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Report

# Prince of Wales Omāroro Reservoir - Preliminary Design Report Addendum

Prepared for Wellington Water Ltd

Prepared by CH2M Beca Ltd

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## Revision History

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A	Mhairi Rademaker	Draft	20/04/2017
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## Document Acceptance

Action	Name	Signed	Date
Prepared by	Mhairi Rademaker		21/04/2017
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Approved by	Wayne Estment		26/04/2017
on behalf of	CH2M Beca Ltd		

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# 1 Introduction

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In 2013, Beca prepared a preliminary design report for the Hospital Prince of Wales Reservoir, now the Prince of Wales/Omāroro Reservoir.

A number of changes are proposed to that report, primarily as a result of a decision to investigate using both the upper and lower fields for storage of material and equipment during construction and to potentially raise both the upper and lower fields to dispose of excess material.

Further assessments have also been undertaken including landscape and visual, traffic, recreation, noise, and stormwater, and a draft Construction Erosion and Sediment Control Plan developed. These reports supersede some of the information provided in the 2013 report.

The following section outlines the change to the 2013 report at a high level. The relevant reports should be relied on for detailed information where referenced.

## 2 Changes to Preliminary Design Report

The table below identified where there are changes to information provided in the Preliminary Design Report and where further information is now available. Where there are any discrepancies between information in the Preliminary Design Report, the *Town Belt Act Easement Request* and any of the reports appended to the Easement Request, the more recent information shall prevail.

Section	Type of change	2017 Update / amendment
<b>1 Introduction</b>		
1.1 Background	Amendment	<ul style="list-style-type: none"> <li>Reservoir purpose has changed and no longer includes the specific post disaster function of only servicing Wellington Hospital. The Prince of Wales/Omāroro reservoir, is required for servicing the Wellington low level water supply zone, providing potable water to approximately 70,000 residents, a significant range of commercial and industrial businesses and various critical community facilities. The Wellington low level water supply zone covers the Wellington Central Business District (CBD); Thorndon, Newtown, Mount Cook, Hataitai, Kilbirnie, Miramar, Strathmore and Seatoun.</li> <li>The proposed Prince of Wales/Omāroro Reservoir is required to significantly expand the zone's local water storage capacity, for the following purposes: <ul style="list-style-type: none"> <li>Operational and strategic/disaster resilience: <ul style="list-style-type: none"> <li>To enhance the zone's resilience to both temporary and significant water supply disruption events, such as may be associated with a natural hazard event.</li> </ul> </li> <li>Network management and maintenance: <ul style="list-style-type: none"> <li>To assist with optimising the function of the local water supply network and without disrupting water supply enable WWL to undertake needed maintenance activities on the existing reservoirs and network.</li> </ul> </li> <li>Growth and wellbeing: <ul style="list-style-type: none"> <li>To support existing economic activity and growth, along with community health and wellbeing.</li> </ul> </li> </ul> <p>These functions are critical to supporting and sustaining Wellington's economy, the health of its communities, and the city's ability to withstand temporary water disruption supply events and recover from significant events, such as an earthquake.</p> </li> <li>The reservoir programme was delayed and is now expected to be complete, subject to funding and obtaining required approvals and consents, by 2021</li> <li>The <i>Park and Surplus Materials Options Assessment Report</i> is superseded. It is now planned to use both the upper and lower Prince of Wales Park playing fields for material and equipment storage. Provision is included for raising one or both of the fields with material excavated from the reservoir site. Surplus excavated material, not required for field raising or reservoir burial, will be disposed off-site.</li> </ul>

1.2	Objectives	No change	
1.3	Site location	No change	
1.4	Purpose and scope of report	No change	
1.5	Associated and referenced reports	Amendment	<ul style="list-style-type: none"> <li>The <i>Hospital Prince of Wales Reservoir Park and Surplus Materials Options Assessment Report</i> is superseded</li> </ul>
<b>2 Selected arrangement</b>			
2.1	Introduction	No change	
2.2	Site layout	No change	
2.3	Reservoir structure	No change	
2.4	Tunnel structure	No change	
2.5	Reservoir pipework	No change	
2.6	Service connections	Amendment	<ul style="list-style-type: none"> <li>The scour overflow pipework will be sized to a peak flow rate of 400 L/s</li> </ul>
2.7	Access and parking	Further information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Traffic Assessment (2017)</i> includes a discussion of access and parking provisions during construction</li> </ul>
2.8	Landscaping arrangements	Further information	<ul style="list-style-type: none"> <li>This section and the <i>Landscape Report (2013)</i> should be read in conjunction with the <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Effects Assessment (2017)</i></li> </ul>
2.9.1	Temporary material storage	Section superseded	<ul style="list-style-type: none"> <li>This section and the <i>Park and Surplus Materials Options Assessment Report</i> is superseded. It is now planned to use both the upper and lower fields for material and equipment storage. Provision is included for raising one or both of the fields with the excess material excavated from the reservoir site.</li> <li>The <i>Town Belt Act Easement Request</i> and appended specialist report discuss the options for temporary material storage</li> </ul>
2.9.2	Permanent arrangement	Section superseded	<ul style="list-style-type: none"> <li>This section and the <i>Park and Surplus Materials Options Assessment Report</i> is superseded. It is now planned to use both the upper and lower fields for material and equipment storage. Provision is included for raising one or both of the fields with the excess material excavated from the reservoir site.</li> <li>The <i>Town Belt Act Easement Request</i> and appended specialist report discuss the options for the permanent arrangement</li> </ul>
<b>3 Site factors</b>			
3.1	Introduction	No change	
3.2	Geotechnical considerations	No change	
3.3	Site seismicity	No change	

3.4	Local street connections	Further information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i> includes a detailed consideration of construction traffic</li> </ul>
3.5	Town belt access paths	Further information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Assessment of Effects on Recreation</i> includes further detail on existing paths through the site</li> </ul>
<b>4 Environmental factors</b>			
4.1.1	Location in Town Belt – General	No change	
4.1.2	Access through Town Belt	Section superseded	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Assessment of Effects on Recreation</i> includes detail on existing paths and paths to be maintained during construction</li> </ul>
4.2	Visual effects	Further Information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Effects Assessment</i>, includes visual simulations</li> </ul>
4.3	Urban design issues	Further Information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Effects Assessment and Assessment of Effects on Recreation</i> contains further information</li> </ul>
4.4	Cultural issues	Further information	<ul style="list-style-type: none"> <li>Further engagement has been undertaken with iwi</li> <li>A <i>Cultural Impact Report</i> has been prepared</li> </ul>
4.5	Archaeological	No change	
4.6	Ecological impact	Section superseded	<ul style="list-style-type: none"> <li>This section is superseded by the <i>Prince of Wales/Omāroro Reservoir Ecological Effects Assessment</i>, which includes visual simulations</li> </ul>
4.7	Construction impacts	Further information	<ul style="list-style-type: none"> <li>Further information on construction effects is provided in the following reports:</li> <li><i>Prince of Wales/Omāroro Reservoir Assessment of Effects on Recreation</i></li> <li><i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i></li> <li><i>Prince of Wales/Omāroro Reservoir Construction Noise Assessment</i></li> <li><i>Draft Prince of Wales/Omāroro Reservoir Erosion and Sediment Control Plan</i></li> </ul>
4.8	Demolition of superseded facilities	No change	
<b>5 Preliminary design</b>			
5.1	Introduction	No change	
5.2	Consultation	Further information	<ul style="list-style-type: none"> <li>Further consultation has been undertaken with WCC and the public as detailed in the <i>Town Belt Act Easement Request</i></li> </ul>
5.3	Hydraulic design criteria	No change	
5.4	Reservoir structure	No change	
5.5	Reservoir circulation and mixing provisions	No change	

5.6	Tunnel structure	No change	
5.7	Reservoir pipework	No change	
5.8 & 5.9	Existing utility services and modifications	Further information	<ul style="list-style-type: none"> <li>Some existing utilities are affected by the proposed stockpiling and raising of the fields. These include a wastewater pipe, water mains and 33 kV power cables crossing the upper and lower playing fields. Allowance has been included for the existing wastewater pipe that is shown across the lower playing field and one watermain near the centre of the upper playing field to be relocated. Other services are not under the large stockpiles but do receive increased permanent level of cover of up to 1.5 m. There is a risk that these utilities will need relocating.</li> </ul>
5.10	Service connections to the reservoir	No change	
5.11	Drainage	Further Information	<ul style="list-style-type: none"> <li>Further information is provided in the <i>Prince of Wales/Omāroro Reservoir Stormwater Assessment</i></li> </ul>
5.12	Reservoir cover earthworks	No change	
5.13	Earthworks surrounding the reservoir	No change	
5.14.1	Landscaping	Further Information	<ul style="list-style-type: none"> <li>Further information is provided in the <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Effects Assessment</i></li> </ul>
5.14.2	Urban design furniture	Further Information	<ul style="list-style-type: none"> <li>Further information is provided in the <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Effects Assessment</i></li> </ul>
5.14.3	Construction access	Further information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i> includes a detailed consideration of construction access and traffic</li> </ul>
5.14.4	Construction phase public walkways	Further information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Assessment of Effects on Recreation</i> includes further detail on paths to be maintained during construction</li> </ul>
5.15	Temporary and permanent works on upper park	Section superseded	<ul style="list-style-type: none"> <li>This section is superseded. The <i>Town Belt Act Easement Request</i> and appended specialist report include detail on temporary stockpiling and permanent raising of both the upper and lower fields</li> </ul>
5.14	Summary of scope of works	Amendment	<ul style="list-style-type: none"> <li>In the event that both the upper and lower fields are raised, the volume of material to be disposed of off-site could reduce to around 14,500m<sup>3</sup></li> </ul>
5.17	Contract strategy	No change	
5.18.1	Contractors site access	Amendment	<ul style="list-style-type: none"> <li>Buffer extended to 10m around fill area to provide space for working and for erosion and sediment control measures</li> <li>Working area extended to cover the full extent of both the upper and lower fields</li> </ul>
5.18.2	Site access and traffic control	Section superseded	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i> includes a detailed consideration of construction access and parking arrangements on Rolleston Street</li> </ul>

		<ul style="list-style-type: none"> <li>That assessment demonstrates that truck and trailer units cannot be used at the site (unsuitable tracking curves in and out of Rolleston Street)</li> </ul>
5.18.3 Hours of work	Further information	<ul style="list-style-type: none"> <li>There is no change to the hours of work; however, the <i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i> includes a recommendation to limit the majority of truck movements to between outside of peak commute hours to mitigate traffic effects</li> </ul>
5.18.4 Public relations	Amendment	<ul style="list-style-type: none"> <li>Due to the high profile nature of the works, the <i>Public Relations Plan</i> may be managed by Wellington Water rather than the contractor. This will be confirmed prior to construction.</li> </ul>
5.18.5 Noise	Section superseded	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Construction Noise Assessment</i> concludes that construction noise may just exceed the NZ Standard and provides further recommendations for management of construction noise</li> </ul>
5.18.6 Dust	Amendment	<ul style="list-style-type: none"> <li>The <i>Draft Prince of Wales/Omāroro Reservoir Erosion and Sediment Control Plan</i> includes high-level dust control measures. Complaint management will be outlined in a Construction Environmental Management Plan</li> </ul>
5.18.7 Environmental Management	Amendment	<ul style="list-style-type: none"> <li>The information in this section will generally be covered in a Construction Environmental Plan, the <i>Draft Prince of Wales/Omāroro Reservoir Erosion and Sediment Control Plan</i> and the <i>Prince of Wales/Omāroro Reservoir Traffic Assessment</i></li> </ul>
5.19 Construction sequence	Amendment	<ul style="list-style-type: none"> <li>Material, including topsoil, will be stockpiled on both the upper and lower fields</li> </ul>
5.20 Preliminary project programme	Out of date	<ul style="list-style-type: none"> <li>An updated programme has not been prepared</li> <li>Resource consents are expected to be granted in the first half of 2018 with construction potentially starting in the 2018/2019 earthworks season, depending on detailed design timing</li> <li>Works are expected to take two years</li> </ul>
5.21 Construction cost estimate	Out of date	<ul style="list-style-type: none"> <li>An updated cost estimate has not been prepared</li> </ul>
5.22 Risk register	No change	
<b>6 Detailed design considerations</b>		
6.1 Introduction	No change	
6.2 Safety in design	No change	
6.3 Temporary excavations for construction	No change	
6.4 Drainage	Section superseded	<ul style="list-style-type: none"> <li>This section is superseded by the <i>Prince of Wales/Omāroro Reservoir Stormwater Assessment</i></li> </ul>
6.5 Reservoir structure	No change	
6.6 Tunnel structure	No change	
6.7 Reservoir pipework	No change	

6.8	Electrical and control systems	No change	
6.9	Landscaping and access arrangements	Further Information	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Assessment</i> includes further consideration of landscaping</li> <li>The <i>Prince of Wales/Omāroro Reservoir Assessment of Effects on Recreation</i> includes further detail on existing paths through the site and which tracks may be usable during construction</li> </ul>
6.10	Construction preliminary and general specification	No change	
<b>7 RMA consenting and consultation</b>			
7.1	Consenting process	Amendment	<ul style="list-style-type: none"> <li>The Reserves Act and Town Belt Deed no longer apply. Instead approval is being sought under the Wellington Town Belt Act 2016</li> </ul>
7.2	Consent requirements	No change	<ul style="list-style-type: none"> <li>Consent requirements remain generally as identified</li> </ul>
7.3	Consultation to date	Amendment	<ul style="list-style-type: none"> <li>Further consultation has been undertaken with WCC and the public as detailed in the <i>Town Belt Act Easement Request</i></li> </ul>
7.4	Consenting strategy and activities	Amendment	<ul style="list-style-type: none"> <li>Activities generally remain as noted; however, written endorsement from WCC Parks and Garden and the Town Belt Trustees will be replaced with the easement required under the Wellington Town Belt Act 2016</li> </ul>
7.5	Consultation material on visual impact	Superseded	<ul style="list-style-type: none"> <li>The <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Assessment</i> includes visual simulations</li> </ul>
7.6	Objective of project and consideration of alternatives	Additional information	<ul style="list-style-type: none"> <li>The <i>Site Selection Summary Report</i> outlines the alternative sites investigated. The <i>Town Belt Act Easement Request</i> includes further information on assessment of alternatives, and the objectives of the reservoir project</li> </ul>
<b>Appendices</b>			
A	Structural basis of design	No change	
B	Mechanical basis of design	No change	
C	Geotechnical basis of design	No change	
D	Landscape report	Further Information	<ul style="list-style-type: none"> <li>Further information is provided within the <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Assessment</i></li> </ul>
E	Reservoir mixing analysis	No change	
F	Preliminary project programme	Out of date	<ul style="list-style-type: none"> <li>Updated programme not provided</li> </ul>
G	Cost estimate summary table	Out of date	<ul style="list-style-type: none"> <li>Updated costs not provided</li> </ul>
H	Drawings	No change	<ul style="list-style-type: none"> <li>No change except as altered by <i>Prince of Wales/Omāroro Reservoir Landscape and Visual Assessment</i></li> </ul>