FROM SNOW TO BUSHFIRE – SERVICING THE HIGH COUNTRY

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ABSTRACT

East Gippsland Water provides water services to twenty-seven towns and sewerage services to seventeen as well as many rural consumers in an area of approximately 20,000 square kilometres ranging from Bairnsdale (South West) to Mallacoota (East) and Dinner Plain (North). Whilst the majority of these towns are located on the coastal plains, the towns of Swifts Creek, Omeo and Dinner Plain sit in the heart of Victoria's (God's Own) High Country. This paper will provide some insight into the operating issues encountered due to extreme weather conditions, distance from major towns / supply centres and also how we maintained services during the recent "Australia Day" bushfires.

KEY WORDS

Snow, bushfire, drought, flood.

1.0 INTRODUCTION

Omeo Depot has a staff of 2.5 which includes Works Super and one full time and one part time O&M staff. We run a conventional water treatment plant in Omeo itself, Chlorine Dioxide disinfection plant in Swifts Creek and an Ultra Violet disinfection system in operation in Dinner Plain. In addition we have sewer systems in Omeo and Dinner Plain. Our plants are reasonably new and we are in the process of completing some upgrades on the Omeo Water Treatment Plant and Dinner Plain WWTP. Most of the tasks we have are fairly generic to most water Authorities, however there are a number of factors that, whilst not exclusive to us, make servicing the High Country an almost daily challenge. In the last twelve months or so the people of the region have experienced drought, bushfire and flash flooding and add that to the "normal" year of snowfalls and freezing temperatures it makes for an interesting (to say the least) place to live and work.

2.0 DISCUSSION

2.1 The Weather and Safety

Early in December 2001, I had a fill-in staff member come up from Lakes Entrance. We went to Swifts Creek in 35 degree heat to do some work lathered in sunscreen and wearing the big hats. Next day off to Dinner plain to meet a tenderer for the WWTP upgrade and it was snowing. Our man remarked that "you need a sense of humour to live here!" and he's dead right. The weather is one of our biggest factors and apart from just being cold, it also makes roads dangerous, travel times longer and exposure whilst working a major concern.

Safety is a major issue in our business and the winter certainly makes us more aware of slips and trips on steps and roadways, and the general need to be more aware of what is happening around you at all times.

2.2 Water Meters

Operationally, whilst you attempt to alleviate a problem in one way, it is easy for the solution to cause a problem in another way. One of the best examples is water meters. We've all got them and they are usually a small part of our work. In Dinner Plain, they are a major item. They are essentially the weak point in our system and as such we go to great lengths to ensure they are insulated and protected from the elements. More often than not, they are put under the lodges with some sort of protective covering. It's not too high tech – generally a foam vegie box from the supermarket with an insulation batt inside and a brick on top, but it certainly affords them good protection. In one respect, this makes them more difficult to access when reading meters, but we only do this twice a year. The real problem is getting to them if they burst in winter.

Often times the access hatches are under eaves and of course this is where the snow comes off the roof, leaving, at times, eight feet of snow to get through to get to the problem. Thankfully, over the past few years we have encountered less and less of this due to more consultation with builders and plumbers and better places to put meters. Under the front step with covered veranda is our preference now where possible.

2.3 Water Quality Sampling

Winter causes all sorts of problems with other rudimentary tasks such as sampling and whilst it isn't something normally considered a problem, here it can be a real headache. Up until recently we sampled from fire hydrants in Dinner Plain due to houses having no outside taps and the water being turned off when nobody is in residence. Contamination of sites is always a possibility – have you ever tried to "flame" a hydrant? We have now installed new sampling equipment that fits onto the Meter Stop Tap giving us reliable sample points year round but again we had to choose sites carefully to ensure they would still be accessible after heavy snowfalls.

Access to things like the treated wastewater storage ponds for sampling in winter coupled with the fact that they are frozen over makes routine sampling anything but routine. We are, at the time of writing, looking into changing our licence requirements with the EPA to cease sampling in the winter months.

The ponds would be more than likely running almost anaerobically in winter whilst frozen and as well as not being representative it is difficult to make safe. We are running siphons from the ponds for easier access but even the siphon lines freeze in winter!

2.4 Water Treatment -Omeo

Omeo has similar problems in winter with temperatures recorded at lower than minus 10°C at times. We have made some interesting discoveries in the past few years, one being that soda ash in a 10% solution will in fact go out of solution with an air temperature of minus 6°C! This was discovered one particular coolish night and in the morning was found crystallised on the sides of the mixing tank. We had ideas of heating the water etc. etc. and have since discovered that running a 5% solution will withstand temperatures of less than minus 10°C.

The Omeo water treatment plant however will not stand up to such temperatures at times. After another night that may have rendered many a brass monkey incomplete, one of the staff received a phone call from the alarm dialler at the Plant. Omeo WTP is a 0.6 ML/day conventional package water treatment plant with a 200Kl clear water storage feeding to two break pressure tanks in town. The break pressure tanks have hydraulically operated valves working off a ball float. These do tend to freeze in winter and thaw mid morning allowing the tank to fill again. Due to low usage the freezing doesn't do too much harm supply wise.

This particular night though, the float froze in the open position, causing the tank to fill and over flow. This went unnoticed until our man went to find out what was going on. The plant had not been able to keep up with demand and drained the 200kL tank. It had called for a backwash and with no water to backwash with, had shut down and alarmed. When the plant was restarted, no water came out. In the time all this had happened the pipe from the plant to the clear water tank, or at least the exposed part, had frozen solid. It was minus 11°C.

We have had icebergs floating in the Omeo water storage, people skiing on Dinner Plain's frozen treated water ponds, walls blown out with frozen pipes, frost that hangs horizontally off the chain link fence, we have to use a blowtorch to unfreeze locks to get into our facilities, fog so thick you can't see over the bonnet of the car, it snows in January one year, and the following January we had a little fire……

3.0 BUSHFIRES

The Bogong Complex of fires that devastated Victoria's North East in January this year had a massive impact on the provision of services to our area. It's fair to say that our role was largely anonymous however vital it actually was.

The reality is that people expected to have water to protect their homes without realising the enormous amount

of work and planning went into achieving this. And that's fair enough – that's our job, it is something that people generally don't need to think about. Turn the tap on, water should come out. Flush the toilet, things should disappear from view. The same level of service is expected from the phone company, the electric company, the gas company – we're not alone.

So to cut a long story short, we needed to provide the CFA with all the information we had about our systems, identify potential supply problem areas, put a number of contingency plans in place with regards to loss of power, and implement strategies to protect the authority's assets in three towns that are 70 kilometres apart – with three staff who have their own homes and families in town to think about as well. We relied on back up support from head office and other depots who got equipment to us quickly and on short notice.

3.1 The Systems and Their Limitations

Omeo has around 300 consumers with a peak day demand of around 500kL. In the weeks leading up to Australia Day the population trebled with CFA, DSE and Parks crews working around the clock. Combined with that were drought conditions and voluntary water restrictions in place and a population of very nervous people all putting in watering systems and the like to protect their properties. The plant was running at maximum output even before the fire hit us.

Dinner Plain is supplied from two bores which can only deliver 9 L/s. Taking into account flow from the bores and storage tank draw down and estimating using 15 L/s during fire fighting activities, there would be about 7 hours worth of water in the event of fire – obviously a lot less time the more hydrants they plugged in. With our bores and storage tanks the only source of water, we were very limited so we made arrangements for a quick fill pump to be set up at the wastewater ponds, around 3 km away from Dinner Plain Village to use effluent for fire fighting should the need arise. We highlighted to the CFA the EPA/DHS requirements for the use of recycled water for fire fighting.

Swifts Creek has a 4ML storage and the reticulation system can also be pressurised via the river pumps. Swifts Creek was seen as the least problematic system – provided someone could get to the pumps, start the generator if required and open the cross connection valve from the rising main to the retic. - we trained up the local electrician.

3.2 Fire Emergency Preparations - Omeo

The first issue for us was emergency supply to Omeo so our preparation began there on Monday the 13th of January. The basin was not totally full due to algal problems we had been experiencing so that needed to be topped up. The algal issue complicated the emergency supply so talks were held at this time regarding super dosing the basin with sodium hypo. The Basin was dosed with hypo by mixing 40 litres of hypo per 10kL of water carted by a local contractor from the Livingstone Creek which runs through town. This served a dual role in also adding 130kL to the basin supply.

The plan was to run water from Butchers Creek (gravity supply from source to Omeo WTP) through the plant until the clear water tank ran out and open the emergency 5 ML basin outlet after

that to keep up. It wasn't ideal but it was our only option. Our 800 L tanks were prepared as mobile water carriers to protect our own assets from fire, one on a trailer, one on a ute. The CFA would take water from the Livingstone Creek as much as possible and leave the Omeo town supply as a last resort. This would then allow people to defend their own homes, with the water we could provide.

A genset was hired for the Main Sewage pumping station and we organised to have a satellite phone in case of communication loss.

3.3 Dinner Plain

Our mobile genset was taken to Dinner Plain to protect the bore supply. DSE put in a fire break around the bores and discussions were held with CFA regarding protection of our assets, especially the bores.

We tested our defence system of overflowing the elevated tank to wet down the wooden tower and its surrounds. Impressed with the outcome, we had a meeting with CFA and told them of our strategy and briefed them on the limitations of the Dinner Plain Water Supply system.

3.4 The New Omeo Plan

By Friday the 24th, tankers in Omeo were starting to take water, and we had a request for drinking water at Benambra, a town not served by us normally. Lots of people in town were starting to run emergency sprinkler/fire hose systems and busloads of personnel were coming into town resulting in record water usage of 640 kL for the day. This caused some problems with the plant and I decided on a new plan of attack. We organised to have a mobile pump sent up from Lakes Entrance and supplement the water from the 5 ML basin straight into the clear water tank. This way we could maintain disinfection with more accuracy, provide more pressure to the top end of town by maintaining the level in the contact tank and generally have better water quality with less chance of having ongoing problems after the event.

By 4pm on the Saturday some embers had started to drop on the town and although they were cold people were starting to put all their plans into action and water usage for the day topped 600 kL again.

3.5 Australia Day

On Sunday (Australia Day) water was flowing back into the 5 ML basin and it had filled up a bit overnight. We were still in good shape although usage was high. 5 tankers of water (150kL) had gone to Benambra over the last couple of days. We found out they had been topping up tanks and had to put a stop to this and made arrangements to the effect that we could supply water for drinking but not for household consumption. It was a tough call but the Omeo supply was already stretched to its limits.

At 11am the fire spotted to within a few kilometres of town and within the next 30 minutes all hell broke loose. The town went pitch dark with the smoke covering the sun and the red glow behind

the hills to the west and North became larger and more threatening. By 1 pm we had no power and we managed to divert the raw water past the plant and directly to the clear water tank. A generator was hooked up to the hypo pump and disinfection was maintained throughout. A clearing southerly change hit at 1.30pm pushing the main fire front back on itself but spot fires continued to burn all over town and at 2.30pm came to within 50m of the water treatment plant. Things settled down a bit and we continued patrolling our assets and also put our generator at the supermarket to maintain the fridges and freezers. When the power was restored, we had maintained a residual of 0.3 at the plant and I tested all points of the system including (and especially) the refuge area. All samples showed low but acceptable residuals and I made a report to the media liaison that although people could experience some colour and taste differences, the water was safe to drink and should improve within the next 24 hours. I checked in with our local contact at Dinner Plain who said that they had no real hassles there. The danger of travelling on the roads made it impossible to be there ourselves.

The next three days were spent assessing what we got right, what we could improve, and getting the water back to its usual standard. Water usage slowed down and we refilled the basin for the next onslaught to come.

3.6 Here We Go Again

Thursday the 30th of January could only be described as a really, really bad day! Although we were as prepared as we could be, we could not have imagined the sheer speed and ferocity of the bushfire that came at us on that day. Northerly winds gusting over 100kms an hour, spot fires from one end of Omeo to another and the main fire front coming at us from three directions. It was undoubtedly the most frightening thing I have ever seen. I am pleased to say that all the planning we had put in place and the work we had done with the CFA paid off. All the problems we thought we may encounter occurred, and all the contingencies we had put in place worked.

There are obvious limitations to a gravity system and at the peak of the fires we did run out of pressure in some areas, and the high level break pressure tank started to lose ground, with water going out faster than we could fill it. This was always going to happen when the CFA had to revert to hydrant use (which they had avoided for as long as possible), at one stage I counted as many as seven hydrants going but all in all the system coped as well as we could have expected. As well as Omeo, the fires threatened Dinner Plain with our reclaimed water irrigation area sustaining a lot of damage. We helped out with this over the phone until we could get through around 7.00pm to check. Fires also threatened Swifts Creek and another staff member who was on his way up to relieve me so I could take a break stayed there until the danger had passed, checking in every 30 minutes. That was a bonus as we could not get to Swifts Creek because of the fires jumping the roads. Again, we maintained disinfection in all systems throughout the crisis, even though Omeo lost power for the next 2 days.

3.7 The Aftermath

Our best estimates put our water use for the day in Omeo at 1.5 ML, most of that in a four hour period.

The damage we sustained was relatively minor when we consider what may have been. Up to 6

manholes damaged by bulldozers, up to half Dinner Plain irrigation area damaged plus 500 meters of fencing, garden beds and sleepers at sewage pumping station totalled, up to a dozen water meters melted, some service leaks but all in all not too bad.

4.0 And then Came the Rain

After the fires came the flash flooding causing havoc again. People were wondering what was next. With catchments heavily damaged, massive rafts of debris flowed into the rivers and streams that supplied Swifts Creek resulting in turbidity of over 2000 NTU and we had to resort to water restrictions and carted water from the Omeo supply. Our little treatment plant worked overtime again, as we were still providing drinking water to outside consumers, the rain had washed debris into people's water tanks from their roofs and their streams were choked.

When the worst of the debris had settled in the river we experimented, with the help of Aluminates in Morwell, with Dosing PAC10LB into the rising main from the pump station, to flocc out the sediment, letting it settle in the storage. It worked well with raw water turbidities as high as 100NTU. We were getting water into town with less than 2 NTU.

5.0 CONCLUSION

The people in the area have been very complimentary about the job we have done and I think the profile of EGW has been raised from "just another government department" to an organization that really has put not only our consumers, but the whole of the wider communities welfare above all else. During the fires we provided drinking water to communities outside our own area, supplied a generator to the general store to maintain the food stores, hay has been donated from our Bruce's Track farming enterprise, we pumped septics that were overloading, liaised with CFA constantly with their response procedures, helped people with damaged services, advised on home protection with regards to water use and probably most importantly, gave people a sense of confidence that they would be able to defend their homes with the system available to them. All this and still maintained water quality (with regards to disinfection).

We are still receiving requests for advice on water quality from people in outlying areas reliant on tanks and dam water in the wake of the floods.

As I write the snow is falling again, in my head I can hear the pipes starting to freeze and I hope it doesn't snow while I'm playing footy on the weekend. The coach gets cranky when I get called out but hey, that's life in the high country.

6.0 ACKNOWLEDEMENTS

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