



WATERSHED

10 May 2018

Queenstown Lakes District Council
10 Gorge Road
Queenstown

Dear Andrew Tipene,

HAWEA SHA DEVELOPMENT

As per your request, we have undertaken hydraulic modelling to consider the infrastructure required to supply the proposed 400 Lot Special Housing Area (SHA) development and the interim infrastructure to supply initial stages from 50-200Lots.

DEMAND ASSESSMENT

The demand has been assessed based on information provided from the various developers as tabulated and referenced below.

Table 1: Development Details

Development	No. of Residential Lots / Commercial / Industrial Area	Reference
Full Development	400	Development Infrastructure Assessment (DIA) request form
Initial Stage	50 to 200 Lots	

The key design parameters outlined in Queenstown Lakes District Council Land Development and Subdivision Code of Practice (2015) are as follows:

- Daily consumption of 700 L/p/day
- Number of people per dwelling = 3
- Peak Day Demand (over a 12-month period) = Average Day Demand x PF:
 - (a) PF = 1.5 for populations over 10,000;
 - (b) PF = 2 for populations below 2,000.
- Peak Hourly Demand = Average Hourly Demand (on peak day) x PF (over a 24-hour period):
 - (a) PF = 2 for populations over 10,000;
 - (b) PF = 5 for populations below 2,000.
- Firefighting demands as specified in SNZ PAS 4509
- Commercial / Industrial demands are assessed on a consumption figure of 12m³/Ha/Day

The firefighting classification for the proposed SHA is unknown and therefore assumed to be a standard residential development with a fire class of FW2 25L/s.



WATERSHED

Table 2 shows the demand calculation for each of the developments.

Table 2: Average and Peak Day Demand Calculations

Development Stage	No. of Residential Lots / Area	Population	Average Demand (L/s)	Peak Daily Demand (L/s)
Initial Stage of 50 Lots	50	150	1.22	2.43
Initial Stage of 100 Lots	100	300	2.43	4.86
Initial Stage of 200 Lots	200	600	4.86	9.72
Full Development	400	1200	9.72	19.44

Peak Hour Demand

The peak hour factor can be considered in several different ways.

- The peak hour factor for the Hawea network derived during the calibration of the hydraulic model is 2.18.
- The standard domestic equivalent profile has a peak hour factor of 2.3.
- The suggested design peak hour factor is 5 for population less than 2000, or 2 for populations greater than 10,000.

The per capita demand assessed during the model calibration matches well with the design criteria, therefore it is reasonable to assume that a similar peak hour factor would also apply and not the design value of 5 for a population less than 2000.

Therefore for the purposes of assessing these subdivisions, the domestic equivalent profile has been used applying a peak hour factor of 2.3. This should still be conservative with the derived factor for Hawea at 2.18.

LEVELS OF SERVICE

The levels of service agreed upon with QLDC for the current system performance assessment as part of the model development and calibration project are outlined below:

- The minimum service pressure is 200-300kpa
- The maximum service pressures is 700-800kpa

These levels of service along with the requirements of the Fire Fighting Water Supplies Code of Practice form the basis for the system performance analysis.

Queenstown Lakes District Council does not prescribe any level of service criteria relating to pipe head loss, generally speaking pipe head loss per unit length for new pipes should ideally be < 2 m/km, or 2- 5 m/km for normal operation.



HAWEA NETWORK ASSUMPTIONS

This analysis assumes that the operation of the current network will remain the same with direct injection from the Scotts Beach Bore Field while the reservoir is filling, or gravity supply from the reservoir. It is assumed any upgrades required to the bore pumps or the capacity of pipework to and from the reservoir and the reservoir itself would be addressed by QLDC as part of the Network Strategy and LTP process.

PROPOSED INFRASTRUCTURE REQUIREMENTS

The infrastructure requirements for supplying the SHA have been considered in two stages. Firstly, the requirements for supplying the network under future demands with the ultimate development of the SHA at 400Lots. Secondly, what can be supplied in terms of an initial stage (50 to 200 Lots) and the pipe work required to satisfy this.

Future Demands Scenario

For the future demand scenario (2058 growth figures in ModelGrowth_v2) a new 350mm diameter watermain is required from the Scotts Beach Bore field, down Capell Avenue to Cemetery Road, with a 250mm diameter watermain on Cemetery Road from the existing 300mm watermain connecting to the new watermain on Capell Avenue.

Initial Staging based on Current Demands Scenario

For the initial staging based on the current peak day demand, 50 to 200 Lots could be the SHA could be serviced from a 150mm watermain on Capell Avenue connecting to the existing network. QLDC prefer to ensure their networks are robust and resilient and a long length of single supply to the proposed SHA development is undesirable. Therefore, a second 150mm watermain on Cemetery Road should also be constructed. These watermains also form part of the supply network for the future demand scenario considered.

Figure 1 shows the proposed network layout for servicing the SHA.

SUMMARY

The hydraulic model is a representation of the physical water supply system and as noted in the model development and calibration report it has limitation to its accuracy. The demands and peaking factors used to assess the development are based on assumptions and the actual final water demands may vary.

The recommended infrastructure for both the initial and future development should be confirmed by QLDC when a full network strategy is undertaken for Hawea. The network strategy should confirm additional source water from Scott Beach or otherwise, additional



WATERSHED

reservoir storage, and network upgrades to meet ultimate future demands. Consideration should also be given to pressure reduction within Hawea.

We trust this report meet your requirements. Please contact Charlotte Broadbent on 021766475 charlotte.broadbent@wse.co.nz if you wish to discuss any aspects of this report further.

Regards,

Charlotte Broadbent

Director / Senior Civil Engineer



**SOUTHERN
LAND**

SURVEYING | PLANNING | LAND DEVELOPMENT

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Universal Developments Hawea Ltd
PO Box 798
WANAKA

14 May 2018

Job Ref: U4266

Attention: Lane Hocking

Dear Lane,

Lake Hawea Special Housing Area

Infrastructure Report

1. Introduction

1.1. General

Southern Land Ltd has been engaged by Universal Developments Ltd to undertake an assessment of the existing infrastructure in the vicinity of land bounded by Cemetery Road and Domain Road at Lake Hawea Township.

This report will assess the potential future demands of proposed residential and commercial development in this area. It will do so in relation to requirements the Queenstown Lakes District Council's Code of Practice for Subdivision Engineering.

This report will provide a high level assessment of the likely future demands on infrastructure from the proposed development and will relate this to the Queenstown Lakes District Council's (QLDC) Capital Expenditure Programme for Lake Hawea (see Appendix A).

*Directors
VERGNE WILSON
R.P.Surv, B.Surv,
NZCE (Civil), MNZIS, CSNZ,
Licensed Cadastral Surveyor*

*LUC WAITE
B.Surv, MNZIS, CSNZ,
Licensed Cadastral Surveyor*

*TIM DENNIS
B.Eng, GIPENZ*

1.2. The Site

The proposed development site is located on the southern fringe of the existing Lake Hawea Township. It is bounded on its northern side by Cemetery Road and legally described as Lot 2 DP 343855. It is comprised in CFR 180128.



Figure 1: Proposed development site

The site is but slopes very gently from north to south (approximately between 0.5% and 1% of fall to the south).

1.3. The Proposed Development

The proposed development will provide residential and commercial land in an area that is otherwise of low productive and landscape value. The development will take a comprehensive approach in order to provide a number of benefits.

Infrastructure upgrades that will accommodate the proposed development are planned for Lake Hawea with funding allocated in the Long Term Plan (LTP). Please see excerpts in attached email (Appendix B).

In addition we have investigated and confirmed that short term solutions are also available and acceptable for both water supply and wastewater management for the proposed development to provide ultimate certainty over timing. Although these may not be required they are available to ensure that the development is not dependant on timing of the upgrades. These short term or temporary measures are outlined in sections 2 and 3 below.

2. Water Supply

2.1. General

The Hawea Bore Pump Station and Treatment Plant were constructed in 2014 & 2015. The pump station draws from 4 bores and the treatment facility provides UV treatment and chlorination. The bores have been sized to allow for larger pumps such that capacity from these bores can be increased as required to meet growth demands. Upgrades to the Hawea Water Supply System are programmed in the CAPEX programme as shown in the table below. (See also correspondence from Stuart Pile at QLDC – Appendix B)

HAWEA WATER SUPPLY			2017/18	2018/19	2019/20
1.0	SUPPLY UPGRADES				
1.1	WTP UPGRADE	Possible filtration barrier at WTP	CP 5200	\$ 210,000	
1.2	NETWORK UPGRADES	Upsize Caples Ave section of watermain	CP 6027	\$ 241,500	\$ 65,138
1.3	NETWORK OPTIMISATION	Placeholder funding for supply upgrades	CP 6983	\$ 250,000	\$ 250,000

Table 1: QLDC LTP finding/upgrade programme for the Hawea Water Supply System.

The QLDC has commissioned Watershed to prepare a preliminary modelling report and assessment of the Hawea reticulated water system (see appendix F). This assessment also provides commentary on required future upgrades to cater for continued growth in Hawea Township. This includes two large diameter trunk mains (350mm dia from Scott's beach Bore Field and 250mm dia from the existing 300mm dia main adjacent to Tim's Field). These upgrades would be timed in line with growth of the wider Hawea Township.

2.2. The Development

The Watershed assessment provides an indication of the likely demands for water and the required infrastructure to supply the development.

A logical development approach would see initial stages situated in close proximity to existing infrastructure to minimise the cost of making a water supply available to the development site. In this case it is proposed that initial stages are located adjacent to Cemetery Road nearby the unformed southern end of Capel Ave.

New lots will require connection to the reticulated water supply in terms of Council's standards.

The key design parameters outlined in Queenstown Lakes District Council Land Development and Subdivision Code of Practice (2015) are as follows:

- Daily consumption of 700 L/p/day
- Number of people per dwelling = 3
- Peak Day Demand (over a 12-month period) = Average Day Demand x PF:
 - (a) PF = 1.5 for populations over 10,000;
 - (b) PF = 2 for populations below 2,000.
- Peak Hourly Demand = Average Hourly Demand (on peak day) x PF (over a 24-hour period):
 - (a) PF = 2 for populations over 10,000;
 - (b) PF = 5 for populations below 2,000.
- Firefighting demands as specified in SNZ PAS 4509
- Commercial / Industrial demands are assessed on a consumption figure of 12m³/Ha/Day

The firefighting classification for the proposed SHA is unknown and therefore assumed to be a standard residential development with a fire class of FW2 25L/s.

To provide the proposed development with a water supply that fulfils the above requirements connections will need to be made to existing infrastructure. Watershed has advised that a 150mm diameter main line would need to be installed from the northern end of the unformed Capel Ave to the boundary of the development site. A second 150mm dia main line would need to connect through to existing infrastructure at the western end of Cemetery Road to form a closed loop. This equates to approximately 1.8km of 150mm water main. Please refer to the Watershed plan contained in Appendix E.

Watershed has advised that the installation of this 150mm dia main will provide a complying water supply. This will effectively act as a short term solution to the provision of water supply to the development. Although depending on timing this could be coordinated with councils planned other pipe upgrades (identified in the LTP) to improve efficiencies.

The QLDC CAPEX programme identifies an upside to the Capel Ave water main in the 2018/19/20 (see table 1 above) which will provide additional supply for more than 200 lots.

Accordingly water supply can be provided to the development.

3. Wastewater Disposal

3.1. General

Wastewater in the Lake Hawea Township is currently reticulated to the Hawea Wastewater Treatment Plant located on Domain Road. QLDC accepts that this plant runs near or above its capacity and is not fit for purpose.

The QLDC has funding allocated in its CAPEX programme for connecting the Lake Hawea Township to the Project Pure Wastewater Treatment Plant. This will be by way of a 12km long pipeline. The construction of this pipeline is scheduled for commencement in approximately 2 years' time. It is in the QLDC's Long Term Plan funding programme as outlined in the table below.

HAWEA WASTEWATER SERVICING			2017/18	2018/19	2019/20
ENABLING WORKS: PLANNING & CONSENTS	River Clutha pipe bridge	CP 0554 / NEW8			
DESIGN	Full pumping system design (WWPS & pipeline)	CP 4036		\$ 704,875	
CONSTRUCTION	12km pipeline from Hawea to P Pure (inc over River Clutha)	CP 4036			\$ 1,799,375

Table 2: QLDC LTP funding programme for the Lake Hawea Township wastewater pipeline to Project Pure. (See also appendix B)

3.2. The Development

All new residential allotments will require connection to the QLDC's wastewater network, in terms of Council's standards.

As noted in section 1.2 above the topography of the site slopes gently from the north to the south. The site lends itself to effective gravity wastewater reticulation. Preliminary concept designs indicate that the proposed development can be serviced by a gravity main that will connect into the existing gravity system on Domain Road just south of the existing oxidation pond.

New drainage infrastructure will be appropriately sized to ensure immediate and future development is adequately provided for.

We have considered short term wastewater management solutions for the development so it is not dependant on the timing of upgrades. Should the initial

stages need to start discharging wastewater to the reticulated system before the Hawea Wastewater Treatment Plant was connected to Project Pure the following options are available:

1. Temporary storage chambers: Chambers situated at the downstream end of a new gravity system would act to attenuate peak flows. The chambers would collect day-time flows and then pump wastewater to the oxidation ponds over low flow periods (likely at night time).
2. Truck Transfer: Chambers situated at the downstream end of a new gravity system would collect wastewater. The wastewater would then be transferred by truck to Project Pure.
3. On site treatment: A temporary onsite treatment plant could be established. The plant would be decommissioned once the pipeline to Project Pure was operational.

Discussions with Andrew Tipene of the QLDC infrastructure team have indicated council would be supportive of these temporary measures should they be required.

4. Stormwater Disposal

4.1. General

Due to an absence of any downstream stormwater infrastructure and the QLDC's movement to recent engineering standards the development will be required to attenuate peak flows of stormwater to pre development levels. This will need to be achieved through the implementation of a Low Impact Design (LID) system. LID utilises a network of overland flow paths (usually grass swales) and soakage features to treat and dispose of stormwater to adjacent waterways or to ground.

The Otago Regional Council (ORC) has been consulted and has identified two significant issues in relation to stormwater management (See appendix C).

1. The need to recharge local aquifers with stormwater.
2. Treatment of stormwater to avoid contamination of groundwater.

The LID approach lends itself to management of both of these issues.

4.2. QLDC Design Requirements

Subdivision engineering design is required to be in accordance with QLDC Land Development & Subdivision Code of Practice. This document generally references requirements of New Zealand Standard NZS 4404:2010 Land Development and Subdivision Infrastructure, with a number of amendments.

Provided below is a summary of requirements in the Code of Practice that are relevant to stormwater engineering design for the proposed development.

The QLDC Code of Practice specifies the following design storm standard for subdivision development:

Clause 4.3.5 Design criteria

Discharge to an existing network from a primary system shall be at a rate (litres per second) no greater than would have occurred for the undeveloped catchment during a 60 minute 5-year storm.

Clause 4.3.5.1 Design Storms

All Primary Systems shall, as a minimum, cater for the worst case 1 in 20-year return period (5% AEP) storm with no surface flooding.

Where no secondary flow path is available the worst case 1 in 100-year return period (1% AEP) storm shall be catered for with no surface flooding.

Clause 4.3.7.1 Low Impact Design Stormwater System

This clause states QLDC's preference for low impact design (LID) stormwater control solutions but qualifies the preference by requiring the approval of maintenance requirements before submitting LID proposals for acceptance.

Clause 4.3.7.4 Detention Ponds

This clause identifies detention basins as being an acceptable element in LID stormwater management but states that "Detention ponds shall only be used with prior approval from Council."

The QLDC CoP notes that the primary objective of a stormwater system is to:

1. Manage surface water run-off to minimise flood damage to property both within the development and downstream of the development.
2. Manage adverse effects on the environment.

The following developer driven element must also be managed:

3. Practicability in terms of construction and maintenance practice and cost.

There are a range of LID stormwater options available to manage stormwater with the above objectives in mind. Some of these are listed in the CoP as follows:

4.3.7.3 Low impact design devices

The types of low impact design devices that could be considered for use include:

- (a) Detention ponds;*
- (b) Wetlands;*
- (c) Vegetated swales;*
- (d) Rain gardens;*
- (e) Rainwater tanks;*
- (f) Soakage pits and soak holes;*
- (g) Filter strips;*
- (h) Infiltration trenches/basins;*
- (i) Permeable paving;*
- (j) Green roofs;*
- (k) Tree pits.*

4.3. Proposed Development

It is anticipated that the site topography and geology will lend itself to the implementation of a range of the above LID elements.

Based on test pits and soakage tests at adjacent development Sentinel Park onsite soakage is anticipated to be a viable option at the proposed development. Free draining glacial outwash gravels were uniformly distributed across the site. This type of geology is well suited to disposal of stormwater to ground via soakage pits, detention basins, rain gardens, vegetated swales and infiltration trenches/basins.

Again as the site slopes gently from north to south overland flows can be comfortably directed through the site. The gentle slope across the site also supports a LID stormwater management approach. A gentle slope results in an increased time of concentration of stormwater flows. This delays and reduces peak flows in storm events as stormwater takes longer to reach any given point in the system. Stormwater also has a greater opportunity to soak to ground through vegetated swales along the way.

The adjacent Hawea River provides a suitable discharge point in the event of extreme rainfall occurrences.

In conjunction with site specific investigations the detailed design phase will focus on defining a network of LID elements designed to manage stormwater in accordance with The QLDC's objectives. This will ensure soakage and conveyance structures are located in appropriate locations to take full advantage of high soakage rates.

5. Power and Telecommunications

The development Lot can be readily serviced with both power supply and telecommunications infrastructure. (See accompanying availability of services letter from Aurora and email from Chrous – Appendix D).

6. Summary

All major infrastructural elements can either be made available to the site in the immediate term or future upgrades are programmed in the LTP. These are summarised as follows:

- Water supply for domestic and firefighting requirements can be made available to the site with the installation of 150mm dia water lines from Capel Ave and Cemetery Road. Future upgrades will be required to serve later stages of development. There are provisions in the LTP for future upgrades.

- New infrastructure can be readily installed to provide gravity reticulation to the Domain Road oxidation pond. The LTP provides for a new pipeline connection to Project Pure. Short term options are available to serve the proposed development should there be any delays in the pipeline becoming operational.
- New developments are required to achieve stormwater neutrality. This is as anticipated and solutions are available.
- Power and telecommunications are readily available to the site
- There are short term solutions to infrastructure requirements while upgrades programmed in the LTP are implemented. Therefore ensuring the development is not dependant on timing of upgrades.

Should you have any questions please do not hesitate to contact the writer.

Yours faithfully

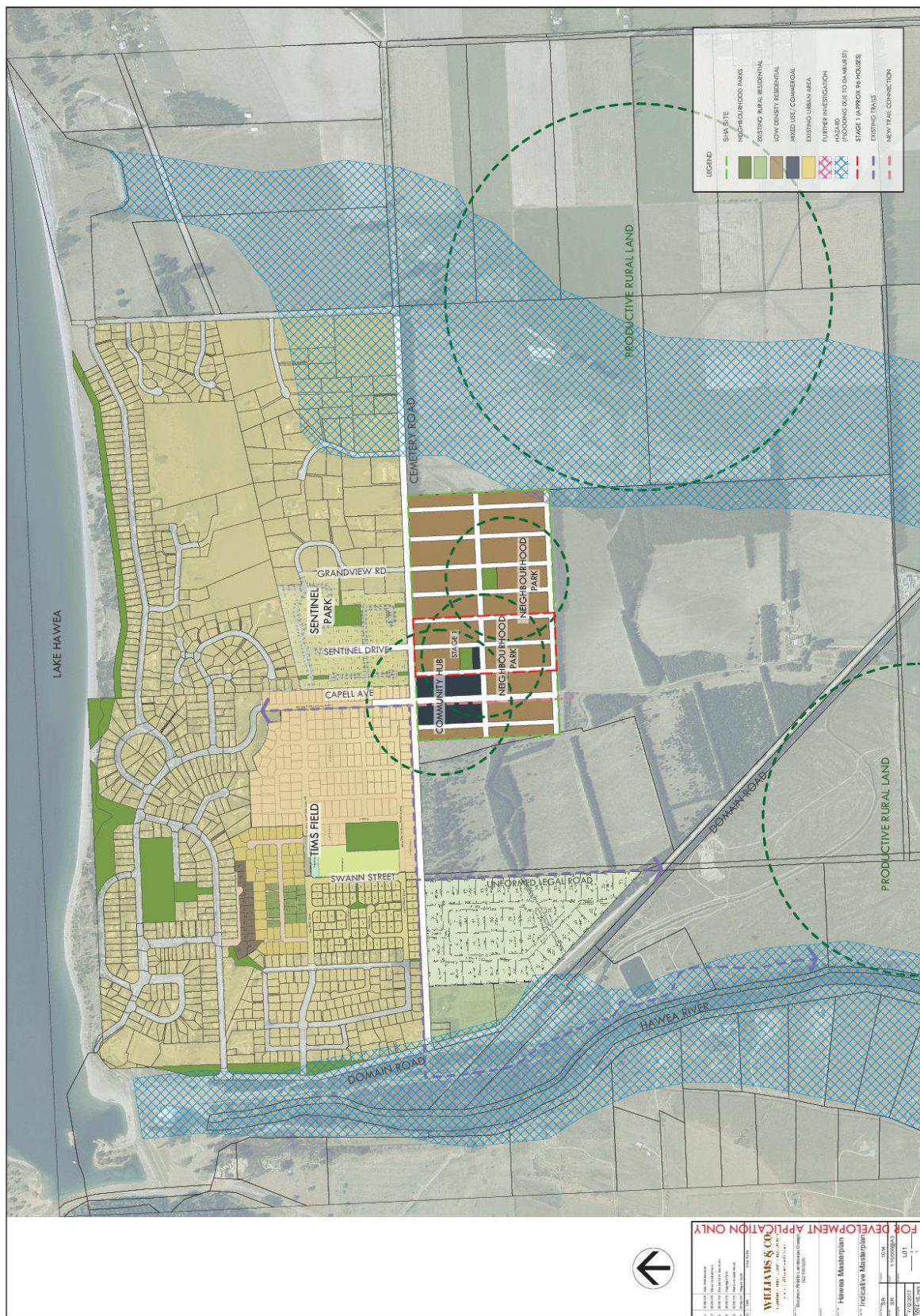
Southern Land

A handwritten signature in dark ink, appearing to read 'Luc Waite', is written over the printed name.

Luc Waite

Director

Master plan



Appendix B

Email correspondence (QLDC)

From: Stuart Pile <Stuart.Pile@qldc.govt.nz>
Sent: Wednesday, 18 April 2018 5:28 PM
To: Andrew Tipene
Subject: RE: RE: Hawea - Potential New Subdivision

Hi Andrew

Our CAPEX programme for Hawea has significant monies attributed to the management of wastewater from this scheme which continues to be a challenge for QLDC.

At present we have a non compliant wastewater treatment plant which is simply not fit for purpose. We have undertaken a business case which, at present, has the preferred option looking like a new pump system and pipeline that would convey sewage to our Project Pure WWTP. This project would involve construction of a 12km pipeline which would follow legal roads and easements for the vast majority of its length. A new bridge is hoped to be built over the River Clutha that would support our pipeline. This option aligns with our strategy for centralised wastewater management rather than the continued operation of smaller plants. It should be noted that Luggate will also be connected into the P Pure treatment plan.

LTP funding to support this project is as follows;

PROJECT PURE UPGRADES & DEVELOPMENT			2017/18	2018/19	2019/20	2020/21	2021/22	2022
SCREEN UPGRADES	New duty / standby screening system to increase screen capacity	CP 0560	\$ 599,843					
CENTRIFUGE UPGRADE	New duty / standby centrifuge system	CP 6284		\$ 416,000				
PPURE CAPACITY UPGRADE DESIGN	Design for new third SBR tank installation	CP 6284			\$ 530,000			
PPURE CAPACITY UPGRADE	Construction and commissioning	CP 6284				\$ 2,385,000	\$ 2,385,000	
INSTALL FOG TREATMENT FACILITY AT P PURE	Design and construction	CP 6667			\$ 500,000	\$ 500,000		
HAWEA WASTEWATER SERVICING			2017/18	2018/19	2019/20	2020/21	2021/22	2022
ENABLING WORKS, PLANNING & CONSENTS	River Clutha pipe bridge	CP 0554 / NEW8						
DESIGN	Full pumping system design (WWPS & pipeline)	CP 4036		\$ 704,875				
CONSTRUCTION	12km pipeline from Hawea to P Pure (inc over River Clutha)	CP 4036			\$ 1,799,375	\$ 1,799,375		

In terms of capacity, it is well timed that we are made aware of future developments now so that we can size our trunk infrastructure accordingly. It should also be noted that in order for the P Pure plant to receive this additional load, capacity upgrades shall be required here also. Hence I also have included the upgrades planned for our Project Pure wastewater treatment plant.

Water supply

The Hawea Bore Pump Station and Treatment Plant was constructed in 2014/15 and includes four bores and a treatment facility that includes chlorination and UV. The bores were sized to allow for larger pumps and any new housing development of significant size would likely result in us looking at pump upgrade. We have also recognised the network improvements that could be made in Hawea so funding also sits in the CAPEX programme for this also. The Hawea water supply improvements are as follows;

HAWEA WATER SUPPLY			2017/18	2018/19	2019/20	2020/21	2021/22
1.0	SUPPLY UPGRADES						
1.1	WTP UPGRADE	Possible filtration barrier at WTP	CP 5200	\$ 210,000			
1.2	NETWORK UPGRADES	Upsize Caples Ave section of watermain	CP 6027	\$ 241,500	\$ 65,138		
1.3	NETWORK OPTIMISATION	Placeholder funding for supply upgrades	CP 6983	\$ 250,000	\$ 250,000		

We intend to commence master planning for Hawea in the next 3 – 6 months. This will aim to determine what reservoir capacity and other trunk improvements need to be made to support future growth. Our intention here being that we would then revise and allocate more CAPEX funding in the 2021 LTP – allowing us to leverage DC's off relevant parties.

I hope this helps

Stuart

Appendix C

Email correspondence (ORC)

From: Warren Hanley <warren.hanley@orc.govt.nz>
Date: 15 March 2018 at 1:06:27 PM NZDT
To: Lane Hocking <lane.hocking@yahoo.com>, "blair.devlin@qldc.govt.nz" <blair.devlin@qldc.govt.nz>
Cc: Dale Meredith <Dale.Meredith@orc.govt.nz>
Subject: SHA proposal for Hawea (Cemetery Road) - ORC response

Hi Lane, Blair

Thank you both for approaching ORC early in the planning process for this proposed SHA development. ORC appreciates being able to contribute with input at an early stage and we hope you likewise find our response useful for any further planning, and a robust process.

Rainfall in the wider Hawea area contributes to the recharge of its local aquifers, particularly the Hawea Flat aquifer which is located south of the Hawea township (see attachment map image for general indication of area). An increase in hard surfaces (roofs, paved areas, roading) can reduce natural recharge of groundwater aquifers. ORC provides information on this issue in its report titled 'Rainfall recharge assessment for Otago groundwater basins' – this can be downloaded at <https://www.orc.govt.nz/plans-policies-reports/reports-and-publications/groundwater>

ORC expectations

For this proposal, ORC will be interested in the approach to the 3 waters services, Potable water, wastewater and storm water.

ORC's expectation is that drinking water supply and wastewater will be serviced by reticulated communal services (not 'on-site' services such as septic tanks). For wastewater, a high quality of treatment will be necessary to protect the groundwater resource, particularly as the development grows.

The management of stormwater will also be an issue of high interest to ORC, particularly the treatment method before disposal to ensure it avoids contamination of groundwater.

Also please note that the disposal of stormwater and wastewater from the development, if not to reticulated network systems (i.e. council managed), will need to comply with the rules of the ORC water plan - and possibly require ORC consent. Lane, when you have a bit more detail, I'd suggest you contact us to arrange a meeting with some ORC staff, including our consents team. If possible Blair, it would be good to have someone from QLDC attend as well. We may be able to arrange to hold this on site.

Recommendations

ORC would recommend the following:

1. QLDC confirm to ORC/developers as soon as possible any updates on its future development plans (incl. infrastructure upgrades etc) for Hawea - including this proposal. This will help with work ORC will be undertaking later this year to update its groundwater flow modelling for water allocation purposes;
2. When the proposal is progressed with further information available, additional input (including consenting advice) is sought from ORC; and
3. That an assessment of environmental effects for the proposed development includes:
 - assessing the effects of the development on the wider recharge for Hawea's aquifers and groundwater levels
 - confirmation, including details of treatment, as to how drinking water and wastewater will be managed
 - confirmation, including details of treatment, as to how stormwater will be managed

If you have any questions or points in this email you'd like to discuss further, please feel welcome to contact me.

Warren.



Warren Hanley
Senior Resource Planner Liaison

Otago Regional Council
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Dunedin 9054
Phone (03) 470 7443 or 0800 474 082
www.orc.govt.nz

Power & Chorus confirmation

AURORA ENERGY LIMITED
PO Box 5140, Dunedin 9058
PH 0800 22 00 05
WEB www.auroraenergy.co.nz



14 May 2018

Your ref:

Our ref:

Universal Developments Hawea Limited
C/- Luc Waite
Southern Land Limited
PO Box 713
WANAKA

By email only: luc@southernland.co.nz

Dear Luc

**ELECTRICITY SUPPLY FOR PROPOSED SPECIAL HOUSING AREA, CEMETERY ROAD, LAKE HAWEA
400 LOT SUBDIVISION OF LOTS 1-3 DP 343855**

Thank you for your letter and accompanying plans dated 14 May 2018, outlining the above proposed development.

Aurora Energy can make an electricity supply available for this development, subject to the following conditions:

- Supply confirmation is limited to a single phase 15kVA supply per lot;
- Easements in gross, in favour of Aurora Energy, must be granted over the placement of all new and existing Aurora Energy plant associated with this development, unless installed in road reserve;
- Where the development involves further subdivision of a land parcel containing an existing serviced installation, the mains cables (overhead or underground) intended to supply each lot must be completely contained within the lot that it serves. In some cases this will require relocation of the cable serving the existing installation;
- All electrical installations must comply with Aurora Energy's Network Connection Standard and related standards & policies;
- The developer must comply with the Electricity Act, subordinate Regulations and associated Codes of Practice. Particular attention must be paid to the minimum distances between power lines and other structures defined in NZECP34:2001 "NZ Electrical Code of Practice for Electrical Safe Distances";
- No building shall be erected over any electricity easement without specific written authority from Aurora's General Manager – Network Commercial;
- The developer is responsible for all resource consents and local authority approvals;
- The developer will be required to make capital contributions toward the costs of providing the power supply, in accordance with Aurora Energy's Capital Contributions policy prevailing at the time the development, or each stage of development, proceeds;
- This approval will lapse within 12 months of the date of this letter, unless the developer enters into a formal supply agreement with Aurora Energy for this development;

Please note that this letter is to confirm that a power supply can be made available and does not imply that a power supply is available now, or that Aurora Energy will make power available at its cost.

Aurora Energy's Network Connection Standard and Capital Contributions policy provide more specific information on matters identified in this letter. These documents are available on Aurora Energy's website.

Should you require further information or clarification please contact the undersigned.

Yours sincerely



Richard Starkey

Commercial Development Manager

Luc Waite

From: TSG <TSG@chorus.co.nz>
Sent: Wednesday, 16 May 2018 10:55 a.m.
To: Luc Waite
Subject: Chorus Acknowledgement | WNK46417 - WNK: Cemetery Road, Lake Hawea. (Lot 2 DP 343855) 400 Lots - Estimate

Good morning Luc,

Thank you for providing an indication of your development plans in this area. I can confirm that we have infrastructure in the general land area that you are proposing to develop. Chorus will be able to extend our network to provide connection availability. However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The cost involved would be a minimum of our current standard fee of \$1600 per lot excluding GST. The 1st stage would also incur the cost of establishing the feeder fibre to the subdivision. This cost can only be finalised at the time that you are ready to proceed with the 1st stage.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and home owners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan when you are ready to proceed with stage 1.

Thanks,

Matt Lock
Network Services Coordinator

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Appendix E

Watershed water supply network assessment – Figure 1



Appendix F

Watershed water supply network assessment report