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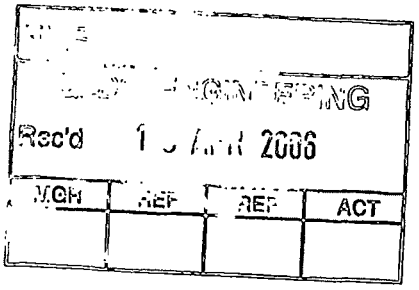

06 April 2006

Martin O'Malley
QLDC Engineering
Private Bag 50072
QUEENSTOWN

Dear Martin,

Jacks Point Development – RM050655

Further to our discussions we now enclose a summary of the key design criteria for the water supply and wastewater at Jacks Point in response to your letter dated 15 March 2006.

We trust that this information is sufficient to fully answer your queries. We are available to meet with you again should you require any further clarification.

SCAN ME PLEASE

Yours sincerely

Ken F Gousmett
Construction Management Services

Copy: Reg Fraser, CivicCorp

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Jacks Point Development – RM050655
Water Supply and Wastewater – Key Design Criteria

Water Supply

The water supply was commissioned in mid December 2005, with only the treatment still in construction (due for completion on 31 May). This was the subject of a land use consent RM040843 and ORC consents 2004.724 and 2004.725.

- Current configuration is two identical pumps each of 82 litres/sec capacity, one duty and one standby.
- There is provision for a future third pump at which time there will be two duty pumps.
- The rising main is designed for 164 litres/sec.
- Initially the treatment will be UV sterilisation and residual chlorination. It is expected that DE filtration will be added later. Trials of DE, membrane filtration and one other will start shortly together with further water quality testing.
- The treatment plant for Stage 1 is designed for 82 litres/sec. Stage 2 will be 164 litres/sec.
- The water supply will be considered to be a small supply in terms of the NZ Drinking Water Standards 2005 for some time.
- Stage 1 storage consists of a 1200m3 volume buried reinforced concrete tank. Two further tanks of equal volume are planned.
- The demand is based on the projected "future proof" scenario. This is for 3072 dwelling equivalents plus some commercial development with a design demand of 164 litres/sec at peak and 82 litres/sec at average demand. This includes normal household irrigation. The wider resort irrigation and the golf course irrigation are supplied separately.
- The water supply including the trunk gravity mains will serve all of the Coneburn area comprising Henley Downs, Jacks Point and Homestead Bay.
- The average residential demand used in the "future Proof" scenario is 2100 litres per dwelling per day with a peak factor of 2.0. The storage volume removes the need to provide for short term peaks on the supply side of the reservoir.
- The Jacks Point reticulation has been modelled on the basis of 1950 litres/lot/day with a peak daily demand of 2.0 and a peak hourly demand of 2.0. This is close to Council's recently amended standards and is substantially more than NZS4404.
- The ORC consent 2004.724 condition 2 limits the water take to:

Domestic and Domestic Irrigation

2. The rate of abstraction shall not exceed
   (a) 43,785 cubic metres per week;
   (b) 158,546 cubic metres per month;
   (c) 1,331,064 cubic metres between 1 September in a year and 31 August in the following year

The decision of the ORC determined that the maximum demand used to calculate these rates was 3000 litres/dwelling/day. The above rates are based on a development scenario slightly less than the "future proof scenario".

The QLDC consent RM050655 condition 5b requires a minimum of 2100 litres/lot/day.

Wastewater

The wastewater system is decentralised on site treatment and disposal to ground. Construction of the wastewater treatment and disposal system for the N1 residential area is nearing completion. The wastewater system is the subject of land use consent RM060137 and ORC consent 2004.793.

Wastewater design flows are based on 192 litres/person/day with a population of 5 persons per house at peak. This is 960 litres/dwelling/day. No allowance is made for peak flows beyond the house site i.e. no peaking factor has been used. This is because there will be a 4500 litre primary treatment tank installed at every house site with a filtered outlet and discharge either by pumping or gravity syphon to the street sewer. The tank will hold approximately 4 days flow plus space for sludge. Peak flows will be absorbed in the tanks. The reticulation downstream of the tanks is a pressure system without manholes and all joints are sealed. The opportunity for infiltration is zero. The same applies at the treatment plant where all tanks and pipes are sealed.

The only opportunity for infiltration or inflow is at the house sites upstream of the individual tanks. Under the current building regulations and efficient inspections the jointing of the household gravity drains can be expected to be water tight. Gulley traps are required to be 100mm higher than surrounding ground and not in an area that can become inundated. This is now a particular point of inspection. Jacks Point will have a very low risk of infiltration or inflow compared to existing residential areas in Queenstown and Wanaka, which the Council wastewater flows are based on.

Furthermore the ORC consent requires on going monitoring and flow measurement. This will soon provide a record of actual flows and the design for subsequent stages can be adjusted. Also the treatment and disposal system is modular and quite easily added to if required.

All of the roading, stormwater, water and wastewater infrastructure at Jacks Point will be owned and operated by Jacks Point Ltd and in time passed over to the Residents Association. No infrastructure at Jacks Point will pass to Council.

Water and Wastewater Pipeline Testing and Inspections

The following has been provided by Lane Vermaas the site based Utilities Manager for Jacks Point.

For pipeline testing we have a site form agreed with Reg Fraser of CivicCorp when we do testing signed by myself as the Engineer and by the Contractor responsible. This applies to water mains

and sewers. Reg Fraser then comes when available and we re-test some of these sections as he requires with him counter signing the forms. Next Wednesday he is booked in to perform these tests in N1 and N5 residential areas for both water and sewer.

Our own testing is such that the entire 450mm main , the 225 feeder main to N5 , all of N1a (including all lateral leads) and all of the Tablelands, have been tested to 11 Bars and all the sewer reticulation in N1a as well as the 250mm outfall up to the N1 Treatment plant has also been tested to 10 Bars. Besides two minor leaks at the Acuflo boxes all these Tests were successful.

Les Collins will be chlorinating the Reservoir today or tomorrow, after which we will then flush the system and sanitise all the reticulation in the mains and N1a, Tablelands and N5.

Ken F Gousmett
Construction Management Services