

4.0 ASSET DATA

4.1 Asset Summary and Valuation

Taupo District Council (TDC) is responsible for the management of water assets with a replacement value (excluding land value) of approximately \$132 million. The water asset consists of a number of components:

- Treatment Plants (including reservoir and Boosting pump stations)
- Network reticulation (water meter, fire hydrant, valves and Pipes)

The following table gives a summary of the asset stock and valuation as at August 2017 for both treatment and reticulation.

Type	Depreciated Replacement Value	Replacement Value
Treatment	\$18,702,301.37	-
Reticulation Network	\$53,619,259.27	-
TOTAL	\$72,321,560.65	\$132,988,900.23

Table 1: Water Asset Valuation Summary

4.1.1 VALUATION PROCESS

All recorded components have been valued in terms of their replacement and depreciated replacement value. The valuation process has been performed in accordance with generally accepting accounting standards (NZ IAS16 Property, Plant and Equipment) and with NZ local authority asset valuation practices (NZ Infrastructure Valuation and Depreciation Guidelines).

The basic approach has involved:

- a) Preparation of the valuation databases from the various sources of information supplied by TDC.
- b) Adjustment of asset quantities, materials and techniques to reflect an optimum (least cost) modern equivalent replacement that offers the same level of service as that currently provided.
- c) Calculation of optimum replacement cost (ORC) by multiplying asset quantities by appropriate unit construction cost rates and including an allowance for other costs (site establishment, professional fees and financial charges).
- d) Prediction and assignment of economic and remaining lives.
- e) Calculation of Optimised Depreciated Replacement Costs (ODRC) by deducting an allowance for depreciation, taking into account age, remaining life and residual value.

4.2 Asset Component

4.2.1 SOURCE, TREATMENT PLANTS

4.2.1.1 Description

Taupo District Council manages 21 water supplies schemes from 19 water sources.

Water Treatment Plant	Depreciated Replacement Value
Acacia Bay	\$1,759,868.08
Atiamuri	\$177,341.27
Bonshaw Park	\$144,302.19
Centennial Dr	\$1,133,535.17
Hatepe	\$199,396.53
Kinloch	\$474,005.18
Mapara Rd (supplied from Acacia Bay)	\$37,322.00
Mangakino	\$788,582.31
Motuoapa	\$335,855.75
Motutere	\$100,059.43
Omori	\$544,826.11
River Road	\$107,207.93
Turangi	\$1,228,245.69
Tirohanga	\$391,951.83
Taupo	\$9,905,863.64
Waihaha	\$239,202.10
Waitahanui	\$181,043.76
Whakamaru	\$418,704.93
Whakamoenga	\$149,476.69
Whakaroa (supplied from Kinloch)	\$244,704.59
Whareroa	\$140,806.19
TOTAL	\$18,702,301.37

Table 2: Source, Treatment Plant Asset Value

4.2.1.2 Capacity/Performance

The performance of each water treatment plant is assessed based on drinking water standards and resource consent compliance. Monthly and quarterly reports are updated for DWA (Drinking water assessor) in WINZ and Annual Reports are prepared for WRC on each plant detailing the performance of the plant for that year for water quality, daily and annual volume water abstraction results. The type of monitoring reports and analysis carried out is governed by DWSNZ and the resource consent conditions.

The capacity of each scheme and reticulation system is governed by WRC resource consent conditions and this is based in the capacity of the water source and demand for water by the community served.

More information is contained in the appendices on each individual scheme.

4.2.1.3 Condition

The conditions assessment of the Water Treatment Plants, boosting pump stations and reservoir is a live document and is being updated every year by the operation team. The asset register is also reviewed by the network engineer(s). Based on condition assessment and network failure history the maintenance and renewal plans are prepared.

The condition rating is stored on an excel spreadsheet, which is generally derived from the asset register. This condition assessment feedback from operations team and engineering review by Asset Manager determines the maintenance and renewals budget. The asset condition assessment database is manipulated to identify renewal and maintenance requirements, these are overlaid by service request information and the annual compliance reports to determine future work priorities. Ultimately this condition assessment data will be stored in the fully developed AMS, when it is ready.

The revaluation of these assets is done by external consultants every three year.

This condition rating is stored on an excel spreadsheet (TDC Ref: A309067).

4.2.1.4 Treatment Plant Age

The water treatment plants have been constructed at different times as required. In some cases upgrades have occurred. This information is shown in the table below.

Scheme	Source	Type of Treatment (current)	Construction Year	Upgrade Year	Upgrade Type
Acacia Bay inc. Mapara Road	Lake	Chlorination	1987 1987		
Atiamuri	Bore	Chlorination	1992		
Bonshaw Park	Bore	Chlorination	1990		
Centennial Drive (River intake)	River	Chlorination	1988		Chlorine contact tank added in 2017.
Hatepe	Lake	Chlorination	1983		
Kinloch	Lake	Chlorination	1985		
Mangakino	Spring	UV treatment and Chlorination	1965	2011-12	Original PS retained and new WTP built to meet NZDWS.
Motuoapa	Lake	Chlorination	1984		
Motutere	Lake	Chlorination			
Omori	Lake	Coarse screen filter plus Chlorination	1997	1997	Combining of Pukawa and Omori- Kuratau supplies
River Road	Spring	Chlorination	1994		
Lake Terrace	Lake	Membrane	2014	1970 ¹ 2009-14 ²	¹ Upgrading the pump station capacity and Gillies avenue pump station ² New WTP at Lake Terrace to meet NZDWS.
Tirohanga	Spring	Coarse screen filter plus Chlorination	1984	2009	Upgrade to allow supply to new subdivision Serenity Cove

Scheme	Source	Type of Treatment (current)	Construction Year	Upgrade Year	Upgrade Type
Turangi	Spring	UV Treatment, Chlorination and fluoridation	1965-67	2011-12	Pump station and WTP to meet NZDWS.
Waihaha	Spring	Chlorination	1983		
Waitahanui	Bore	Chlorination	1988		
Whakamaru	Bore	Chlorination	1983	1992	To service all
Whakamoenga Point	Bore	Chlorination	1992	2008	Upgrade pumps
Whareroa	Bore	Chlorination	1989	2010	Upgrade pumps

Table 3: Treatment Plant Type and Ages

4.2.2 RETICULATION

4.2.2.1 Reticulation Description

Reticulation includes pipes (both gravity and pumping), Fire hydrant, water meters, backflow preventors, pressure relief, air release and or boundary / isolation valves.

Water Reticulation	Depreciated Replacement Value
Acacia Bay	\$1,835,400.17
Atiamuri	\$312,288.17
Bonshaw Park	\$307,471.26
Centennial Dr	\$1,249,760.51
Hatepe	\$269,170.10
Kinloch	\$2,618,313.83
Mapara Rd (supplied from Acacia Bay)	\$1,107,020.29
Mangakino	\$874,812.02
Motuoapa	\$994,676.78
Motutere	\$89,587.94
Omori	\$2,372,072.57
River Road	\$672,202.62
Turangi	\$3,392,870.50
Tirohanga	\$1,731,524.05
Taupo	\$32,209,914.52
Waihaha	\$1,933,138.25
Waitahanui	\$184,329.13
Whakamaru	\$172,164.45
Whakamoenga	\$326,662.76
Whakarua (supplied from Kinloch)	\$656,092.56
Whareroa	\$309,786.79
TOTAL	\$53,619,259.27

Table 4: Scheme Reticulation Value

4.2.2.2 Reticulation Condition

The condition assessment data is generally collected by analysing the pipe age, material of construction, customer service records, leak detection surveys and historical failure. This is not extensive and it is noted that further condition and any failure assessment will be regularly done on pipe sections which are below ground that are nearing their theoretical lives. An operational budget is proposed in the LTP (refer appendix Z) based on historical maintenance contract expenditure and future needs based on upgrade of WTP. From these assessments key renewals works is identified and prioritised.

An annual fire hydrant programme is also undertaken as a part of network capacity assessment during peak summer times.

There is current evidence of water loss in some supply networks. Reducing this water loss will reduce the amount of water that needs to be treated and aims to reduce treatment plant costs.

In some of the smaller water schemes the organics and suspended impurities is often high which can cause a blockages of domestic water filter system. The water network flushing programme will be developed and the online monitoring of raw water turbidity and or selective abstractions system will aim to reduce these problems.

4.2.2.3 Reticulation Performance

Reticulation performance is assessed through the number of services requests received on the particular asset, how many water quality (taste and odour) related complaints that gets registered and if any leaks /bursts occur causing low water pressure and or disruption in water supply.

The main problem within the reticulation occur because of leaks and bursts caused by excessive pressure and or water hammer, aging steel pipework, or accidental damage during excavation work.

Fire hydrant testing program identifies the areas that need improvement to achieve the minimum flow and pressure requirements.

There is a significant proportion of old AC pipe within the water supply network. This pipe is still performing relatively well but is needing to be treated carefully.

4.2.2.4 Reticulation Age

The approximate life expectancy of the pipe work and fittings is shown on the graphs below. Individual scheme profiles are listed in the renewal plans.

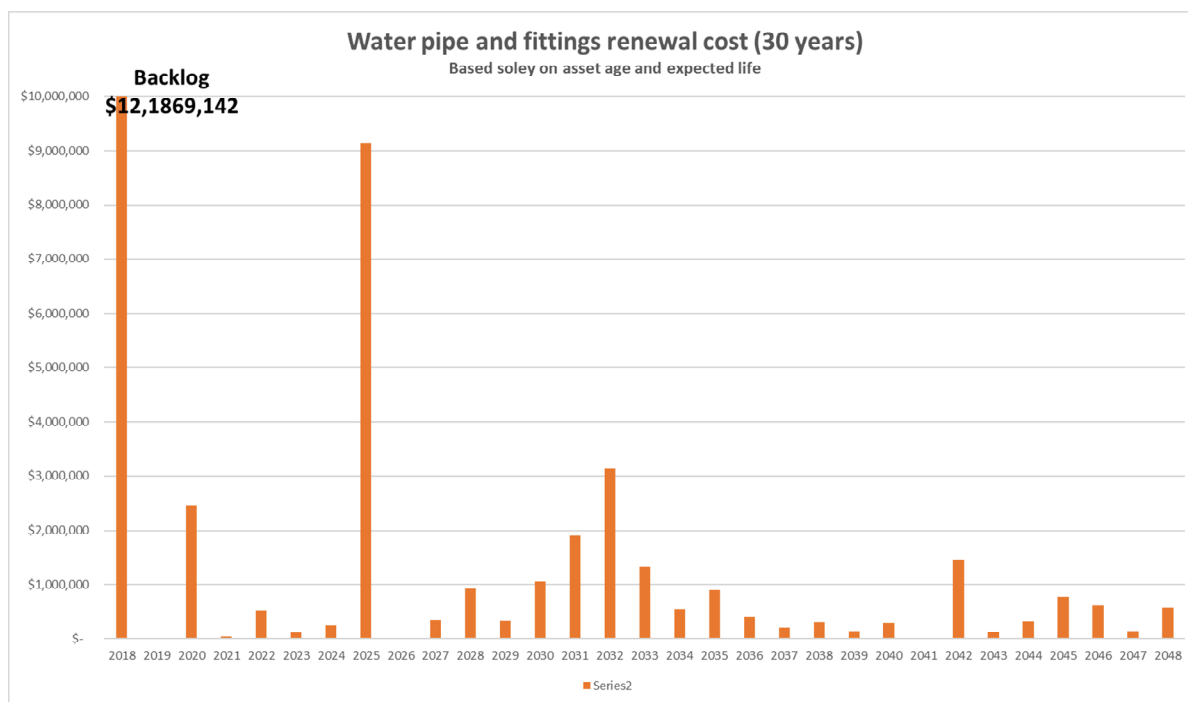


Figure 2: water pipe and fittings Renewal Profile

4.2.3 BOOSTING PUMP STATIONS

There are a number of booster pump stations are the pump stations within the network that are not associated with water treatment plants.

Scheme	Pump station
Kinloch	Loch Eagle PS
Mapara Road	Mapara Road PS
	Blueridge PS
Omori/ Kuratao/ Pukawa	High Level PS (Omori)
	Pukawa PS
Taupō	Gillies Avenue PS
	Nukuhau PS
	Woodward Street PS
	Ashwood PS
	Broadland Road PS
	Titoki PS
	Airport PS
	Arrowsmith (Botanic Heights) PS
Tirohanga/ Serenity Cove (Rural)	Spencer Road PS
	Serenity Cove PS
Waihaha (Rural)	Waihaha PS

Scheme	Pump station
Whakaroa	Whakaroa Low PS
	Whakaroa High PS

Table 5: List of Water Pump Stations

4.2.3.1 Pump Station Condition

Each pump station condition is assessed every year by the treatment plant team. This includes looking at the condition of the following; pumps, valves, structural condition, contact tank, reservoirs, ladder, platform, electrical control panel and telemetry. There is a gradual replacement programme currently in place.

Upgrade to electrical control and telemetry at water pump stations is being rolled out on a priority basis.

4.2.3.2 Pump Station Performance

Overall the pump stations are performing as expected. As pumps are replaced it is expected that more efficient pumps can be used which will improve the pumping performance and reduce the operational costs through reduced power requirements.

4.2.3.3 Pump Station Age

The varying components of the WTP/ Boosting pump stations have different life expectancies. Expected life of new asset is identified as follows:

- Civil Structure: 80 year
- Pipe and associated fittings: 100 year
- Pumps, mechanical and Electrical: 25 year
- Process component (membranes): 3-5 year
- Process component (UV lamps/ arsenic removal media): 1-1½ year
- Instrumentation: 10-15 year.

4.2.4 RESERVOIR /STORAGE

Water storage is provided at each scheme to meet daily demands and to provide resilience in emergency events.

In total there are 62 water storage units across the district with a combined capacity of 30,000m³.

4.3 Asset Confidence Rating

The asset valuation assigns confidence ratings to the source data and unit cost rates and to other items as appropriate (refer objective A1349065). The overall confidence rating for the water asset is **B-**.

Grade Score	Grade	Description	Accuracy
1-2	A	High Accuracies, data based on reliable documents	±5%
2-3	B	Data based on some supporting documentation	±10%
3-4	C	50% Estimated, data based on local knowledge	±15%
4-5	D	Significant Data Estimated / No Data, data based on best estimate of experienced person	±30%

Table 6: Key to Asset Confidence Rating

Attribute	Confidence Grade			
	D	C	B	A
Asset data				
Physical properties (length/size/materials)				
Location				
Age				
Condition				
Performance				
Deterioration rate				
Financial data				
<u>Opex</u>				
Operation costs				
Maintenance costs				
Asset management costs				
Interest rates				
Depreciation				
<u>Renewals</u>				
Unit rates				
Project scope				
Cost estimates				
<u>Capital works</u>				
Demand forecast				
Project timing				
Project scope				
Project costs				
<u>Project prioritisation</u>				

Table 7: Summary of Asset Confidence Ratings