TO THE MAYOR AND COUNCILLORS OF THE MACKENZIE DISTRICT COUNCIL

Membership of the Asset and Services Committee:
Cr James Leslie (Chairman)
Claire Barlow (Mayor)
Cr Noel Jackson
Cr Evan Williams
Cr Russell Armstrong
Cr Murray Cox
Cr Graham Smith

Notice is given of the Meeting of the Asset and Services Committee to be held on Tuesday, February 3, 2015, following the completion of the Finance Committee meeting.

VENUE: Council Chambers, Fairlie.

BUSINESS: As per agenda attached

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

ASSET AND SERVICES COMMITTEE

Agenda for Tuesday, February 3, 2015

APOLOGIES

DECLARATIONS OF INTEREST

MINUTES:

Confirm and adopt as a correct record the minutes of the Asset and Services Committee meeting held on November 25, 2014, including those matters taken in public excluded.

VISITOR:

Murray Petrie from Opus will attend the meeting to answer questions related to the Twizel Water Supply Review.

REPORTS:

1. Asset Manager's Report (attached).
2. Manuka Tce, Twizel Water Supply Review (attached).
3. Fairlie Water Supply (for discussion).

PUBLIC EXCLUDED:

Resolve that the public, be excluded from the following part of the proceedings of this meeting namely:

1. Previous minutes of the Asset and Services Committee meeting on November 25, 2014.

General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
Previous minutes November 25, 2014.	Enable commercial negotiations	48(1)(a)(i)

This resolution is made in reliance on Section 48(1)(a)(i) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by Section 6 or Section 7 of that Act, which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public are as follows*: Previous minutes of the Asset and Services Committee under section 7(2)(i).*

RESOLUTION TO RESUME OPEN MEETING

ADJOURNMENTS: 10.30am - Morning Tea
12pm - Lunch

MACKENZIE DISTRICT COUNCIL

MINUTES OF A MEETING OF THE ASSET AND SERVICES COMMITTEE HELD IN THE COUNCIL CHAMBERS, FAIRLIE, ON TUESDAY, NOVEMBER 25, 2014, AT 11.40AM

PRESENT:

Cr James Leslie (Chairman)
Mayor Claire Barlow
Cr Graham Smith
Cr Evan Williams
Cr Russell Armstrong

IN ATTENDANCE:

Wayne Barnett (Chief Executive Officer)
Bernie Haar (Asset Manager)
Geoff Horler (Utilities Manager)
Suzy Ratahi (Roading Manager)
Arlene Goss (Committee Clerk)

APOLOGIES:

An apology was received from Cr Jackson.

DECLARATIONS OF INTEREST:

There were no declarations of interest.

MINUTES:

Resolved that the minutes of the meeting of the Asset and Services Committee held on October 16, 2014, including those parts taken in public excluded, be confirmed as an accurate record.

Russell Armstrong/Evan Williams

REPORTS:

ASSET MANAGERS MONTHLY REPORT – NOVEMBER 2014:

The purpose of this report was to update the Asset and Services Committee on the progress on various projects and also the normal operation of the department for the past month. The following matters were included in the discussion of this report:

Bernie Haar took the report as read. He said he has met with the Twizel Community Board and Opus regarding the Twizel water upgrade. They are planning to publish a regular update in the Twizel Update. Bernie Haar will draft this and send it to the community board chairman and Cr Leslie for checking.

Cr Smith asked if the Twizel water upgrade was on track. Yes. Will there be any disruption to Twizel water? Bernie Haar spoke regarding the risks of a disruption to the water supply. He is looking at shutting down the town supply over a 2-3 hour period starting at 10-11pm. This would happen after Christmas. He would talk to the fire service and have contingency plans in place if it goes wrong.

Suzy Ratahi spoke regarding the roading report attached at page 14 of the agenda. NZTA has carried out an audit to make sure council complies with

funding requirements and has given council a gold star. The chairman congratulated Suzy on an excellent result.

The chairman said he was concerned about council's emergency reinstatement funding from NZTA. Suzy Ratahi said it would be very unlikely to get more than 70%. She outlined some of the requirements for funding. The chief executive said there were few things that were going to arise from this. There would be a requirement to have a reserve fund built up. There was also deferred maintenance occurring and this was getting worse. NZTA had been putting the squeeze on and the signals were that it would squeeze further. This would put council in a situation of having more deferred maintenance or having to meet the funding gap.

Cr Smith asked if council was going back to keeping good roading reserves. The chief executive said yes but decisions needed to be made regarding levels of service and whether council would fund above the subsidised level. There was further discussion on this matter. It was agreed that this issue needed to go to the community for wider discussion on levels of service.

The meeting adjourned at 12.08pm for lunch and reconvened at 12.35pm.

Geoff Horler asked if there were any questions regarding the utilities report. Cr Smith asked regarding the installation of the new sewerage pump at the Fairlie campground. This has been completed within budget.

The chairman asked for an update on the turbidity problems at the Twizel filter. A new filter had been running since Friday last week and was working well. This was an on-going problem but the extent of the problem would depend on the size of the filter. This was proceeding with monitoring taking place.

Regarding solid waste, solid waste manager Angie Taylor sent an apology for not being at the meeting. Bernie Haar spoke on her behalf. Bin audits were progressing. The education cartoons were being re-vamped. There had been a big clean-up at the Twizel Recovery Park with planting planned.

Cr Smith asked regarding gate fees at Twizel being behind budget, recyclables being down and the cost of waste cartage rising. Bernie Haar spoke regarding the reasons for these.

Cr Armstrong said the four square owner at Twizel was planning to talk to Angie Taylor regarding recycling his waste. Bernie Haar said he would follow up on this.

Resolved that the report be received.

Graham Smith/Russell Armstrong

PUBLIC EXCLUDED:

Resolved that the public be excluded from the following part of the proceedings of this meeting namely:

1. Previous minutes of the Asset and Services Committee meeting on October 16, 2014.
2. Clayton Road Land Ownership.
3. Contract 1218 Pumping Plant Supply Twizel.
4. Contract 1219 Emergency Generator.

General subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
Previous minutes October 16, 2014.	Commercial sensitivity	48(1)(a)(i)
Clayton Road Land Ownership	Maintain legal professional privilege	48(1)(a)(i)
Contract 1218 Pumping Plant Supply	Enable commercial negotiations	48(1)(a)(i)
Contract 1219 Emergency Generator	Enable commercial negotiations	48(1)(a)(i)

This resolution is made in reliance on Section 48(1)(a)(i) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by Section 6 or Section 7 of that Act, which would be prejudiced by the holding of the whole or the relevant part of the proceedings of the meeting in public are as follows*: Previous minutes of the Asset and Services Committee under section 7(2)(b)(ii). Clayton Road Land Ownership under section 7(2)(g).Contracts 1218 and 1219 under section 7(2)(i).*

Russell Armstrong/Claire Barlow

The Asset and Services Committee continued in open meeting.

THERE BEING NO FURTHER BUSINESS THE CHAIRMAN DECLARED THE MEETING CLOSED AT 1.11PM

CHAIRMAN: _____

DATE: _____

MACKENZIE DISTRICT COUNCIL

REPORT TO: ASSETS AND SERVICES COMMITTEE

FROM: ASSET MANAGER

SUBJECT: ASSET MANAGER'S MONTHLY REPORT

MEETING DATE: 3rd FEBRUARY 2015

REF: WAS 1/1

ENDORSED BY: CHIEF EXECUTIVE OFFICER

REASON FOR REPORT

To update the Assets and Services Committee on the progress on various projects and also the normal operation of the department for the past month.

RECOMMENDATION:

1. That the report be received.

BERNIE HAAR
ASSET MANAGER

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

ASSET MANAGEMENT

PROJECT PROGRESS

Twizel- Proposed upgrade to meet DWS

The table below sets out the work progress and decisions required.

Item	Outcome
1) Twizel Reservoir Liner Replacement. Will be included in the 2015-25 LTP for consideration. The liner is likely to be replaced in 2015-16.	Liner Report received. Included in the LTP for 2015-18
2) Twizel Water - Bench scale testing of 1µm cartridges for turbidity removal. Turbidimeter now being fitted. Geoff to emphasise to Whitestone Contracting the importance of filling in the record sheets.	This has been installed and testing is underway. Results to-date have shown some inconstancies that we think is coming from silt on the liner being stirred up from the turbulence caused by the pump inflow. The test cartridge filter is being re-plumbed to record directly off the raw well water before it hits the reservoir. This has had a significant improvement with the test cartridge not replaced in six weeks.
3) Twizel Water – Screens. Camera inspection of No. 2 bore has been carried out. Opus have thoughts on way forward.	Pump is to be installed in No 2 bore. Draw down testing to be undertaken to re-develop the well. This will give an indication how well the screen/well is performing. Results will give an indication of required upgrade procedure for Bore No.1.
4) Twizel Water Supply, Water Safety Plan (PHRMP). Supply now compliant with the Health Act. The water testing procedures are now to be sorted out so that the water will be compliant with DWSNZ. Geoff to discuss with the DWA.	Completed

5) Twizel - Information for Reticulation Modelling. Bernie to recheck zone maps to confirm "on-demand" and "restricted" for the Residential 4 zone in question. Murray can the contact Jeff McLean again to undertake the modelling. Modelling is also to consider: • Larger Retic. pipe required from the reservoir to the take off point for the new trunk main to the west. • Mackenzie Drive has 2 x 150mm dia. pipes. Could replace one with a larger pipe and run a rider main (fusion welded) inside the other, with cross links in places and valves at streets off.	Completed This work to be completed shortly The modelling is critical as pipe sizing confirmation is required for the Year 1 of the AC pipe replacement programme. In addition to the pipe sizing questions to the left there are other sizing questions such as; □ Mt Cook Street – 150mm pipe the right size or replace with different size? □ Pipe to Meridian location – 150 AC at present; replace with 63mm because of lower demand? □ etc
6) Twizel Booster Pumps When flow demands are confirmed (Item 6 above and Item 15 below) then contract documents preparation for supply can be started. Preliminary layouts for the stages of acceptable. Detailed design layouts for installation of booster pumps and treatment equipment can commence. Issues identified during preliminary design require short reports to be submitted for consideration: • Best chemical type for chlorination. • Protozoa testing versus Cartridge Filtration for higher log credit requirement.	Tenders considered and accepted Tenders considered and accepted Cryptosporidium testing is underway.
7) Pipe Condition Survey When results from the most recent samples have been received Bernie and Geoff will travel to Opus CHCH office – looking for interpretation of the data across the whole network. This will then lead to the required replacement programme and a report	All samples have been tested and the results supplied confirms the need to start the replacement programme in 2015 and continue for the next 20 years, spending $200,000 to $250,000 per annum. Report on the agenda for consideration. Opus is preparing a report on the findings for

prepared. A presentation will then be made to the council and Community Board. MDC will be looking to Opus to provide guidance with replacement options – relining/pipe cracking/etc. Preparation of contract documents, etc will also be required in the longer term.	both the Council and the community Board's information. Completed. Over time the options to replace, refurbish or reline will have to be considered.
8) SCADA Upgrade Meeting earlier in the day (11th) with Judy Blakemore (TDC). Sharing of some resources could be possible. Memorandum of Understanding between TDC/MDC needs to be prepared. Geoff to manage project for MDC. MP to keep in touch re space requirements, etc.	Geoff is working on this so that the first site can be installed in Twizel as part of the upgrade. A Memorandum of Understanding between TDC/MDC has been prepared and is subject to review prior to the parties executing the document. Completed
9) Manuka Tce Water Supply Opus to proceed with this work.	Report on the agenda for consideration.
10) Tekapo WTP chlorination/UV compliance. Keith Turner and Geoff to meet to discuss non-compliance (paperwork)?	All compliance matters sorted out.
11) Fairlie Water Supply – New source. All piping and turbidimeter installed. Electrician to wire up turbidimeter and testing can start. Cello data logger will be downloaded once a month.	Installation complete and data being recorded.
12) Fairlie Reticulation Renewals Aerial maps supplied showing required work. Opus to provide offer of service for design, MSQA(?) and estimate.	Tenders considered and accepted

30 Year Infrastructure Strategy

This document has been completed in draft. It has been sent to Audit New Zealand for initial review and also to Waugh Consultants for review of its legislative compliance. The response from Audit NZ was positive but they want some extra work in a few areas. This will be worked through and the completed document bought to Council for adoption as soon as possible.

The draft document has also been presented to the Community Board as the mechanism to illustrate the infrastructure issues that they will face over the next 30 years. By presenting this document in its entirety to them they also get to understand all the infrastructure issues all the communities and the district face in that time.

To date the Asset Management Team have invested 864 hours into work developing this strategy and the AMPs.

ROADING

General Maintenance

Pre-reseal repairs are now complete. The reseal contractor was programmed to start in December, however they have been delayed and are now planning on starting in the Twizel area in February.
The maintenance contractor has carried out further holding repairs on various roads that have had to be removed from the reseal list due to limited available subsidised funding. There is risk that these roads could fail due to loss of waterproofness.
The current hot, dry spell we are in has caused minor maintenance issues on our unsealed roads, with the low moisture content, more fines are dissipating from the pavement surface, and this in turn has seen an increase in the number of dust complaints. The hot weather has also caused some flushing issues in our sealed road network, predominantly in the urban network, with most failures occurring in Tekapo and Twizel.

Environmental Maintenance

To date, spend in environmental maintenance is $113,640.49, this is tracking higher than expected due to various flushing issues on our sealed roads. It also includes mowing, vegetation spraying, and winter snow clearance/ice gritting activities. Work in the Coal River bed to protect the bridge were also part funded out of this budget.

Sealed Pavement Rehabilitation

A 600 meter section of Clayton Road, approximately 3km from State Highway 79 has received a 200mm overlay, this was in part due to the poor camber, however, the main reason for rebuilding this section was inadequate pavement depth and strength to cater for the higher number of heavier vehicles now accessing this road. Completion is expected the week beginning 26th January. There is a further 600 m section to complete in the next 2 years between end of current rehab and Hamilton Road, the seal is significantly cracked and showing shoving failures, a classic sign of an unsuitable pavement.

Bridge Replacements and Minor Improvements

- Bridge deck construction has begun offsite with a pre-pour inspection booked at the time of writing this report.

- Mount Michael Valley Road Site benching has begun and Blair Excavation is making good progress, works are scheduled to be completed week beginning 26th January


BLAIR EXCAVATION
FAIRLIE

- Netcon have completed a stub pole removal on Middle Valley Road, which will enable Blair Excavations to complete site benching.

- Whitestone Contracting have completed set out on Irishman Drive/Maitland Place, construction is expected to start the 26th January.

Lake Tekapo Footbridge

Funding has been approved by NZTA for this project to the level of $681,000. To receive the full allocation of NZTA's co-investment the Tekapo Footbridge Society must ensure completion of the bridge by 30th of June 2015. At least $681,000 of work has to be completed and be invoiced to Council by 30 June 2015 to ensure the co-investment from NZTA is able to be claimed this financial year.

The Footbridge Society and its Contractors will need to be diligent to achieve this tight timeframe. The Asset Manager and the Roading Manager are convening a meeting of all parties to assist meeting this tight timeframe and ensure the co-investment from NZTA and Council is not lost.

Cass River Bridge

As a part of the LTP and 30 year infrastructure strategy, Opus international Consultancy was commissioned to complete an options assessment study. We are awaiting the full report, however, Opus staff have drafted the following summary

"The favoured position for a replacement bridge is at the current bridge site given this is a narrow point in the river, the current bridge appears to have performed well at this site and this minimises approach works. Downstream from this location the very active riverbed fans out presenting ongoing issues with maintaining flows beneath any bridge crossing downstream of the current site.

The full length bridge option matches the length of the existing bridge (nominally 125m long). A conventional design using hollow core bridge beams (16 to 18 m spans) with a 4.2 m carriageway width and vehicle barriers (W-section guardrail) is expected to cost in the order of $1.4M. This provides a 100 year design life and achieves full HN-HO-72 design loading.

The attached drawings [not provided] *show a low cost bridging option (which we have previously used) comprising a proprietary double tee superstructure with 14m spans and a 3.3m carriageway between timber kerbs and side rails. This would provide a minimum 50 year design life and would cater for Class 1 (legal highway) loading including 50Max vehicles. We consider this would be a suitable option at this site. A full length bridge option with this form of construction is expected to cost in the order of $780k. This option would have low ongoing maintenance.*

A reduced length, low cost bridge option could also be considered for this site comprising three 14m spans and a sacrificial approach which would breach in a moderate flood. Due to the constriction of the river, the embankments at the abutments would be prone to scour and significant rock protection would be required. To reduce ongoing issues with the approach being eroded by the mobile low flow river channel, a low level rock rip rap guide bank (weir) may also be required. The initial construction costs for a reduced length bridge with and without a guide bank are expected to be in the order of $525k and $615k respectively. For these options there would be ongoing maintenance/reinstatement of the approach and guide bank and this significantly reduces the savings over a full length bridge when considering the 'whole of life' cost of options. A reduced length bridge also introduces other issues including potential safety concerns regarding site inter-visibility, interference with the irrigation scheme currently being upgraded at this site, plus the resource consenting process through ECan would be considerably more complicated."

A full report, complete with drawings, will be presented to Council at the earliest opportunity, where a more robust discussion can take place with assessment of all available options so that the outcome can be included in the Long Term Plan.

Collaboration Update

Work has commenced once again on the Maintenance Contract within the technical officers group. There has been a clear direction given from the C.E and Mayoral group that the technical group will prepare *"documentation for individual road maintenance contracts for each of the four councils. The contracts will adopt a common maintenance specification and will be tendered at the same time. The contracts will be structured to allow contractors to offer discount prices if they are awarded more than one contract."*

There will be a substantial staff involvement and commitment of time to progress the maintenance contract if it is to go to tender in April/May to allow a start date on 1 October 2015. This project along with preparing the bid to NZTA for the NLTP, the 30 Year Infrastructure Strategy, AMP, LTP and the One Network Road Classification implementation is putting considerable pressure on our limited staff resource to the point that the day to day work is suffering. If this situation was to continue a review of future staffing levels may be required.

External consultancy costs already associated with writing the maintenance contract are considerable with Mackenzie has agreeing to contribute 21% of the total cost of preparing the contract documents. These unbudgeted expenses are charged to the Roading

Consultancy budget, which will be over extended by the end of financial year. Total external costs to Mackenzie to date is $3952.68 plus GST.

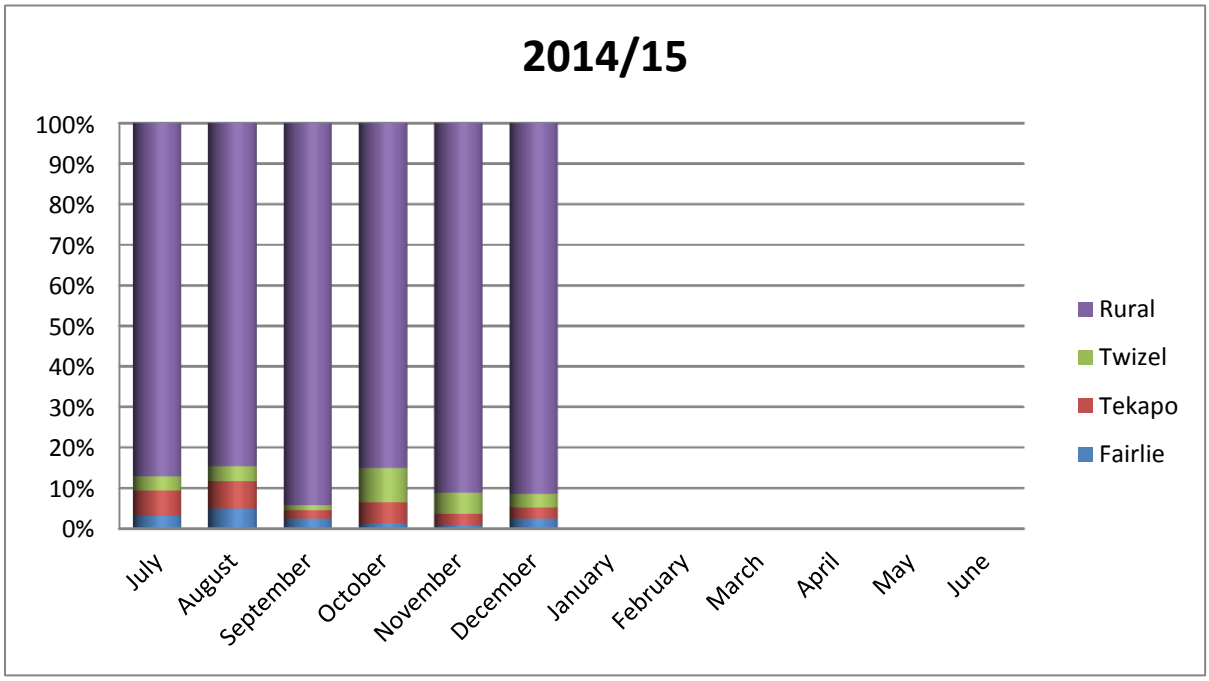
One Network Road Classification

The assessing of Mackenzie District Councils Roads under the ONRC framework was completed by staff and available for regional moderation in October 2014. NZTA had expected to undertake regional moderation in December, but is now expected to be completed sometime in the January-March period. This exercise may change our classification assessment and potentially impact on the level of service for those effected roads. Further information has now been released in regards to implementing ONRC. Whilst staff understood the implementation of ONRC would require a significant amount of work capturing various data to enable reporting on the required performance measures, it came as a real surprise to staff, that NZTA require Council to provide that level of detail for the last two years of the 2012-15 NLTP. The 2013/14 data set is required to be completed prior to the 31st March 2015. Again this is impacting on staffs ability to keep up with the increasing level of reporting required by NZTA and continue to do justice to their day job.

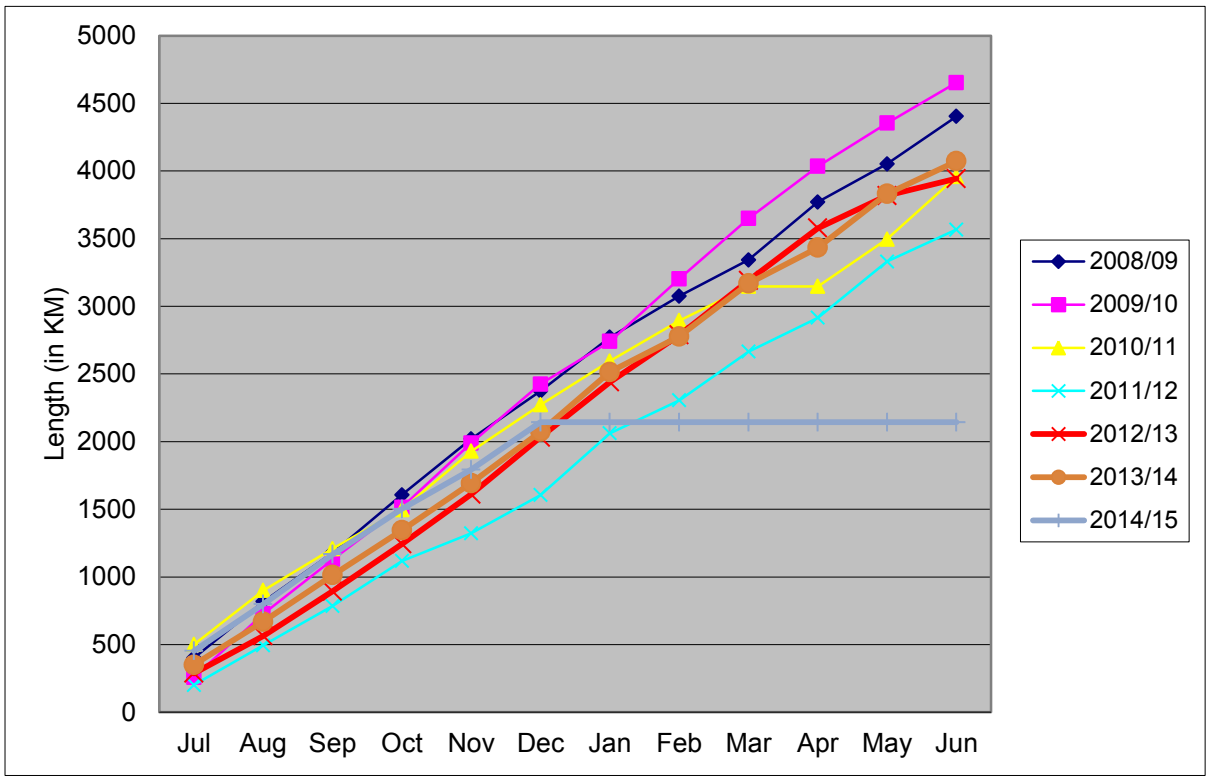
A breakdown of Mackenzie District Council Roading Network, as determined by staff in the One Network Road Classifications, is as follows;

Access Low Volume	387 km
Access	86 km
Secondary Collector	238 km
Primary Collector	480 m

Amaglamated Roading Budgets Graph Showing Percentage Share



Unsealed Road Grading (Cumulative)



UTILITIES

Budget Update

FAIRLIE

Water:

End of October the Operation and Maintenance expenditure. Electricity cost $1,084 is under budget. Contractor's costs are $22,887 under budget. Water quality monitoring $2,571 is under budget.

Wastewater:

End of October the Operation and Maintenance expenditure. Electricity cost $1,670 is under budget. Contractor's costs are $12,541over budget. Consent monitoring $2,695 is on budget.

Storm water:

End of October the Operation and Maintenance expenditure. Contractor's costs are $792 under budget.

TEKAPO

Water:

End of October the Operation and Maintenance expenditure. Power $3275 is over budget this could be due to not allowing enough for the UV plant and new pump station in Lochinver sub-division. Contractor's costs are $21,110 under budget. Water quality monitoring $2,156 is under budget.

Wastewater:

End of October the Operation and Maintenance expenditure. Power $6,691 is under budget. Contractor's costs are $26,468 over budget this is due to problems at the Domain pump station. Consent monitoring $1,378 is on budget.

Storm water:
End of October the Operation and Maintenance expenditure. Contractor's costs are $5,347 over budget. Consent monitoring $531 is on budget.

TWIZEL
Water:
End of October the Operation and Maintenance expenditure. Contractor's costs are $55,776 over budget. Time spent of keeping old plant running. Power $38,177 is under budget. Water quality monitoring $2,402 is under budget.
Wastewater:
End of October the Operation and Maintenance expenditure. Contractor's costs are $9,260, on budget. Power $1,038 is under budget. Consent Monitoring is $755 is under budget.
Storm water:
End of October the Operation and Maintenance expenditure Contractors costs are $5,401 over budget. Consent monitoring $312 is under budget.

BURKES PASS
Water:
End of October the Operation and Maintenance expenditure. Contractor's costs are $2,331 on budget. Water quality monitoring $1,317 is over budget. Extra testing has been done.
Wastewater:
End of October the Operation and Maintenance expenditure. Contractor's costs are $761 over budget. Monitoring for consent is $1,379 is over budget.

General comments:

Water restriction in both Fairlie and Twizel.

Restrictions were imposed in Fairlie because Condition 6 of our Resource Consent for the water take has a condition that whenever the unmodified flow (as defined in the Opihi River Regional Plan) in the Opihi River at State Highway one Bridge as estimated by the Canterbury Regional Council is:

A. Between 2.5 cubic metres per second and 8.1 cubic metres per second, the following measures shall be undertaken:
a. the Fairlie community shall be informed via newsletters and public notices of the need to conserve water to maintain flows in the Opihi river;
b. significant restrictions on hosing, irrigation and other non-domestic water use restrictions shall be implemented, including a limit of two hours of any hosing/irrigation per day per property; and
c. the restrictions specified above shall be monitored and enforced.

B. At or less than 2.5 cubic metres per second, the following measures shall be undertaken:
a. the Fairlie community shall be informed via newsletters and public notices that the Opihi River has reached its minimum flow and significant water conservation measures need to be implemented;
b. a total ban on hosing and any other irrigation use shall be implemented;

c. significant restrictions on other non-domestic water use shall be implemented; and
d. the hosing/irrigation ban and other restrictions shall be monitored and enforced.

C. Less than 8.1 cubic metres per second, weekly reports shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, that detail the daily amounts of water abstracted over the prior week and the measures implemented to comply with this condition.

Twizel has similar Resource Consent conditions:
The consent holder shall take all practicable steps to:
a. Avoid leakage from pipes and structures forming part of the reticulation system associated with the abstraction; and
b. Avoid the use of water for irrigation onto impermeable surfaces and river or stream riparian strips; and
c. Promote the efficient use of water by all water users within the scheme on an ongoing basis by such measures as demonstrated in a Water Conservation Management Plan.

When flows in the Twizel River at the State Highway 8, at or about map reference Topo50 BZ15:6933-9569, reach 1,000 litres per second water shall only be taken in accordance with the Water Conservation Management Plan prepared under Condition (8).

Water Conservation Management Plan details how water will be conserved during times of low river flows
a. Restrictions on irrigation of reserve areas, including cessation of irrigation when flows in the Twizel River are at or below the minimum flow in Condition (7);
b. Restrictions on the use of water for filling or topping up swimming pools; and
c. Restrictions on the use of water in garden and lawn areas.

The other more pressing issue was a bit more complex first trigger was limited water getting to the Drive due to high demand because of the numbers in Twizel and the desire to irrigate dry lawns and gardens. Possibly of greater concern was the aging pumps failed, there were two occasions where only three pumps were operational from the original six. Rex Miller Engineering worked their magic to get the two that failed working again on those occasions.

There have been some lessons learnt from this year. The first and most important is how we inform the community that restrictions are in place and what they are.
Options to be considered are a multimedia approach radio, local news letters and possibly a bill board or mobile message board. Keeping up to date information on our web site as to what restrictions are in place and more educational material on how they can comply and why.

It is clear there is a need to provide good information on how best to use the water that is available to them.

There is plenty of evidence of water wastage in Twizel with a lot of water running off properties and down the gutter. Here is an example of what I mean. Before the restrictions were imposed I received a call as to why they have received an account for water. This property has had a meter for some time on looking at the reading it was found that in a 199 day period they had used 1,929 cubic metres of water on this property in Twizel it is budgeted for 1400 litres per day per property. Which would mean in this period the amount

used should have been 278 cubic metres. So this property had used 1,651 cubic metres more than budgeted for over that period.

A recent survey, undertaken privately by a Twizel resident indicated that over half the residents chose, even though they knew about the restrictions, chose not to comply. I find this really disappointing as they are taking water from other people due to reduced pressure or putting the town at risk by reducing the firefighting capability by reducing pressure at the hydrants.

The photo below shows a vacant section in North West Arch on Thursday 22nd January with a sprinkler going and reports are that this had been operational since at least 8.00am when it was first reported.

If people don't conserve water when required there may have to be a review of the way we deal with them. Currently if we observe non-compliance we discuss with the owner and usually solves the problem. If it is a vacant property we access the property and turn the hose off and advise the property owner.

A recent email from a ratepayer in Twizel illustrates the point very well:

Can you tell me how it is that certain properties on Northwest Arch (and elsewhere) have bright green lawns and water them freely and openly whilst the rest of us watch our lawns turn brown and wither because we comply with the water restrictions?

There were a few events that suffered due to the drought so it is suggested that a process where a permit may be issued for a one off event and advertised to allow them to go ahead.

Burkes Pass

Burkes Pass had to have a boiled water notice issued in the last week we have since had three clear retests.

SOLID WASTE

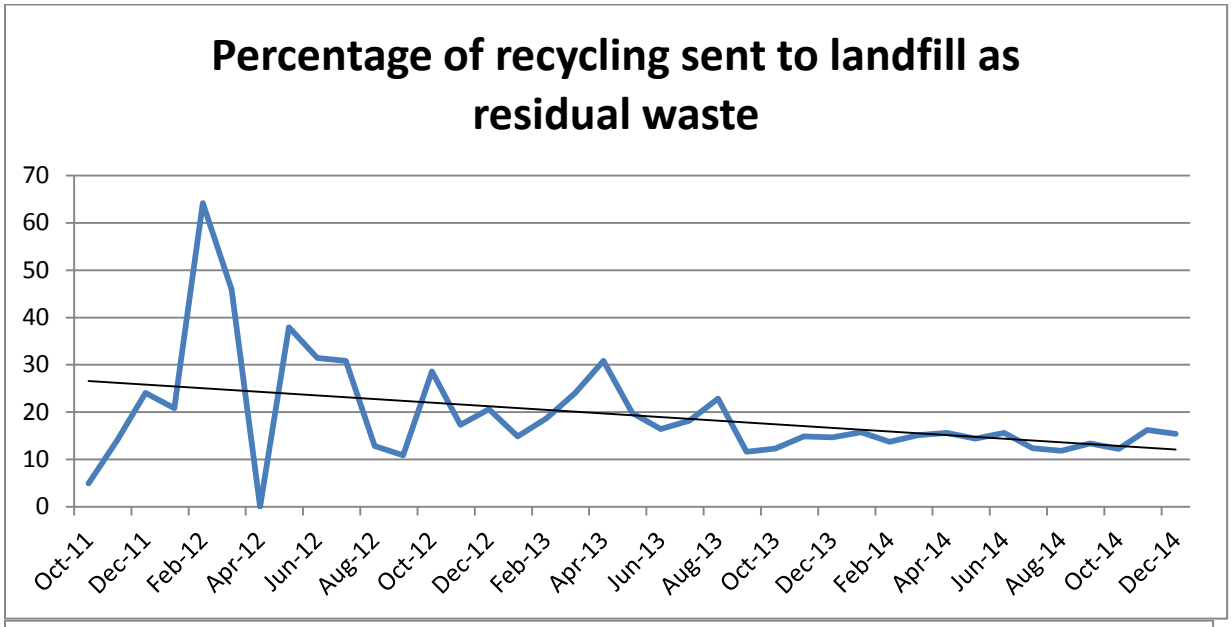
Christmas period
The summer season has progressed reasonably smoothly. Another double rubbish and recycling collection was run in Tekapo this year and was well utilised by households. This is run in the collection week where a large portion of holiday home owners will leave town and falls within a recycling collection week. The Tekapo recovery park has limited opening hours and the double collection is aimed at avoiding residual waste storage issues.

Education
Holiday homes – no glass stickers
Communication with holiday home rental companies in Tekapo and Twizel is underway relating to the development of resources to help visitors use our wheelie bin system correctly. One of our main issues with holiday home rentals is glass being put in the recycling bin rather than the glass crate. To address this, I have organised new "no glass" stickers for the lids of yellow bins. These were distributed towards the end of last year and I will be discussing the effectiveness of these with the rental companies and our contractor.

Cloth nappy packs – more packs available soon
The cloth nappy packs were well received last year and further packs will be available soon. Surveys of those who purchased packs are underway.

Use of public place bins
A number of reports have been coming in where domestic waste is being disposed of in the public place bins. This appears to be a particular problem in Tekapo. The disposal of general household waste in public bins is contrary to the Council's Solid Waste Bylaw. I am currently investigating the most appropriate way to impose fines as a deterrent for this issue.

Metal recycling
Please refer to attached report.


Percentage of recycling sent to landfill as residual waste
70
60
50
40
30
20
10
0
Oct-11
Dec-11
Feb-12
Apr-12
Jun-12
Aug-12
Oct-12
Dec-12
Feb-13
Apr-13
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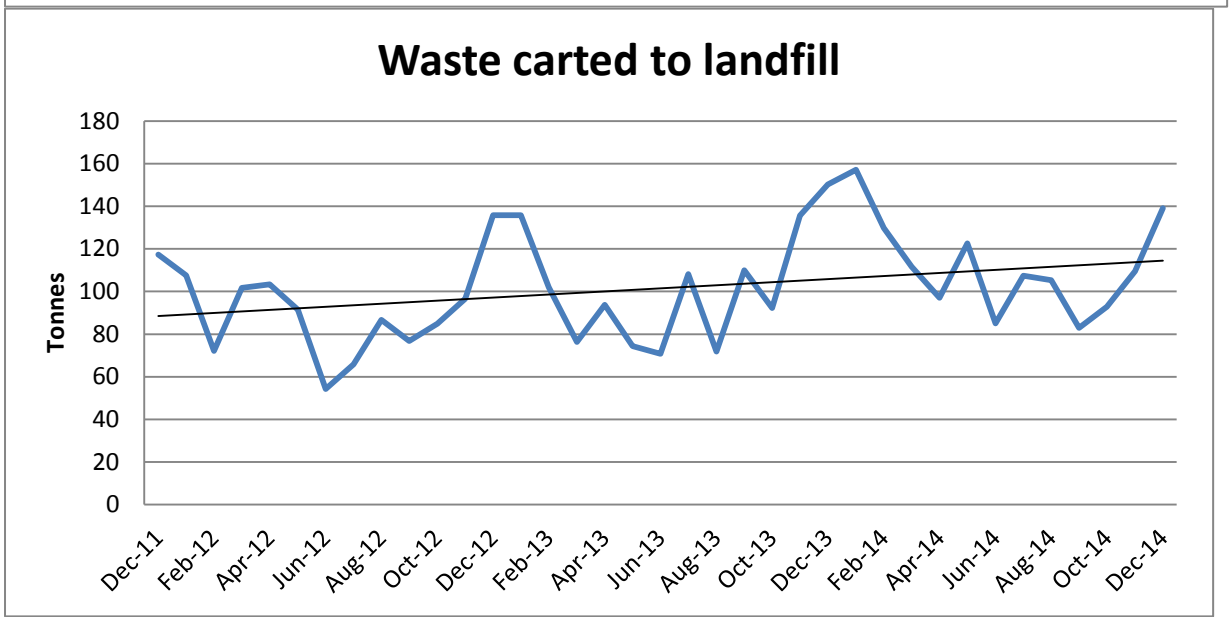
Oct-14
Dec-14


Waste carted to landfill
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160
140
120
100
80
60
40
20
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Dec-11
Feb-12
Apr-12
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Oct-14
Dec-14

MACKENZIE DISTRICT COUNCIL

REPORT TO: ASSETS AND SERVICES COMMITTEE

FROM: ASSET MANAGER

SUBJECT: MANUKA TERRACE - TWIZEL WATER SUPPLY REVIEW

MEETING DATE: 3rd FEBRUARY 2015

REF: WAS 16/22

ENDORSED BY: CHIEF EXECUTIVE OFFICER

PURPOSE OF REPORT:

To advise and consider the report from Opus International Consultants Ltd on the review of the options for the proposed water supply for Manuka Terrace, Twizel.

STAFF RECOMMENDATIONS:

1. That the report be received.

2. That the report be provided in its entirety to the rate payers in Manuka Terrace and that it be the subject of a further round of consultation to determine if the project should proceed.

BERNIE HAAR
ASSET MANAGER

WAYNE BARNETT
CHIEF EXECUTIVE OFFICER

BACKGROUND:

In 2007 Council proposed to provide a potable water supply for Manuka Terrace and consulted on a proposal. The letter written to the rate payer at the time illustrates the proposal.

Over the last five years, there has been significant development in the Manuka Terrace area and there has now been 201 sections created. As you will be aware, Council required power to be connected to the sections but allowed the individual owners to source their own water supplies.

Over time, it became apparent that the bores people had to put in to find water were up to 85m deep and the costs to drill these were in excess of $16,000 each. Council became aware of these costs and believed that if everyone contributed to a fund then, collectively a community water supply could be installed for considerably less cost.

A report was commissioned early this year to investigate the proposal and determine the costs, both to establish a supply and also the annual running costs.

Basis of design
The water supply to each property would be a restricted supply providing 1820l/day. Each user would need to provide a tank and probably a pump to provide operating storage and pressure.

It would allow for a total of 300 lots, thus allowing for some future subdivision.

It is expected that the water supply would meet the Drinking Water Standards of NZ 2005, thus ensuring that the water would be safe to drink.

Conclusion
The report recommends the installation of a new bore and piped reticulation at an estimated cost of $500,000 which is approximately $2,500 per property.

The estimated annual running costs are approximately $225 per property. The capital and operating cost estimates do NOT include the cost of customer tanks and pumps.

When one compares this with each property installing their own bore or even sharing a bore with three or four neighbours, the community scheme is a very attractive option.

Council recognised this and have asked that I contact all property owners to gauge support for a community scheme before committing to the project.

As a result of that consultation it was proposed to proceed with the proposal and so began a process to find the location of a suitable water source. There were problems with water quality from some bores and quantity as was a problem.

Eventually a suitable site was found at the west end of the development. This greater pumping distance added considerably to the cost of the scheme and a review of its viability was requested by Council.

That review document is attached for consideration.

ATTACHMENTS:

Appended to this item is the report prepared by Opus International Consultants Ltd:

1. Manuka Terrace - Twizel Water Supply Review

POLICY STATUS:

SIGNIFICANCE OF DECISION REQUESTED:

The provision of this new water supply is likely to be included in Council's Significance and Engagement Policy as strategic assets and as such will require a degree of consultation with our stake holders.

ISSUES AND OPTIONS:

The report cover in detail the various issues and the strategies required to deal with them.

CONSIDERATIONS:

Legal Considerations:

Financial Considerations:

The capital cost of this proposal is estimated to be $1,383,000, with an annual operating cost in the order of $21,000.

The report details how this project could be funded and as an example one of the scenarios is summarized in the follow table:

No of Lots	Capital Cost/Lot	Operating Cost /Lot	Funding Cost per year/Lot - 10 yr Term
198	$6,985	$86	$910
300	$4,610	$72	$601

Other Considerations:

None

CONCLUSION:

The reasons for the provision of a water supply for the Manuka Terrace area are as valid today as they were in 2007. The review document confirms that a potable water supply on a restricted basis can be provide at cost per rate payer less than they would pay for the development of a water supply on their own property.

There has not been however a significant request from those residents for the service.

It is recommended that the Council circulate this report to all ratepayers in Manuka Terrace as it provides a full picture of the proposal. It also recommended that the Council consults with those ratepayers as their desires to continue with this project or not. By using the report as part of the consultation document the ratepayers will be presented with the full picture so that they can make an informed decision.

Mackenzie District Council

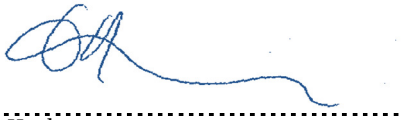
Manuka Terrace - Twizel Water Supply Review

Mackenzie District Council

Manuka Terrace - Twizel

Water Supply Review

Prepared By



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Date: 25 November 2014
Reference: 6-CZ016.00
Status: Final

1 Introduction and Background

The Manuka Terrace area to the southwest of Twizel is an area of rural residential development which has no community water supply scheme. Instead, land owners to date have installed their own separate bore supplies to provide water on an individual lot basis.

A number of wells have been drilled, most of which have shown low yields for high draw down. While adequate for the modest amounts of water required on an individual lot basis, most have been unsuitable for a wider combined rural supply scheme.

A small number of wells have shown much higher yields at low draw downs, and these have all been located near the southwest corner close to Lake Ohau.

This report investigates the development of a community scheme, by reviewing previous reports, and updating them for the most recent information obtained through pump testing at the most promising well locations, and developing an overall scheme proposal, including water treatment, treated water storage and reticulation to the scheme area.

A preliminary scheme layout is developed, and a cost estimate for the scheme prepared for consideration by Mackenzie District Council (MDC). The preliminary plans, scheme layout and cost estimate will help inform both Council and private landowners and will assist with consultation over further development options for a community restricted rural water supply scheme.

2 Previous Bore Source Investigations

Four previous reports by Opus in recent years have investigated bores and water supply issues and options for the Manuka Terrace area.

These are:

1. Manuka Terrace Water Supply Investigation –Issues and Options Report, July 2007
2. Twizel and Manuka Terrace Water Supplies – Implementation Issues and Options, February 2009
3. Manuka Terrace Pumping Test Analysis, 25 August 2011
4. Manuka Terrace Groundwater Pumping Analysis, June 2012

The first report looked at the wider context of options for a separate supply and the likely configuration.

The second report considered further the standalone option, plus a range of other options which included a supply from the Twizel urban water supply. This report also expanded the area of supply to include a further 50 lots in an area bounded by Lake Ohau, the Ohau Canal and the Ohau River. The report concluded that a standalone supply was the most cost effective option, but was not definitive as to the source location. Further work was required to identify the best option for a standalone bore location capable of providing up to 8L/s to meet projected demand.

Reports 3 and 4 investigated potential suitability of existing bore locations, with a view to confirming the best location for a new well to supply the standalone scheme. The result of this testing was not definitive, primarily due to a number of gear failures or inadequacies in the well driller's test equipment, resulting in some remaining uncertainty.

Nevertheless, it was clear from the test pumping carried out that the best locations would be closer to Lake Ohau than had been assumed by the preliminary scheme layout proposed in the 2007 Report, and that for any scenario, use of an existing 150mm diameter bore would be unlikely to provide the required flow.

3 Proposed Bore

3.1 Location

Of the bores test pumped, only well 6 showed promise. This is consistent with ECan well records which have 3 wells in the vicinity of well 6 which have relatively high specific capacity and transmissivity.

There is considerable confusion as to the absolute location of the 3 wells referred to in the ECan record, although their general location is known.

ECan H38/0052 is understood to be well 1.

While there has in the past been reference to H38/0053 being well 3, this is contradicted by information supplied by the driller, Washingtons Exploration Ltd, who record well 3 as H38/0054, and we consider this to be correct, supported by both its depth and borelog as provided by Washingtons. There is no driller's record at ECan for H38/0054 other than the initial consent to install.

We consider that H38/0053 is actually well 2. This linkage is suggested by the overall depth and depth to water level comparison across these three bores. As physically located on the ground, well 2 lies on about the same surface contour as well 1, at a higher elevation than other wells in the area. Well H38/0053 has the same depth, an almost identical borelog, and a similar depth to water level to H38/0052 (well 1), consistent with it being at a higher elevation relative to all others in this area. Ground levels suggest these well locations are both elevated relative to wells 7 and 8.

In our opinion, H38/0050 is likely to be either well 7, 8 or (less likely) well 4.

The uncertainty appears to arise from the process, which initially records well co-ordinates based on the application for consent to install a bore. These co-ordinates often appear not to be updated with actual co-ordinates, or even bore logs, once installation has occurred. All of these wells were originally drilled for NZ Forest Establishment Ltd, who at the time were the owners of all the land covering wells 2 to 9. The installation consents appear to have been located somewhat generically to get them in the system, and actual location could have been anywhere within this general area on their land, to suit the subdivision lot layout.

Wells H38/0050, H38/0052 and H38/0053 are the highest specific capacity wells (of those whose specific capacity is known) in the Manuka Terrace area.

The most recent and significant body of work which details the hydrogeology of this area is that recorded in Hydrogeology of the Mackenzie Basin, Thesis for the Degree of Master of Science in Engineering Geology, K Cooksey, 2008, University of Canterbury (Cooksey).

Cooksey records all three of these wells being in Tekapo Formation materials, and all three may be within the Till material zone, though the actual boundary on the ground is not obvious. The tested well 6 is more likely to be in the Gravel Outwash material of the Tekapo Formation, but no bore log has been sighted for this well. Specific capacity (approximately 2L/s/m) for well 6 is lower than that of the 3 higher yielding wells (range from approximately 6 - 22L/s/m).

It is our view that the most suitable location for a standalone well is close to Lake Ohau and towards the Ohau Canal, within the Tekapo Formation Till material, as shown in Cooksey Appendix 7D, page 210. Note also that this Appendix shows the locations of bores H38/0050 and H38/0053 as plotted by ECan, which are known to be in error, as discussed above. Their likely actual location places these all within the Till zone.

The actual location will require negotiation and agreement with a land owner in the target location, since there is currently no public owned land in the vicinity. The site will need to avoid the overhead powerlines, and be close to an available 400V power supply. We have assumed that the well pump will supply water through a scheme water treatment plant located adjacent to and on the same site as the source well. An area will be required sufficient for a secure wellhead installation, small water treatment plant building, and electrical controls and telemetry. The site will require perimeter fencing and an access track and parking area. The area required is expected to be around 100m^2.

One option would be to utilise a new well close to the highest specific capacity well (H38/0050), provided the owner is amenable and provided its location can be identified on the ground. This would be on the basis that any such public supply well could reduce or eliminate the need for a standalone bore requirement for the landowner. However aquifer characteristics can vary quite significantly over very short distances, so the only way to be sure of a well with the same specific capacity would be to drill directly alongside the existing high yield well.

A plan showing actual locations of all known wells in this vicinity (GPS and visually confirmed locations as recorded by John O'Connor, former Utilities Engineer, MDC) is included in Appendix 1.

A plan showing the preferred area for the new supply well is included in Appendix 2

3.2 Well Construction

There are two primary considerations when determining bore construction. The first is static water level, and both its expected seasonal variation and the variation over time in use. Secondly, the specific capacity of the well will affect the amount of drawdown required to achieve the design flow rate.

Static water level at well 6 is known to have varied over a range of 28.3m to 30m below ground level between February 2011 and February 2012 respectively.

The second consideration can have a significant impact on well depth. In this case, with the observed range of specific capacity of wells in this vicinity of between 2 and 22L/s/m, the required drawdown for a yield of 8L/s could vary between a minimum of 0.4m and a maximum of 4m, but is likely to be in the 1-2m range.

Installation of a 300mm well has been proposed in previous reports, and we have continued our analysis based on this well size, which is considered conservative for the flows required. Well depth is likely to be around 40m to the aquifer level, with 2m of screen (maximum).

Under the 4m drawdown scenario, the water level could be drawn down to perhaps as much as 38m below ground level, including a 4m margin which we would expect to accommodate either more extreme seasonal variations than have been observed or longer term water level reductions as a result of this or other future nearby takes.

After adding on a pump and motor length of 1.5-1.8m below 38m, the pump base would in this instance end up close to the bottom of the well.

It should be possible for the well to be constructed such that an extension below the base of the screen could be installed if initial well testing indicated the drawdown was going to be at the higher margins of the range indicated above. Even if this extension was installed at a smaller diameter of DN200mm, this would be of an adequate size for any pump required to deliver 8L/s, which could readily be achieved using a pump suitable for installation in even a 200mm diameter bore.

3.3 Pump and Headworks

We have assessed a pump based on a worse case expected drawdown of 38m below ground level and a total delivery static head of 83m. The pumped rising main to the reservoirs has been sized as DN100 Series 2 PVC-O for a cost effective bore sizing and an acceptable compromise between pumping losses and pipe cost.

A suitable pump selection would be a 10 stage Lowara Z631 (13kW), and this would be linked to the surface via 100mm screwed and socketed steel pipe. Low well level protection would also be provided. A concrete pad would be poured at the wellhead to provide a secure well, and dip access provided for ECan, together with such other works required to meet their consent requirements. We would propose to install metering inside the treatment plant building, and with flow output linked to telemetry.

3.4 Cost Estimates

The preliminary cost estimate to install a 300mm well to 41m depth with 2m screen, including development, step drawdown testing and 72hr pump test is $67,000. The preliminary cost estimate to install a 10 stage Lowara Z631 (13kW) pump, complete headworks, and provide for electrical supply and controls and connection to the wellhead is $46,000.

4 Water Treatment Requirements

4.1 Expected Water Quality

The new well is expected to have the same water quality as Well 6, as it will be drawing from essentially the same aquifer. Water test results from Well 6 indicate a good water quality, with mid-range pH and all chemical analytes comfortably within the NZDWS required values. While earlier tests on this well in 2011 had higher turbidity of 4.15NTU, subsequent testing in 2012 during the 3 day test pumping indicated declining values of 0.92 initially, declining to 0.13 towards the end of pumping. It is likely the 2011 result was affected by a lack of use of the well, and that the 3 day test

in effect further developed the well. We would expect that with suitable screening installed in a new well, turbidity would be reliably less than 1 NTU.

4.2 Design Peak Flow Rate

Previous assessments of this area have concluded that the current layout includes 198 Lots, but that there is potential for up to 300 lots if subdivision down to the 4Ha minimum occurs across the whole area.

Our assessment is based on the maximum possible number of 300 Lots.

For a restricted scheme drawing a maximum of 1820L/property/day, the maximum flow requirement (based on a 20hr treatment period, allowing time for scheduled lamp maintenance or other unscheduled outages) for treatment is 300x1820/20L/hr, or approximately 8L/s, to match the design well pump flow rate.

4.3 Treatment Methods

Treatment requirements to achieve NZ Drinking Water Standards for water drawn from a depth of >30m as in this instance are likely to be the ability to achieve a minimum 2 log credit removal. This would be met by the use of UV treatment.

4.4 Proposed Treatment Plant and Location

Treatment plant requirements are expected to be relatively modest, with the pressure UV filtration of pumped water from the well being carried out prior to water entering storage. The UV plant would be installed in a small treatment building located adjacent to the well head, to avoid the need for two sites to have power supply connections. Some control feedback may still be necessary from the reservoir site to control the well pump, but as this will have a negligible power requirement it may be possible for this to be delivered by a small solar cell powered installation.

4.5 Cost Estimate

The preliminary cost estimate for a pressure UV installation, metering, treatment plant building, access road, electricity supply and electrical controls and telemetry to operate the plant, designed to treat up to 8L/s is $122,000.

5 Storage Proposed

5.1 Purpose of Storage Provision

The Ministry of Health generally requires a minimum of 24hrs (at average daily demand) of treated water storage for public water supplies. Such storage allows a reasonable period of time for scheduled maintenance or for unplanned service outages in the pumped well, rising main, or water treatment plant to be repaired.

However a Manuka Terrace public restricted rural water supply would require each property to provide a minimum of 72hrs storage (i.e. 5,460L). This could be seen as removing the need for any storage within the scheme headworks, however some capacity should nevertheless be provided as an

operational buffer in any event, and storage at the scheme high point, as has previously been proposed, also allows for gravity distribution throughout the scheme area, simplifying the well pumping and UV treatment operating regimes.

5.2 Storage Proposal

We recommend a minimum of 6hrs storage be provided, or 455L/lot, which for a maximum of 300 lots would result in a total working storage of 137m3 for the full extent of development possible in this area. For operational flexibility and to allow for some staging with time we suggest two or more reservoirs are allowed for, with an initial installation of around 70m^3 which could in future be supplemented by additional reservoirs to meet the needs of development as it progresses.

5.3 Cost Estimate

The preliminary cost estimate for an initial 66m^3 of storage utilising two interlinked 33m^3 RX Plastics MaxTanks, including inlet, outlet, scour and overflow connections, isolating and operating valves, solar powered control telemetry, pad foundations and associated miscellaneous works is $35,000. Expansion of this storage capacity to 132m^{3}would cost a further $20,000. This may prove sufficient, or an additional 33m^3 of storage could be provided for a further $10,000.

An area of land will be required sufficient for the interlinked tanks and probably a small control and telemetry installation (suitable for exterior installation). The site will require perimeter fencing to keep stock out, and an access track and parking area. The area required is expected to be around 200m^2.

6 Reticulation

6.1 Previous Proposed Layout

The previous proposed layout for the pumped rising main was based on a well located towards the highpoint on Manuka Terrace, with this connected through to the reservoir site across country through privately owned land.

Based on aerial views of this route, a section of this private land route passes through young plantation forest, and in view of this the route is no longer recommended.

The previous reticulation rates were based on mole plough installation rates from recent (at that time) contracts for MDC. It is likely that pipes will be laid predominantly in gravels. Mole plough installation of PE or PVC pipes through gravels is not desirable. Bedding conditions would not meet the manufacturer's standards, and any warranties from the pipe suppliers would in all probability be voided if such methods of installation were used through this type of material. For this reason, mole plough installation is not recommended, and this has a significant impact on the rates for this element of the project.

6.2 Updated Proposed Layout

The new pumped rising main layout proposed follows the vehicle access route at the eastern end and then Manuka Terrace all the way through the high point of Manuka Terrace, before heading south

across private land to the proposed reservoir and treatment plant site, east of the area of plantation forest.

This main has been sized as DN100 Series 2 PVC-O PN12.5, to provide a cost effective pipe internal diameter which reasonably balances the energy costs of pipe friction losses against pipe cost. Air, scour and line valves have been allowed for given the length of this line, and gradient changes along the route.

Reticulation for distribution has been retained as previously proposed in the 2007 report, except that pipe indicated as either DN90 or DN 110 has also been replaced with DN100 Series 2 PVC-O PN12.5, which has a pipe bore of 121.9mm. Given the lengths of this pipe which would be required across the project, we would expect the cost of this pipe to be competitive even when compared to polyethylene pipe options. DN63 and smaller would be MDPE PN12 pipe.

6.3 Cost Estimate

The preliminary cost estimate for all pumped rising main and distribution reticulation as shown on the reticulation layout drawing in Appendix 3 is $735,000.

7 Staging Options

The only element for which staging may be practical is the headworks storage. It is not practical to stage well installation, pumping, treatment or reticulation components, as it is not cost effective to install these elements sized for a lower capacity initially and then upgrade them. However, at the time the scheme is implemented, it may be possible to defer some reticulation elements towards the extremities of the network depending on actual location of properties seeking connection at that time. This will most likely apply only to sections of DN40 pipeline at the eastern end of the Manuka Terrace area.

Storage could be staged by developing half the required ultimate storage now, and installing the second half of storage once more than half of the available connections are taken up. However the value deferred would be expected to be only around 2% of the estimated total development costs, so the justification for such deferral is not strong.

8 Discussion and Summary of Costs

8.1 Capital Costs

All component estimates are subject to a further 15% contingency allowance, and are GST exclusive.

Total scheme costs are significantly higher than our 2007 and 2009 Reports. There are two primary reasons for this. The first is the additional length of pumped rising main that results from a suitable well source being much closer to Lake Ohau, at the western extremity of the development area. Secondly, reticulation rates used in the earlier reports were based on rates provided by MDC, using trenchless installation methods which are not considered appropriate in the gravels prevailing in the Manuka Terrace area. Our rates are based on trench and lay installation, with shared trenching of the pumped rising main with distribution mains in some sections, to minimise installation costs.

One of the consequences of the much higher reticulation costs is that the alternative scenario using pressure pumping into the reticulation rather than gravity becomes more feasible. We have had a preliminary look at the relative costs of a pressure pumping installation versus the gravity scheme discussed above, and consider that costs could be slightly cheaper using this approach. While the pumping installation itself is quite cheap relative to the cost of pumped rising main not required, this is then largely offset by the need to increase the size of the reticulation required for a significant length of the supply side due to the pressure pump station being located at the western end of the development area.

Nevertheless, our initial analysis is that a saving of $60-100k may be possible from this approach. It should be noted that in this instance we would still utilise storage at the well site as a buffer between the well and reticulation. The 2007 report suggested using VSD controlled well pumps pumping directly to reticulation, but we consider this would be problematic, both with regard to the control of flows through the proposed UV treatment facility while still achieving appropriate dose rates, and due to limitations on the use of VSDs on bore pumps due to issues with adequate motor cooling at reduced speeds.

Is it questionable whether the added complexity and likely higher maintenance costs of a constant pumping supply option would justify the minor overall cost savings, and we have not at this stage looked at this in more detail. In terms of energy costs, we would expect the two options to have very similar annual power costs.

No detailed costs have been allowed for those related to land. However a provisional sum of $50,000 has been included, to allow for easement, land purchase or lease compensations, obtaining designations over the treatment site, legal fees, survey and lodgement costs, etc.

In summary, scheme costs are set out in Table 1 below:

Scheme Component	Preliminary Cost Estimate (±15%)
New Well	$67,000
Well Pump and Headworks	$46,000
Water Treatment Plant	$122,000
Treated Water Storage (based on 132m^3)	$55,000
Pumped Rising Main	$254,000
Distribution Reticulation	$481,000
Land Related Costs (Provisional)	$50,000
Consents (well install, water take, building consent, etc)	$18,000
Contingency (~15%)	$164,000
Engineering Fees (~10%)	$126,000
Total	**$1,383,000**

Table 1: Summary of Scheme Costs

8.2 Operating Costs

In addition to the Capital costs we have also considered the expected operating costs per year.

We have allowed for UV consumables in this costing, as well as operator time (1 hour on average per week plus 15hrs/annum for unscheduled maintenance) and power costs for both the UV plant and the well pump. Costs are based on a power cost of $0.20/kWh, and we have assumed the ultimate demand profile of 300 occupied lots.

We have also assumed a peak day to average day demand ratio for this rural restricted scheme of 1.5, with the peak demand being 1820L/lot/day.

On this basis, annual operating costs are expected to be around $21,600 per annum for 300 lots.

9 Capital and Operating Cost Per Existing Lot

To assist with consultation, we have calculated the per property Capital and Operating costs that would be incurred as a result of scheme implementation, based on the existing layout of 198 lots, and an alternative based on the maximum of 300 lots.

In addition, Capital funding costs are presented based on different loan terms, assuming an interest rate of 5.5%p.a., and paying back both principal and interest monthly over the term of the loan.

No of Lots	Capital Cost/Lot	Operating Cost per yr/Lot	Funding cost per yr/Lot 10yr term	Funding cost per yr/Lot 15yr term	Funding cost per yr/Lot 20yr term
198	$6,985	$86	$910	$685	$577
300	$4,610	$72	$601	$452	$381

Table 2: Funding Costs - Interest Rate 5.5%p.a.

Note that the above funding costs are for Capital costs only, and do not include the identified operating costs, nor do these allow for depreciation costs.

A further analysis has been done to look at interest rate sensitivity, using an interest rate of 7.5%p.a. In this scenario funding costs become:

No of Lots	Capital Cost/Lot	Operating Cost per yr/Lot	Funding cost per yr/Lot 10yr term	Funding cost per yr/Lot 15yr term	Funding cost per yr/Lot 20yr term
198	$6,985	$86	$995	$777	$676
300	$4,610	$72	$657	$513	$446

Table 3: Funding Costs - Interest Rate 7.5%p.a.

This discussion does not consider the mechanism for recovery, or how this funding recovery might be split between existing properties which choose to connect up front, existing properties which

choose to connect in future, existing properties which choose to go it alone (if this is an option) and costs to future lot developments (i.e. between the 198 lots now and the 300 lots of ultimate development). A development funding policy addressing these matters should be developed if this project proceeds.

10 Recommendations

The above report sets out our latest updated costs (overall and per property) for a standalone scheme to supply Manuka Terrace, supplied with raw water from a well located within the development area. We recommend that MDC consider this report, the implications on scheme affordability and consequently the overall scheme viability. Subject to confirmation that the scheme is viable, we make the following additional recommendations.

We consider that the location proposed for this new well would have the greatest chance of success in achieving the required quantity and quality from a single bore and with modest drawdown. Nevertheless, prior to finally determining a new well location, we recommend that a modest amount is spent attempting to confirm on the ground the actual locations which correspond to the three wells in the ECan database for this area, since well efficiency appears to vary reasonably widely within a quite small area.

It may be possible to pin point these wells through a combination of interviews with Washington exploration and depth sounding, although at worst isolating the most productive well could require some limited pump testing sufficient to establish well specific capacities.

Following on from this, we also recommend that, MDC consider approaching key property owners with a view to negotiating access to, compensation for or purchase of the well site, any pipeline route easements, and the reservoir/tank farm site.

Further, we recommend that MDC use this report as the basis for consultation with landowners in the Manuka Terrace area, with a view to reaching agreement on an implementation programme if a consensus to proceed can be reached.

APPENDIX 1 – GPS LOCATION OF KNOWN WELLS

APPENDIX 2 – TARGET AREA FOR NEW WELL

APPENDIX 3 – PROPOSED RETICULATION LAYOUT

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Production Well
Location Area
Glen-Lyon-Rd
969 m
Imagery Date: 4/3/2014
2011
© 2014 Google
Image © 2014 DigitalGlobe
©2010 Google
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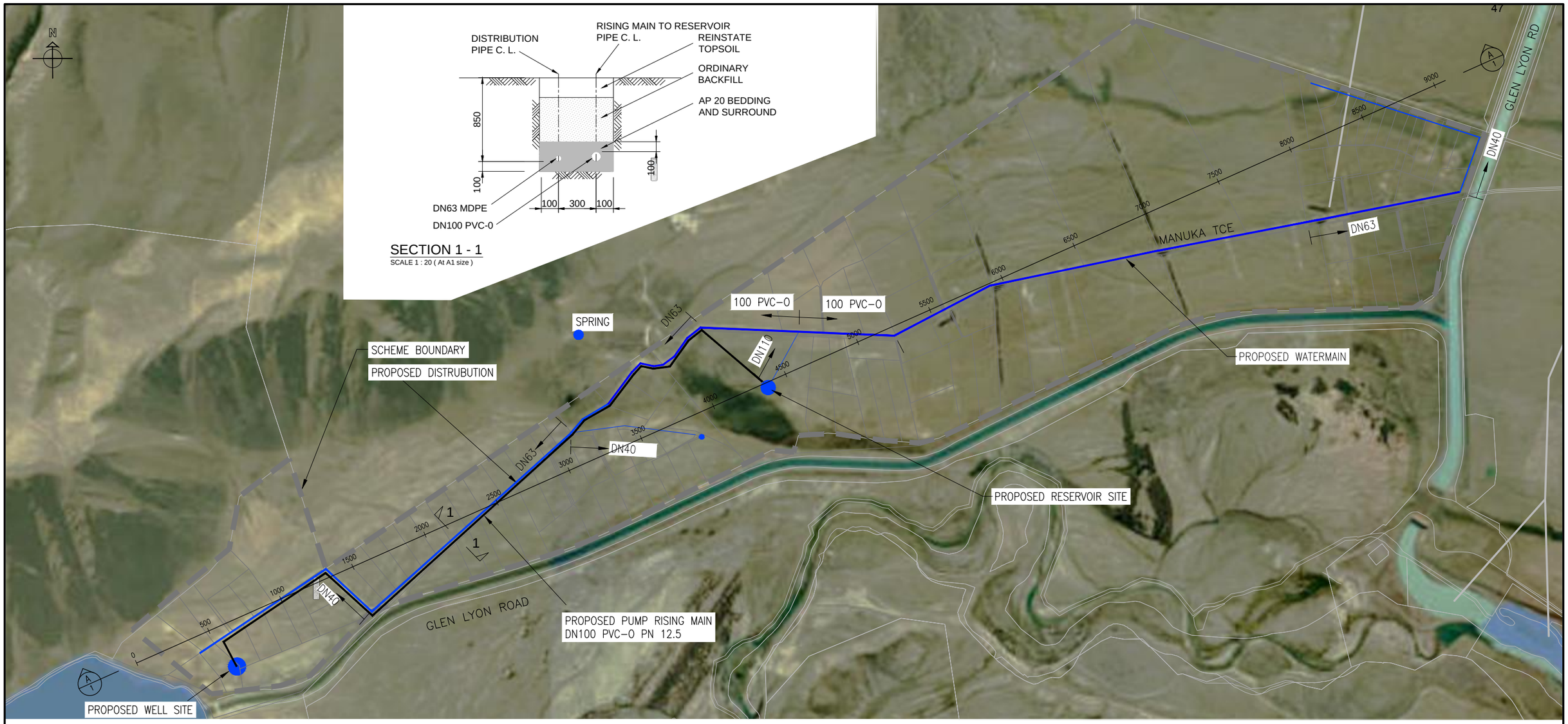

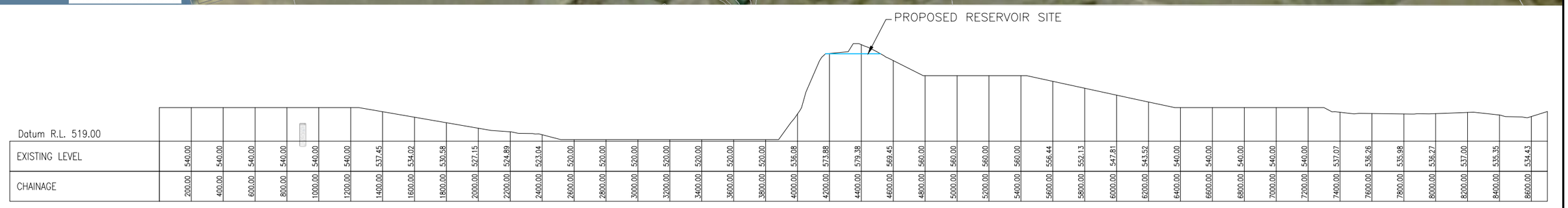

SECTION A–A

				BY	CHECKED	DATE
			DESIGN	EG & DH	GB	06/07
			DRAWN	RAS & DW	EG & DH	06/07
			APPROVED			
R2 Revised well site	D H	3-9-2014	This drawing and its contents are the property of Opus International Consultants Limited. Any unauthorised employment or reproduction, in full or in part, is forbidden.			
R1 UPDATED FOR 300 LOTS	GB	07/07				
AMENDMENT	APP'D	DATE				

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TITLE: MACKENZIE DISTRICT COUNCIL
MANUKA TERRACE WATER SUPPLY
ISSUES AND OPTIONS REPORT

PLAN AND CROSS SECTION

STATUS	FILE				
REPORT	3CW494.00/10CE – 6-CZ016.00				
SCALE	PLOT DATE	FEATURE IDENTIFIER	CODE	SHEET	REVISION
1:12500 (A1)	03/09/14 @ 10:37	6/392/38	7704	1	R2

GRAPHIC SCALES

g:\mackenzie district council\6cz015.00 twizel water supply–detail design 2014\drawings\manuka terrace water supply drawing 6–cz016.00\revised ground model_ras.dwg – Layout1 ORIGINAL SHEET SIZE A1 [840x594]