An environmental incident management process sets out the actions that should be undertaken in response to any environmental incident including discharges from the site.

Environmental incidents include:

- Incidents with an actual effect on the environment
- Incidents with the potential to cause an effect but does not and/or which has no material effect on the environment (eg spills contained within the site)

WCC and GWRC should be notified as soon as practicable within 1 working day of identification of any of the following where there is an actual effect on the environment:

- A discharge of any contaminant (including sediment in excess of the triggers set out in the ESCP) to any waterbody
- A construction nuisance effect (noise, vibration, dust) exceeding any limits set by the Project consents
- A discharge from any non-stabilised area that is not treated by erosion and sediment control measures required the ESCP
- The failure of any erosion and sediment control device
- Unconsented removal, loss, or damage to vegetation
- An unexpected archaeological or cultural discovery
- Any other incident which either directly or indirectly causes, or is likely to cause, adverse ecological effects that are not authorised by the designation or a resource consent

Notification of WCC and GWRC can be by telephone, email, or an alternative method as agreed with the councils.

As soon as practicable following an environmental incident, WWL or their chosen contractor shall:

- Re-establish control measures where these have failed
- Establish control measures where these have not been implemented in accordance with the relevant management plan
- Update the relevant management plan and establish additional control measures where it is identified that these are required
- Liaise with WCC/GWRC to establish if any remediation or rehabilitation is required and whether such remediation or rehabilitation is practical to implement
- Carry out any remedial action as required by and to the satisfaction of WCC/GWRC

An environmental incident register must be maintained during construction of the reservoir and include incidents that has the potential to cause effects as well as those with actual effects. As far as practicable, the register shall include:

- Location, date and time of the incident
- The nature, manner, and cause of the incident
- Weather conditions at the time of the event
- The outcome of the investigation into the incident
- Measures taken to respond to the incident including any remedial actions

This record shall be maintained on site and shall be made available to WCC and GWRC upon request.

6 Complaints management

A complaints management process allows members of the public to raise issues and concerns and to feel that these issues and concerns are being responded to in an appropriate and timely fashion. A contact phone number and email address should be publically advertised and included on all project signage to allow the public to contact the Project team.

To ensure that complaints are appropriately managed, WWL or their chosen contractor should:

- Acknowledge the complaint within 2 working days
- Promptly investigate, identify the urgency associated with the complaint, and communicate that to the complainant
- Take reasonable steps to remedy or mitigate the matters giving rise to the complaint if there are reasonable grounds for the complaint within 10 working days of receiving the complaint or such sooner time as may be reasonably necessary in the circumstances

A complaints register must be maintained during construction of the reservoir. As far as practicable, the register shall include:

- The name and address (where this has been provided) of the complainant
- The nature of the complaint
- Location, date and time of the complaint and also of the alleged event
- Weather conditions at the time of the event and including wind direction and approximate wind strength if the complaint relates to air quality or noise
- The outcome of the investigation into the complaint
- Measures taken to respond to the complaint including any remedial actions
- Any other activities in the area, unrelated to the construction, which may have contributed to the complaint (such as non-Project construction, fires, traffic accidents or unusually dusty conditions generally)

This record shall be maintained on site and shall be made available to WCC and GWRC upon request

7 Roles and responsibilities

7.1 Structure and responsibilities

This section details key project personnel and their responsibilities in relation to environmental management. There are 4 key roles under this CEMP. These roles may be revised during finalisation of this CEMP to ensure that the plan aligns with the structure of the selected contract type and contractor.

Wellington Water Project Manager

- Responsible for management of contract and ultimate responsibility for compliance with all approvals and legislation

Project Manager

- Responsibility for delivery of the Project and compliance with conditions of all approvals
- Ensure all team members comply with conditions of all approvals and this CEMP
- Provide adequate resources are provided to manage environmental issues and obligations

Construction Manager

- Ensures there is a system in place to prevent works from proceeding without appropriate sign-offs
- Develops, implements, and monitors construction activities to ensure compliance with conditions of all approvals and this CEMP
- Reviews environmental incidents and complaints with the Environmental Lead and acts to address issues where needed
- Briefs all site staff, subcontractors, and suppliers on environmental operating procedures and community relations protocols

Environmental lead

- Develops, implements, and monitors environmental management systems (including the CEMP)
- Manages and co-ordinates compliance with all approvals, conditions, and management plans
- Overviews the implementation of erosion and sediment control measures to ensure they are robustly designed, installed, maintained, and modified as appropriate for each stage of works
- Manages response to environmental incidents and complaints

7.2 Contact details

Role	Name	Contact details
Wellington Water project manager	TBC	Phone: Email:
Project manager	TBC	Phone: Email:
Construction manager	TBC	Phone: Email:
Environmental Lead	TBC	Phone: Email:
Wellington City Council compliance contact	TBC	Phone: Email:

Greater Wellington Regional Council compliance contact	TBC	Phone: Email:
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