

## Individual Property owners Submission to Council

(Names and addresses withheld, along with 3<sup>rd</sup> party interests)

Submitter One:

Dear Mayor Kircher,

We are writing to you about the Ohau Water Supply issues.

We currently have an untreated gravity fed water supply. This has to be treated by law.

Fluent want to put in a very expensive bore system to replace it. The majority of people in the village want to keep the current gravity supply and to have it treated by means of a specialised container unit placed beside our power supply so that it can be UV treated.

The current supply is fed from an area that has pristine mountain water flowing towards it.

There have been identified issues about the testing of the water and you yourself have said in the Oamaru Mail there is a "technical fail" due to water "not being delivered to testing facilities during timeframes". We believe that to be particularly so here at your furthest corner of the district.

Besides that there is the enormous cost of trying to put bores in, and the unreliability of the water results for those bores due to possible contamination and/or failure to find water.

There is a sewage pond in the vicinity of proposed bore sites.  
A nearby residence tried and failed to get bore water.

The option of the container being put in place as a starter, and maybe a final solution, is much preferred and a lot cheaper than the nearly 2 million dollar project Fluent want to pursue.

Council surveys show most want to retain the gravity fed option.

A well attended meeting earlier in the year wanted this also and set up a task force to say what we wanted. There has been some lively debate over the months but ultimately to the same end.

For Councillor Hopkins to state in the latest Omarama Gazette that "opposition to some options "might be loud but not necessarily plentiful" is wrong and he should apologise.

Similarly Councillor Dawson stated in the Omarama Gazette that "the supply was "illegal" at present and there was "liability" as councilors." Yes, there would be liability if the standards were not met, but the "supply" itself is not illegal. He clearly implies the supply is illegal when it is not.

I find it disturbing that our local Ahuriri Councillor is not supporting his constituents and is publicly making comments which are not true.

We are aware of a proposed Geopark. Having a water supply gravity fed from the nearby mountains would enhance the Geopark prospect. Having minimal usage of power (just for the UV) and not for the electrical usage of power for a bore and pumping water uphill, would be useful for Geopark status.

The bores would detract from a Geopark as opposed to naturally fed water. The proposal of putting bores right on the lakefront doesn't seem to be conducive because of the visual impact and noise pollution.

We are two of the many supporters for retaining the current gravity fed water supply. We have been living here full time for 19 years and it has been wonderful having our water supply as it is. No one has ever been sick from drinking our water.

We hope the right decisions are made for the benefit of your constituents with properties in the Ohau Village and not for the profit of a company whose interests would be solely for their own business.

Yours faithfully

## Submitter Two:

18 August 2019

We are semi permanent residents at Lake Ohau Village. We have been made aware of the water quality issues from the boil water notices and have installed a UV filter.

Having informed ourselves of the latest developments and options proposed by the WDC and the Residents and Ratepayers Association we are concerned by the approach of the WDC.

A water supply should be sufficient in quantity, safe to drink and reliable. Our current supply can meet these requirements with a little goodwill and commonsense.

Water rates have been collected since the village was first established and it appears that the WDC has not fulfilled its obligations and maintained our water supply. They have also failed to collect reliable data on which to make decisions. The WDC has not protected the intake, storage or the line of the water supply.

We support Submitters One [name omitted] submission to the WDC, 12th August 2019.

Living in our house in Ohau Village we appreciate the beautiful unadulterated alpine water we have presently as well as the unspoiled environment surrounding the village. In the 21st century, pure fresh water is a sought after commodity that we are so fortunate to have access to. How can the council be so shortsighted as to do away with this supply and replace it with a supply of uncertain quality? It will require more electricity to run, will cost the ratepayers more, possibly need more treatment and result in an inferior product.

The data that has been collected is not reliable as has been pointed out in detail in the Submitters One [name omitted] and LOVRRRA's submissions.

Another major concern for us is that if bores are drilled and a treatment plant built they will have a very big impact on the environment of the village. No matter where they will be situated they will be unsightly, noisy and will negatively impact the residents. Ohau Village is an area of outstanding natural beauty and should be preserved as such. Once spoiled, there is no going back.

Travelling recently in Switzerland we see the fruits of a government that really values water. We have swum in rivers and lakes flowing through their largest cities, Geneva, Zurich and Bern. We have been to hotels and restaurants where they proudly market their own spring water at their tables. They know the true value of beautiful, pure, life giving water. I doubt they would relinquish this on the strength of unreliable data or for a landowner's personal gain at the expense of the public who have after all a legal right for it to be retained.

Your sincerely

Submitter Three:

**Sent:** Friday, July 26, 2019 4:26 PM

**Subject:** Lake Ohau Alpine Village Water upgrade proposal

I am writing to express my concern about the proposed water upgrade. I live permanently at the Village

As I see it, the report prepared by Fluent has some serious flaws.

- \* The Fluent Report uses water quality readings taken from a single source in the village. I understand that to be fully accurate water sampling in a water system needs to be taken from a variety of sources and readings noted to have eColi need to be followed up.. This has not happened.
- \* The current system has been operating for a number of years. As far as I am aware, very little, if any, maintenance work has been done on the system so contaminants may have entered the system at various places.
- \* I feel the water requirements proposed vastly exceed the amount actually used.

I would like the following procedures implemented.

- \* Delay adopting the Fluent proposal.
- \* Install procedures to obtain accurate water quality data. If this is not acceptable, install a temporary portable treatment plant. I understand an estimate from APEX to do this has been obtained.
- \* Carry out deferred maintenance of tanks. Empty and remove sediment, repair any cracks, line tanks if needed.
- \* Remove wilding pines and weeds in close proximity to the water pipe which feeds the village network.
- \* Measure water quality for a year at random points and following procedures as required by the Department of Health to establish what type and level of treatment is required.
- \* Install flow meters for a year to measure supply and demand and detect leaks in the network.
- \* Fix any leaks detected by flow meters.
- \* Convert temporary treatment plant to permanent based on accurate water quality measurements.
- \* If turbidity measurements indicate a problem, install a monitoring facility in a side stream.

I understand that access to the current system is in perpetuity, ie, that the landowner cannot deny access. I also understand that the current water take site has an access right for another 16 years. Further, I understand that the current landowner is keen to have these access rights revoked. However, no good reason has been given for this. Why should Council give in to the desires of one landowner when this could compromise the water supply of a whole village and necessitate vast expense to install a new water system.

One final point - the system proposed by Fluent uses a water supply from bores. Have any test bores in the area proposed for the new water supply ever been undertaken?

Thank you for your time. I look forward to hearing from you further in this matter.

Yours sincerely,

## Submitter Four:

Reference: Lake Ohau Village proposed water supply upgrade

To: The Mayor and Councillors Waitaki District Council

And to: The CEO Waitaki District Council

And to: The newly appointed Independent Consultant

Date: 19<sup>th</sup> August 2019

### Introduction:

We are property owners & ratepayers of three properties within the village and frequently stay at our holiday home at Lake Ohau Village, we make this submission as individuals.

The view of the majority of LOVRRRA members is that the existing gravity-fed supply and water source on nearby private land with the long-term water take consent rights guaranteeing the continual supply to the Village should remain, we too strongly support that view.

Few people make submissions simply because they believe in what the authority tells them, just as in this case, most cannot challenge or even understand the reports as this not their area of experience or expertise, so simply accept what they are being told.

Ohau Village has a number of people who have experience, knowledge and understanding of who can understand and interpret what has been produced, and hence why the WDC position is being challenged.

My background is over 28 years in water management, NRW (non-revenue water) management and potable water reticulation investigations. Our business Detection Services employs over 70 staff, NRW specialists, leakage management technicians and pipeline analysis hydraulic engineers and chemical engineers, solely specialising in potable water systems across New Zealand and Australia. We also undertake water management projects around the world, and have staff involved in ADB / international water management projects and have managed large international water supply systems, we work for and advise most of the major water authorities across Australia and New Zealand.

We also have undertaken work for WDC. By making this submission I risk future work with WDC, but I make my position based on knowledge, experience and doing the right thing for this community and the wider ratepayer community, an ethical stand is far more important and I retain my integrity.

This response is borne out of the sheer frustration we as a community have experienced by process and apparent agendas being played out by WDC and their consultant and the utter disgraceful waste of ratepayers money being squandered on consultants, it is a disgrace to council and if the wider public were aware, I am sure they too would be up in arms.

My submission is more focusing on the "elephant in the room".

### Background:

About 3 to 4 years ago when this issue was again introduced, I, on behalf of my company Detection Services, made an offer to WDC to fully investigate this system to enable WDC to have a complete understanding of the system's condition, operation, capacity and identify the potential NRW (non-revenue water) and the demand requirements within the entire system. This offer was entirely free to WDC (no cost) as a gesture of community spirit and support of WDC to help understand and establish what the real needs and system capacity were. My offer was ignored by WDC on the two occasions this was made.

If WDC had acted upon this free offer, I am confident we would not be in the conflict between residents and WDC we are in today. Knowledge and facts are what is needed, and these are exactly what are lacking from the Fluent and WDC report.

Further, in late December 2018 I was requested by the community to review and produce a report in response to the August 2018 report by Fluent for the meeting convened by Council in early January in regards to the proposed water supply changes.

This report was produced in order to identify the differences of opinion and to help WDC in their assessment of the situation. This reported was ignored by WDC and no formal response was offered other than a verbal "I don't agree with the report" by Mr Goldingham at the LOVRRRA task force meeting when questioned on it. This report cost WDC nothing, it was produced at my cost to help both sides better understand the system and demand requirements.

A copy of this report is attached for WDC and the new consultant to review.

I ask you all to please read this report in conjunction with the August 2018 Fluent report.

It will help you achieve a balanced viewpoint based on real demand profiles and system capacities and needs, and identify the many assumptions used by Fluent that are baseless and

misleading. The report is not based on assumptions and exaggerated, incorrectly calculated future capacity requirements and extrapolated leakage as assumed future demand to generate a false impression for the need for a greater supply requirement. The review is based on industry standard calculations and commonly used demand profiles used across New Zealand. I am open to answer questions and provide clarification.

The current system: The “elephant” in the room.

The current system is adequate. In fact it is more than adequate for current and future demand. This system was designed to accommodate and supply 137 properties with full occupancy and on demand supply. The only thing that has changed is the village is highly likely never to have full occupancy. As well and since the development of this water system water conservation is far more widely accepted and adopted as well more water efficient appliances are available. Consequently, general water consumption has decreased considerably over past years. The system at absolute full capacity will only reach around 70% of the system’s consent allowance, but in fact would likely only peak at around 20% of its potential capacity as the system was tested and proven to exceed over 7 litres a second. It was not tested past this capacity as I understand.

Also consider the design, capacity and future demand requirements that were placed on the developer by WDC. WDC would have reviewed and approved this water supply to meet the full demand capacity requirements of a fully occupied village. Either they got it horribly wrong 30 years ago or they have got it wrong today. Actually the evidence clearly shows they got it correct 30 years ago and with surplus capacity.

I again refer to my report prepared in January of this year which goes into more detail on demand calculations.

A number of wild and outrageous claims have been expressed within Fluent reports about peak demand and capacity, something not well thought through or appears made without a hydraulic or capacity consideration.

#### Campground and Avoca House

Both of these supplies are unmetered and uncontrolled, I understand WDC have no legal obligation to supply these nor does DoC have an obligation to have a water supply at this campground at all.

Both of these sites are an extreme risk to the security of the village supply, both are unmetered, uncontrolled and the campground users blatantly abuse this supply during summer period, drawing potentially as much if not more than the village’s entire demand.

The Avoca House and campground should have their own supply, or and at very most a restricted supply to a header tank as a bare minimum, and both be metered at the town supply connection, not at their sites.

To expect the ratepayers of Ohau Village to subsidise and build an entirely new water supply system to accommodate these two connections and 20 unspecified additional connection is not only bizarre but an arrogant position of WDC.

What “commitments” or indications has WDC made to “other parties”?

#### Conflict of interest:

I have addressed this before and have been ignored. Is there a potential conflict of interest here, where the engaged consultant appears to be involved throughout the entire process from recommendation, specification, design, engineering, and project delivery, as appears to be the case with other water supply projects delivered by Fluent for WDC, refer to Fluent’s website.

Furthermore, it is in the interests of the consultant to design and recommend the most expensive solutions as these contracts typically are a “clip the ticket”, the more WDC spend, (well actually the ratepayers), the more the consultant makes. Our proposal is far more environmentally friendly, more efficient and a far lower CAPEX cost and much lower OPEX cost. It is what the community wants, but will not generate the revenue for the consultant they would like.

A number of “less than successful” water systems have been designed and implemented under the guidance of this consultant for WDC. Has this been forgotten? I’m sure it is neither forgotten or forgiven by those residents affected. Is WDC planning on another?

Furthermore, this consultant has been in direct contact with the consultant and treatment plant designer we have engaged, questioning them. This is a clear breach of protocol. Fluent is a competitor and treatment plant designer, it is absolutely inappropriate for one competitor to engage with another. And if this was directed by WDC then this makes this situation even more

intolerable and questionable, and could introduce legal ramifications.

This entire process has been, in my opinion, questionable and an abuse of ratepayers money.

Water consent land:

We have a consent for a further 16 years, and with rights that will highly likely be renewed, there is no logical reason to move an excellent, proven source to an unproven questionable location.

Common sense would say this is illogical.

WDC's position, when asked about the additional 20 new connections, is a vague response, "well just in case" just in case of what?

It is time WDC provided a formal response and be transparent.

By removing the water off one person's land for their tax free financial gain and passing these costs onto the village of 137 properties for the rest of our lives is unacceptable.

We have also asked WDC about the likely new subdivision. It has repeatedly denied that there is any talk, discussion or application for a new subdivision or similar yet WDC hold fast on the additional 20 connections. Why?

Again, a formal response on this matter stating your above position is requested.

This community is not naïve. We can all see what is likely to occur if the water take is removed from this land. Even your engineer at the task force meeting held in the Ohau Village on the 24<sup>th</sup> May accidentally admitted he "now needs to go and advise the other parties of a potential change" when questioned on whether he was referring to Don Edwards, he sheepishly admitted yes.

The landowner is sitting on a large subdividable block of land if this water is removed. The landowner has also made comments to locals that the water is coming off his land. "It is not if, but when", he states. Where would the landowner get this from other than WDC? There are many events and actions that only reinforce to the village that a behind the scenes deal or agreement has likely been made between WDC and the landowner and the unspecified "other parties".

The incredible waste of ratepayer's money spent on consultants in an attempt to find fault or reason not to keep the water supply in its existing location only draws more attention on the reasoning behind this.

#### Discrepancies

Numerous discrepancies and errors have been identified and highlighted, many within my report of January 2019, the following are few additional that have come to light since this time.

Consumption demand from campground:

We have been advised and supplied flow figures (not data) by WDC of a demand profile generated by a metered supply to the campground. Yet upon investigation after the "apparent" claimed data was collected, there is no meter installed. Flow data cannot be generated from an unmetered supply. You can draw your own conclusions here.

Village demand flow profiles:

I have personally been asking for this data for nearly 4 years without a response, yet miraculously some intermittent and incomplete data appeared at the very 11<sup>th</sup> hour to the TF (Task Force) for review. We perform analysis on flow data for NRW and Demand Management profiles as a business, we do these hundreds of times a year. We can very quickly identify questionable data and discrepancies. This data appears to fall into this category.

Rates received by WDC:

WDC has received rates from every property and section from the start of this village being established, over 30 years ago. This amounts to a considerable sum.

To add to this, the infrastructure and complete water supply system was not paid for by WDC, but paid for in full directly and indirectly by every property owner in this village through the cost of their properties.

WDC has received a significant income from this village for a system we paid for, this remuneration received could be in the region of 1-3+ million. Where is this money?

Demand for payment for new connections:

WDC has also embarked on collecting a "connection tax" for all new connections. Through enquiries made I have discovered that this may not be legal.

WDC has received water rates from every property for many years. Those not using the services still pay these rates, yet WDC now demand a further payment to connect and use what we have already been paying for multiple times over. Interestingly as people "talk" this amount seems to vary depending upon who you talk to. Payments appear to range from under \$5K to \$10K, some have paid less and have been told by WDC to not tell anyone.

30-40 new properties over recent years at say an average "connection tax" of \$8K, another \$300K collected for a system WDC do not spend money on.  
But it brings up yet another question: where is all this money this community has paid to WDC for the village?

#### Maintenance:

This topic follows the rates received as it is directly connected.

It has become apparent from our research that this supply has had the absolute bare minimum maintenance and support, more leaning towards less than the bare minimum needed. This has been reinforced by WDC's own staff and comments that they cannot access the pipes or tanks, intake galleries etc due to access restrictions. But there are no legal access restrictions.

Inspection of the tanks, intakes clearly shows WDC has highly unlikely visited these in many years, the intake (gallery) was so overgrown it took considerable time to even locate it despite having good prior knowledge of its location.

The tanks have probably never been cleaned or flushed, the reticulation has likely never been flushed. Where have our rates been spent? It appears, clearly not on our water supply.

The "pipe track" is required to be maintained and cleared of trees, WDC responsibility I understand, yet another task we pay for that is not delivered.

#### Turbidity:

There continues to be claims the turbidity is high in this network. I am in this industry and I can generate high turbidity results in the most well-maintained networks. That doesn't make it a reliable result or representative of the network.

These tanks have not, as it appears, ever been cleaned, flushed or maintained, nor has the reticulation. Thirty years of sediment accumulation is not a fault of the source, it is a fault of the lack of required minimum maintenance.

If you didn't clean your car for 30 years, but it was hardly used, and didn't need replacing, but only needed cleaning, would you wash it for \$10 or buy a new one for \$40,000? This is what WDC are expecting the village ratepayers to do, buy a new one, because WDC won't clean or maintain the perfectly good one we already have.

Building a new source will not likely change the turbidity. To use a simple everyday analogy, the source, the storage tanks and the reticulation are no different to a fuel system in a car.

The source is the petrol pump at the station, the fuel tank is the storage tank and the fuel lines are the reticulation.

If a fuel line becomes contaminated, blocked or a cause of problems, do you change your fuel source, No. Do you change your fuel tank, No. You clean the fuel lines and the storage from where the problem is likely coming from.

WDC need to clean the storage tanks and flush the mains properly as is required of WDC to do as part of a normal maintenance and preventative maintenance program and what we have paid our rates for, for the past 30 years.

Only then can WDC collect turbidity samples that are more representative of the system and source water, until this is done the turbidity claims are irrelevant, false and misleading.

#### Contamination:

The risks of contamination to the system are more likely generated by poor or substandard maintenance or works occurring on the mains or by third parties. Certainly not likely from the source, changing the source of water will in no way minimise or mitigate these risks, the risks remain.

WDC needs to ensure maintenance and operational procedures are known its staff and they are trained to meet these industry standards. As well WDC must control who is authorised to work on the mains. No one without the correct training, accreditation or authority should ever touch the mains, this is our drink water.

Evidence of this has been clearly seen during fire training exercises where stones are coming out of the pipe and in some cases blocking the hydrant outlet from within. A serious firefighting risk in-itself let alone the contamination risk.

One thing is for certain, these stones did not come from the source / gallery, it is not possible.

These stones, sediments, dirt and potentially contaminants have entered these pipes likely through poor or substandard maintenance procedures, these same procedures, or lack of, are the greatest risk to the safety of our water supply, not the source.

Leakage, we all can appreciate a leaking water main is highly unlikely to allow infiltration /



contamination into the pipe as it is pressurised pushing water out. But when a burst occurs or a shutdown, planned or unplanned, in this type of situation a vacuum will often occur as the water below the opening / break etc drains away with the effects of gravity. This creates a vacuum (suction) drawing anything in the vicinity of the pipe into the pipe, this is where serious contamination can occur. Not from the pristine water source as we have. Again, I reiterate changing the source will not mitigate these risks.

#### Fluent Reports:

In my review of the Fluent reports I have identified numerous discrepancies, assumptions and calculations based on flawed data and calculations based on a lack of in-depth NRW and demand management knowledge, experience or knowhow.

The first Fluent report we have seen, August 2018, cost the ratepayers \$31,000, an enormous sum for a report that is in most part incorrect and non-factual and was co-written by WDC staff, yet still cost the ratepayers \$31,000.

Subsequently numerous more Fluent reports have emerged, all in what appears an attempt to discredit the LOVRRRA position, with a total of nine different supply design options produced by Fluent. All with one focus in mind that being to remove the supply from current source and completely off the property the water consent is held for.

WDC has squandered ratepayer's money not once but multiple times in order to achieve what appears an internal agenda and unofficial agreement with the landowner to remove the water supply off his land.

Just how much money has WDC spend of our rates money with Fluent on reports, assessments, meetings etc to try and block our community's common sense approach to a practical, logical and far more cost-effective solution?

Why doesn't WDC have the internal capability to undertake these simple research and investigation reports without the need to engage hugely expensive consultants, and if there is a lack of capability within WDC, why use a consultant who, as it appears, knows less than WDC on this topic (as it was co-written by WDC) and certainly appears to not have the background knowledge or experience in NRW and Demand forecasting and calculations that is required for this report.

#### Conclusion:

In conclusion, the basis for the reason to move the current water supply is, we believe, clearly flawed, the information used to create the position by WDC is flawed, unreliable and questionable at best and the process and skills used to establish this position are likely inappropriate.

The position and action/s undertaken by WDC and its consultant on behalf of WDC, paid for by the very ratepayers who simply want a common sense and economic solution and to retain their existing water source, has been a disappointing experience.

This has only highlighted the abuse and squandering of ratepayers money to meet agendas that are not in the best interest of those the decisions are being made on behalf of and who are ultimately paying for it, and who will have to live with it into the future.

WDC now have an opportunity to stop, take a breather with the new water quality announcement of the 31<sup>st</sup> July this year and start a correct, controlled and unbiased collection of accurate, reliable, consistent and trustworthy data on the village's water supply. Future reviews must be undertaken by a consultant or professional who has the relevant skills in this area, not selected simply as they are cheaper, as WDC has stated. In hindsight looking at the costs to date I feel this statement is likely far from correct as well.

"The bitter taste of poor quality remains long after the price is forgotten"

**Addendum submission of:** Stephen Simmons

**Reference:** Lake Ohau Village proposed water supply upgrade

**To:** The Mayor and Councillors Waitaki District Council

**And to:** The CEO Waitaki District Council

**Date:** 24<sup>th</sup> August 2019

**Introduction:**

This submission is in response to the “recommendation” document produced by WDC Engineer Michael Goldingham (undated) and the review by DC Brown (2-Aug 2019) prepared for the “Assets Committee Meeting” planned for the 27<sup>th</sup> August, received by the Task Force on the evening of 23<sup>rd</sup> August.

I feel a response to this document is essential as it again infers information which is, and remains assumptions, misleading and / or factually wrong.

Firstly, and most importantly, the report by DC Brown was prepared on the 2<sup>nd</sup> August 2019, the Task Force received this on the evening of Friday the 23<sup>rd</sup>, and not directly from WDC. The entire DC Brown report is void of any credentials, qualifications, or experience that shows their selection is relevant or appropriate to review this, nor is there any reference to who they work for or if they are an independent sole trader. Why would this report not be supplied with credentials to give credence to the findings?

Secondly, I would like to address the repeated claims of urgency within this recommendation, and the suggestions this has been going on for 10 years. If it has taken 10 years to get to this point then some very serious questions must be asked of those engineers and management responsible.

Why and who is responsible?

This admission is damning in itself, it highlights potential inadequacies, ignorance of risk, and lack of ownership and accountability.

But even more relevant, it indicates this decision is now being made under pressure, not to deliver an appropriate solution that is either genuinely needed or wanted by the community, but simply to tick a box and say we (WDC) are now covered. This is achieved by forcing an unwanted and what still appears is a completely unnecessary system upon a community who simply do not want or cannot afford it.

Ten years is a disgrace, and only WDC are responsible for this, adding unnecessary cost and burden on your ratepayers, do not infer we the ratepayers are part of the problem.

There are too many flaws, errors and discrepancies in these documents to list them all here or do I have the time to respond at such short notice.

### Cost comparisons:

This "WDC recommendation" document page under "Summary of Options considered" suggests, *"in summary, all options are likely to cost around the same"*.

This is not correct, WDC consultant has continually attempted to inflate our cost option adding what appears enormous design costs and other "costs" they will likely charge WDC which are unnecessary or inappropriate and hugely inflated.

Please take these insinuations by WDC, and Fluent as biased and potentially misleading and undertake your own detailed analysis of the costs. Also talk with the alternative system suppliers APEX for a true representation of the costs, please consider, Fluent are competitors to APEX and have no interest in supporting their solution over theirs.

Is there a serious conflict of interest here where a competitor reviews and comments on their competitor's offer as part of an evaluation process?

### "Inequitable" supply arrangements:

This refers to on demand and restricted supply.

Again, another completely irrelevant position or reason to move a completely adequate supply.

The only reason there is any inequitable position is solely because of WDC's inability to manage their own internal requirement and act with consistency.

Despite this, I have not heard one genuine complaint that this is an issue, and is it really an issue, or is this just another WDC "red herring"?

I suspect the latter.

### Current Service levels (page 2)

Here Mr Goldingham states:

*"The village supply was established as a restricted flow supply where the design flow for each lot was a set volume of 455 l/day"*

I have reviewed the documentation provided and within this I can only find a comment made in a letter by Jeff Cuthbertson the then Asset Manager of WDC on the 18<sup>th</sup> July 2003 where he writes:

"What we have found through this investigation is that there could be a major problem in that it appears that the original consent was designed as a restricted water supply, ie 100 gallons (454.6 litres) of water per day.

I draw you to consider these statements and those of Mr Goldingham, this letter does not state it is a restricted supply at all, it simply suggests it appears it might have been. The consent is not a restricted supply and the capacity of the consent suggests otherwise, and the consent does not specify a restricted supply.

I also draw your attention to the highlighted section of that statement, I have highlighted this in the same way as it is highlighted in the received documentation, only the words that suggest it's a restricted supply are highlighted, it is not in "context", is this deliberately misleading?

Furthermore, the letter talks of a 3" main, the mains as we now understand are 4" in the village which again suggests serious irregularities in the information held and used by WDC for their findings and recommendations.

In addition to this, the difference between a 3" (75mm) and a 4" (100mm) main are hugely significant in supply demand capability.

The supply capacity of a 4" main over a 3" has nearly **80%** higher capacity without taking into account reduced friction head loss by the larger pipe supply, but implying a 3" main infers reduced supply, further non-factual inferences.

Despite the misleading information put forward by WDC, it still remains that the current supply is more than sufficient and any suggestions by WDC that it is not, is misleading and unfounded. WDC still remain unable to prove in any way that the current supply is insufficient, if the review panel approve this new system based on misleading and misinformation then it is a serious case of mismanagement and will be challenged.

What are the real supply arrangements for Ohau Village?

We have the following beliefs and responses from WDC as to what our supply is...

- 1 On demand, unrestricted supply
- 2 Combination of restricted and on demand
- 3 Restricted supply - **2000** litres per day (have a copy of letter from WDC stating this)
- 4 Restricted supply - **1000** litres per day
- 5 Restricted supply - **600** litres per day
- 6 Restricted supply - **454** litres per day.

Six scenarios exist presented by WDC to various ratepayers over various times, which is it?

### **Known capacity**

In a report by WDC presented to the Ohau Village dated 1<sup>st</sup> June 2014 by Neil Jorgensen, copy attached, it very clearly states throughout this report that *sufficient quantity and quality are both known to be available and are a positive to reason to retain existing source.*

Cost estimates to upgrade are in the region of **\$150K**.

What has changed in 5 years?

- 1 Still no thorough or measured investigations of the system's capacity or quality.
- 2 The engagement of a hugely expensive consultant promoting their own solution on WDC and the ratepayers for in the region of a mere **1000%** increase.

### **Page 2 Background:**

References to Havelock North, a red herring, there are absolutely no similarities between the Ohau Water supply system, environment or situation.

### **Page 3, last paragraph:**

"The location of the bores is not affected by the location of the sewage ponds", what factual evidence is this based on? The 39-year-old letter "attachment 8" suggesting "*It is not anticipated that any effluent will reach any of the two lakes*".

Any other factual based information this statement is based on?

## Comments on attachments:

**Attachment 8** Consultants / planners letter  
Page 3 Sewage (b)

Highlighted, *"It is **not anticipated** that any effluent will reach any of the two lakes"*

"not anticipated" certainly not guaranteed and absolutely no commitment from this consultant, just a vague "not anticipated" made 39 years ago.

Let us now put this into perspective, WDC is now planning on taking our drinking water from directly down stream of two significant effluent discharges , Ohau Village and Ohau Lodge and expect us to believe it is totally fine without any testing based on a "non-committal" vague comment by a developer 39 years ago who wanted to get a consent approved for financial gain?

Please can you advise the Ohau community who at WDC will take ultimate responsibly, personally, legally and professionally for this and the costs involved if you get it wrong, can I remind you of Otematata?

## **Attachment 9**

Covered in response

## **Attachment 16** 13 May 2004

Letter from Barbara MacKay:

This letter has been included and again sections highlighted to infer a position that is not. The words: *"the supply has dropped significantly"* are highlighted, yet the key point of this letter is refuting this position, yet those have not been highlighted, why would this be, is this another deliberate attempt to take letters and comments out of context to fulfil an agenda?

## **Attachment 17** March Construction:

More out of context highlights.

Unfortunately, I have not had the time to comment on the D C Brown report due the lateness of receiving it.

General overview, this report appears based only on the data provided by WDC and Fluent, this data is flawed and misleading, therefore we can only expect a flawed and biased outcome recommendation from Brown as this all Brown has to work with.

Neither the Task Force nor the LOVRRRA were given any opportunity to communicate directly with Brown who we, as ratepayers, have paid for.

To also suggest that considerable communication between LOVRAA / TF and WDC occurred is farcical and insulting.

**If WDC were able to provide the LOVRRRA factually based evidence that the water supply is genuinely insufficient our position would likely be very different.**

Until WDC do what is reasonably and professionally required and expected we will continue to oppose this process.

This process must stop now and allow for a true and reliable assessment of the village water supply to be undertaken.

Submitter Five:

Hi,

[Details Omitted] We wish to register our support for your Option 1 but hope the visual and noise impacts of the associated infrastructure can be minimised - including underground electricity reticulation, burying tanks, sound proofing and planting.

Regards

Submitter Six:

**SUBMISSION OF JILL AND DAVID STONE, RATEPAYERS OF LAKE OHAU VILLAGE IN RELATION TO THE PROPOSED UPGRADE OF THE LAKE OHAU VILLAGE WATER SUPPLY**

**TO:** The Mayor and Councillors Waitaki District Council

**AND TO:** The CEO Waitaki District Council

**AND TO:** The newly appointed Independent Consultant

**DATE: 12 August 2019**

**INTRODUCTION**

As ratepayers and semi-permanent residents of Lake Ohau Village (“Village”) and property owners for 16 years we make this submission as individuals. The view of the majority of ratepayers is that the gravity-fed supply and the existing source of drinking water on adjacent private land and the precious legal rights guaranteeing that supply to the Village should remain. We support that view.

Nine options have been proposed by Council’s consultants. All require a new water supply in a new location reliant on unexplored bore water in questionable locations. All are dependent on pumps requiring uninterrupted power supply, the abandonment of a water ‘take’ not due to be reviewed until 2035 (16 years away) and the surrender of registered easements which are in favour of the residents of Lake Ohau Village as ratepayers of Waitaki District, to convey the water to the Village and have access to the existing infrastructure “forever”.

It would be prudent of Councillors and Council to avoid acting with haste based on flawed data and misleading assumptions, and thus unreliable conclusions, supplied to them by consultants. Poor advice from consultants, the veracity of which can easily be contested and refuted, will not ‘protect’ Councillors from an unwise decision made by them especially when a sensible and compliant alternative favoured by those who will ultimately pay most of the cost is available.

We propose a solution to the upgrade of the Village water supply that meets Council’s obligation to provide clean and safe drinking water to Lake Ohau Village. The solution is achievable, cost effective, scientifically sound, environmentally sensible and acceptable to Village ratepayers. It requires the least amount of work by Council and importantly complies with the Drinking Water Standards.

Our personal recommendation is based on research and fact not speculation and assumption. We ask that you give it fair and open-minded consideration.

**OVERVIEW**

The existing system was designed and constructed for the Village alone. Council’s consultants appear to want to allow for 20 or more connections in addition to connections to all the Village sections, yet the Village cannot expand. Perhaps there is another undisclosed reason? It is fair to say some suspicion surrounds the motives of the landowner whose land is subject to the easements and water ‘take’. That water right is highly likely to be renewed in 2035 given the importance of a public work providing potable water supply to a remote small community. Keep in mind that the land was purchased by the current owner in 2000 with ‘eyes wide open’. He well knew of the encumbrances on the land being the legal rights protecting the Village water supply. Is there more to the desire by Council’s consultants to move the water supply than to “*meet the Drinking Water Standards*”?

The Lake Ohau Alpine Village Residents and Ratepayers Association (“LOAVRRA”) has made a submission to Council proposing a temporary solution. We consider that solution is premature because of the lack of reliable data, it may not be feasible or as cost effective as hoped and it will be exposed to a subjective risk assessment by Council’s consultants because of the lack of confirmed detail. Rather the emphasis should be on Council



making an informed decision based on facts which can be established only by gathering reliable data. Facts are not subject to probability and subjective risk assessment.

The submission put forward by LOAVRRA is not on behalf of all Village ratepayers. Council wants to be seen to consult with a 'representative body' but in this instance LOAVRRA carries little weight as only 36 ratepayers are financial members. From the correspondence received from LOAVRRA, of the 36, there were 30 RRA ratepayers who approved of the submission in the recent survey. That is 22% of the 136 Village ratepayers. The submission does not have the support of 78% of Village ratepayers.

Regardless, what is not in contention is that the LOAVRRA submission and most Village ratepayers support retaining the existing water source and gravity-fed supply.

The decision on a final option for the Lake Ohau Village water upgrade is to be made by the Council Assets Committee on 27 August 2019. We understand an independent review is now being undertaken. Please ensure all our earlier correspondence and documents are made available to that reviewer.

## **OUR RECOMMENDATION**

**A major 'game-changer' to the water upgrade decision is the announcement 31 July 2019 by Government for transitional arrangements of up to five years to allow water suppliers to adjust to the regulations with support from a new dedicated regulator.**

**It would therefore be reasonable, pragmatic and prudent of WDC to defer any immediate decision in relation to the Ohau upgrade. Our recommendation is that nothing is done until the water is accurately measured for capacity, demand and quality and reliable data is available. Council now has time to research and then make an informed decision.**

**We propose a Phased Approach:**

- 1. Preparation of an approved Water Safety Plan.**
- 2. The multi-user connections (Lake Middleton campground and the school facility Avoca House) should immediately be put on restricted supply and charged by metering.**
- 3. The 'boiled water' notice stays in place until water treatment is installed.**
- 4. The existing storage tanks are cleaned.**
- 5. Flow meters and appropriate water sampling points are installed throughout the Village network.**
- 6. Reliable data is collected for water quality, capacity and consumption over a year to cover seasonal trends.**
- 7. During this time any leakages or contamination detected in the network by flow meter data can be repaired.**
- 8. Following analysis of water quality data obtained, an appropriate water treatment plant can be installed.**
- 9. Analysis of supply and demand will determine the need for household water meters to discourage overuse and restrictions on garden sprinklers during peak demand. As appropriate, convert all Village connections to on-demand.**
- 10. It is unlikely, but in the event that more capacity is required at peak times, a supplementary bore can be investigated.**

## **KEY ISSUES FOR CONSIDERATION**

### **1. Supply and demand**

Council asserts that "anecdotally", "*the stream (water source) is impacted by drought and unlikely to meet future demands from the village*". On the contrary, the stream has a very large catchment and

has never been impacted by drought, and the current scheme was designed to meet standard household consumption for all possible connections within the Village boundary. Villagers have never experienced inadequate supply of water.

Rather than rely on hearsay, Council can accurately measure capacity and consumption. Standard procedure would be for Council to install flow meters throughout the network and measure supply and demand over a year to cover seasonal variations. Analysis of measured flow data will confirm whether the supply is sufficient for all possible connections within the Village boundary as well as the existing extra connections outside the Village boundary.

Council is not required to allow for any connections outside the Village. However, it has permitted extra connections to Lake Middleton campground, Avoca House and at least one lifestyle block. To control over-consumptions outside the Village these multi-user connections should be put on restricted supply and metered. Council is not required to allow for 20 more sections as Council's consultants propose and should not. Increasing housing density or allowing further development is at odds with landscape values in this pristine environment.

Council has received a technical report by Steve Simmons of Detection Services Ltd. which analyses the capacity of the existing system and maximum forecast consumption. It concludes there is no need to abandon the existing supply because there is plenty of water for on-demand supply to all the sections inside the Village boundary. As well there is sufficient capacity for the extra connections Council has already allowed outside the village.

Although the water system was designed for on-demand supply, Council has introduced restricted supply to newer builds by means of a storage tank. The very few who overuse water by having sprinklers on much of the day need to wait for their tank to refill to restore their water supply. A more effective way to control potential household over-consumption is for all users to have on-demand supply with water meters to encourage economy and penalise overuse.

## 2. Water quality

No informed decision on treatment can be made until **reliable water testing** procedures are set up in an approved Water Safety Plan as required by the Department of Health and implemented, and water quality is monitored for at least a year (to cover seasonal variations) at source and at sample points throughout the network.

The historical data is unreliable because of the sampling location, the method of sampling and the sampling procedures:

- The same location has been used for the majority of samples. It is a dead end, a no-flow section and above ground where sediment can accumulate and the temperature in the pipe can increase. It appears the line is not flushed before taking a sample. The recorded temperature of samples fluctuates considerably more than would be expected in the network where the pipes are all underground.
- The Dept. of Health recommends random sampling at different locations in the network. It seems that there has only ever been one sampling location.
- There has never been any follow-up investigation and re-testing when E. coli levels are >1.
- There is inadequate documentation. For instance, it is known that the sample taken 28 June 2019 was from a tap inside the house at 44 Ohau Drive but that is not recorded. Such a location could result in abnormal readings which have little to do with the water quality in the network.

- Samples are not delivered to the laboratory until at least the day after the sample was taken. An article in the Oamaru Mail August 2, 2109 quotes Waitaki Mayor Gary Kircher that *“samples were not delivered to testing facilities during timeframes established under the Drinking- water Standards”*. Clearly a delay in delivery can affect the reliability of samples.

It would be safer for all holiday homes to have on-demand supply. At present, where there is infrequent occupation of houses presently on restricted supply there is potential for their tank water to deteriorate. To flush their water adequately they would need to empty the tank and wait for it to refill.

### **3. The absence of an alternative proven safe water supply.**

For Council to make a decision to abandon the existing supply when there is no alternative proven safe source would be irresponsible. It would be imprudent to spend money on drilling test bores unless and until the existing supply is proved to have insufficient capacity to meet the needs of the Village.

Council’s consultants have put forward a proposal for bores below the village beside the main road along the lakeside. Even the consultants have questioned whether there is an adequate protection zone at that location for Consent to be obtained. Further, bore water at that site will be affected by the fine glacial silt which frequently clouds adjacent Lake Ohau for lengthy periods. There is a risk of seepage from the sewage pond and contamination from runoff from the adjacent road and storm water from the village above.

Council’s consultants have hypothesised about potential bore sites immediately to the west of the village on private land. A landowner in the vicinity has drilled and was unable to find any source of suitable water.

### **4. Water protection zone**

Since 1991, legal protection of water quality and other aspects of source waters has been achieved under the Resource Management Act 1991 (“RMA”). Regional Councils have responsibility, under s30(1)(c) of the RMA, to control land use and issue Resource Consents in order to protect water quality within a catchment. Regional Plans, District Plans and Resource Consents under the RMA are designed to assist the management of source water quality. Environment Canterbury has rules for Water Protection Zones that control or prohibit certain land use activities within a specific distance of a surface water supply intake.

Council’s consultants are making a big deal of the cost of fencing the water protection zone because the landholder apparently proposes to run sheep. He actually wants to subdivide. The landowner will invalidate the Resource Consent and may be liable for fencing if he does introduce livestock. The part of the Water Protection Zone on Department of Conservation (“DOC”) land does not need to be fenced because DOC will not have livestock. The spring source of the Ohau water supply is already fenced.

Is the suggestion that the landowner is to *“run a few sheep”* a convenient assertion to worry Council into a rushed decision? At present he cannot because of the Water Protection Zone. Has he ever run stock on the land since buying the property in 2000? Is there another agenda?

Also, of concern is that the A2O trail slices right through the Water Protection Zone. The Consent for the water supply was issued before the A2O bike trail was constructed. Perhaps the Consent is now invalidated by the A2O bike trail. If so, DOC or Tourism Waitaki Limited may be responsible for fencing the section of the Alps to Ocean Trail which passes through the Water Protection Zone in order to limit human activity to the trail itself. An A2O picnic table beside Freehold Creek probably encourages bikers to take a ‘toilet stop’ in the vicinity.

## 5. Legality of the existing system

It was reported in the August 2019 Omarama Gazette that at the meeting of the Ahuriri Community Board 8 July, "*Councillor Dawson said the supply was "illegal" at present and there was "liability" as Councillors, because they had to ensure drinking water met the standards set*" (Emphasis added). Council Dawson is factually and legally wrong and his statement is mischievous and misleading.

Given the announcement 31 July 2019 by Government, transitional arrangements of **up to five years** can be made to allow water suppliers to adjust to the regulations, if necessary with support from the new dedicated regulator.

Throughout the consultation period various assertions have been made by Council's consultants as to the "legality" of the existing water supply. All were mostly incorrect and as a consequence misleading.

The facts are:

- The 35 year Consent for the existing water take expires in 2035. Renewal on expiry of an existing consent for an essential public utility for another 35 years is a matter of course.
- The existing easements on Edwards' land for the piping of water and human and vehicle access for maintenance to the supply are "forever".
- A water treatment plant is necessary maintenance. It is required by legislation. It could be installed within the existing easement with associated connection to the power line (which crosses the easement), transformer, underground cable and backup generator. The water treatment plant will contain equipment for continuous remote monitoring.

## 6. Why the urgency?

The consent for the existing supply has another 16 years to run (the 35 year Consent expires 2035). Its renewal would be almost certain given the reliance of a small remote community on what is an essential public utility, especially as the water will be treated appropriately.

Although the allocation of funds to upgrade is in Council's Annual Plan for 2019/2020, it would be prudent to defer implementation until an informed decision can be made based on reliable data.

As well, and of major importance, is the recent Government announcement (31 July), the effect of which is to take the pressure off Council and allow five years for compliance with the drinking- water regulations.

## PROPOSAL FOR A PHASED IMPLEMENTATION

1. Implement a **Water Safety Plan** as approved by the Department of Health.
2. **Restricted tank supply** should be installed immediately at **Lake Middleton campground and Avoca House** with **permanent meters** so that each is charged based on usage. This action is needed to measure and control consumption to ensure usage by these multiusers is not excessive, regardless of whatever water supply Council decides on. As the campground is classified as "standard", the Department of Conservation ('DOC') is not required to supply water on tap to the campground as lake water (from Lake Ohau) is nearby and available. DOC is not required to provide flushing toilets. Although no longer the responsibility of Council, the campground needs a total overhaul with removal of exotic wildings and pest plants (particularly broom and blackberry) and replacement with native species and upgraded vehicle access. It could be re-established as an eco-friendly prototype with sustainable facilities which could be a model for elsewhere in NZ, especially areas being provided for so called "Freedom" campers.
3. The **'boiled water' notice** would stay in place for at least a further 12 months until reliable data is gathered and a solution implemented. By comparison, if Council decided instead to investigate a bore solution there would likely be a longer delay because an uncertain number of test bores would need to be drilled and the water quality measured over a year as it could be subject to seasonal variations.

- It is also possible no suitable bore water will be found. A completely new infrastructure would be needed for bore water and changes would probably be required to the existing distribution network.
4. The **existing storage tanks** should be cleaned to remove sediment build-up over 35 years and repaired if needed. They are certainly not beyond repair. How much sediment is removed from the tanks needs to be measured and recorded. That will be a guide to how effective the infiltration gallery is and the turbidity of the source water. It is remarkable that the system has worked so well without any cleaning of the tanks or maintenance of the infiltration gallery in all the 35 years since commissioned.
  5. **Sampling points** need to be set up throughout the network for regular testing and analysis of water quality (as approved by the Department of Health) and similarly **flow meters** installed throughout the network to measure supply and demand. This will also be useful to locate where there are leakages and contamination in the network and should be undertaken whatever water supply Council decides on. The monitoring will need to be for at least 12 months to cover seasonal fluctuations.
  6. Progressively over the 12 months, based on the data collected, identify and record where leakages are occurring and where there is contamination in the network. Carry out (and record) maintenance to fix such problems detected.
  7. After 12 months **analyse** all the data collected:
    - Trends in turbidity, E. coli, total coliforms, pH, temperature, identifying where maintenance as above has improved the water quality
    - Water supply and consumption, identifying the effect of fixing leaks in the network
  8. Based on the analysis of the water quality, install **treatment** as required to meet the Drinking-water Standards for New Zealand 2005 (Revised 2018) (“DWSNZ”).

As an example of a compliant scheme in a comparable situation consider the Mt. Somers Water Supply. It is similar to that of Lake Ohau Village. Both are classified as “small supplies”; the source is shallow groundwater; both are gravity-fed and have an infiltration gallery. The *Mt Somers Water Safety Plan (attached)* was prepared in accordance with “*Small Drinking-water Supplies: Preparing a Water Safety Plan*”, Ministry of Health (2014). It provides an example of an appropriate water safety plan and the treatment installed to meet the DWSNZ. Treatment consists of cartridge filtration, UV disinfection, a turbidity meter, chlorine dosing and chlorine analyser. A standby power generator is installed onsite and is sufficient to operate the treatment plant in the event of power supply interruption. Mount Somers is connected to the district wide telemetry system.

A suitable treatment plant can be supplied by APEX Environmental Ltd. of Timaru (**attached APEX specification and APEX estimate**).

Connection to the power line, transformer, underground cable to an appropriate treatment plant (located between the infiltration gallery and the existing tanks), monitoring equipment and backup generator can be installed both practically and legally within the existing easement on Edwards’ land. It is “maintenance” of an essential utility which is required by law and is not new work.

9. Based on analysis of water supply and consumption, if needed install **household meters**, to encourage economy and penalise excessive usage, and restrict use of garden sprinklers. As appropriate, convert all Village connections to **on-demand**. The household storage tank water for those on restricted supply may be unsafe if the dwelling is occupied infrequently.
10. In the unlikely event that flow results indicate that more capacity is required at peak times, investigate the potential for a **supplementary bore**.

## CONCLUSION

Much time and resources have been expended by all parties to arrive at this point in the consultation process.

Fortuitously, in recent days central Government has given Council a reprieve. Council should take it, do the scientifically accurate testing and analysis of the current water supply and then and only then make an informed decision.

It should not be a surprise to Council that Village ratepayers are suspicious as to why they are being told by Councillor Dawson "*the water supply has to go*". At the 2017 AGM of LOAVRRA, Councillor Dawson suggested that the zoning for some land adjacent to the Village be changed from Rural to Residential to enable subdivision, and he asked "How would you like a coffee shop?".

It is no secret that Edwards considers the Village water supply will be off his land and that he intends to subdivide as he has personally admitted to two Village ratepayers in July this year. The compelling motivation to do so now is because the revised District Plan will increase the minimum lot size, restrict the ability to subdivide and likely take into account the effect on the landscape values of the Lake Ohau basin.

The "Gorilla in the Room" is that the landowner wants to subdivide and cannot do so as long as the existing supply arrangement remains.

The interests of 'other parties' should have no bearing whatsoever on the ultimate decision unless of course undertakings or lesser commitments have been given to certain parties. If that is so they must be voided as being immoral and in conflict with the interests of the ratepayers and consumers of the water. Council must act in good faith and with transparency and in the interests of ratepayers affected by the proposed upgrade.

Our **recommendation** is simple: retain the existing supply and defer any substantive and budgetary decisions until the full facts are known. Then install appropriate treatment for compliance.

END

David and Jill Stone

6 Huxley Terrace

Lake Ohau Village

Waitaki District

Postal:

Box 197

Twizel 7944

**Sent:** 18 July, 2019 12:29 PM

**Subject:** Lake Ohau Water Upgrade

Hello

Now as a courtesy to you as CEO we wish to update you on another matter concerning Lake Ohau Village, being the Water Upgrade project.

We met with \_\_\_\_\_ 11 July to discuss the issues. Below is the letter 12 July we sent to \_\_\_\_\_ following that meeting and a follow up letter 14 July and attached are the several relevant documents and Papers. Can we refer you particularly to the last three attachments.

Probably you will want to know what the emails and attachments 'boil-down' to. Briefly that is:

1. The Village ratepayers want to retain the existing water supply from Freehold Creek through the existing infrastructure.

2. There is no evidence that that the source of water is inadequate in terms of quality and quantity and the needs of the Village, i.e. consumption. All that is said in the Fluent Reports is either conjecture or unsupported assumptions.
3. Proper testing of the existing supply over at least one year is required to accurately measure quality, supply and demand.
4. Proper investigation and testing of the quality, quantity and viability of bore water (especially if proposed to be taken near Lake Ohau Road) is essential before any decision to abandon the existing source is considered but may be premature if the Phased Approach is adopted.
5. A solution exists that enables Council promptly to comply with the new Drinking Water Standards, namely the portable containerised APEX water treatment plant in use elsewhere in New Zealand (refer the last two attachments above).
6. The Village would like to see a Phased Approach (attached Water Upgrade Issues, see Issue 4) followed which incorporates the above and allows for the possibility of supplementary bore water.
7. There is increasing speculation as to why Council appears to want to abandon the rights it has over Don Edwards's land to the source and piping of good water to the Village, and what would then happen to that land.
8. The subject of the Ohau Upgrade should be deferred to a later meeting of the Assets Committee when reliable and professional sound evidence of the current water supply can be presented to Council and Village ratepayers, and in the meantime the APEX plant is installed.

Not quite in a 'nut-shell' but intended for you quickly to get to grips with the issue from our point of view and that of an ever growing number of ratepayers.

We see little point in dissecting all the options put up by Fluent. Rather we, that is \_\_\_\_ and I, are putting to you a pragmatic, compliant, environmentally sound, financially prudent and, frankly, sensible solution.

The issue about a landowners intentions is related and cannot be ignored. Council holds on behalf of the Village the rights to an exceptional water supply; it would be unwise for it to consider further to abandon that supply as it has in many of Fluent's options.

Your comments in reply would be welcome. How is it appropriate to have this relevant correspondence from us presented to all Councillors as part of the Papers to be considered by them prior to making a decision?

Regards

**Sent:** Sunday, 14 July 2019 6:45 PM

**Subject:** Lake Ohau Water Upgrade

Hello

The Water Upgrade Issues report emailed previously did not include all the references. The **complete report** is attached.

Please will you keep us in touch with what is happening to our request to you for the Ohau Water Upgrade decision to be delayed until the required data is obtained and an informed decision can be made?

The decision is the most significant in the history of the Ohau Village and is a matter of increasing concern to all Village ratepayers. Please can we have the courtesy of being personally kept informed of developments and advised of any proposed motion to be put to Councillors.

[This section omitted]

Regards

**Sent:** 12 July 2019 19:19

**Subject:** FW: Lake Ohau Village Water Upgrade - Addendum to yesterday's meeting

Apologies, an incomplete version of our email to you below was inadvertently sent to you a short while ago. The full and complete message to you appears below and with all attachments above. Regards.

**Sent:** 12 July 2019 19:10

**Subject:** Lake Ohau Village Water Upgrade - Addendum to yesterday's meeting

Hello

Thank you for meeting with us yesterday and listening to our Proposal for a Phased Approach to upgrade the current water supply to Lake Ohau Village **without** abandoning the existing water 'take', Infiltration Gallery, storage tanks (eight) and pipes.

Please will you take into account the following **additional** information:

1. The **fourth attached** document "APEX 2<sup>nd</sup> communication" is the APEX Ohau Water Treatment Plant Technical Specification including photos. It was received after the meeting with you. We handed to you APEX's first communication 5 July (the **fifth attachment** "Q190610 \_\_\_ Ohau WTP.PDF"). Reading the two together you have a cost estimate and specification for a treatment plant to comply with the Drinking-water Standards NZ. It is based on the historical water sample test results which should be updated.
2. The **third attached** document "Water Upgrade Issues" is our assessment of the issues and describes in Issue 4 (page 3) a portable treatment plant as part of the Proposal for a Phased Approach.
3. According to the memorandum in the "8 July 2019 Ahuriri Community Board Meeting" (**first attachment**), "The 'best' overall upgrade option will be brought to the 27 August meeting of Council's Assets Committee".

We ask that:

- a. The decision of the Assets Committee for a final solution is **deferred** until reliable water sample test data is obtained and factual information on capacity and consumption is available (by flow meter measurements at strategic points in the network). This information will take 12 months to gather because of seasonal variation.
  - b. Either any water treatment is deferred until a final solution is made, or an interim portable water treatment plant to meet the Drinking-water Standards. It could prove to be a **permanent** solution. The treatment plant could be located where the pipeline passes through [a neighbour property] The obvious initial step is to clean out for the first time the eight tanks which have been in operation since 1985.
4. The community should not be compelled to pay for an entirely new water scheme and without proof that the existing supply has insufficient capacity. All the bore options put



forward in the Fluent reports are hypothetical. Council and its consultants have no evidence that any proposed bore will be feasible and local knowledge indicates otherwise. How can a decision involving probably \$2m be made by Council without verifiable evidence supported by reliable data? For Council to do so would be an abuse of power and, frankly, irresponsible and negligent.

5. Our expectation as with all citizens is that a governing body will always act in the best interests of its constituents and in good faith. That does not appear to be occurring here given the misinformation that Council has allowed to flow (pun intended) from itself and from its consultant Fluent Infrastructure Solutions Ltd ("Fluent").
6. To allow an untested completely new system relying on an unexplored bore source of water to be foisted on a small community is irresponsible and unacceptable. To do so when there is no evidence that the existing supply is not fit for purpose would be contrary to common sense and good governance by Council.
7. The first 'Option' put forward in December 2018 by Council to all ratepayers wasn't an option at all. It was a unilateral bureaucratic decision purportedly based on a consultant's report assuming a (hypothetical) bore supply with two choices about on-demand/ restricted supply and chlorine/no chlorine. What followed after protest were seven variations on the original theme. Council is paying for questionable professional advice.
8. Finally Council listened (with one ear) to the Village's preferred Option (9) for an upgrade to the existing supply and that has been misconstrued and turned into 'abandonment' of the existing supply. A **comparison** of the Village Phased Approach Proposal with the Fluent Option 9 Memo is contained in the **second attachment** ("D&J comment on Fluent report (Option 9)").
9. The **third attachment** "Water Upgrade Issues" summarises the issues and describes the steps of the Phased Approach.

\_\_\_\_\_, for the reasons above and those expressed to you yesterday, this is a serious matter in a number of respects. It goes beyond merely the upgrade of a community water supply to meet the Drinking-water Standards NZ.

Please defer the matter being decided prematurely by Council by having it removed from the Agenda for the August 27 meeting, and have our Proposal for a Phased Approach independently and truthfully investigated in the interests of natural justice, i.e. the rule against bias and the right to a fair hearing. That is what the Village expects.

There has been too much time and money wasted on misdirected efforts looking at unresearched and impractical 'Options'.

Let's work together to get a solution that will work efficiently and economically for fifty years and more, and one that is within a realistic and fair budget for the affected ratepayers.

We personally remain ready to assist Council in any manner we can and to be a conduit to some Village ratepayers. The Association has 36 members out of 147 property owners. Contact with what probably is 'the silent majority' is essential before Council decides.

By the way it was a pleasure to meet you in person.

Regards



Mount Somers Water Supply  
Water Safety Plan





**Ashburton**  
DISTRICT COUNCIL

## Mount Somers Water Supply Water Safety Plan

*Version 2.0: June 2015*

Authorised by: \_\_\_\_\_

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Ashburton District Council

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Drinking Water Assessor

Review Date: May 2016




## Document Control

<b>Version No</b>	<b>Description</b>	<b>Authorised</b>	<b>Approval Date</b>
V1.0	Public Health Risk Management Plan 2008	AG	February 2008
V2.0	Water Safety Plan Rewrite	AG	June 2015

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# 1 Background

Ashburton District Council (ADC) own and manage the Mount Somers drinking water supply. Under the Health (Drinking Water) Amendment Act 2007 (the Act) water suppliers have a duty to prepare and implement Water Safety Plans (WSP), formerly Public Health Risk Management Plans (PHRMP) [Section 69Z].

The Act places a responsibility on Council to take all practicable steps to comply with the drinking water standards [Section 69V]. This requirement can be met in part by implementing the provisions of an approved Water Safety Plan that relate to the drinking water standards.

The purpose of a Water Safety Plan is to identify the public health risks associated with a drinking water supply. A Water Safety Plan identifies what could go wrong with a water supply and what measures can be put in place to prevent or eliminate the risk to public health.

Mount Somers is classified as a small supply under the legislation and is therefore required to be compliant with the Act by 01 July 2015. In 2008 the Ministry of Health (MoH) approved a PHRMP for Mount Somers.

The original PHRMP focused on identifying water quality and reliability of supply risks in need of attention. Since the approval of the 2008 PHRMP a significant upgrade has taken place. This WSP update has been prepared to ensure the risk information contained within the plan remains current and relevant.



## **2 Implementation, Review and Reporting**

### **2.1 Implementation of the Plan**

The Assets Manager is responsible for implementation of the WSP within the timeframes indicated, subject to community and Council approvals, funding constraints and availability of resources. The Assets Manager is also responsible for the ongoing review and updating of the WSP and associated Improvement Schedule.

### **2.2 Reviewing Plan Performance**

The WSP will be fully reviewed and updated at least every five years by the ADC Assets Manager in conjunction with Council Assets staff and Maintenance Contractor staff. If significant changes are made to the water supply during this time, the WSP will be reviewed and updated as appropriate.

The review will include an assessment of any events, non-compliances, near misses and unexpected situations that have occurred; progress against the improvement schedule; and any changes to any of the supply elements. Adjustments will be made to the plan as a result of information provided by this assessment.

### **2.3 Duration of the Plan**

This Plan shall remain in force for a period of up to five years following approval.

### **2.4 Revision and Re-approval of the Plan**

It is a requirement that the WSP be reviewed, revised and submitted for re-approval within five years of approval. During the five year period, the document will be kept current through the following steps:

- Collating comments from those regularly using the WSP and making any required changes;
- Monitoring customer complaints and making any required changes;
- Incorporating any minor changes that have been made to the water supply;
- Updating the risk tables as required;
- Updating the improvement schedule.

### **2.5 Links to other Quality Systems**

This Water Safety Plan will contribute improvement measures to the Activity Management Plan (AMP) for prioritisation and funding via the Long Term Plan (LTP).

### 3 Supply Details

<b>Supply</b>	
Supply Name	<i>Mount Somers</i>
WINZ Community Code	<i>MTS001</i>
Supply Owner	<i>Ashburton District Council</i>
Supply Manager	<i>Andrew Guthrie</i>
Supply Operator	<i>Ashburton Contracting Ltd – Robin Jenkinson (NZCE Civil, R.E.A.)</i>
Population Served by Supply	<i>260</i>
Supply Grading	<i>Uu</i>
<b>Source</b>	
Source Name	<i>Woolshed Creek</i>
Source WINZ Code	<i>S00219</i>
Location	<i>Confluence of Woolshed Creek and Stony Creek</i>
Map Reference	<i>NZMS 260 K36:7668-2371 NZTM X and Y: 1466680 - 5162071</i>
Type of Source	<i>Surface Water</i>
Depth of Bore	<i>N/A: Shallow infiltration gallery 4.0m below ground level</i>
Consent Number	<i>CRC022026</i>
Consent Expires	<i>15 July 2037</i>
Maximum Consented water take:	<i>4.9 l/s; 65,000m<sup>3</sup>/year</i>
<b>Treatment Plant</b>	
Treatment Plant Name	<i>Mount Somers</i>
Treatment Plant WINZ Code	<i>TP00329</i>
Location	<i>Ashburton Gorge Road</i>
Map Reference	<i>NZTM X and Y: 1470259 - 5160136</i>
Treatment Processes	<i>Chlorination, UV, Filtration</i>
Consented Volume	<i>65,000m<sup>3</sup></i>
Average Volume (2013/14)	<i>30,666m<sup>3</sup></i>
<b>Distribution</b>	
Distribution Zone Name	<i>Mount Somers Township</i>
Distribution Zone WINZ Code	<i>MTS001MS</i>
Distribution Zone Population	<i>260</i>

<b>Regulatory Compliance</b>	
Standards compliance assessed against	<i>DWSNZ 2005 (rev 2008)</i>
Laboratory undertaking analyses	<i>Ashburton District Council</i>
Secure bore water	<i>No</i>
Bacterial compliance criteria used for water leaving the treatment plant	<i>Criterion 1</i>
Bacterial compliance for water leaving the treatment plant has been achieved for the last 4 quarters.	<i>Yes</i>
Protozoa log removal requirement required for the supply	<i>Yet to be assigned</i>
Protozoa treatment process	<i>UV disinfection unit (Wedeco Spektron 50e) and Filtec 1micron cartridge filter</i>
Protozoa compliance for water leaving the treatment plant has been achieved for the last 4 quarters.	<i>No</i>
Compliance criteria used for water in the distribution zone.	<i>Criterion 6A</i>
Bacteria compliance for water in the distribution zone has been achieved for the last 4 quarters.	<i>Yes</i>
P2 determinands allocated to supply	<i>No</i>
Chemical compliance achieved for the last 4 quarters.	<i>Yes</i>
Cyanobacteria identified in the supply	<i>No</i>
Cyano bacterial compliance has been achieved for the last 4 quarters.	<i>N/A</i>
Identify any transgressions that have occurred in the last 4 quarters <i>Nil</i>	

### 3.1 Contact Details

#### Water Supply Owner:

Ashburton District Council  
 PO Box 94, Ashburton  
 Contact: Andrew Guthrie, Assets Manager  
 Phone: 03 307-7741

#### Water Supply Operator:

Ashburton Contracting Ltd  
 PO Box 264, Ashburton  
 Contact: Robin Jenkinson  
 Phone 03: 308-4039

## **4 Methodology**

This WSP has been prepared generally in accordance with “Small Drinking-water Supplies: Preparing a Water Safety Plan”, Ministry of Health (2014). This section of the WSP describes the approach taken to develop the plan and a brief overview of what is included.

### **4.1 System Description**

The water supply has been described and a schematic diagram prepared to illustrate the key elements of the supply (section 5). Critical points and barriers to contamination are also illustrated (Sections 7 and 8).

### **4.2 Consultation**

Version 1 of this plan was prepared in 2008 in consultation with Ashburton District Council water supply management and operational staff and in accordance with existing documentation.

A site visit with the Plant Operator took place on 7 October 2014. Critical points, barriers to contamination, risks to the supply, preventative measures in place, and monitoring requirements were discussed at this time and the information provided has been used to inform this WSP.

The Version 2.0 WSP draft was reviewed by and discussed with Ashburton District Council Assets Manager Andrew Guthrie and Robin Jenkinson of Ashburton Contracting Ltd prior to completion.

### **4.3 Risk Assessment**

A qualitative risk assessment approach has been taken following a similar approach to that outlined in Appendix 2 of “A Framework on How to Prepare and Develop Public Health Risk Management Plans for Drinking-water Supplies”, Ministry of Health (2014). This allows the prioritisation of improvement needs and development of the Improvement Schedule.

The scales used have been adapted slightly from those suggested in Appendix 2 of “A Framework on How to Prepare and Develop Public Health Risk Management Plans for Drinking-water Supplies”, Ministry of Health (2014).

Changes have been made to achieve a better spread of risk level outcomes, and to ensure relativity between the risks assessed for supplies of varying sizes. This is necessary as it is intended that Improvement Schedule items from individual supplies be consolidated into a master list for implementation. This is necessary as it is intended that improvement schedule items from individual supplies can be consolidated into a master list for implementation.

**Table 1 Likelihood Scale**

Likelihood	Frequency	Description
Likely	More than once per year	The threat can be expected to occur
Quite Common	Once per 1-5 years	The threat will quite commonly occur
Unlikely	Once per 5-10 years	The threat may occur occasionally
Unusual	Once per 10-50 years	The threat could infrequently occur
Rare	Less than once per 50 years	The threat may occur in exceptional circumstances

**Table 2 Consequence Scale**

Consequences	Microbiologically contaminated water	Chemically contaminated water	Supply interruption	Poor aesthetic water quality
Negligible		Minor chemical contamination event	Unplanned supply interruption for up to 8 hours	Poor aesthetic water quality of nuisance value only
Minor	Microbiological contamination (<100 population)	Recurrent chemical contamination (<100 population)	Unplanned supply interruption for in excess of 8 hours (<100 population)	
Medium	Microbiological contamination (100-500 population)	Recurrent chemical contamination (100-500 population)	Unplanned supply interruption for in excess of 8 hours (100-500 population)	Ongoing poor aesthetic water quality (may lead consumers to obtain water from other sources)
Major	Microbiological contamination (500-5000 population)	Recurrent chemical contamination (500-5000 population)	Unplanned supply interruption for in excess of 8 hours (500-5000 population)	
Substantial	Microbiological contamination (>5000 population)  OR high potential for loss of life or hospitalisation with life threatening or long-term consequences	Recurrent chemical contamination (>5000 population).  OR high potential for loss of life or hospitalisation with life threatening or long-term consequences.	Unplanned supply interruption for in excess of 8 hours (>5000 population)	

Potential public health risks have been evaluated using the Likelihood and Consequence scales tabulated above (Tables 1-2) to determine a risk level from low to extreme (Table 3 below).

**Table 3 Risk Level Allocation Table**

	Consequence				
Likelihood	Negligible	Minor	Medium	Major	Substantial
Likely	Low	Medium	Very High	Extreme	Extreme
Quite Common	Low	Medium	High	Very High	Extreme
Unlikely	Low	Medium	High	Very High	Very High
Unusual	Low	Low	Medium	High	Very High
Rare	Low	Low	Medium	Medium	High

Risk tables have been prepared to summarise:

- a) What could happen that may cause drinking water to become unsafe,
- b) What measures are in place to prevent this from occurring and whether this is sufficient,
- c) The assessed level of risk, and
- d) What could be done to eliminate, isolate or minimise the risks.

These full tables can be found in section 10.

#### 4.4 Improvement Schedule

An improvement schedule (section 11) has been derived from the risk tables and is prioritised according to the assessed level of public health risk associated with hazards that are not adequately controlled at present.

Improvement measures identified in this WSP will be carried forward to the next AMP and LTP for approval and inclusion in annual budgets following the statutory public consultation process. Implementation of the improvement schedule is ultimately subject to Council funding approval, and/or obtaining alternative funding.

#### 4.5 Benefits of Proposed Improvements

The proposed improvements will provide public health benefits by reducing the risk of adverse health outcomes associated with drinking water quality. In particular, risks will be reduced through the provision of water treatment systems that are appropriate to the raw water quality and catchment conditions, and that are compliant with the Drinking-water Standards for New Zealand.

The proposed improvements include preparing an Emergency Response Plan and ensuring all plant records and emergency response procedures are up to date and available onsite. Having these in place

will help Council and contracting staff to prepare for, manage, and respond to unforeseen situations in a timely and appropriate manner.

The adoption and implementation of a backflow prevention policy will help to mitigate the risk of backflow contamination and provide guidance on backflow prevention device requirements within the Ashburton District.

The proposed improvement schedule includes undertaking a criticality analysis, developing an Emergency Response Plan, and reviewing and maintaining Activity Management Plans and associated asset renewal programmes to minimise failures. Each of these will facilitate strategic planning and assist in guiding the overall management of the scheme.

#### **4.6 Contingency Plans**

Contingency plans have been prepared (section 12) to provide guidance in the event that control measures fail to prevent the occurrence of a risk event that may present acute risk to public health. The Water Supply Operator is responsible for implementation of the contingency plans when monitoring has identified the occurrence of a risk event.

## 5 General Description

Water is abstracted from an infiltration gallery located on the flood plain near the confluence of Stony and Woolshed Creeks. It is inferred that the shallow groundwater is recharged primarily from these surface water courses with the South Branch of the Ashburton River about 800m away.

Water is abstracted via an infiltration gallery. Water is conveyed by gravity to the Mount Somers Water Treatment Plant on Ashburton Gorge Road, approximately 4.2 km away. There are 103 properties connected to the Mount Somers water supply, with an approximate resident population of 260.

Vulnerable population groups include:

- Mt Somers Primary School
- Hotel/Café
- Tearooms/Dairy
- Camping ground

### 5.1 Plant Upgrade

A number of works have been carried out since the initial PHRMP. The trunk main into the township was duplicated with the addition of a new 150mm PVC-U pipeline, reservoir storage was increased from 65m<sup>3</sup> to 125m<sup>3</sup> to provide greater reliability, a standby generator was installed, and additional telemetry equipment commissioned to allow more effective monitoring of the site.

In 2013 the Mount Somers drinking water scheme was further upgraded. A new treatment plant building was constructed with cartridge filtration, UV disinfection, a turbidity meter, and two new booster pumps installed. During the 2013 upgrade improvements to the chlorine dosing system were made including the installation of a new storage tank and chlorine analyser.

### 5.2 Description of Source

The intake comprises two DN150mm perforated AC pipes, approximately 90m long, running in parallel between two manhole chambers. The pipes are reported to be buried at a depth of 4-5 metres below ground level. The water from the infiltration gallery flows through a predominantly DN100mm PVC trunkmain to the water treatment plant on Ashburton Gorge Road.

The surrounding rural catchment is largely agricultural land. There are several lime quarries in the area, some disused coal workings, and typical hill country agricultural activities. Overall, the upper catchment poses a low risk to the water supply. The greatest potential for contamination would appear to be land-use activities in the immediate vicinity of the intake.

A temporary alternative supply was established during the dry summer months of 2003/04 when insufficient water was able to be abstracted from the gallery. A privately owned shallow bore (Acland bore) near the gallery was used to pump into a 5,000 litre tank connected to the raw water trunk main.



The Acland bore remains available as an emergency source of water however the capacity is very limited. A flow of roughly 1.8 L/s is able to be maintained to provide a life line supply. The bore is regularly (approximately monthly) given a test run by the Plant Operator. The operation procedure for utilising the bore is kept at the treatment plant.

The Acland bore is not currently included in the water quality monitoring programme and the bore does not appear to have a water permit to take water. The improvement schedule in this WSP includes formalising the use of this bore.

Figure 1 (below) illustrates the Mount Somers water supply from source to reticulation.

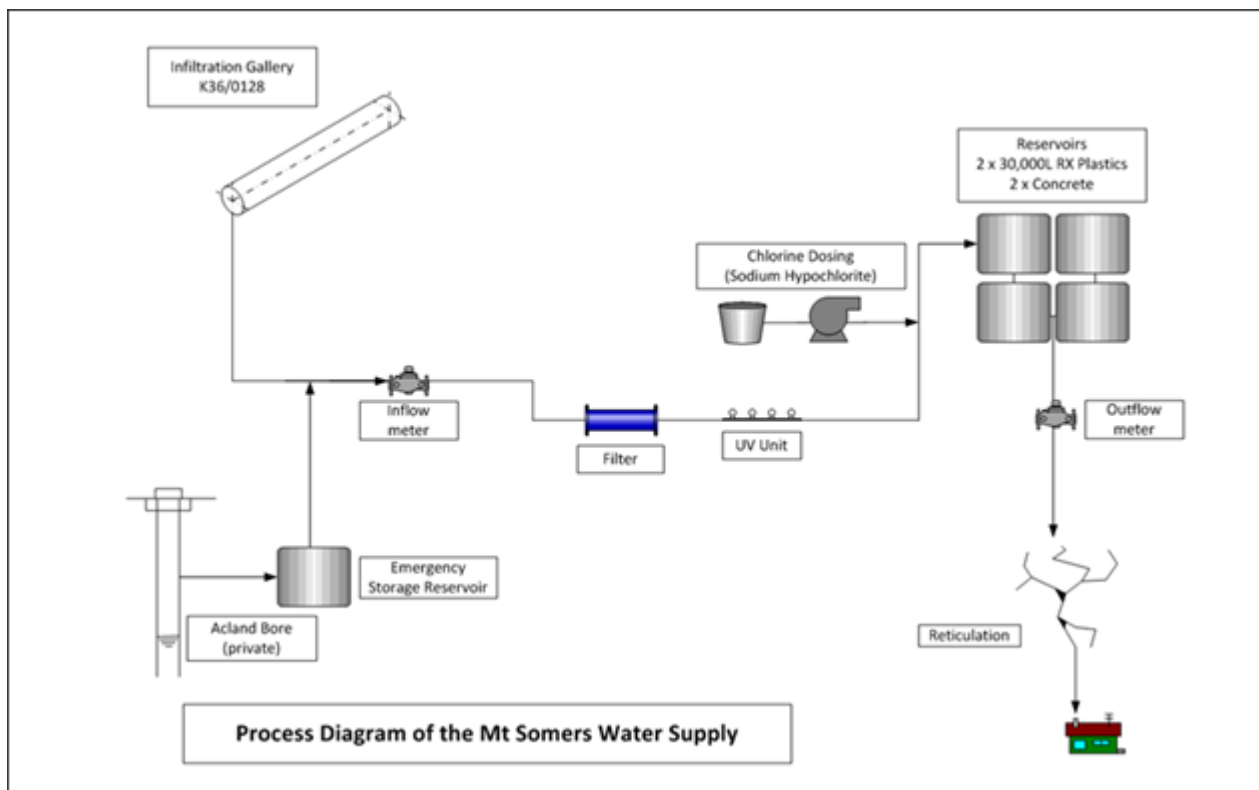


Figure 1: Mount Somers Water Supply Process Diagram

### 5.3 Treatment and Distribution

To address the risk of protozoa contamination, filtration and UV disinfection equipment was installed as part of the 2013 upgrade. Water passes through the 1 micron cartridge filter and Wedeco UV unit before being chlorinated with sodium hypochlorite.

Treated water is stored in three of the four reservoirs which supply the distribution zone. The fourth reservoir has been decommissioned and is no longer in use. As this is a gravity system, supply pressure is maintained from the storage tanks.

A standby power generator is installed onsite and is sufficient to operate the treatment plant in the event of power supply interruption.

## **5.4 Monitoring and Alarms**

Water quality monitoring is carried out by the Ashburton District Council Environmental Monitoring staff in accordance with the Drinking Water Standards for New Zealand 2005 (revised 2008) (DWSNZ). Raw and treated water can be sampled at the treatment plant. Zone samples are taken at the distribution sample bollard located on Tramway Road.

E.coli, turbidity, free available chlorine (FAC), and pH are sampled weekly at the treatment plant and monthly in the distribution zone (Tramway Road). Monthly nitrate monitoring is also carried out at the treatment plant.

Mount Somers is connected to the district wide telemetry system. SCADA is used to report power failure, booster pump fault, generator run/fault, cartridge filter fault, UV intensity warning, high and low chlorine residual, high and low reservoir level, and high turbidity to the operator by alarms.

SCADA also records booster pumps on/off, pump run hours, sodium hypochlorite tank level, fluoride tank high and low level, system pressure, filtration differential pressure, totalised flows, reservoir level and turbidity. Figure 2 over the page provides a screenshot of the information recorded in the SCADA system.

## **5.5 Maintenance and Administration**

Mount Somers water supply is owned and managed by the Ashburton District Council. The scheme is administered at the main council offices in Baring Square West, Ashburton. The supply is operated and maintained by Council's utilities contractor Ashburton Contracting Ltd (ACL).

Qualified field staff are appointed to operate and maintain the plant. The personnel involved in the day to-day management and operation of the water scheme are adequately trained and qualified. ACL and Council staff involved in the operation of the plant undertake on-going training.

State	Equipment Name	Point Name	Value	Units	Notes Available	Output	I/O Point Reference
	Site	Comms Usage Today (%)	2.05	%			
	Site	Last Comms	2014-09-22 13:3				
	Site	Comms Usage Yesterday (%)	2.04	%			
NML	Site	Critical Instrument Fault Alarm	0				RDI 46
NML	Site	DC Power Supply Fault	0				RDI 37
	Site	DLP Version	0	????			NAI 3
NML	Site	Generator Fault	0				RDI 36
NML	Site	Generator Running	0				RDI 24
NML	Site	Power Fail	0				RDI 35
NML	Site	UPS Fault	0				RDI 38
	Reservoir	Level	89	%			RAI 1
	Reservoir	Level PLC	89	%			RAI 8
NML	Reservoir	High Level	0				NDI 2
NML	Reservoir	High Level PLC	0				RDI 47
	Reservoir	High Level SP	99	%			NAO 2
NML	Reservoir	Low Level	0				NDI 3
NML	Reservoir	Low Level PLC	0				RDI 48
	Reservoir	Low Level SP	70	%			NAO 3
	Chlorine	Residual	0.67	mg/L			RAI 15
NML	Chlorine	Residual High	0				RDI 40
	Chlorine	Residual High SP	1.9	????			NAO 4
NML	Chlorine	Residual Low	0				RDI 39
	Chlorine	Residual Low SP	0.3	????			NAO 5
NML	Chlorine	Tank Level	290	L			RAI 18
	Chlorine	Tank Low Level	0				RDI 42
	Chlorine	Used Today	3	L			RAI 25
ON	Booster Pump 1	Auto	1				RDI 10
NML	Booster Pump 1	Fault	0				RDI 30
	Booster Pump 1	Hours Run	????	Hours			
	Booster Pump 1	HoursLast2	0				
	Booster Pump 1	HoursLast24	0	Hours			
OFF	Booster Pump 1	Run	0				RDI 9
	Booster Pump 1	Speed	0	Hz			RAI 16
	Booster Pump 1	Starts	0	Starts			
	Booster Pump 1	StartsLast2	1				
	Booster Pump 1	StartsLast24	1	Starts			
	Booster Pump 1	Weekly Run Hours	0	Hrs			RAI 23
ON	Booster Pump 2	Auto	1				RDI 13
NML	Booster Pump 2	Fault	0				RDI 31
	Booster Pump 2	Hours Run	0.06	Hours			
	Booster Pump 2	HoursLast2	0.1				
	Booster Pump 2	HoursLast24	0.1	Hours			
OFF	Booster Pump 2	Run	0				RDI 12
	Booster Pump 2	Speed	0	Hz			RAI 17
	Booster Pump 2	Starts	0	Starts			
	Booster Pump 2	StartsLast2	1				
	Booster Pump 2	StartsLast24	1	Starts			
	Booster Pump 2	Weekly Run Hours	0	Hrs			RAI 24
NML	Booster Pumps	Low Flow Fault	0				RDI 32
NML	Cartridge Filter	Differential Pressure	0	kPa			RAI 13
NML	Cartridge Filter	Differential Pressure High Fault	0				RDI 34
NML	Cartridge Filter	Differential Pressure High Warning	0				RDI 33
	Flows	Reservoir Outflow	1.1	L/s			RAI 12
NML	Inlet Valve	Actuator Fault	0				RDI 28
ON	Inlet Valve	Closed	1				RDI 19
OFF	Inlet Valve	Opened	0				RDI 18
OFF	Plant	Auto	0				RDI 16
	Plant	Flow	0	l/s			RAI 11
ON	Plant	Manual	1				RDI 17
OFF	Plant	Required to Run	0				RDI 14
NML	PLC	Comms Link Fail	0				NDI 6
	Totalised Flow	Plant Flow Yesterday	16930	CuM			RAI 28
	Totalised Flow	Plant Weekly Flow Total	16772	CuM			RAI 20
	Totalised Flow	Reservoir Outflow Yesterday	69	CuM			RAI 29
	Totalised Flow	Reservoir Weekly Outflow Total	551	CuM			RAI 21
	Totalised Flow	Supply Weekly Flow Total	0	CuM			RAI 19
NML	Turbidity	High Alarm	0				RDI 25
	Turbidity	Turbidity - Raw	0.15	NTU			RAI 9
	Turbidity	Turbidity - Treated	0.09	NTU			RAI 10
	UV	Intensity	0	l/m <sup>2</sup>			RAI 7
NML	UV	Lamp Hours High Alarm	0				RDI 27
	UV	Lamp Run Hours	2424	Hours			RAI 22
NML	UV	System Fault	0				RDI 26
ON	UV	System Operating	1				RDI 22
	UV	TEST - Target Intensity	0	l/m <sup>2</sup>			RAI 11
NML	UV	UV Intensity Warning	0				RDI 29
OFF	UV	UV Ready	0				RDI 20
NML	UV	UV Warning	0				RDI 15

Figure 2: SCADA Monitoring and Alarms

6 Water Supply Catchment and Distribution Maps

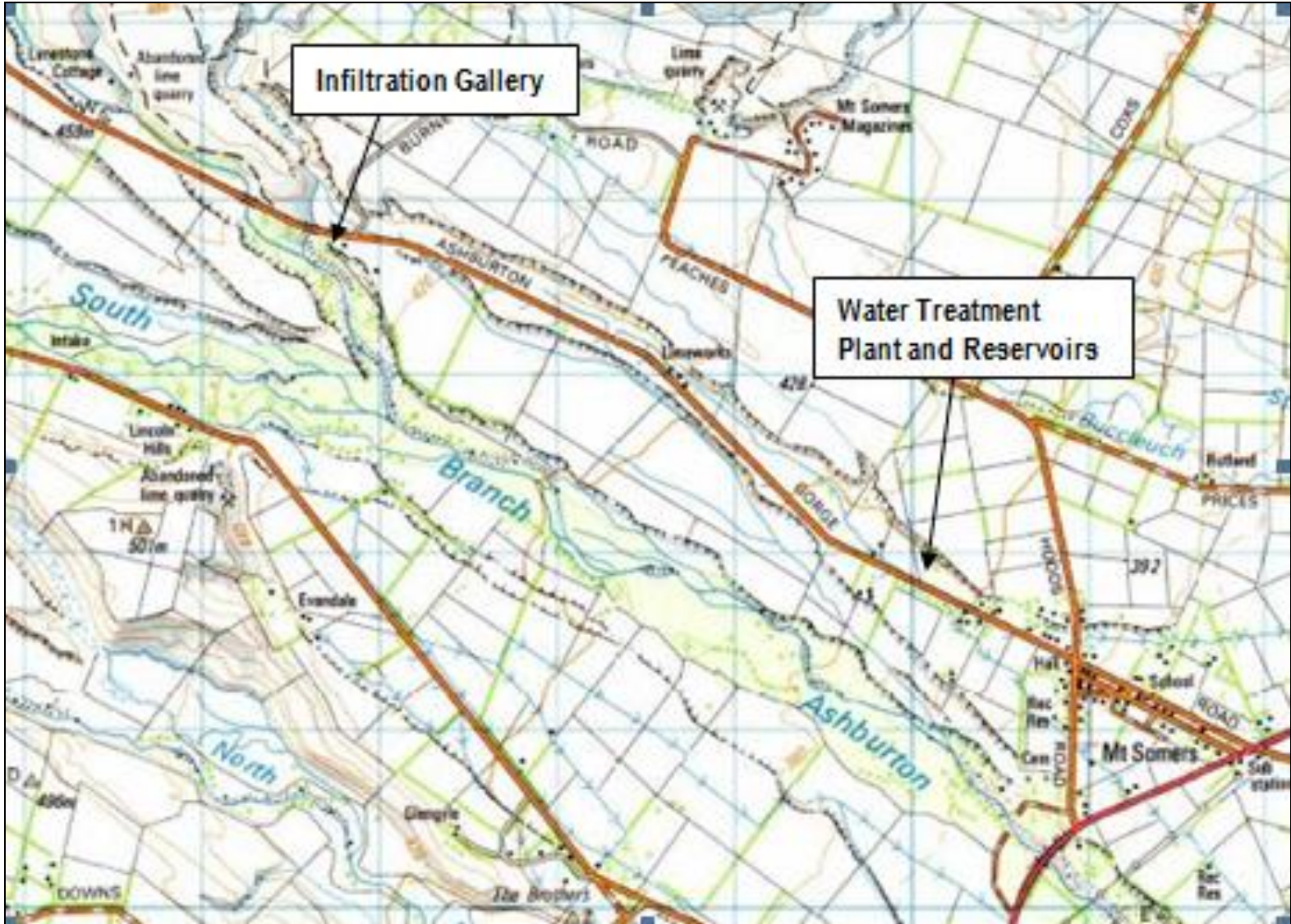


Figure 3: Mount Somers Water Supply Location



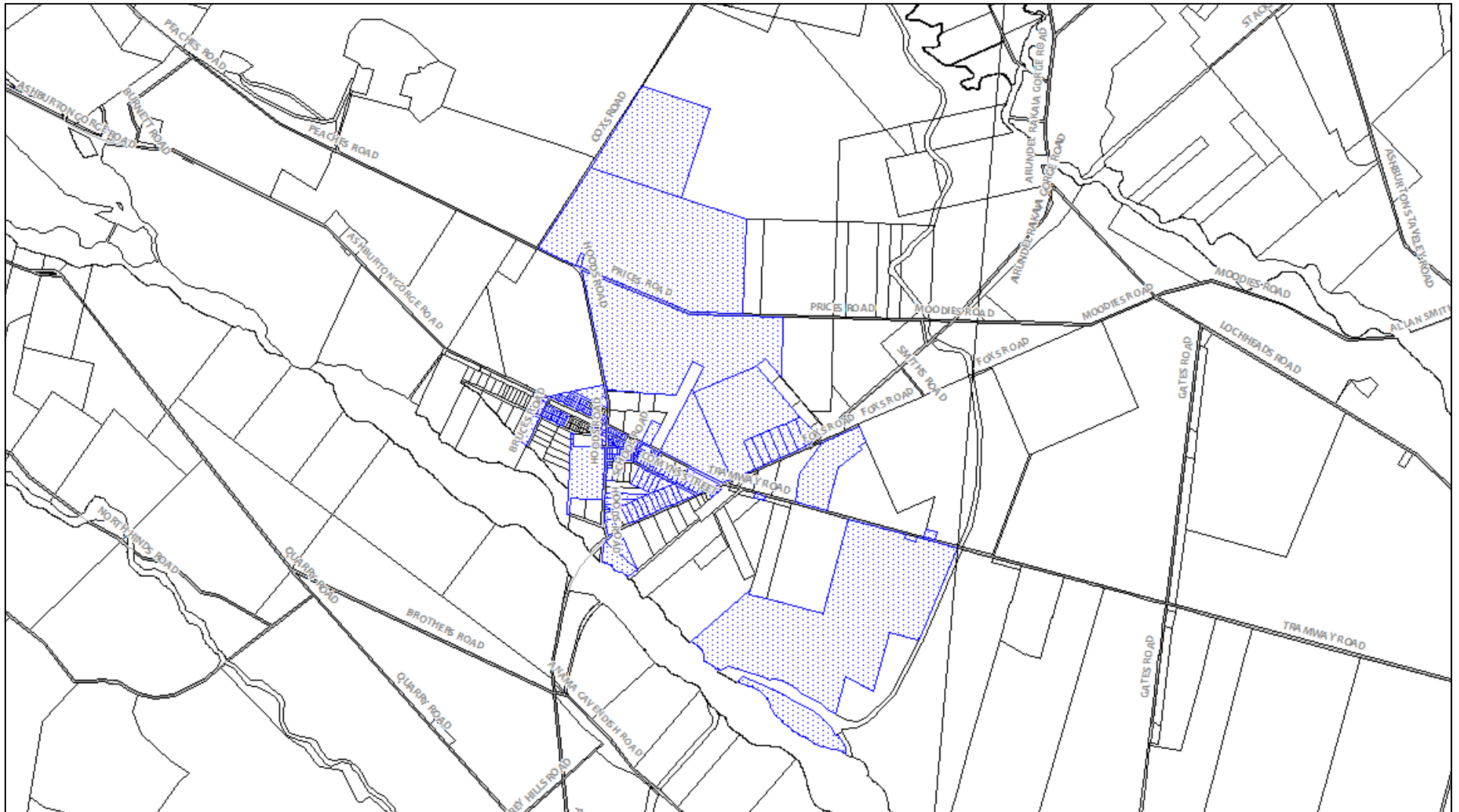


Figure 4: Distribution Map

## 7 Critical Points for Hazard Management

Figure 5 (over the page) presents a schematic of the water supply from source to consumer. Critical points, where hazards can be eliminated, minimised or isolated are indicated in blue. Barriers to contamination are indicated in red.

**Critical points** where hazards can be eliminated, minimised or isolated are tabulated below.

Critical Point	Description
Catchment	<i>A contamination event in the catchment may make water unsuitable for treatment</i>
Intake	<i>Intake failure means eventual loss of supply</i>
Chlorine dosing	<i>Failure may result in a lack of bacterial and viral control Overdosing may exceed chemical MAV</i>
UV disinfection and filtration	<i>Failure may result in a lack of protozoan control</i>
Treated water storage	<i>Possible point for microbiological contamination</i>

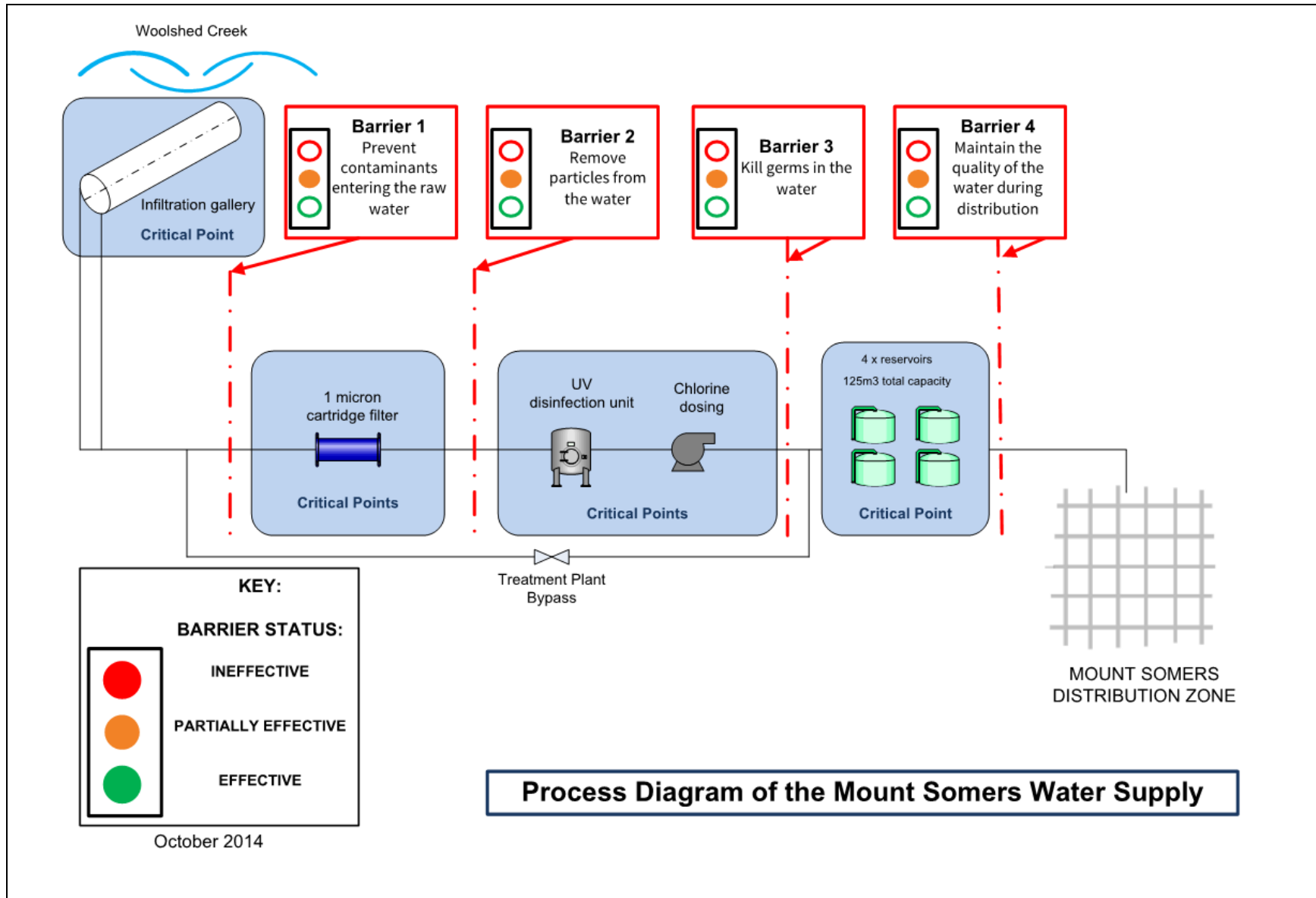


Figure 4: Mount Somers Water Supply Schematic

## 8 Barriers to Contamination

The following section discusses what barriers are in place to reduce the risk to public health from the Mount Somers drinking water supply. A Framework on How to Prepare and Develop Water Safety Plans for Drinking-water Supplies by the Ministry of Health (2014) states the barriers should:

- Prevent contaminants entering the raw water
- Remove particles from the water
- Kill germs in the water
- Maintain the quality of the water during distribution

### 8.1 Prevent Contaminants from Entering the Raw Water

Shallow groundwater typically has lower concentrations of suspended solids and microbiological contamination than surface water. The alluvial river gravels provide a level of natural filtration prior to abstraction via the gallery. A clay sanitary seal along the intake pipeline provides an effective physical barrier against contamination.

Some protection is provided by the Land and Water Regional Plan (LWRP), as the infiltration gallery is regarded as a community drinking water supply under Section 16, Schedule 1. This means that a community drinking water supply protection zone applies, restricting and in some cases prohibiting some activities within a specified distance of the gallery. This includes activities such as stormwater discharge, on-site wastewater treatment/disposal devices, and discharge of agrichemicals.

The source and gallery therefore provides a partial barrier to contamination. Full protection of this catchment, including elimination of agricultural activities and restricted access is not considered feasible. A catchment risk categorisation survey is yet to be completed for the Mount Somers scheme.

### 8.2 Remove particles from the water

The surface watercourses are subject to periods of high turbidity following rainfall in the catchment. Filtration through the river gravels at the intake is believed to be reasonably effective at removing suspended solids, but it can be assumed that the raw water delivered to the treatment plant will have elevated turbidity on occasion.

In 2014 the average turbidity value of treated water recorded at the treatment plant and in the distribution zone was 0.19NTU. The maximum values were recorded in April 2014 following a period of heavy rainfall. The maximum value at the treatment plant was 1.22NTU and 0.54NTU in the distribution zone. The minimum values recorded were 0.07NTU at the treatment plant and 0.08NTU in the distribution zone.

The cartridge filter installed as part of the 2013 upgrade removes sediment from the raw water prior to the UV and chlorine treatment. This filter further enhances the partial barrier and will contribute to protozoa compliance once the log credit requirement has been assigned.



### **8.3 Kill germs in the water**

The treatment plant uses chlorination and a Wedeco Spektron 50e UV unit to disinfect the water. UVT is measured at the plant, which the Plant Operator monitors and records during routine inspections. UV intensity is continuously monitored and there is a power failure alarm for the site which indicates that the UV along with other onsite equipment is not functional.

There is a high turbidity alarm which alerts the Plant Operator that a turbidity event is occurring and that the UV unit may not be working to its full capacity.

The UV unit run hours are monitored and the UV lamps are replaced every 14,000 hours. At the same time the quartz sleeves and sensor are cleaned and inspected. This procedure is well documented and is in accordance with the manufacturer's recommendations.

Chlorination and UV disinfection further enhance the partial barrier to contamination.

### **8.4 Maintain the quality of the water during distribution**

The water supplied is dosed with sodium hypochlorite to ensure there is a residual available to protect against microbiological contamination throughout the system.

#### **Reservoir**

The reservoirs are located within a locked fence. The reservoirs have high level inlets and low level outlets to promote circulation to ensure water does not remain in the reservoirs for extended periods of time. The reservoirs are covered to prevent unauthorised access and ingress of contaminants or rainwater.

#### **Emergency Generator**

Power supply to the site is usually reliable but storm and snow events may result in localised or widespread power outages in this area. The gravity supply of raw water is not interrupted by a power supply failure, however, the disinfection dosing pump will not operate so untreated could be delivered to the distribution zone. A standby generator is located onsite to maintain a treated supply in the event of power failure.

#### **Maintenance and Training**

Hygiene procedures are documented and followed for all distribution system maintenance. The personnel involved with the operation and maintenance of the plant are all trained and experienced.

## 8.5 General

Access to the Mount Somers water supply components is restricted. The gallery, treatment plant, and reservoirs are all located in fenced compounds. The building housing the treatment equipment and the chemical shed are both clean and locked.

New connections are fitted with a backflow prevention device. Together these measures contribute to the provision of a partial barrier against contamination.

## 9 Photographs of supply elements



**Photo 1:** Intake gallery manholes inside locked compound



**Photo 2:** Intake gallery fenced compound with far manhole in the distance





**Photo 3:** Treatment plant and generator



**Photo 4:** Chlorine dosing shed



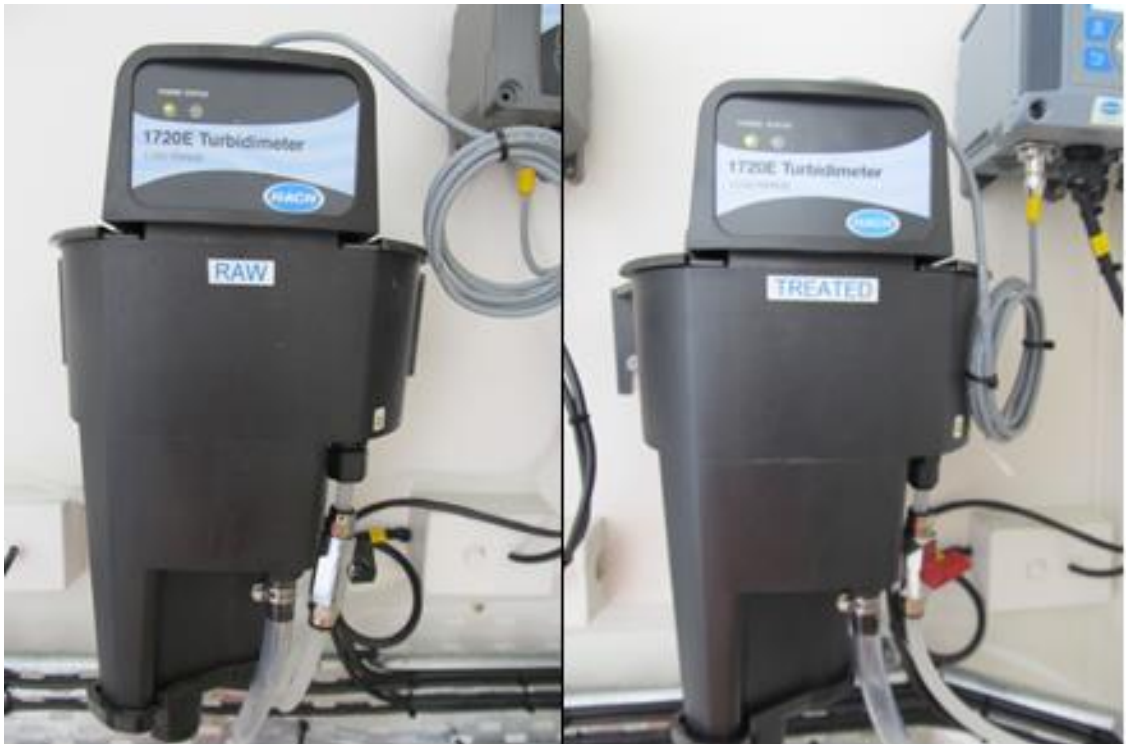
**Photo 5:** Booster pumps



**Photo 6:** Inflow and outflow meters



**Photo 7:** UV and filtration units



**Photo 8:** Raw and treated water turbidity meters





**Photo 9:** UV display unit



**Photo 10:** Chlorine tank



**Photo 11:** Chlorine analyser



**Photo 12:** Sampling taps





**Photo 13:** Control Panel



**Photo 14:** Reservoirs

## 10 Risk Tables

### 10.1 Risk Assessment Worksheet – Catchment and Intake

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			<i>What could be done to improve?</i>
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control and/or Identify Risk Event	Controlled? Yes / No / Partial	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
C1	Bacterial or protozoal contamination in catchment	Unprotected catchment surface water – humans, livestock, septic tanks, agricultural activities, surface runoff, etc.	<p>Alluvial river gravels provide a certain degree of filtration.</p> <p>Raw water turbidity is continuously monitored.</p> <p>Chlorine, UV disinfection and filtration used to treat water.</p> <p>Mount Somers now included in the annual basic water chemistry testing.</p>	Partial	Unlikely	Medium	Medium	<p>Ongoing liaison with adjacent landowners to raise/maintain awareness of catchment protection.</p> <p>Encourage best practice agricultural activities and riparian management.</p>

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			<i>What could be done to improve?</i>
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control and/or Identify Risk Event	Controlled? Yes / No / Partial	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
C2	Chemical contamination in catchment	Unprotected catchment surface water – agrichemicals, surface runoff, etc.	Alluvial river gravels provide a certain degree of filtration.  Community drinking water supply protection zone under NRRP / LWRP.	Partial	Unlikely	Medium	Medium	Complete catchment assessment and have log credit requirement assigned.  Encourage best practice agricultural activities and riparian management.  Ongoing liaison with adjacent landowners to raise/maintain awareness of catchment protection.  Use the Ministry of Health ‘Priority 2 Determinand Identification Guide September 2012’ to determine if there are any other chemical risks, e.g. disinfection by-products.

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			<i>What could be done to improve?</i>
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control and/or Identify Risk Event	Controlled? Yes / No / Partial	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
C3	Contamination of source water	Contaminant entry via intake structure.	Sanitary seal over infiltration gallery.  Gallery area fenced and stock excluded.  Intake structure is secured against bird/vermin entry and unauthorised access.  Intake structure is inspected fortnightly.	Partial	Unlikely	Medium	Medium	Ensure all manholes are locked and/or adequately secured.
C4	Insufficient water available	Drought, low river levels.	Fortnightly intake water level monitoring.  Demand management when intake level is low.	Partial	Quite common	Medium	High	Review need for increased demand management.
C5	Insufficient water available	Damage to intake structures – natural hazards, e.g. flooding, earthquakes.	Acland bore available as an alternative source.	No	Unusual	Medium	Medium	Investigate resilience of plant to natural hazards.  Develop Emergency Response Plan and implement if water supply cannot be maintained.

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			<i>What could be done to improve?</i>
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control and/or Identify Risk Event	Controlled? Yes / No / Partial	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
C6	Insufficient water available	Damage to intake structures – vandalism.	Intake structure is secured against unauthorised access and is not situated in a location prone to vandalism.	Yes				
C7	Insufficient water available	Intake pump failure or power supply interruption.	N/A - No intake pump. Gravity supply from intake.	Yes				
C8	Insufficient water available	Intake failure – deterioration of the infiltration gallery and/or the supply pipelines.	Monitoring flows to treatment plant.	No	Unusual	Medium	Medium	Review and maintain Activity Management Plans and associated asset renewal programmes to minimise failures.
C9	Insufficient water available	Raw water trunk main failure.	Duplicate mains allow supply to be maintained if one of the mains is out of service.	Partial	Unusual	Medium	Medium	As above.

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			<i>What could be done to improve?</i>
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control and/or Identify Risk Event	Controlled? Yes / No / Partial	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
C10	Insufficient water available	Drought conditions, gallery runs dry.	Acland bore available as an alternative source.	Partial	Unlikely	Medium	High	<p>Formalise the use of the Acland bore (water quality monitoring, resource consent, establish protocols for implementation, operation procedure).</p> <p>Investigate alternative source.</p> <p>Investigate resilience of plant to natural hazards.</p> <p>Develop Emergency Response Plan and implement if water supply cannot be maintained.</p>
C11	Contamination of source water	Contaminant entry via raw water trunk mains (air valves).	Partially effective downstream disinfection barrier.	Partial	Unusual	Medium	Medium	Regularly inspect air valves and undertake remedial works as required to address potential backflow issues.

10.2 Risk Assessment Worksheet – Treatment

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
T1	Inadequate disinfection (not enough free available chlorine)	Dosing pump malfunction, control system malfunction, or power supply interruption.	Standby power generation.  Power failure SCADA alarm.  Routine checks and inspections.  FAC monitoring (SCADA value and alarm).  E. coli monitoring.  UV disinfection and filtration provided in addition to chlorination.	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
<b>Ref</b>	<b>Risk Event</b>	<b>Potential Cause of Risk Event</b>	<b>Measures in Place to Control Risk Event</b>	<b>Controlled? Yes / No</b>	<b>Likelihood of Risk Event</b>	<b>Consequences of Risk Event</b>	<b>Risk Level, Urgent Attention Required?</b>	<b>Additional Measures to Control Risk Event</b>
T2	Inadequate disinfection (not enough free available chlorine)	Incorrect dose rate or solution strength too low or run out of chlorine solution.	Routine checks and inspections. Sodium hypochlorite solution delivered by reputable supplier. FAC value and alarms recorded on SCADA. Chlorine tank low level alarm on SCADA. UV disinfection and filtration provided in addition to chlorination.	Yes				



<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
T3	Inadequate disinfection (not enough free available chlorine)	High chlorine demand as a result of high turbidity.	Turbidity monitoring (SCADA alarm) prompts manual dose rate adjustment.  FAC monitoring (SCADA value and alarm).  UV disinfection and filtration provided in addition to chlorination.	Yes				
T4	Inadequate disinfection (not enough free available chlorine)	Short-circuiting through reservoir reducing contact time.	High level inlet, low level outlet.  FAC monitored on telemetry. Low FAC alarm on SCADA.  E. coli monitoring.  UV disinfection and filtration provided in addition to chlorination.	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
T5	Over-chlorination (too much free available chlorine)	Dosing pump or control system malfunction.	Chlorine analyser installed onsite.  FAC monitoring (SCADA value and alarm).  Regular FAC sampling undertaken by ADC staff.  FAC equipment routinely calibrated.	Yes				
T6	Over-chlorination (too much free available chlorine)	Incorrect dose rate or solution strength too high.	Sodium hypochlorite dose rate is flow paced at a ratio of 1:6.  High FAC alarm on SCADA.  Sodium hypochlorite solution delivered by reputable supplier.  Instructions for refilling the chlorine solution are on site.	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
T7	Failure to remove chemical contaminants from raw water	Treatment system inadequate.	No known chemicals in source water (i.e. no official P2 determinands).  Mount Somers source water is included in the annual basic water chemistry testing.	No	Unusual	Medium	Medium	Use the Ministry of Health 'Priority 2 Determinand Identification Guide September 2012' to determine if there are any other chemical risks, e.g. disinfection by-products.
T8	Inadequate protozoa removal/inactivation	Treatment system inadequate.	UV disinfection and filtration systems in place.  Manual UVT checks.	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
T9	Inadequate protozoa removal/inactivation	UV system malfunction, bulb/ballast failure, control system malfunction, or power supply interruption.	Routine checks, inspections, cleaning and lamp replacement in accordance with manufacturer's recommendations.  Standby power generation.  Power failure SCADA alarm.  Manual UVT checks.  UV dose recorded on SCADA.	Partial	Unlikely	Medium	Medium	Investigate resilience of plant to natural hazards.  Develop Emergency Response Plan and implement if drinking water standards cannot be met.
T10	Inadequate protozoa removal/inactivation	High turbidity (low UVT).	Filtration unit installed.  Manual UVT checks.  UV dose recorded on SCADA.	Partial	Unlikely	Medium	Medium	Investigate resilience of plant to natural hazards.  Develop Emergency Response Plan and implement if drinking water standards cannot be met.

### 10.3 Risk Assessment Worksheet – Storage and Distribution

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
S1	Stored water quality deterioration	Inadequate reservoir turnover	All reservoirs have high level inlets and low level outlets.  Less than one day's storage in reservoir.	Yes				
S2	Introduction of contaminants into the distribution system	Contamination via storage reservoir – bird/vermin entry, roof runoff, unauthorised access.	Reservoirs covered and locked.  Reservoirs inspected weekly.  Chlorine residual maintained in system.	Partial	Unusual	Medium	Medium	Lock the access ladder on large reservoir.
S3	Introduction of contaminants into the distribution system	Backflow from customer connections.	Chlorine residual maintained in system.  New connections are examined against the ADC backflow prevention policy.	Partial	Unusual	Medium	Medium	Adopt and implement backflow prevention policy for customer connections.

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
S4	Introduction of contaminants into the distribution system	Operation and maintenance activities.	Operators follow documented hygiene procedures to minimise risk.  Chlorine residual maintained in system.	Yes				
S5	Introduction of contaminants into the distribution system	Pressure fluctuation resulting in negative pressures.	Pressure fluctuations unlikely to occur in this gravity supply system.	Partial	Unusual	Medium	Medium	Regularly inspect air valves and undertake remedial works as required to address potential backflow issues.
S6	Introduction of contaminants into the distribution system	Pipe materials, age and condition, plumbosolvency.	Customers are notified of plumbosolvency twice per year as required by DWSNZ.  Activity Management Plans and associated asset renewal programmes in place.	Partial	Unusual	Medium	Medium	Review and maintain activity management plans and associated asset renewal programmes to minimise deterioration.

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
S7	Insufficient water	Reservoir or water main failure.	<p>Three reservoirs and duplicate mains provides some redundancy.</p> <p>The reservoirs are inspected weekly.</p> <p>The reservoir levels are monitored.</p> <p>Shutdowns are managed to avoid pressure surges and undue damage to the existing mains.</p>	Partial	Unusual	Medium	Medium	<p>Implement and use Asset Management System (AMS) for programming and monitoring regular maintenance and inspection/monitoring tasks.</p> <p>Undertake a criticality analysis of the network to assist renewals planning.</p> <p>Investigate resilience of plant to natural hazards.</p> <p>Develop Emergency Response Plan and implement if drinking water standards cannot be met.</p>
S8	Insufficient water	Vandalism of reservoir	<p>Reservoir level is monitored (SCADA alarm).</p> <p>Reservoir sites are not situated in locations prone to vandalism.</p> <p>Reservoirs are located in fenced area.</p>	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
S9	Insufficient water available	Catastrophic failure, e.g. seismic activity damaging equipment.	Reservoir, treatment plant, and associated equipment inspected following a significant earthquake.  Standby generator onsite to maintain power supply.	Partial	Unusual	Medium	Medium	Investigate resilience of plant to natural hazards.  Develop Emergency Response Plan and implement if drinking water standards cannot be met.



10.4 Risk Assessment Worksheet – Other

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
O1	Incorrect water quality data used for supply management (failure to identify inadequate water quality)	Inappropriate/inadequate/incorrect sampling and reporting.	<p>Council have a sampling calendar for sampling compliance.</p> <p>Staff are trained to take samples and alternate personnel are available to cover for absences.</p> <p>Results are reported through WINZ system to the Drinking Water Assessor.</p> <p>Sampling locations are clearly labelled.</p> <p>Annual IANZ accreditation for Council laboratory.</p>	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
O2	System does not perform as intended	Incorrect operation, inadequate maintenance.	<p>Operators have sound knowledge of systems.</p> <p>There is an Operation and Maintenance manual.</p> <p>Key operation instructions are displayed permanently on site.</p> <p>An operations log is kept on site.</p> <p>Plant records are copied and filed.</p>	Partial	Unusual	Negligible	Low	<p>Review and maintain activity management plans and associated asset renewal programmes to plan for regular maintenance and inspection/monitoring tasks.</p> <p>Review and maintain activity management plans and associated asset renewal programmes to plan for regular maintenance and inspection/monitoring tasks.</p> <p>Ensure all plant records – including manuals, drawings, procedure instructions and emergency response plan are up to date and available at the plant.</p>

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
Ref	Risk Event	Potential Cause of Risk Event	Measures in Place to Control Risk Event	Controlled? Yes / No	Likelihood of Risk Event	Consequences of Risk Event	Risk Level, Urgent Attention Required?	Additional Measures to Control Risk Event
O3	System does not perform as intended	Inadequate skills or training.	Staff are qualified and experienced, and supported by an ongoing training programme.	Partial	Unusual	Negligible	Low	<p>Council to place a requirement in the service provider to ensure Operation and Maintenance Procedure Manual is up to date and available at the plant.</p> <p>Council to place a requirement on the service provider to provide staff with relevant training and skills.</p>
O4	System damaged or contaminated by construction/maintenance work	Inadequate controls on construction and maintenance work.	<p>All maintenance is undertaken by contractor's trained/authorised staff.</p> <p>Construction work is appropriately supervised.</p> <p>Carriageway Access Request (CAR) and Before You Dig used to permit maintenance and construction works.</p>	Yes				

<i>List what could happen that may cause drinking-water to become unsafe (deterioration in water quality)</i>			<i>Is this under control?</i>		<i>If not, judge whether this needs urgent attention. Urgent attention is needed for something that happens a lot and/or could cause significant illness.</i>			
<b>Ref</b>	<b>Risk Event</b>	<b>Potential Cause of Risk Event</b>	<b>Measures in Place to Control Risk Event</b>	<b>Controlled? Yes / No</b>	<b>Likelihood of Risk Event</b>	<b>Consequences of Risk Event</b>	<b>Risk Level, Urgent Attention Required?</b>	<b>Additional Measures to Control Risk Event</b>
O5	Inability to access site(s) for operation/ maintenance/ emergency works	Flood, slip, bridge washout, snow fall or other hazard preventing vehicular access.	<p>Access roads are in good condition and are not generally vulnerable to natural hazards.</p> <p>Operations staff are equipped with suitable 4WD vehicles and given training in these use of these.</p>	Yes				

## 11 Improvement Schedule

The following Improvement Schedule has been derived from the Risk Tables presented in Section 10 and is prioritised according to the assessed level of public health risk associated with hazards that are not adequately controlled at present. The Improvement Schedule is presented in two sections:

### ***Part I: Major Projects and Capital Works***

These projects will generally provide the greatest benefits in terms of addressing public health risks but typically require high levels of funding that may not be realistic for the community involved. It is noted that Council operate a targeted rating system such that capital costs associated with each water supply are borne by those ratepayers with connections to the supply. Implementation of these improvements will be subject to consultation through the Long Term Plan. Where funding is not allocated it may not be possible to implement these works as proposed in the improvement schedule.

### ***Part II: Management and Operational Improvements***

These improvements will generally not provide the same degree of risk reduction as the proposed capital works upgrades but collectively they contribute to providing and maintaining effective barriers to contamination and can often be undertaken within existing operational budgets. These works are prioritised on the basis of the risk level identified and budget/resource availability.

### ***Prioritisation***

The priority for implementation is initially based on the identified risk level as follows:

Extreme risk	=	Priority 1
Very High Risk	=	Priority 2
High risk	=	Priority 3
Medium risk	=	Priority 4
Low risk	=	Priority 5

Priorities have then been modified (generally elevated) where improvement items are related or need to be sequenced together.

### ***Responsibility***

Responsibility for implementation of specific improvement items have been identified.

AM = Assets Manager

ACL = Ashburton Contracting Ltd

### ***Cost Estimates***

Cost estimates presented in the improvement schedule are intended to provide an indication of the typical cost associated with the item. In particular, the capital works improvements cost estimates presented here are initial estimates and additional work is required to adequately scope and cost these works. In some instances there is no direct cost other than Council staff time.

### ***Timeframes***

The proposed timeframe for implementation reflects the assessed priority, anticipated funding arrangements and availability of resources. Some lower priority, low cost improvements may be completed at an earlier date where staff resources are available.

### ***Compliance Timeframe***

The Mount Somers water supply falls in the category of a small drinking water supply under the Health Act. This requires that all practicable steps are taken to comply with the Drinking Water Standards by 1 July 2015.

11.1 Table 13.1: Improvement Schedule - Part I

Mount Somers Water Supply Improvement Schedule				Part I: Major Projects and Capital Works			
Priority	Risk Level	Water Supply Area	Reference to Risk Table	Details of Proposed Works	Person Responsible	Expected Cost	Intended date of Completion
No major projects or capital works are anticipated at this stage.							

11.2 Table 13.2: Improvement Schedule - Part II

Mount Somers Water Supply Improvement Schedule				Part II: Minor Projects and Operational Improvements			
Priority	Risk Level	Water Supply Area	Reference to Risk Table	Details of Proposed Works	Person Responsible	Expected Cost	Intended date of Completion
4	Medium	Catchment and intake	C1, C2	Ongoing liaison with adjacent landowners to raise/maintain awareness of catchment protection.	AM	Administration costs +staff time	Ongoing
4	Medium	Catchment and intake	C1, C2	Encourage best practice agricultural activities and riparian management.	AM	Administration costs +staff time	Ongoing
4	Medium	Catchment and intake	C2	Complete catchment assessment and have log credit requirement assigned.	AM	Staff time	01/12/2014
4	Medium	Catchment and intake, and treatment	C2, T7	Use the Ministry of Health 'Priority 2 Determinand Identification Guide September 2012' to determine if there are any other chemical risks, e.g. disinfection by-products.	AM	Staff time	Ongoing
4	Medium	Catchment and intake	C3	Ensure all intake manholes are locked and/or adequately secured.	AM	\$300	01/12/2015
3	High	Catchment and intake	C4	Review need for increased demand management.	AM	Staff time	01/12/2015
3	High	Catchment and intake	C10	Formalise the use of the Acland bore (water quality monitoring, resource consent, establish protocols for implementation, operation procedure).	AM	\$500 + staff time	01/12/2015
3	High	Catchment and intake	C10	Investigate alternative source.	AM	\$2,000 + staff time	01/12/2015



Mount Somers Water Supply Improvement Schedule				Part II: Minor Projects and Operational Improvements			
Priority	Risk Level	Water Supply Area	Reference to Risk Table	Details of Proposed Works	Person Responsible	Expected Cost	Intended date of Completion
4	Medium	Catchment and intake, treatment, storage and distribution	C5, C10, T9, T10, S7, S9	Develop Emergency Response Plan and implement if water supply cannot be maintained or drinking water standards cannot be achieved.	AM	\$5,000 + staff time	01/07/2018
4	Medium	Source, treatment, distribution	C5, C10, T9, T10, S7, S9	Investigate resilience of plant to natural hazards.	AM	Staff time	1/12/15
4	Medium	Catchment and intake, storage and distribution, Other	C8, C9, S6, O2	Review and maintain Activity Management Plans and associated asset renewal programmes to minimise failures.	AM	Staff time	Ongoing
4	Medium	Catchment and intake, storage and distribution	C11, S5	Regularly inspect air valves and undertake remedial works as required to address potential backflow issues.	AM	Staff time	Ongoing
4	Medium	Storage and distribution	S2	Lock the access ladder on large reservoir.	AM	\$1,000	01/12/2015
4	Medium	Storage and distribution	S3	Adopt and implement backflow prevention policy for customer connections.	AM	\$15,000 + staff time	01/07/2016
4	Medium	Storage and distribution	S7	Undertake a criticality analysis of the network to assist renewals planning.	AM	Staff time	01/07/2018

Mount Somers Water Supply Improvement Schedule				Part II: Minor Projects and Operational Improvements			
Priority	Risk Level	Water Supply Area	Reference to Risk Table	Details of Proposed Works	Person Responsible	Expected Cost	Intended date of Completion
4	Medium	Storage and distribution	S7	Implement and use Asset Management System (AMS) for programming and monitoring regular maintenance and inspection/monitoring tasks.	AM	Unspecified amount + staff time	01/07/2018
5	Low	Other	O2	Ensure all plant records – including manuals, drawings, procedure instructions and emergency response plan are up to date and available at the plant.	ACL	Staff time	01/12/2015
5	Low	Other	O3	Council to place a requirement in the service provider to ensure Operation and Maintenance Procedure Manual is up to date and available at the plant.	AM	Staff time	01/07/2016
5	Low	Other	O3	Council to place a requirement on the service provider to provide staff with relevant training and skills.	AM	Staff time	01/07/2016

## 12 Contingency Plan

The following contingency plan outlines appropriate responses to a range of potential situations where risk control measures fail to prevent a hazard event that may result in a situation of acute risk to public health.

The occurrence of a hazard, or risk event, may be indicated by monitoring systems, observed by ADC or ACL staff or reported by the public. Consumer complaints of illness or water quality issues may also indicate that a risk event has occurred.

The contingency actions identified are intended to provide a general guide and may need to be adapted to suit specific hazard situations.

### 12.1 Severe Microbiological Contamination of Source Water

<b>Indicators</b>	A contamination event in the catchment may be observed by or reported to ADC staff Reported illness among consumers Positive E. coli monitoring results
<b>Actions</b>	Issue "Boil Water" notice Advise Drinking Water Assessor (DWA) Inspect catchment and intake to identify source of contamination and rectify problem as quickly as possible Consider provision of emergency treatment or alternative water supply (e.g. reinstate decommissioned bore or use tankers) Disinfect contaminated reservoirs and flush mains Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

### 12.2 Chemical Contamination of Source Water

<b>Indicators</b>	A contamination event in the catchment may be observed by or reported to ADC staff Reported water quality concerns from consumers (taste, odour, colour) Illness among consumers
<b>Actions</b>	Advise Drinking Water Assessor (DWA) Assess situation and advise customers regarding use/treatment/disposal of contaminated water Arrange emergency water supply if necessary Inspect catchment and intake to identify source of contamination and rectify problem as quickly as possible Flush contaminated reservoirs and mains Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

### 12.3 Insufficient Source Water Available

<b>Indicators</b>	Observed or reported low ground water levels Gallery runs dry
<b>Actions</b>	Advise customers to conserve water Apply demand management strategies as required Implement emergency water supply if necessary Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

### 12.4 Insufficient Water Available due to Leakage

<b>Indicators</b>	Observed or reported reduction in pressure or water availability
<b>Actions</b>	Advise customers to conserve water Implement demand management strategies as required Arrange emergency water supply if necessary Investigate system leakages and undertake repairation Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

### 12.5 E. coli Transgression in Water Leaving Treatment Plant

<b>Indicators</b>	E. coli transgression reported following routine monitoring
<b>Actions</b>	Follow transgression response procedure in DWSNZ Advise Drinking Water Assessor (DWA) Commence daily E. coli testing at Water Treatment Plant Use an enumeration test method Sample in distribution system Investigate cause, inspect plant and source Take remedial action Continue to sample for E. coli until three consecutive samples are free of E. coli If E. coli is found in repeat samples consult with DWA, intensify remedial action, increase disinfection, consider 'Boil Water' notice, consider alternative supply
<b>Responsibility</b>	Assets Manager

## 12.6 Over-Chlorination

<b>Indicators</b>	Monitoring shows high FAC SCADA alarm reports high FAC
<b>Actions</b>	Assess potential risk to consumers and advise accordingly Inspect treatment plant to identify cause of problem and rectify as quickly as possible Flush system if necessary Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

## 12.7 Inadequate Disinfection

<b>Indicators</b>	Monitoring shows low or no FAC SCADA alarm reports low FAC
<b>Actions</b>	Inspect treatment plant to identify cause of contamination and rectify problem as quickly as possible Assess the situation and consider issuing a precautionary boil water notice if deemed appropriate Notify DWA of situation and actions taken Consider provision of emergency treatment equipment or alternative water supply (e.g. tankers) Disinfect contaminated reservoirs and flush mains Keep customers informed and advise once regular service is restored
<b>Responsibility</b>	Assets Manager

## 12.8 E. coli Transgression in Water in the Distribution Zone

<b>Indicators</b>	E. coli transgression reported following routine monitoring
<b>Actions</b>	Follow transgression response procedure in DWSNZ (Figure 4.2 in 2008 version), and ADC response procedures Advise Drinking Water Assessor (DWA) Inspect plant/source Collect sample at plant for E. coli test, enumerate E. coli Resample distribution at original and adjacent sites Investigate cause and undertake remedial action If E. coli < 10 per 100mL consult DWA, resample distribution zone and enumerate for E. coli for three days, continue investigation of fault If E. coli > 10 per 100mL consult DWA, consider 'Boil Water' notice, continue investigation of cause, begin disinfection, consider flushing contaminated water to waste, intensify action, consider providing alternative supply Continue until fault is corrected and E. coli is absent for three consecutive days and DWA is satisfied that there is no remaining contamination
<b>Responsibility</b>	Assets Manager

## 12.9 Chemical Contamination of Water in Distribution Zone

<b>Indicators:</b>	Chemical contaminant in distribution zone (including over-chlorination)
<b>Actions:</b>	<p>Advise Drinking Water Assessor (DWA)</p> <p>Assess situation and advise customers regarding use/treatment/disposal of contaminated water</p> <p>Arrange emergency water supply (tankers) if necessary</p> <p>Inspect catchment and intake to identify source of contamination and rectify problem as quickly as possible</p> <p>Flush contaminated reservoirs and mains If necessary</p> <p>Keep customers informed and advise once regular service is restored</p>
<b>Responsibility:</b>	Assets Manager

## 12.10 Insufficient Water Available in the Distribution Zone

<b>Indicators</b>	Low pressure and flow in the distribution
<b>Actions</b>	<p>Advise customers to conserve water</p> <p>Implement demand management strategies as required</p> <p>Arrange emergency water supply if necessary</p> <p>Keep customers informed and advise once regular service is restored</p>
<b>Responsibility</b>	Assets Manager

## 12.11 Insufficient Water Available due to Unplanned Shutdown

<b>Indicators</b>	Unplanned shutdown will be reported to ADC staff by contractor
<b>Actions</b>	<p>Keep customers informed and advise once regular service is restored</p> <p>Arrange emergency water supply if necessary</p>
<b>Responsibility</b>	ACL and Assets Manager



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11 July 2019

Mr. S Simmons  
C/- Lake Ohau Ratepayer's Association  
**LAKE OHAU**

Dear Steve

### **Q190610 OHAU WATER TREATMENT PLANT TECHNICAL SPECIFICATION**

Thank you for the opportunity to look at the water treatment requirements for your village in order to bring you in compliance with the NZ Drinking Water Standards.

#### Information Provided

Our design and offer is based on the following information provided:

- The water take consent is for 2.2L/sec and 190m<sup>3</sup>/day
- Sample results for the village provided for period November 2001 to August 2018, covering *E. coli* and total coliforms, turbidity, pH and temperature
- We understand Vodafone cellular reception is available

#### Our Offer

Our offer includes the following main components:

- Turbidity in the water supply from the gallery to the existing storage tanks will be monitored in a side stream and an actuated valve will close the supply should the turbidity be above a high level set point
- A cut in will be made to the existing gravity feed to the village at the proposed location of the treatment plant (feed into the treatment plant and discharge from the plant)
- A containerised treatment plant is offered that provides bacterial and 3-log protozoal compliance (99.9% removal)
- A dual pump pressure booster set will be installed in the container, together with six 20,000L concrete tanks installed on site, to provide treated water storage and maintain pressure in the network

Compliance with the NZ Drinking Water Standards 2005 (revised 2018) is achieved with 10-micron filtration, 5-micron filtration and validated UV disinfection. A chlorine dosing system is included for the protection of the downstream network. Additional log credits can be obtained, if required, by changing the type of filters installed. This would have a minor impact on capital cost and may require more frequent filter changes.

#### Our Approach

We have offered a containerised treatment plant as this provides a number of advantages:

- Off-site fabrication in a workshop eliminates any effects of site conditions/weather that could impact on overall project timelines or quality
- Off-site fabrication allows health and safety to be well managed
- The treatment process can be thoroughly tested and commissioned before the plant is delivered to site

safe water by design



- The plant can be easily relocated in the future if required

We have considerable experience in the design, build, installation and commissioning of containerised treatment plants, as shown in the photos provided below. Systems are fully drawn in AutoCAD Plant 3D and wastewater treatment plants are designed using Biowin biological modeling software.



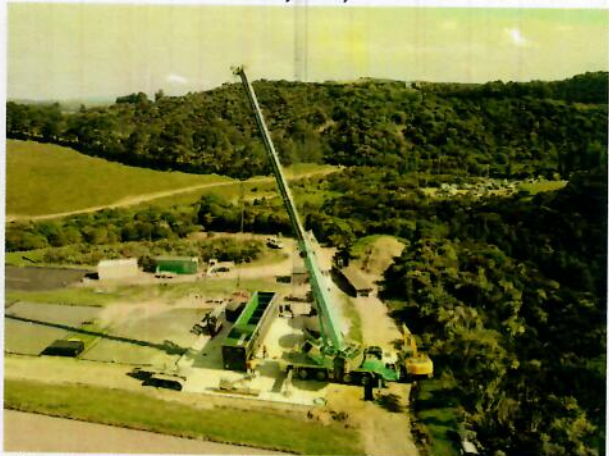
*Apex containerised drinking water filtration plant for Timaru District Council*



*Apex containerised water treatment plant for Christchurch City Council (delivered in partnership with Citycare)*



*Apex containerised MBR wastewater treatment plant for Watercare (Warkworth)*



*Apex containerised MBR wastewater treatment plant for Watercare (Owhanake)*

Regards

A handwritten signature in black ink, appearing to read "SK", is placed below the word "Regards".

**DR STEVE KROENING**  
**BUSINESS DEVELOPMENT MANAGER**





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5 July 2019

Mr. S Simmons  
C/- Lake Ohau Ratepayer's Association  
**LAKE OHAU**

Dear Steve

### **BUDGET PRICE Q190610 FOR OHAU WATER TREATMENT PLANT**

Thank you for the opportunity to look at the water treatment requirements for your village in order to bring you in compliance with the NZ Drinking Water Standards.

#### Information Provided

- Water take consent is for 2.2L/sec and 190m3/day
- Sample results for the village provided for period November 2001 to August 2018, covering *E. coli* and total coliforms, turbidity, pH and temperature
- We understand Vodafone cell reception is available

#### Design Basis

We offer this proposal on the following basis:

- Turbidity in the water supply from the gallery to the existing storage tanks will be monitored in a side stream and an actuated valve will close the supply should the turbidity be above a high level set point
- A cut in will be made to the existing gravity feed to the village at the proposed location of the treatment plant (feed into the treatment plant and discharge from the plant)
- A containerised treatment plant is offered that provides bacterial and 3-log protozoal compliance (99.9% removal) through:
  - Pre-filtration with 10-micron nominal filters
  - Final filtration with 5-micron nominal filters
  - UV disinfection with a dose of 40mJ/cm<sup>2</sup>
  - Chlorine dosing system to provide a residual in the post-treatment storage tanks and network
- A dual pump pressure booster set will be installed in the container, together with six 20,000L concrete tanks installed on site, to provide treated water storage and maintain pressure in the network

Additional log credits can be obtained, if required, by changing the type of filters installed. This will have a minor impact on capital cost and may require more frequent filter changes.

#### Scope of Supply

Our scope of supply is as follows:

- Feed water monitoring
  - Supply and install one (1) motorised valve in the feed line between the gallery and the existing storage tanks

safe water by design

- Supply and install one (1) turbidity sensor in a side stream off the feed line, with solar power and telemetry back to the containerised treatment plant
- Cut in to existing gravity feed line to the village
  - Supply and install three (3) manual valves, one for the feed to the new plant, one for the discharge from the new plant, and one bypass valve in the main line
  - All required work by an approved contractor to flush and disinfect the line
- Containerised treatment plant
  - One (1) 20' shipping container, lined with access door and lighting
  - One (1) pressure control valve and one (1) motorised isolation valve in the feed to the plant
  - Two (2) housings with 10-micron nominal filters
  - Two (2) housings with 5-micron nominal filters
  - One (1) turbidity sensor on the outlet of the filters
  - One (1) flow meter
  - One (1) UV unit validated to ÖNORM with a minimum dose of 40mJ/cm<sup>2</sup> at a UVT above 80%
  - One (1) UV intensity sensor
  - One (1) chlorine dosing pump with all required accessories including one (1) flow meter for feed-forward proportional dosing and chemical containment
  - One (1) safety shower
  - All required pipe work (schedule 80 PVC), fittings and valves
  - Electrical control panel including PLC, HMI and with telemetry system
- Treated water storage system
  - Six (6) 20,000L concrete storage tanks connected to the treatment plant, together, and to the pressure boosting pump set, with PVC pipe including all required valves and fittings
  - One (1) level transmitter
  - One (1) Grundfos dual-pump set with integrated controller and tank mounted within the container (40m<sup>3</sup>/hour at 5 bar)

#### Budget Price

The total budget price to design, supply, install, commission and validate all works described above is **\$470,000+GST**. This consists of the following parts:

- Feed water monitoring and cut in to existing pipe line - \$80,000+GST
- Containerised treatment plant (including booster pump set and freight to site) - \$315,000
- Water storage system (including freight to site) - \$60,000+GST
- Plinths for location of container - \$15,000+GST

Please note this is a budget price only and this letter does not constitute an offer capable of acceptance. We would welcome the opportunity to further develop this into a fixed price offer for you.

Regards



**DR STEVE KROENING**  
**BUSINESS DEVELOPMENT MANAGER**

**From:** David Stone [<mailto:david@stone.org.nz>]  
**Sent:** 26 August 2019 23:04  
**To:** Gary Kircher; Fergus Power  
**Cc:** Elfrida Ward  
**Subject:** Ohau Water Upgrade - Easements - Treatment Plant location

Hello Gary and Fergus

One issue that has not been canvassed when considering the how and where of the upgrade is the legal rights under the water right (or water 'take') and the registered Easements especially the **Right to Convey Water**.

If after scientifically proper and correct testing - which logic dictates must happen - the current water supply is proved to be adequate, the issue becomes "where can the water be treated?".

I invite your lawyers, in-house or contract, to consider, as I have, the terms of both Easements. Likely as not they will conclude that a treatment plant of the type proposed by APEX can be placed as of right on the Easement to Convey Water between the infiltration gallery and the storage tanks. Landowner consent is required but must not be unreasonably withheld. Access and egress to all infrastructure, existing and new, is as now achieved by the Right of Way Easement.

The lawyers will do their research particularly of the **terms implied** in every Easement, meaning where the law imposes the terms of an easement in the absence of express terms (ie terms stated in the Easement document) as is the case here where there are none. That is achieved pursuant to the Land Transfer Regulations 2018, specifically Schedule 5, Clause 1 (Interpretation), 3 (Right to Convey Water) and 10 (General rights). The APEX treatment plant or similar falls within the definition of "**easement facility**" in Clause 1 (a) which states (Emphasis added):

*"(a) for a right to convey water, means pipes, pumps, pump sheds, storage tanks, **water purifying equipment**, and other equipment suitable for that purpose (whether above or under the ground), and anything in replacement or substitution:".*

Consequently, assuming that quality and capacity of the water from the water 'take' is proven to be satisfactory, as many suspect, a treatment plant can be placed on the Edward's land to treat the water supply to the requisite standard. That is what the Easement permits.

Further, the treatment plant could easily be connected to the power supply line, also permitted by a registered Easement on the subject land, that crosses both Easements. A transformer (if necessary), cabling and backup generator can all be placed on the Right to Convey Water Easement.

Therefore Council has all the legal authority and logistics needed to retain the existing water supply and to treat it at a sensible point, namely after extraction and before storage, and all at modest cost.

Lest we all forget, Edwards purchased the land 'eyes wide open' in the knowledge of the existence of the 'take' and the all registered Easements. The purchase price paid no doubt reflected the effect of those encumbrances registered against the land namely that they would preclude later subdivision. However, now he wants those encumbrances removed, and he has stated he believes they are to be removed (the correct expression is "be surrendered") by Council so he can subdivide. Who is hoodwinking who?

Please realise that the Phased Approach, actually conceived by Jill, is not only feasible by also legally possible. Council can treat the water onsite.

Do not be fooled by the landowner or other interested parties who seem intent on persuading Council to surrender the precious rights it holds effectively **in trust** for all Village ratepayers over the subject land **in perpetuity**, or by questionable advice .

Please understand this is not a legal opinion. Rather I am suggesting Council takes a hard look at its legal rights in relation to the existing water supply and how that supply can be maintained in its existing state and the water be treated nearby to the appropriate standard. That said I will gladly discuss this important issue with your lawyers.

Regards

David

## FURTHER SUBMISSION OF DAVID AND JILL STONE IN RELATION TO THE PROPOSED UPGRADE OF THE LAKE OHAU VILLAGE WATER SUPPLY

**TO:** Mayor Gary Kircher and Councillors, Waitaki District Council

**TO:** CEO Fergus Power, Waitaki District Council

**DATE:** 1 September 2019

Council, we believe, will make a decision on upgrading the Ohau Water Supply on 24 September, giving time to consider more carefully the options available before that decision is made. In anticipation of that meeting we understand Council is to 'workshop' the issue tomorrow.

In addition to our submissions 12 August 2019 and addendum 26 August 2019, we respectfully request our comments below together with a 'Suggested Road Map' (**attached**) for implementation of the Phased Approach be considered at Council's Workshop and at the meeting 24 September next.

Our comments are made in good faith and intended to be collaborative and non-confrontational. We seek to be positive and constructive to assist Council to make a sound decision.

Without revisiting the past, there appears to be three issues that concern Council: risk, time and cost.

Summarising the current position:

1. Council and Ohau Village ratepayers are in agreement that:
  - The water has to be treated to comply with the Department of Health Drinking-water Standards (<https://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2018> )
  - A water supply is required with capacity to meet the reasonable needs of the Village
  - An equitable water rating system is desirable
  - An economical upgrade is required
2. It is now generally recognised by Council and Ohau Village ratepayers that:
  - Historical water quality data is unreliable (**refer** Footnote)
  - Peak consumption occurs only briefly over Christmas / New Year and the data is skewed because of the unlimited supply to both Lake Middleton campground and Avoca House (connections for which the system was not designed)
3. Village ratepayers ask for an informed decision based on facts and one that is in the best interests of ratepayers and Council.
4. Submissions to Council have highlighted the requirement for a reliable supply which is suitable for this location. Factors that need to be considered are:
  - The remoteness of this location
  - The relatively pristine nature of the area
  - The area is subject at times to power cuts due to adverse weather conditions
  - The Ohau Basin is environmentally significant, especially in terms of landscape values
  - The negative visual impact of structures such as bores, pumps and storage tanks
  - The effect of sound (for instance continual pumps) in an area lacking any mechanical noise pollution
  - The desire of Villagers to protect Village Reserves, which are being restored by volunteers according to a planting plan of native species agreed with Council
  - The impact of all the above on residents, visitors and tourists, including A2O bikers and Te Araroa walkers who pass the Village alongside the adjacent MacKinnon Reserve.

- The Ohau Basin is likely to have further environmental protection in the revised District Plan and more restrictions on development

5. Village ratepayers favour the retention of the existing supply because:

- It is gravity fed and needs no pumps and is not affected by power cuts
- There has been no problem with capacity
- It is likely to need minimal treatment. No Villagers have fallen ill from drinking the water (whether boiled or not)
- The existing supply has no negative visual impact. It is not visible from the Village or the main road

6. Village ratepayers support an upgrade which follows a logical Phased Approach.

Most of these steps are applicable whatever upgrade is decided:

- Implement an approved Water Safety Plan. It is required whether or not the supply is compliant.
- Carry out deferred maintenance (clean the storage tanks)
- Put Lake Middleton campground and Avoca House on restricted metered supply
- Install household meters on all connections to measure consumption and keep each ratepayer informed
- Measure and analyse capacity, consumption and quality over a year (because of seasonal variation)
- After testing and analysis, install appropriate water treatment of the existing supply
- Convert Village properties on restricted supply to on-demand
- Charge water according to consumption, and encourage responsible use by charging more for excessive usage
- Consider a supplementary bore only if and when needed

7. Risks

Conjecture about the number of permanent residents and rented properties is not a reliable way to ascertain consumption. A proper due diligence is required to establish existing demand and forecast whether the capacity of the existing supply will satisfy the needs of a fully developed Village of potentially 136 sections. Only then can an informed and responsible decision be made by Council.

A supplementary bore should be considered only if and when needed.

Villagers do not want Council to put at risk the current supply by investing in a scheme based on unproven bore water. They do not want a bore on Mackinnon Reserve (a Natural Reserve) adjacent to the main road and in proximity to the sewage pond and in a location which will be susceptible to run-off of storm water from the village above and the adjacent road. There is a risk that there will not be an adequate Capture Zone and a consented Water Protection Zone and that bore water will contain fine glacial silt from nearby Lake Ohau which will be difficult to filter.

Does Council intend to surrender precious legal rights protecting the existing supply of water **in perpetuity**? Is it appreciated by all Councillors that access to the existing supply exists “forever”?

The Right to Convey Water and the Rights of Way to service the necessary infrastructure and any improvements to it are protected by registered easements in favour of Council. In effect Council holds those rights **in trust** for Village ratepayers and occupiers for all time. Without agreement of Villagers those rights should never be surrendered. It would be a breach of moral and possible legal duties Council owes to Villagers if it were to do so, and could be contested.

The risk to Council of proceeding with an inappropriately located bore supply based on unsubstantiated assumptions and hypothesis before proper investigation and analysis of the existing supply is very high. Conducting a proper investigation and analysis will eliminate that risk to Council.

The ‘Suggested Road Map’ has been prepared by a company owned and operated by a Village ratepayer. It is authoritative and industry-based. It presents a safe, no- risk process that prevents Council making a big mistake, and can be implemented immediately.

8. Time

Council has been given a **reprieve**. On 31 July Government announced a new regime for drinking water supplies and will soon promulgate regulations to action the new regime. Council now has five (5) years to implement a scheme to

comply with the Department of Health Drinking-water Standards. This provides Council with the opportunity to implement a Phased Approach promoted by a number of Village ratepayers and the Residents and Ratepayers Association. Council will be respected if it shows leadership and the moral courage to review its advice to date and put in place a proper study for a year.

Making a substantive decision to proceed with a bore supply on 24 September when voting starts between 20-25 September would be morally wrong and not a 'good look', especially as the make-up of Council could change. Is there a convention or protocol that major decisions should not be made close to an election? That budget planning has been approved does not justify a rushed decision. Indeed it might raise suspicions. Further, should an existing Council attempt to bind an incoming Council on a contentious matter and one in which the media is now taking an interest? Do Councillors want the Ohau water upgrade to be a media-fuelled election issue?

Council now has time to make progress and to be seen to be doing something constructive by implementing a scientific testing programme of the existing supply. Only then can Council make an informed decision based on fact. That course of action will be seen by all WDC ratepayers as responsible and prudent, and demonstrates that Council listens to its ratepayers.

#### 9. Cost

Regardless of what has already been spent, the cost of a testing programme is minor in comparison to the costs to Council of a bad decision.

The cost to retain the existing supply and install a suitable treatment plant is the most economical solution.

There is no need for a supplementary bore now and it may never be needed.

#### 10. Other factors

There may be other factors bearing on Councillors' minds that we are not aware of. If so, these should be explained to Villagers in the spirit of good faith and transparency. It has not escaped the notice of Villagers that the words "subdivision", "development" and "additional connections" have had currency in the Ohau Basin for some time and still do.

Concern by Villagers is not 'nimbyism'. Do we need another Tekapo? The Ohau Basin is the 'jewel in the crown' of the Waitaki District and requires protection of its mostly unspoilt and unmodified environmental values.

It is encouraging that there is recognition by Council planners of the environmental values of this area and an intention to ensure planning regulations fully protect those values in the revised District Plan. It would be reprehensible to rush through an unwise decision to give up the existing supply and the rights associated with it and allow a landowner to subdivide before the revised District Plan is effective.

#### 11 Finally, we are willing to be part of any discussion in a respectful and positive manner to assist the making of a wise decision.

David and Jill Stone  
6 Huxley Terrace  
Lake Ohau Village  
1 September 2019

#### Footnote

Quoting from the Addendum 26 August 2019 to our submission 12 August 2019:

"Council has recently acknowledged to the Department of Health that proper water sampling procedures have not been followed: *"Council recognises that the current sampling point is not ideal e.g. a longer flushing time is required to obtain a representative sample from the water main. They also said that in order to comply with the Drinking-water Standards, they have listed sampling sites on their improvement schedule for Lake Ohau Village water supply."* (Email to Jill Stone 13 August 2019 from Simon Ou, Health Protection Officer/Drinking Water Assessor, Public Health South)."



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## WDC

### Ohau Village Water Supply suggested “Road Map”

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The following simple “road map” has been prepared as a suggested way forward to accommodate all affected parties, as well as keeping the momentum active and visible, while working towards a measured outcome.

The recent change in policy allowing a 5-year extension of facilitating the implementation of upgraded water supplies allows all parties to take a breather, review, measure and reconsider.

The village realises and accepts some form of treatment is required, there is no disagreement on this position.

What is important for WDC and the village is to be making a decision based on facts or facts as best we can determine. It is not in either WDC or the village’s interests to build something that may not be required.

A little time and money spent wisely now could potentially save WDC and the ratepayers a considerable sum going forward, both in CAPEX and OPPEX as well create an agreed and accepted understanding from both parties as to what is really needed, reducing conflict based on decisions made without evidence.

The findings could possibly suggest a new source is required. We are open to this and accept this. On the other hand the existing source might be shown to be adequate.

Measure, monitor and reassess. *“If you cannot measure, you cannot manage”*

These simple and low-cost solutions will give WDC the information it needs to make an informed decision. These investments are not a one-off cost with no further benefit, but will and should form part of a smarter management of any network going forward, this minimal investment will give WDC a picture of this operation’s performance now and in the future.

This is not wasted money.



## Stage 1

### Metering and understanding demand:

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- a) Install one meter downstream from the storage tanks. This can be a smaller diameter meter than the pipe diameter as a short-reduced section will have minimal effect of the hydraulic head loss but could reduce cost.  
As well, a smaller meter will improve the flow data accuracy particularly at low flow \ velocities.

Apparently a meter exists somewhere but the data we have seen appears intermittent and does not match patterns we anticipate. This meter may be suitable but should be logged with a daily transmit data logger.

Logger to have threshold breach alarms to activate an alarm to send an alert if flow exceeds a set threshold, or the pressure drops below a certain threshold. This should be a minimum of 15-minute 24/7 polling of flow demand of data.

- b) Install a meter at the entry point on the supply main into the village to act as a balance calculation indicator between the supply tanks and village to detect a leak or unauthorised connections off the supply main.

Estimated cost: Install 2 x mechanical meters, civils etc \$8-10K  
One may already exist

- c) Install a GSM flow and pressure logger to the water meter/s to send daily data, alarms and pressures.

The pressure would potentially serve as level sensor for the tanks. The pressure could not exceed the maximum inlet level of the source supply provided an air gap separation is present. This also would assist in understanding the rate of replenishing and thus the source capacity (potentially). Though a little rudimentary it could help with supply understanding as a by-product of the flow monitoring.

Estimated cost: Hardware under \$2500.00 (for two)  
Battery power, remote communication, 5-year battery, 3G or 4G NBloT

- d) Campground and Avoca House  
Install restrictors on both of these now and a meter.  
Enforce the installation of a tank in the near future.
- e) Install meters on all known connections off this supply outside of the village approved serviced area.

Total estimated spend for STAGE ONE – likely well under \$15,000 (unless you get Fluent involved)

This is simple operational work, it does not need a consultant.

## Stage 2

### Customer Metering

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Stage two is not absolutely essential but it will give WDC a more in-depth understanding of demand profiles, by customer and by season, I would recommend this if a budget was available.

As I understand most connections have a manifold type toby connection, this means a meter can simply be installed by removing the blue cap and screwing in a meter, no plumbing or civils costs required. This is a very low-cost solution and serves many purposes, now and in the future, and should be a consideration regardless to meter all properties, therefore this is not a wasted investment.

What we will learn and understand is the following:

- (a) Real demand profiles could be established for the village, permanent, holidays homes and AirB&Bs
- (b) System water balances could be achieved easily
- (c) Seasonal demand profiles established
- (d) Leakage detected on internal plumbing
- (e) Leakage detected on the reticulation and supply main
- (f) Overall network balance achieved against the supply meter

Estimated cost per meter	likely under	\$50 each
70 connected properties approximately		say \$4000.00
Labour not included		

## Stage 3

### On-demand supply

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As the majority of villages were more in favour of on-demand supply then part of the measurement process could involve the removal of the restrictors and connect directly from mains supply to the house bypassing the tank.

This is again not essential, but a “nice to know” and will help WDC and the village understand what the potential impact on demand may have on their supply demand.

This would serve to establish what the real demand is for an unrestricted supply but would allow WDC to reconnect the supply back via the tank if deemed necessary.

Estimated maybe 30 homes would require this: plumbing cost \$500 max per house

30 x \$500	\$15,000 maximum
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This may not be necessary as a first stage as we could measure both unrestricted and restricted to gauge the differences in consumption.

Many connections on restricted supply already have pipes direct to the mains, so that in the event of a power cut water is still available (household tanks require a pump).

## **Stage 4**

### **Water Quality Treatment:**

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Water quality testing to required Department of Health standards needs to start immediately. Water quality could be easily monitored at source for turbidity, and contamination.

After 12 months of testing and analysis, suitable water treatment can be installed.

As part of the water treatment plant, a permanent solar powered/ GSM communications with real time alarming of events would be in the range of \$30,000

Lower cost options may also be available, battery powered GSM Likely under \$10K

## **Stage 5**

### **Cleaning and maintenance of the system**

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If water quality at source or prior to the tanks was deemed of a treatable quality, then the tanks should be inspected and cleaned of the 30+ years of accumulated sediments and biofilm.

Then followed by the supply main and then the town's reticulation.

Consideration for a brief shock dose chlorine flush to remove biofilm and any contaminants that may have entered during this process.

After this stage the water sampling and testing regime needs to follow the strict guidelines as set out by the regulators.

If WDC were to undertake both Stages 1 and 2, Detection Services would undertake the testing and analysis of the data at no cost to WDC.

We anticipate we could arrange regular meter readings by village residents to support the ongoing analysis.

Steve Simmons