

Memorandum

Date 30 May 2018
To Hearing Commissioners
From Warwick Goldsmith on behalf of the Requestor, Northlake Investments Limited
Subject Plan Change 53 – Additional Information

1. This Memorandum is lodged with the Council, on behalf of the Requestor, to assist in an efficient hearing process. Counsel requests that this Memorandum be forwarded to the Commissioners and to the Submitters.

Infrastructure

2. Part 12 of the Council's s42A Report, which commences on page 52 and deals with 'Issue 5: Infrastructure' addresses issues relating to infrastructure requirements. Paragraph 12.14, on page 55, lists some matters in respect of which additional information is required. That request is reiterated in paragraph 12.18.
3. Accompanying this Memorandum are the following two documents:
 - a. "Northlake Investments Limited Memo: Response to QLDC s42A Report on PC53" dated 16/05/18. This document contains a detailed response to the issues raised in paragraph 12.14 of the s42A Report.
 - b. Letter from QLDC dated 22 May 2018 confirming that, having received and considered the information detailed in the document referred to in a. above, the QLDC Property and Infrastructure are satisfied that water and wastewater infrastructure can be provided to support PC53.
4. This information is being circulated now, in advance of the hearing, to provide the Commissioners and Submitters an opportunity to read and consider the information prior to the hearing. A representative of Paterson Pitts Group will be available at the hearing to read the enclosed Memo (if required by the Commission) and to answer any questions in relation to it.

Witnesses – Hearing Presentation

5. The application as lodged and notified, together with the evidence which has been lodged for the Requestor, together contain a very detailed assessment of all the matters relevant to PC53. The Council's s42A Report recommends approval of PC53, subject to clarification of some minor issues and with some recommended changes to the PC53 plan provisions. Only two submitters have lodged expert evidence. That evidence is limited to, and focuses on, the retail aspect of PC53, with specific reference to provision for a supermarket. No concerns in relation to any other issue are raised in that evidence. There is no expert evidence from any other Submitters in support of issues raised in their submissions.
6. Counsel's preference in a hearing of this nature in order to minimise unnecessary repetition, is not to present additional evidence in relation to matters which have been fully canvassed in pre-circulated documentation and which do not appear to be in issue or have not been raised in the s42A Report or in pre-lodged evidence. Accordingly, in relation to traffic, infrastructure and landscaping/urban design issues:
 - a. Witnesses will be present for the Requestor at the hearing. Those witnesses will adopt the relevant pre-circulated materials as their evidence and will not provide any additional evidence. Those witnesses will be present for the purpose of answering any questions from the Commission.
 - b. The witnesses which fall into this category are:
 - i. Alex Todd – infrastructure;
 - ii. Andy Carr – traffic;
 - iii. Paddy Baxter – landscaping/urban design.
7. Relatively brief rebuttal evidence will be presented in response to the retail and planning evidence lodged by the Submitters WDL and CLHL.



Warwick Goldsmith

Barrister

Counsel for the Requestor, Northlake Investments Limited

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**NORTHLAKE INVESTMENTS LIMITED
MEMO:
RESPONSE TO QLDC S42A REPORT ON PC53**

PROJECT: Northlake
PRINCIPAL: Northlake Investments Limited
OUR REF: W4481-7
DATE: May 2018

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REVISION / APPROVAL PANEL

Rev:	Date:	Prepared By:	Reviewed By:	Comments:
0	16/05/18	AGT	Client	Original issue

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1. SCOPE

This memo is intended to provide a summary response to the clarifications sought in paragraph 12.14 of Queenstown Lakes District Council's (Council) s42A report on Plan Change 53.

The clarification sought relate to water supply and wastewater infrastructure.

2. BACKGROUND

Paragraph 12.14 of Council's s42A report states "*I also note that Mr Vail has also recommended that additional information is provided, or would be helpful to be able to be completely satisfied that the plan change can be accommodated within the Council's existing and planned water and wastewater network:*

Detailed modelling and appraisal of options for the upgrade of the QLDC wastewater network downstream of its junction with Outlet Road and Aubrey Road to ensure it has capacity for the existing and proposed residential yields.

Updated hydraulic modelling of the water supply network the reflect the existing and proposed residential yields of 777 and 832 dwellings respectively and the proposed commercial areas of 1000m² and 2500m² respectively. Modelling should clearly show the firefighting classifications and flows.

Review of, and confirmation by QLDC that, the Applicants proposed use of peaking factor of 4.6 (rather than QLDC's standard 6.6) for minimum water demand, based on measured data from the neighbouring Beacon Point area, is applicable to the Northlake Development.

Further liaison between QLDC and the Applicant to confirm QLDC's program of upgrade works to the water supply network and how this affects the staging of the development and associated water supply connections (particularly the new 250mm dia main to Beacon Point Reservoir).

3. WATER SUPPLY

The following addresses the points b, c & d listed above.

3.1 Water Supply modelling

3.1.1 Residential Water Supply

To best clarify the queries raised regarding water supply it is appropriate to start with the query raised in the Holmes Consulting Infrastructure Review (IR) paragraph 8.1 regarding the yield numbers used in various reports. The yield numbers referenced in the IR can be best explained as follows

- 777 = maximum hypothetical dwelling units on the Northlake Investments Limited (NIL) land using the activity area boundaries approved under RM160152 (ODP)
- 832 = maximum hypothetical dwelling units on the NIL land using the activity area boundaries proposed in PC 53
- 682 = hypothetical number of dwelling units used to model what will become the lower pressure zone at Northlake. The lower pressure zone can be defined as anywhere below the RL 350m and therefore only accounts for part of the Northlake Development. The current density provisions enable 170 dwelling units at an elevation above RL 350m noting that this area will require specific design to deliver lots with the required level of service. These discussions have commenced with Council, but development in this upper area is still some years away.

Attached to this memo (refer to **Appendix 1**) is plan showing the proposed activity areas highlighted to match Stages 1-14 used in the Watershed modelling exercise (report dated 31 August 2017 – refer to **Appendix 2**). The maximum hypothetical residential dwelling unit yield for this area is 608. That is 74 dwelling units less than the number considered by Watershed.

The reason that Watershed modelled a higher theoretical scenario is due to Stage 13 in the lower pressure zone having been shown at a higher density than anticipated by the zoning provisions on the plans that they were modelling from.

In summary, Watershed have already modelled the lower pressure zone at a higher hypothetical dwelling unit count than is anticipated under the proposed density of PC 53 and concluded that the lower pressure zone is capable of supplying 682 dwelling units to the level of services required by QLDC.

The additional 55 lots anticipated by PC53 can therefore be accommodated within the demand scenario previously modelled by Watershed for QLDC.

3.1.2 Commercial Water Supply

The modelling undertaken by Watershed (report dated 31 August 2017 – refer to **Appendix 2**) makes allowance for 30 equivalent residential units in the Village Centre (refer to Table 1 of this report). This was based on a total Village Centre area of 1.416ha (total lot area not GFA) and an average residential lot size in Northlake Stages 1-3 of 450m². This allowance for an equivalent 30 lots equates to a Peak Daily Demand of 1.458l/s that has already been included in the modelling. This allowance is considered slightly conservative and has been checked by analysis of Table 5.1 in the LDSCoP which sets out indicative wastewater flows for industrial/commercial areas noting that wastewater flows out for industrial/commercial areas are a reasonable measure of water supply flows in. The Peak Daily Demand figure of 1.458l/s over 1.416ha (as shown in the Watershed report) gives a Peak Daily Demand per hectare of 1.03l/s/ha. Relating this value back to Table 5.1 of the LDSCoP shows that this is equivalent to somewhere between a medium and heavy industry type in terms of water usage.

Given that the 2500m² GFA requested under PC53 is known to be a mix of supermarket (1250m²) and business/commercial (the remaining 1250m²) it is considered that the current modelling adequately covers the likely water supply demands within the commercial precinct at Northlake and concludes that the requested area can be accommodated.

3.1.3 Connection to Beacon Point Reservoir

Point d. of paragraph 12.14 in Council's s42A report recommends further discussions between the Applicant and QLDC regarding upgrades works to the water supply network and Beacon Point Reservoir. The Applicant and I met with Andrew Tipene (QLDC – Infrastructure Development Engineer) on 14 May 2018. It was noted during this discussion that the requests made under PC 53 only relate to the lower pressure zone i.e. that area below RL 350m and as stated in the Watershed report 682 dwelling units are able to be serviced in the lower pressure zone without the 250mm dia watermain being connected to the Beacon Point Reservoir. The 682 dwelling units is less than the hypothetical maximum yield if PC 53 is approved.

As the development progresses west and into the upper pressure zone the 250mm main will be extended and eventually connected to the Beacon Point Reservoir. It is noted that Council are currently liaising with landowners and engineers to upgrade the Beacon Point reservoir and that the Applicant will continue to work in with Council as required.

3.2 Water Demand Peaking Factor

The s42A report recommends clarifications regarding the use of a water demand peaking factor of 4.6 rather than 6.6 as specified in the QLDC Land Development and Subdivision Code of Practice (LDSCoP). The peaking factor of 4.6 was introduced by QLDC's own consultant Watershed and is based on actual flow testing data. QLDC have provided confirmation via Mark Baker (email dated 13 September 2017) and more recently via Andrew Tipene (meeting on 14 May 2018) that the peaking factor of 4.6 is appropriate. Given that QLDC own and manage all of the water modelling information for the district and are responsible for setting the design parameters for system upgrades etc it is considered appropriate to adopt those parameters (in this case a water demand peaking factor of 4.6).

3.3 Firefighting Supply

The s42A report recommends clarifications regarding firefighting supply. Northlake Stages 1-3 are now complete and 9 hydrants across these stages have been flow tested by the NZ Fire Service. These results are attached (refer to **Appendix 3**). In summary the minimum hydrant flow measured was 24l/s (outside 41 Mt Linton Ave – Lot 69 DP 510104) while the other hydrants typically measured between 37l/s and 44l/s. Of note are the 2 results of >40l/s that were on the Ø250 main (one on Outlet Road, the other on Northlake Drive). Mains capacity results varied from ≈ 65l/s on the Ø100mm watermain to ≈ 100l/s on the Ø250mm watermain on Northlake Drive to >300l/s on the Ø250mm watermain on Outlet Road (note that this hydrant is only 350m from the Ø375mm watermain in Aubrey Road).

PC 53 has requested approval for a supermarket site with a GFA no greater than 1250m² plus additional commercial tenancies with a GFA no greater than 200m², up to a total commercial footprint of 2500m² within the proposed Village Centre. With reference to PAS 4508:2008, the supermarket activity could result in a fire water supply classification of anywhere from FW3 to FW7 with the other commercial activities most likely being FW3.

It is my understanding that QLDC policy is not to guarantee any higher level of service than FW3. It is noted that the Watershed report of 31 August 2017 states that FW3 supply is easily achieved in the village centre area.

If an initial assessment of any particular commercial building (e.g. supermarket) determined that the fire water supply classification for that building was greater than FW3 then the lack of available supply can easily be mitigated by installing an approved sprinkler system since PAS 4505:2008 Table 1 clearly states that the fire water supply classification for all sprinklered structures (other than single family homes) is FW2. It is noted that the first 3 commercial buildings currently being constructed at Northlake (on Lot 1008 DP 515015) are all fitted with an approved sprinkler system, as would the proposed supermarket.

In summary, the results of the hydrant testing in conjunction with the modelling undertaken by Watershed confirm that there is sufficient water supply for residential firefighting as well as commercial firefighting up to a FW3 classification to cater for both the PC 53 increase in residential yield and increase in gross commercial GFA. An initial FW4 or above fire water supply classification can readily be reduced to FW2 with the installation of an approved sprinkler system.

4. WASTEWATER

Point a. of paragraph 12.14 in Council's s42A report recommends modelling and an appraisal of options for the upgrade of the QLDC wastewater network downstream of its junction with Outlet Road and Aubrey Road to ensure it has capacity for the existing and proposed residential yields.

Both the Applicant and Council are aware that even under the pre- PC 53 theoretical yield numbers the existing wastewater network is likely to fail downstream of the Outlet Road / Aubrey Road intersection once the NLSZ is fully developed. This is supported by the Rationale reports supplied with the Infrastructure Report for the PC 53 application.

Upstream of this intersection the 300mm dia main in Outlet Road and Northlake Drive is considered adequate to cater for the wastewater flows from a fully developed Northlake (both pre and post PC 53), Allenby Farms, Urquhart block and the Outlet Camping Ground. At the Outlet Road / Aubrey Road intersection a further two pipes (both 150mm dia) join the network and contribute flows from Hidden Hills, the Northlake 1 Acre development and several other rural residential dwellings in the area however the wastewater main from this intersection up to the corner of Gunn Road and Aubrey Road is only a continuation of the 300mm dia main. The pipe size increases to 375mm from roundabout to Albert Town No2 pump station.

There are several key considerations here:

- 1) The proposed increase in wastewater flow that results from the PC 53 request is 55 lots or 2.39l/s in a peak hour flow scenario. To put this in context, the existing Northlake Special Zone (approximately 1400 lots across 4 landowners) will contribute 60.8l/s, therefore the increase as a percentage is around 4%.
- 2) The modelling undertaken by Rationale has not specified what the critical number of Northlake (or Northlake Special Zone) lots contributing to the existing network will result in an unacceptable number of network failures. A plan is attached to this memo (refer to **Appendix 4**) showing potential development time frames for the Northlake Special Zone as a whole. Assumptions have been made regarding the Allenby Farms, Hikuwai and Urquhart based on publicly available information. What is shown here is that by the end of 2019, there will be potentially 50% of the NLSZ lots developed with the remaining 50% developed by 2022+.
- 3) QLDC has confirmed in relation to the Hikuwai development (also in the Northlake Special Zone) as follows:
 - *The construction of a new wastewater pump station at Rata Street coupled with the upsizing of existing sewer mains downstream on sections of Aubrey Road towards the Albert Town end are projects that have been allocated CAPEX funding in the draft LTP.*
 - *Design and construction of new Rata St WWPS & rising main: 2019/20 – 2021/22*
 - *Upsizing of Aubrey Rd sewer main (Outlet Rd to Gunn Rd roundabout): 2021/22 – 2022/23*
 - *Both projects are masterplan projects so I have confidence they will be taken through to fruition. Please take the timings above with a pinch of salt as we are acutely aware we will need to be flexible with delivery dates given the scale of our CAPEX programme in the next three years. Essentially this means there is a chance these projects could occur earlier.*

The above points were discussed with Andrew Tipene who has advised that we can have confidence the proposed upgrades will be undertaken.

In summary, there are issues with the existing QLDC wastewater network with or without the additional flows created by PC 53 (which can be considered minor in the wider network context). On-going modelling and collaboration between the NLSZ landowners and QLDC is required and fully supported by the Applicant.



Alex Todd
Principal
Paterson Pitts Group (Wanaka)

Appendix 1:



POTENTIAL DWELLING UNITS IN AREA SHOWN ON PLAN		
ACTIVITY AREA	AREA	YIELD (DUs + 15%)
B3	6.97	81
B4	13.60	157
C2	0.72	4
D1	21.18	366
Total		608

Northlake Investments land below RL 350m
(Based on activity areas proposed under PC 53)

Area matches the area referred to as 'Stages 1-14' in
the Watershed report dated 31 August 2017

350m RL
(Design Elevation Contour)

Appendix 2:



WATERSHED

31 August 2017

Queenstown Lakes District Council
10 Gorge Road
Queenstown

Dear Mark Baker,

NORTHLAKE DEVELOPMENT STAGES 1-14

As per your request, we have undertaken hydraulic modelling to review the proposed water supply layout provided by Patterson Pitts Group, with respect to achieving the levels of service required by Queenstown Lakes District Council.

This analysis also included an assessment as to whether Stages 1 to 14 of the development could be supplied without the proposed 250mm connection through to the Beacon Point Reservoir outlet main.

DEMAND ASSESSMENT

The demand has been assessed based on the Northlake Stages 1-14 Proposed Water Supply Layout drawing W4481-7 076 Sheet No. 600 Revision No. 3 and the Queenstown Lakes District Council Land Development and Subdivision Code of Practice (2015).

The key design parameters outlined in Code of Practice 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

The firefighting classification for the village center is assumed to be FW3 50L/s. The remaining development is residential lots and will be assessed as FW2 25L/s.

Table 1 overleaf shows the demand calculation for each of the Stages 1 to 14 of the development.



WATERSHED

Table 1: Average and Peak Day Demand Calculations

Development Stage	No. of Residential Lots	Population	Average Demand (l/s)	Peak Daily Demand (L/s)
Stage 1	36	108	0.875	1.750
Stage 1 A	10	30	0.243	0.486
Stage 2	37	111	0.899	1.799
Stage 3	33	99	0.802	1.604
Stage 4	45	135	1.094	2.188
Stage 5	25	75	0.608	1.215
Stage 6	20	60	0.486	0.972
Village Centre ¹	30	90	0.729	1.458
Stage 7	5	15	0.122	0.243
Stage 8	75	225	1.823	3.646
Stage 9	19	57	0.462	0.924
Stage 10	24	72	0.583	1.167
Stage 11	5	15	0.122	0.243
Stage 12	42	126	1.021	2.042
Stage 13	237	711	5.760	11.521
Stage 14	39	117	0.948	1.896
Total	682	2046	16.58	33.15

¹ The Village Centre and the information provided by the developer assesses the demand as equivalent to 30 Residential Lots.

Peak Hour Demand

The peak hour factor for the Beacon Point area based on the calibrated hydraulic model is 1.437, the domestic equivalent peak hour factor is 2.3. The suggested design peak hour factor is 5 for population less than 2000, or 2 for populations greater than 10,000 resulting in a prorated factor just under 5. Given the demand assessed in the model matches well with the design assumption, it is reasonable to assume that a similar peak hour factor would apply. For the purposes of assessing the Northlake subdivision, the domestic equivalent profile has been used applying a peak hour factor of 2.3.

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.



MODEL RESULTS WITHOUT 250MM CONNECTION

For current peak day demand, pressures within Stage 1 to 14 new sub-division are generally above 300kPa, with the exception of the Node 23 in Stage 8 which falls slightly below, at 295kPa. This would be within the margins of error of the hydraulic model.

Without the 250mm connection from Beacon Point the subdivision is supplied from the proposed new main on Outlook Road and connections through Northburn Road and Mount Linton Avenue. Under this scenario, the maximum head loss per unit length for the mains on these streets ranges from 3.5m/km on Outlook Road to 4.2 m/km on Mount Linton Avenue and to 5.4 m/km on Northburn Road.

The firefighting classifications of 25L/s and 50L/s for the village center is easily achieved.

As noted in the previous assessment of stage 1-7 undertaken in 2016, the area of concern are existing properties at higher elevation on Glenarary Crescent and into Northburn Road. Properties on Glenarary Crescent have been identified in the current system performance assessment as receiving minimum pressure between 200 – 300 kPa. Under this scenario pressure to these customers could be reduced further, with the lowest pressure approximately 225kPa. Generally, the low pressures in this area are a factor of elevation (~357m) with respect to the Beacon Point Reservoir (TWL HGL 388.1m), where the maximum static pressure would be 31m. However, with the additional demand of stages 8 through to 14 creating slightly more head loss the minimum pressures are degraded further (previously still above 250kPa with Stages 1-7).

MODEL RESULTS WITH 250MM CONNECTION

For current peak day demand, pressures within Stage 1 to 14 new sub-division are above 300kPa. The proposed pipes have head loss per unit length under 2 m/km or only slightly above.

The firefighting classifications of 25L/s and 50L/s for the village center is easily achieved.

The proposed pipes have head loss per unit length under 2 m/km or only slightly over with the exception of the first section of the 250mm feed from Beacon Point. This section may initially have higher head loss at 3.5m/km depending on when the Beacon Point Reservoir outlet main is duplicated, as it provides a feed through to Aubrey Road.

Pressures for the higher elevation properties on Glenarary Crescent remain similar to those assessed in the current peak day system performance and are above 250kPa.



NETWORK OBSERVATIONS

Some of the proposed network diameters have changed since the previous assessment of Stages 1-7 undertaken in 2016. Of note is the watermain on Outlook Road which is now a 250mm diameter (previously 150mm) which will ultimately link through the development to Beacon Point Reservoir outlet main. This upgrade is essential to supplying stages 1-14 without the 250mm connection through to Beacon Point Reservoir.

It is also noted that a small area of Stage 14 is above the 350m contour. Consideration should be given to any proposed earthworks and to the proposed zone boundary between the Upper and Lower pressure zones to ensure these sites have sufficient pressures.

In terms of the wider water supply scheme proposed on drawing W4481-7 076 Sheet No. 600 Revision No. 3, it is recommended the pump station is dedicated to supplying only the Upper Pressure Zone. Options for the supply to the Upper Pressure Zone are currently being considered by QLDC and may include a high level reservoir rather than pumping direct online.

The proposed 250mm watermain should remain a gravity watermain through the Upper Pressure Zone to the Lower Pressure Zone. This limits the size of the pump station and ongoing energy costs of pumping excess water only for it to be pressure reduced into the lower zone. It may also be difficult to control the flow through the proposed pressure reducing valve as the Lower Pressure Zone is just part of the much larger Beacon Point Zone, this would then have implications for the design of the pump station, particularly if pumping is direct online.

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 finally water demands may vary.

The modelling results indicate that stages 1-14 can be supplied through the proposed reticulation layout on drawing W4481-7 076 Sheet No. 600 and meet the desired levels of service indicated by Queenstown Lakes District Council. Provided Queenstown Lakes District Councils are comfortable with the level of service provided to the properties on Glenaray Road, and the small area within Stage 14 above the 350m contour is addressed, the proposed water supply design can be accepted.



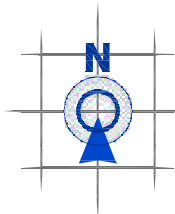
WATERSHED

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

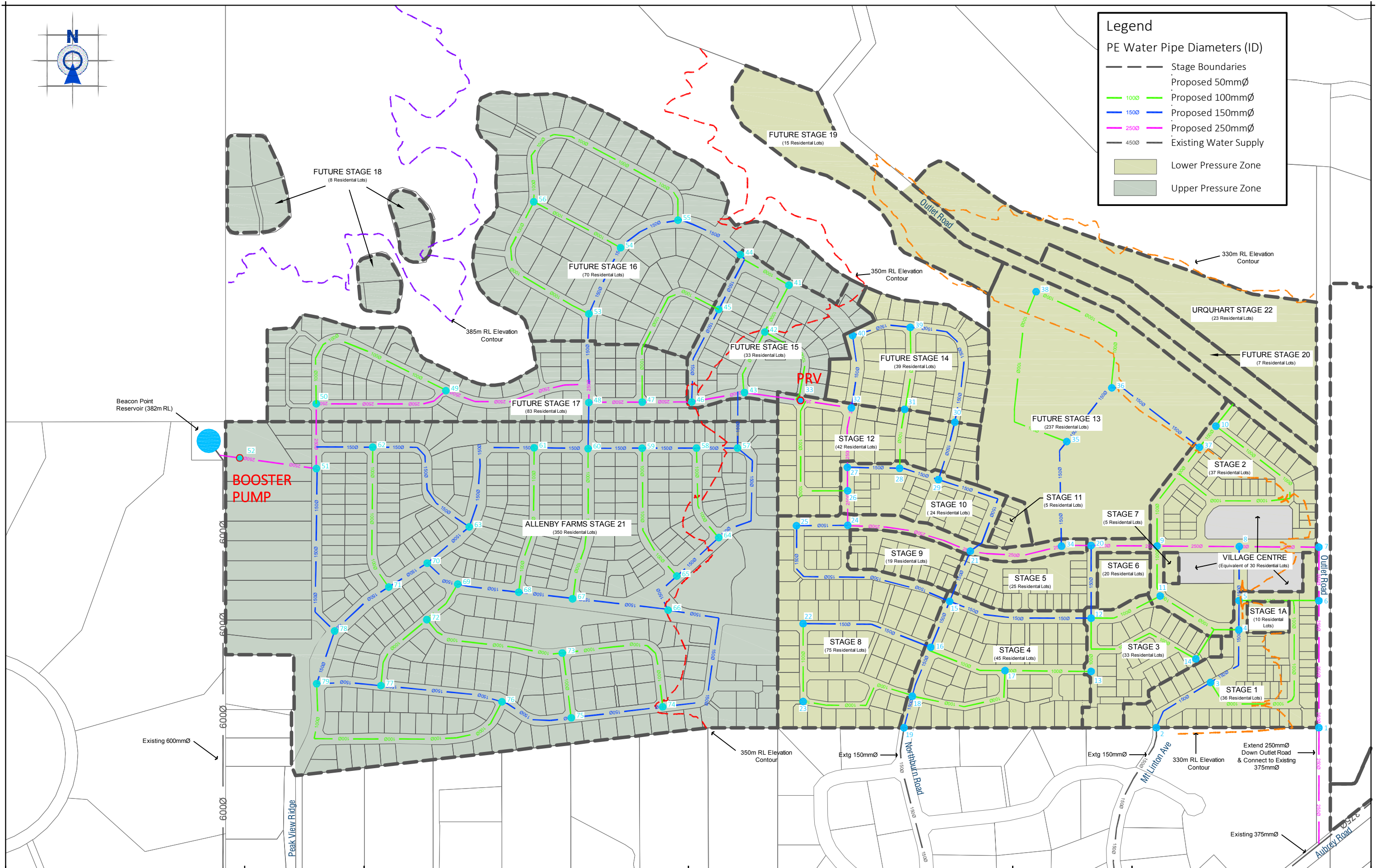
Director / Senior Civil Engineer



Legend

PE Water Pipe Diameters (ID)

Stage Boundaries

Proposed 50mmØ

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Client & Location:

N O R T H L A K E

wanaka

Purpose & Drawing Title:

Lower & Upper Pressure Zones

Overview of Stages 1 - 22

Proposed Water Supply Layout

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Approved by:	AGT						
Job No:	W4481-7	Sheet No:	600	Revision No:	3	Date Created:	21/08/2017

Appendix 3:

<u>NEW ZEALAND FIRE SERVICE-SOUTHERN REGION</u> <u>HYDRANT & MAINS TESTING DATA SHEET</u> Flow Gauge Readings to be between 25 & 100 kPa Hydrants used for pressure readings included as 'Inspect and flush'						STATION No 3785 Wanaka 4 July 2017		
Street No	Location of Hydrant	Date	S.P kPa	R.P kPa	Ring Size	Press	Flow	Main Capacity
	Northlake Subdivision							
	Lot 69 DP510104 Mt Linton Ave Hydrant ID: WH89944		550	425	D4	50	23.9	88.56
	Lot 6 DP510104 Glendene Crescent Hydrant ID: No ID (update GIS)		525	425	D5	50	39.8	91.5
	Lot 1000 DP510104 Glendene Crescent Hydrant ID: WH89942		525	425	D5	50	39.8	91.5
	Lot 17 DP510104 Glendene Crescent Hydrant ID: WH89945		525	450	D5	50	39.8	103.5
	Lot 74 DP510104 Mt Linton Ave Hydrant ID: WH89943		525	450	D5	50	39.8	103.5
	15 Outlet Rd Hydrant ID: WH89947		500	500	D5	60	43.5	>300

Defects:

Northlake Stages 2-3 Hydrant Testing John Smalls & Marty Jillings (NZ Fire) Steve Pemberton (PPG) Tested 6 September 2017					
Hydrant Location	Main Size	Static Pressure (kPa)	Running Pressure (kPa)	Hydrant Discharge (L/s)	Mains Capacity (L/s)
Stage 2 Lot 1006 (WEST)	250mm	500	400	45.3	101.02
Stage 2 Outside Lot 61	100mm	500	200	37.8	62.99
Stage 3 Outside Lot 77	100mm	450	300	37.8	65.39

Appendix 4:



Outlet Camping Ground

CLUTHA RIVER

Urquhart
2020 ≈ 25 lots

Northlake Investments Ltd
2018 ≈ 300 lots
2019 ≈ 150 lots
2020 ≈ 150 lots
2021 ≈ 100 lots
2022 ≈ 130 lots
TOTAL ≈ 830 lots

Allenby Farms Ltd
2019 ≈ 100 lots
2020 ≈ 50 lots
2021 ≈ 50 lots
2022+ ≈ 150 lots
TOTAL ≈ 350 lots

Hikuwai
2018 ≈ 50 lots
2019 ≈ 100 lots
2020 ≈ 50 lots
TOTAL ≈ 200 lots

Overall Potential Development Time Frames within the NLSZ

	Cumulative totals
2018 ≈ 350 lots	≈ 350 lots
2019 ≈ 350 lots	≈ 700 lots
2020 ≈ 275 lots	≈ 975 lots
2021 ≈ 150 lots	≈ 1125 lots
2022 ≈ 280 lots	≈ 1405 lots
TOTAL ≈ 1405 lots	

Note:

- 2018 wastewater flows at Aubrey Road also include the Outlet Camping Ground pump station and the 2 x Ø150mm existing connections at Outlet Road / Aubrey Road intersection
- The potential time frames shown for Hikuwai, Allenby Farms and Urquhart are estimates only
- Lot numbers shown on this plan have been rounded



22 May 2018

Marc Bretherton
Level 1, Brownston House,
Wanaka 9305
PO Box 818, Wanaka 9305

Your Ref: – W4481-7

RE: NORTHLAKE S42A REPORT ON PC53

Dear Marc,

Following clarification of the planned development and construction timing at Northlake, I can confirm that QLDC Property and Infrastructure are satisfied that Water and Wastewater infrastructure can be provided to support Plan Change 53. This is based on the following:

1. Water

- 1.1. 608 dwelling units in the lower pressure zone are proposed and current modelling has shown capacity to supply 682 dwelling units.
- 1.2. 224 additional lots above 350m will require servicing from a new pressure zone to be provided with the construction of the new Beacon Point WTP and associated infrastructure. QLDC will ensure WTP designs and a new high pressure zone can supply these lots. Northlake and QLDC have agreed to work collaboratively to ensure this new pressure zone and connection to the new Beacon Point Reservoir can be achieved at a suitable location that achieves both QLDC and NIL objectives.
- 1.3. Additional commercial demand can be met with surplus modelled water supply in the lower pressure zone.
- 1.4. Commercial fire fighting requirements can be met with the installation of approved PAS 4505:2008 sprinkler systems.
- 1.5. QLDC accepts that the peaking factor of 4.6 used in the water supply modelling by Watershed is appropriate.

2. Wastewater

- 2.1. A 4% increase in wastewater flows from Northlake with PC53 is not considered significant considering upgrades of the downstream network beyond the junction of Outlet and Aubrey Road are known to be necessary and planned within the LTP to support the wider area.

Yours sincerely



Andrew Tipene