



REPORT

STRUCTURAL AND CIVIL ENGINEERS

ARTHUR'S POINT NORTH SHA

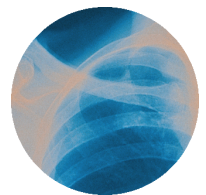
THREE WATERS ASSESSMENT

PREPARED FOR

QUEENSTOWN LAKES DISTRICT COUNCIL

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21 OCTOBER 2015





Arthur's Point North SHA Three Waters Assessment

Prepared For:
Queenstown Lakes District Council

Date: 21 October 2015
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INTRODUCTION

Holmes Consulting Group (HCG) has been engaged by the Queenstown Lakes District Council (QLDC) to provide an assessment of the Three Waters infrastructure for a proposed 4.2 hectare development located in Arthurs Point. The site is located on Lot 1 DP 12913 and it is intended to develop it as a Special Housing Area (SHA) as set out in the Housing Accords and Special Housing Areas Act 2013.

The SHA application proposed subdivision of the site, providing 34 medium density dwellings on the lower sections adjacent to Arthurs Point Road and an additional 6 larger, rural residential properties on the elevated upper section. Further advice has since been provided indicating a higher density, with up to 80 residential units proposed.

Assessments of the existing water supply and wastewater infrastructure for the site have been undertaken by Tonkin & Taylor (T&T) and Rationale respectively. HCG has undertaken a preliminary investigation of the stormwater network requirements.

SCOPE OF WORK

The scope of work for this project included the following:

1. Review water modelling reports to assess capacity and network constraints.
2. Review wastewater modelling reports to assess capacity and network constraints.
3. Complete a desk study to assess the existing stormwater infrastructure and determine network constraints.
4. Report on our findings and recommendations.

LIMITATIONS

Findings presented as a part of this project are for the sole use of QLDC in its evaluation of the subject properties. The findings are not intended for use by other parties, and may not contain sufficient information for the purposes of other parties or other uses.

Our assessments are based on a desk study only. Condition assessments of existing infrastructure have not been undertaken and it has been assumed that any deficiencies due to damaged or aged infrastructure will be addressed within existing renewals budgets.

Our professional services are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field



at this time. No other warranty, expressed or implied, is made as to the professional advice presented in this report.

WATER SUPPLY

Connection to the Council water reticulation is available in Arthurs Point Road, immediately adjacent to the property, with the subdivision being fed from the Arthurs Point Treatment Plant and Reservoir. A 150 mm pipe connecting into the existing 200 mm main in Arthurs Point Road would serve the development site.

T&T's modelling of the proposed subdivision's demand (based upon the ADF 168 m³/day (2.0 l/s) shows that appropriate levels of service in excess of 300 kPa are available to 467 m RL under a worst-case demand scenario. This level corresponds to approximately halfway up the site. The proposed development layout contains the high density within the lower slopes, with the rural residential lots located above this.

Appropriate levels of firefighting service (FW3) are available to the boundary of the subdivision under the worst-case scenario demand.

Options to provide an adequate water supply to the upper rural residential lots include either a new booster pump station, or stand-alone water tanks adjacent to each dwelling. These could be trickle fed from the council supply, with 520 kPa available at the property boundary (meaning a trickle fed supply can just be provided up to the upper boundary at RL 510-520). Given the low number of lots (6) and the low density intended for these lots, it is expected that trickle fed tanks will be a more economical solution than a booster pump station. The tanks would also provide a static firefighting supply for each dwelling.

No upgrade to the Council water supply network would therefore be required for this subdivision to be serviced.

WASTEWATER

Connection to the Council wastewater network is available via the existing 150 mm foul sewer main in Arthurs Point Road, immediately adjacent to the property. Installation of a new 150 mm pipe would connect the development to this main.

Rationale has assessed the downstream capacity of the wastewater network based upon the increase in flow from the development. Their report states that there is sufficient capacity in both the existing pipework and the Arthur's Point pump station to handle the increase in flows. Although a number of network elements downstream of the Arthur's Point pump station show capacity issues under the modelled situation, these are all known issues that are being worked through. The addition of this development is within the capacity of the planned solutions to the known network constraints.



No upgrade to the Council wastewater network would therefore be required to service this development beyond those already required.

STORMWATER

The proposed development site is located on undeveloped, sloping ground and there is no existing stormwater infrastructure within the site. A 450mm culvert located directly adjacent to the site conveys stormwater runoff from the northern side of Arthurs Point Road to an existing stream, with the flows ultimately discharging to the Shotover River.

On account of the increase in stormwater flows that would be generated by the development's related increase in impermeable area, a second culvert (with appropriate downstream outlet and access manholes) would need to be installed under the roadway. It is anticipated that this culvert would be a minimum of 600mm and would direct flows towards the existing stream. This discharge would require the permission of the Department of Conservation (whose land the discharge would occur on) and treatment to ensure compliance with Otago Regional Council policies and rules.

It may be possible to reduce the stormwater flows from the development by the use of soakage pits within each property, which may affect the required sizing of the culverts, however due to the required size and high density of development on the lower portion of the site, it is unlikely that sufficient area would be available. This assessment does not include geotechnical considerations or hazard identification, however it is noted that the upper reaches of the site are within an active schist debris landslide area, and the use of stormwater soak pits within this area would require further investigation. These investigations would be carried out and their relevant effectiveness evaluated during the detailed design process for the subdivision.

This culvert is not considered to be an upgrade to QLDC's network, however, the estimated cost of the culvert, with two headwalls, road reinstatement and downstream erosion protection are approximately \$75,000 + GST.

REQUIRED UPGRADES

No upgrades to the Council water supply or wastewater networks would be required to support this proposed SHA area.

An additional stormwater network would be necessary to service the proposed development. It is expected this network and the discharge point would be included within the infrastructure budget for the development, and as such is not considered a necessary upgrade to Council's stormwater network.