KAWERAU DISTRICT COUNCIL
Asset Management Plan 2020

Wastewater

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Version History

Version	Date	Notes	Author
2015	2015	Final version: AMP - 2015	Tom McDowall
1a	09/02/2018	First revision for 2018	Hanno vd Merwe
1b	15/02/2018	Review: Technical support officer	Tina Mitchell
1c	23/02/2018	Update after MOS review	Hanno vd Merwe
1d	20/02/2018	External review	Kelvin Hill (Western Bay DC)
2	30/02/2018	Submission to Council	Hanno vd Merwe
2a	23/11/2020	First Revision for 2020	Tina Mitchell
2b	8/04/2021	Three Waters Review	Riaan Nel
2c	12/04/2021	Management Review	Hanno vd Merwe
2d	20/07/2021	Post Audit Review amendments	Tina Mitchell

SECTION ONE

Executive Summary

1.1. PURPOSE OF THE PLAN

The overall purpose of this Asset Management Plan is to describe Council's strategies for the management of its waste water assets. The Plan enables Council to meet the present and expected future needs of the Community over a ten year period (according to the 10 year Long Term Plan) and into the future (according to the 30 year Infrastructure Strategy).

The Plan details the assets Council owns and describes how the maintenance, renewal and replacement of these assets will be managed and funded to meet required levels of service for Council's Wastewater Activity in the most cost effective way for households and businesses.

The Asset Management Plan collates high level management, financial, engineering and technical information from various sources into a single document. It is a tool for communicating complex asset management information and strategies with stakeholders and interested parties.

The level of provision of asset management for the wastewater asset was evaluated in 2017 by an independent auditor. The appropriate level was recommended to be raised from the Council's asset management policy of "Core" to "Intermediate" due to the higher risk to the health and well-being of the community in the event of wastewater assets failing to deliver an appropriate level of service.

The latest assessment of the current asset management level and the level required for "Intermediate" showed a gap of 10 percent overall for wastewater. The asset management improvement actions include actions to close this gap.

1.2. ASSET DESCRIPTION

The community is served by a wastewater system designed to manage wastewater collection, treatment and disposal. It has one reticulated wastewater network, servicing around 2,700 properties including approximately 250 businesses. Four large industrial plants use the network to dispose of domestic waste. One business, the Waiu dairy factory is consented and charged for the disposal of trade waste via the wastewater system since June 2019.

Properties connect to the public reticulation system through small pipes. Larger pipes and manholes are used in the network where changes in gradient and direction occur. There are also five pump stations. All wastewater is brought to the treatment plant. Treatment and the discharge of water to ground are carried out in accordance with resource consent requirements and to maintain a healthy environment. Septic tanks are used for the few properties in the District not connected to the network.

The table below summarises the key components of the system including additional infrastructure soon to be vested in Council following the residential developments of Porritt Glade and Central Cove. These additions are shown in brackets in the table:

Key components

Number of properties connected	2685
Length of reticulation (kms)	58
Number of pumping stations	4
Number of treatment plants	1
Manholes	767
Wastewater treated (avg m^3/d)	2,200

The replacement costs and depreciated values of the stormwater asset are shown below:

Replacement and depreciated values

Asset Type	Gross Replacement @30-6-2019	Depreciated Replacement Cost @30-6-2020
Pipelines	$16,757,792	$4,885,094
Laterals	$657,500	$338,736
Manholes	$2,608,670	$776,307
Pumping Station	$206,600	$227,301
Treatment Plant	$7,503,200	$4,938,246
TOTAL	**$27,733,762**	**$11,165,684**

1.3. LEVELS OF SERVICE

Customer levels of service

Council monitors and reports its actual performance against measures and targets contained in the Long Term Plan.

Council targets includes community satisfaction, number of complaints, the number of service requests and time taken to respond as well as number of supply disruptions and failures. The National Research Bureau three yearly community satisfaction survey undertaken in 2020, reports 95% resident satisfaction with the wastewater service that is above the peer group (83%) and national averages (80%).

Technical levels of service

Council seeks to maintain and operate a wastewater system in a manner that is fit for purpose and does not compromise public safety. It also seeks to comply with its wastewater resource consents at all the times.

Constraints to levels of service

Constraints can arise because of capacity, reliability and security of supply, environmental performance and issues relating to the water sources, treatment, storage and reticulation. These are described fully in section 3.3 of the Plan.

Resource consents

Council holds resource consents from the BOP Regional Council for the discharge of treated wastewater from the treatment plant and the breakdown of wastewater solids. Consent conditions relate to the volume, quality and rate of wastewater discharge and its effects on groundwater quality.

Significant adverse effects

Potential adverse effects are the potential overflow of sewage due to pipe blockages and failure of the treatment plant exceeding one day. This would have environmental and potential health effects (i.e. environmental and social wellbeing).

1.4. FUTURE NEEDS

Kawerau's wastewater network is generally adequate for current demands and most of the network has some spare capacity.

The Kawerau District has experienced low general population growth in demand for additional services however has continued to experience a consistent increase in residents over the age of 65. In the 2013 census, the total population of the Kawerau District was 6,363, a decrease of 8.1% or 561 people since the 2006 census. Despite the predicted further decline, the 2018 census showed a modest growth of general population to 7,460.

Council hopes to bolster these gains with economic development initiatives, such as the development of a new industrial park and promotion of the natural environment.

The existing wastewater network has excess capacity enabling it to cope with any reasonable increased demand. A boundary adjustment was carried out in 2012 with the subsequent initial development of the new industrial park. Council constructed a service line to the new industrial park on SH34 in response to this and the new Waiu dairy factory came online with a consent to dispose of trade waste in June 2019.

1.5. LIFE CYCLE MANAGEMENT

Assets

Service connections

Service connections connect properties and businesses waste water lines to gravity reticulation pipes. Service connections may be Asbestos Cement (AC), glazed earthenware, Polyvinyl Chloride/Plastic (PVC), concrete lined steel or concrete, depending on when a property was developed.

Gravity reticulation pipes

Gravity lines connect service connections and properties and businesses wastewater lines to pump stations and eventually to the treatment plant. Depending on location and age, the pipes are asbestos cement, concrete, concrete lined steel, PVC or glazed earthenware.

Rising pipes

Rising pipes are pressurised pipes that connect pumping stations (both Council and private) to receiving gravity reticulation pipes.

Pump stations

There are five pump stations, two pump effluent from Council facilities, one pumps trade waste from the industrial block and two pumps wastewater from low lying housing areas.

Treatment plant

There is a single modern plant that removes solids from the wastewater. The solids are disposed of by vermiculture and the effluent is discharged to rapid infiltration basins.

Manholes

Manholes are used at changes in pipeline gradient, direction, and diameter or at multiple service connections.

Critical Assets

Most components of the wastewater asset are able to fail for a period of 24 hours before intervention is required. Intervention is simple and relatively inexpensive and therefor only a small number of pipes, one pump station and the treatment plant are considered critical.

New assets

The two resource consents for the wastewater treatment plant extend beyond the length of this Plan so there is no requirement to improve its efficiency during the life of the Plan. The proposed new industrial park is not expected to increase flows by more than five percent.

New network assets from recent land developments are to be vested in Council.

Maintenance activities

Beyond the geothermal area of town that requires renewal work, the wastewater network is in a good state of repair. Council intends to operate, maintain and renew the network so that it continues to provide the level of service required in the future. Regular, ongoing maintenance including ongoing removal of problematic street trees will allow the existing levels of service to continue indefinitely.

Renewal/Replacement

Pipes generally deteriorate in line with the National Asset Management Steering Group (NAMS) guidelines with the exception of an area of geothermal activity that includes Kawerau's town centre.

Council's objective is to maximise asset life without compromising service. Replacement decisions are based on the condition, reliability and maintenance cost and risk profile of an asset as well as its age.

The network has been divided into six zones: the first 5 zones are based on the estimated average date of development. The sixth zone is geothermal areas where concrete pipe replacement with PVC pipe is being accelerated.

The zones are:

1. 1955-1957 (~20 500 m)
2. 1962-1970 (~6 700 m)
3. 1973 (~8 800 m)
4. 1978 (~7 100 m)
5. 1980-1996 (~7 700 m)
6. 2000 to present (~2 300 m)

Deferred Maintenance and Disposal Plan

Council policy is to avoid any deferred maintenance and currently there is no known deferred maintenance for the wastewater network. Similarly, there are no specific disposals identified in the Plan.

1.6. FINANCIAL SUMMARY

Kawerau's wastewater asset is adequate for the current and foreseen population and industrial needs.

The funding for wastewater operation and replacement is collected through rates. The funding collected in excess of the actual replacement is being held in the depreciation reserve. At some stage of the replacement cycle the account will go into deficit and Council will raise a loan to fund this deficit. Initially the loan will probably be internal and against the other depreciation reserves.

The model for replacement of wastewater pipes is reasonably accurate as the pipes lives have been verified by physical testing and pipe failures has also confirmed the deterioration rates.

1.7. ASSET MANAGEMENT SYSTEMS AND PROCESSES

Asset management outcomes

Responsibility for asset management outcomes lies with the Manager, Operations and Services.

Accounting and asset management systems

Ozone software is used for accounting and billing. All formal asset management financial reporting including valuation is currently held in Excel spreadsheets. This is being migrated into the AssetFinda system.

The improvement plan proposes that all appropriate financial information be inputted into AssetFinda.

Hard copy plans contain layout details of the structures and all known pipes comprising the wastewater network. Over time these will become obsolete as new information is held on AssetFinda.

Key information flows and processes

Key information flows and process linkages relate to the incorporation of Kawerau's Community Outcomes, the preparation and adherence to Council's annual budgets, environmental monitoring and compliance and to ongoing asset management that maintains levels of service to the community.

1.8. MONITORING AND IMPROVEMENT PLANNING

Improvement items are outlined in section 9 of the Plan. Key improvement activities centre on continuing to increase the accuracy of Council's information relating to the wastewater assets.

The Leadership Team will monitor and review improvement items on a six monthly basis. The improvement plan will be reviewed each year as part of the annual plan development process.

SECTION TWO
Introduction

2.1. PURPOSE OF THE PLAN

The overall purpose of this Asset Management Plan is to describe Council's strategies for the management of its wastewater assets. The Plan enables Council to meet the present and expected future needs of the Community over a ten year period (according to the 10 year Long Term Plan) and into the future (according to the 30 year Infrastructure Strategy).

The plan details the assets Council owns and describes how the maintenance, renewal and replacement of these assets will be managed and funded to meet required levels of service for Council's Wastewater Activity in the most cost effective way.

The asset management plan collates high level management, financial, engineering and technical information from various sources and combines these into a single document. It is a tool for communicating complex asset management information and strategies with stakeholders and interested parties.

2.2. ASSET DESCRIPTION

Council's wastewater system collects, treats and dispose of wastewater (sewage) from properties in the District. Its components are a network of underground pipes, pumping stations and a treatment plant with soakage basins. Wastewater enters the network from properties in built-up parts of the District and is conveyed to the treatment plant where it is treated and then disposed of via rapid infiltration basins and by vermicomposting.

The wastewater network, serves around 2,700 properties including 250 businesses. Four large industrial plants use the network to dispose of domestic wastewater, and one factory has a trade waste consent.

Properties are connected to the public reticulation system through small pipes called service connections. These pipes are generally the responsibility of the property owner. Where a portion of connection passes outside the property boundary to connect to the wastewater network is deemed to belong to Council.

The wastewater network includes 150 – 450mm pipes and manholes where changes in gradient and direction occur. There are pump stations to lift effluent from low lying areas to the gravity network.

All wastewater is brought to the treatment plant. Here the solids are removed and the liquid soaks to ground in rapid infiltration basins where the soil removes bacteria. The discharge of water to ground and the treatment of the removed solids are carried out to meet resource consent requirements and maintain a healthy environment.

Council measures the total solids content and the quantity of the treated water going to the rapid infiltration basins. This information is provided to the BOP Regional Council as required in the consents.

The key components of the Kawerau wastewater system are listed in the following table including additional infrastructure soon to be vested in Council following the residential developments of Porritt Glade and Central Cove. These additions are shown in brackets in the table:

Table 1: Key components

Number of properties connected	2,685
Length of reticulation (kms)	58
Number of pumping stations	4
Number of treatment plants	1
Manholes	767
Wastewater treated (avg m^3/d)	2,200

Septic tanks are used for the few houses in the District not connected to the network.

2.3. OBJECTIVES OF ASSET OWNERSHIP

The goal of the Wastewater Activity is to provide a quality wastewater removal, treatment and disposal service to meet reasonable community needs that enhance community health and safety and the environment.

Council is obligated by the Health Act 1956 and the Building Act 2004 and is supported by the powers given to local authorities in the Local Government Act (LGA) and other legislation to provide wastewater services.

Section 23 of the Health Act 1956 imposes a general duty on Councils to improve, promote, and protect public health within their District. In particular Section 23(c) imposes a duty on Councils to cause all proper steps to be taken to secure the abatement of the nuisance or the removal of the condition. It would be virtually impossible for Council to fulfil this obligation without reticulated wastewater in urban areas.

The activity involves:

- Management and monitoring of wastewater assets and wastewater disposal.
- Repairing or replacing unsound pipes and other wastewater structures and plant.
- Operating the wastewater treatment plant.
- Planning to meet future requirements and improving operations.

Council's principal objectives are:

- To ensure that the wastewater network continues to provide a high quality collection, treatment and disposal service.
- To anticipate the time when it becomes necessary to extend, upgrade or renew the existing wastewater network, and to plan accordingly.
- To ensure the appropriate maintenance of the wastewater network in perpetuity, so that there is no diminution in value and to forecast the estimated future cost of doing so.
- To put in place a sound management regime for all matters relating to the wastewater network.

2.4. CONTRIBUTION TO COMMUNITY OUTCOMES

The Council Community outcomes to which the Wastewater Activity primarily contributes are set out in Table 2 below.

2.5. LINKS TO OTHER STRATEGIC DOCUMENTS

Public infrastructure supports activity that contributes toward the economic, social, cultural and environmental wellbeing of the Community. In addition to wastewater infrastructure, Council owns the water supply and stormwater systems, the District's roads and footpaths, and its public parks, reserves, buildings and facilities. The parts making up those networks and structures and the tools and equipment used to manage and maintain them, are known as Council's assets.

Every three years Council develops a Long Term Plan setting out the range and level of services it will provide to meet identified Community needs and Community Outcomes and indicates anticipated expenditure on assets for the next 10 years. Each year Council adopts an Annual Plan, containing the budget for Council services. Council's ability to deliver services and to do so at a reasonable cost depends on the condition, performance and risk profile of its assets.

In this way, Council's asset management planning is therefore closely linked to its Annual Plan and Long Term Plan.

This Asset Management Plan was developed in conjunction with the Kawerau District Council Long Term Plan 2021-2031. It will underpin and be integrated both into that document, and the Annual Plans made over the next ten years.

Table 2: Contribution to Community Outcomes

Contribution	Outcome
Continuity of sewage collection.	Council infrastructure and services are accessible, age-friendly, effective, efficient and affordable, now and for the future.
Management and monitoring of sewage disposal.	Council regulates, monitors and acts to protect public health and safety, to prevent harm and nuisance and to improve standards in Kawerau's home, commercial and public environments.

SECTION THREE
Levels of Service

3.1. CUSTOMER LEVELS OF SERVICE

The National Research Bureau undertakes an independent survey to measure the level of customer satisfaction with the services provided by Council. The results of these surveys for the Wastewater Activity are shown below.

3% of respondents did not know how they felt about the activity that resolves the skewed result obtained in 2017 when a relatively large fraction of respondents reported the same. The 95% resident satisfaction with the wastewater service however is still above the peer group (88%) and national averages (81%).

Table 3: NRB Survey Results – Water Supply

%	2007	2008	2009	2011	2014	2017	2020
Very/Fairly Satisfied	97	96	99	96	97	91	95
Not very Satisfied	1	1	-	-	2	2	2
Don't Know	2	3	1	4	1	6	3

Table 4: NRB Survey Results – Reasons Residents were not very satisfied

	2007	2008	2009	2011	2014	2017	2020
Odour	1				1	1	
Blocked sewer lines	1				1		
Poor toilet flushing			1			1	
Sewage overflow				1	1		
Communication							2

3.2. TECHNICAL LEVELS OF SERVICE

Council will continue to monitor and report its actual performance against measures and targets described in the LTP. All reporting is done through quarterly reports to the Council by the Manager, Operations and Services.

Table 5: Technical Levels of Service (LOS)

Level of Service	Performance Measure
Provision of a reliable domestic wastewater collection and disposal service	Continuity of service 365 days a year No more than 50 disruptions of service per year >97% Community satisfaction (measured 3 yearly) Zero allowance for Dry Weather Overflows
The total number of complaints received	Complaints per 1000 connections for each criteria • Odour – No more than 1 • System Faults – No more than 15 • Blockages – No more than 15 • Council's response – Nil allowable
Wastewater treatment plant operation	Maintain compliance with resource consents conditions
Callout and fault response times	Sewage overflow report call outs: 1 hr attendance with 8 hrs resolution
Minimal environmental effects	Maintain compliance with resource consents conditions

3.3. CONSTRAINTS TO LEVELS OF SERVICE

The constraints impacting on levels of service of the wastewater network are shown in the table below.

Table 6: Constraints to Levels of Service

Constraint	Component	Comments
Capacity	Service Connections	There are no known constraints of capacity associated with wastewater network connections.
	Public Networks	There are no known constraints of capacity with the current network of pipes. Fat build ups and tree roots temporarily reduce capacity from time to time. Rain inflow and infiltration occurs during heavy rainfall. Investigation into where this is happening is undertaken and appropriate action instigated.
	Treatment Plant	The treatment plant has capacity to cater for a population 30% higher than is currently the case.
	Consents	The consents limit the level of treated liquid that can be disposed of to the Rapid Infiltration Basins (RIBs). The consent allows for twice the current disposal.
Reliability and Security of Service	Network blockages	Limited storage capacity is available in line. However, most storage capacity is used by the time the blockage is detected. Unused storage capacity may provide sufficient time to undertake repair or arrange pumping without significant spillage. Clearance of most blockages is attended to quickly.
	Pump Stations	The pump stations each have two pumps. This provides standby pumping capacity if one pump fails or requires repair. In addition, pump stations are able to be pumped out using portable pumps or sucker trucks.
	Treatment Plant	The critical mechanical and electrical pumps, fans and gearboxes are duplicated so that plant can be run at slightly below maximum performance for long periods. A stock of critical replacement parts is held on site and Kawerau is well serviced with industrial technicians. A spill basin has the capacity to hold several days of wastewater in the event of a significant plant failure. A diesel generator is on site in the event of a significant power outage.
Environmental Considerations	Consent	Obtaining ongoing resource consents could impact on disposal options. However, disposal techniques used; are current recommended practises therefore renewing resource consents is not anticipated to be a problem.
	Environmental Performance	The treatment system is robust and with the available storage capacity, breaches of the consent should only occur due to exceptional circumstances.
Extension	Other capabilities	The system has reserve capacity so additional connection to any part of the reticulation can be undertaken. When lower lying areas are developed, additional pumping stations will be required.

3.4. RESOURCE CONSENTS

Council's current resource consents are shown in the table below.

Table 7: Resource Consents

Consent No.	Source	Purpose	Conditions	Expiry Date
65081	Wastewater Treatment Plant – Discharges	Control discharge of treated wastewater from treatment plant	Quality Quantity	31-10-2032
67265	Disposal of Septage Waste	Control the process of treating septage waste	Control odour No runoff No adverse effects on environment	31-10-2032

3.5. SIGNIFICANT ADVERSE EFFECTS

Council is unaware of any significant adverse effects that the wastewater activity has on the social, economic, environmental or cultural well-being of the Community. Based on groundwater test results taken from around the soakage site in accordance with consent conditions, current practices do not appear to be impacting on the natural underground water quality.

A potential negative effect of the Wastewater activity is the potential overflow of sewage due to pipe blockages. This would have environmental and potential health effects (i.e. environmental and social wellbeing).The adverse impact of blockages is minimised by very prompt attendance to blockages to reduce the instances and quantity of spillage, and subsequent disinfection of any contaminated area.

Potentially significant adverse effects would also occur if the treatment plant failed to operate for a period in excess of one day. This would negatively affect health and the environment (social and environmental wellbeing).

SECTION FOUR

Risk Management

4.1. RISKS

4.1.1. *Physical Risks*

Physical risks are generally:

- As a result of the inevitable natural process of deterioration.
- Because of actions of other parties working or travelling in the vicinity of the assets.
- Because of natural disasters (most commonly earthquakes or flooding).

Durable materials, good workmanship, and careful planning will not always be sufficient to prevent physical damage by persons or natural disasters.

Volcanic eruption may produce ash. The ash will not affect the pipe network but may impact on the Rapid infiltration Basin soakage rates.

The Edgecumbe earthquake in 1987 caused no known damage to the wastewater network. This indicates that the current system has low risk from the more common natural disasters.

4.1.2. *Financial Risks*

Financial risks are those that result in decreased cash flow and/or inability to afford the works that are required.

They include loss of a major ratepayer (requiring the fixed cost burden to be absorbed by the remaining ratepayers), failure to take advantage of any available subsidies and replacing assets before end of useful life, resulting in less than optimal life-cycle cost.

Depreciation is being funded therefore there is a reserve of funds that acts as a buffer if the renewals are required sooner than expected.

4.1.3. *Health and Safety Risk*

Health and safety risks arise as a result of physical actions or omissions of Council staff, contractors, or equipment failure. Health and safety risks are minimised by training staff and employing reputable contractors for maintenance and renewals.

4.1.4. *Environmental Risk*

There are environmental risks consequential to the operation of the wastewater network and/or physical actions or omissions of Council staff or contractors. These risks are managed through compliance with resource consent conditions.

4.1.5. *Regulatory Risk*

The right of the BOP Regional Council to amend consent conditions during the term of consent represents a regulatory risk exposure to Council. However, changes would normally only occur as a response to failure to meet existing consent conditions.

The consequence of changes would be modified treatment practices, that could have capital and operational cost consequences. BOPRC would conduct significant dialogue with Council prior to actually amending conditions and there would normally be a time frame within which to implement changes.

The special rights and status of Tangata Whenua in the resource consent process also represents a risk to Council. Council believes it can minimise this risk by maintaining cordial relationships with local Iwi.

There is also a risk of prosecution if Council fails to comply with legislation.

4.2. RISK MITIGATION

Council actions taken to mitigate risks are set out in the table on the next page.

Insurance
Council has adequate insurance in place to cover the replacement and/or repair of buildings and other valuable assets in this group.

Civil defence and emergency response plans
Council has separated essential staff for recovering the wastewater system in the event of a disaster from the civil defence recovery. The key areas have been identified and responses proposed.

Table 8: Risk Mitigation

Key Exposure	Class of Risk Probability	Residual Exposure Consequence	Mitigation
Physical			
Seismic Event	Medium	High	Earthquake design standards
			Spare capacity
			Special Insurance cover
Flood Event	Low	Low	Storage capacity at treatment plant
			Ongoing search for stormwater ingress
Damage by Others	High	Moderate	Staff available 24/7
Failure due to deterioration of assets	High	Low	Regular treatment plant maintenance
			Staff available 24/7
			Renewal Programme
			Spare capacity at treatment plant and pump stations
			Asset performance monitoring
Power interruption	High	Low	Standby generator available at treatment plant
			Spill basin can store incoming effluent under gravity flow for one day
			Pump stations small and alternative pumps available
Chemical non delivery	Moderate	Moderate	Material ordered before stock runs out.
			Significant storage on site
Financial			
New large consumer	Moderate	Low	Regular meetings with development agency
			Existing plant has 30% reserve capacity
			Developments take time allowing negotiations to take place
			Developments require Council consent
Loss of large consumer	Moderate	Low	Regular meetings with large industries
			Plant can operate on lower flows efficiently
Health and Safety			
Injury to persons or property due to operations	Low	Low	Health and safety practices in place
			Trained staff
			Insurance to cover costs
Sabotage	Low	Moderate	Plant security
			Robust plant
Injury to public	Low	Low	Access denied to treatment plant site
			Significant portion of asset underground
Environmental			
Overflow of wastewater due to pipe blockages or treatment plant failures	Moderate	Moderate	Staff available 24/7 to attend to blockages
			Treatment plant has storage capacity for one day's flow
			Plant has surplus capacity
			Monitoring plant performance
			Monitor blockages in pipework

SECTION FIVE

Future Needs

5.1. CURRENT CAPACITY

5.1.1. *Network*

The capacity of the network is adequate to handle general flows and any stormwater inflows that may happen from time to time. Blockages in the network (1-2 per month) reduce capacity temporarily.

5.1.2. *Pump Stations*

All three pump stations have twin pumps (duty and standby). Each pump has capacity to handle flows even in heavy rain periods. Pump chambers have capacity to store several hours of effluent flow if both pumps are not operational.

5.1.3. *Treatment plant*

Council's wastewater treatment capacity is as follows:

- Primary screening – two screens – 10 000 population. An additional screen can be installed in the primary treatment plant to accommodate a further 5 000 population.
- Solids removal – two clarifiers – current capacity 10,000 population. An additional clarifier can be installed to handle a further 5,000 population if required.
- Solids Treatment – thickener and storage tank – both have the capacity to handle increased volumes to service a population of 15,000. The centrifuge has the capacity to run more hours, thereby having the capacity to manage a population of 15,000.
- Rapid Infiltration Basins – these have the capacity to process 3,000m^3 per day (estimated flow from a population of 15,000).

5.1.4. *Consents*

The worm farm can process solids generated by a population of 15,000 under existing conditions. The consent for the Waste Water Treatment plant and RIBs allows the processing of wastewater from a population of 15,000.

5.2. FUTURE DEMAND

Kawerau's wastewater network is generally adequate for current demands and most of the network has some spare capacity.

The Kawerau District has experienced low general population growth in demand for additional services however has continued to experience a consistent increase in residents over the age of 65. In the 2013 census, the total population of the Kawerau District was 6,363, a decrease of 8.1% or 561 people since the 2006 census. Despite the predicted further decline, the 2018 census showed a modest growth of general population to 7,460.

Council hopes to bolster these gains with economic development initiatives, such as the development of a new industrial park and promotion of the natural environment.

The existing wastewater network has excess capacity enabling it to cope with any reasonable increased demand. A boundary adjustment was carried out in 2012 with the subsequent initial development of a new industrial park. Council constructed a service line to the new industrial park on SH34 in response to this and the new Waiu dairy factory came online with a consent to dispose of trade waste in June 2019. The trade waste consent allows Waiu dairy to discharge a total volume of 400m3/day with a concentration of 200g/m3 of solids. This is an equivalent volume usage of 1700 population from the Treatment Plant.

There remains some influence from stormwater to the wastewater network during very heavy rain. This is likely to be caused by inflow (unauthorised connections) rather than infiltration. Detecting the source and stopping the increase in flow is desirable. The treatment plant and pipes are able to manage the increased flows, but eliminating them will improve plant performance and slightly reduce costs.

Occasional issues that have been identified as affecting capacity are:

- Removal of unauthorised stormwater connections to the wastewater network may reduce the total demand.
- Population growth or decrease will change demand; however the current system can deal with much larger than expected population changes.
- Gradual deterioration of network due to ageing network that may increase infiltration and blockages will require a slow increase in treatment volume; however it is negligible compared to current spare capacity.

5.3. TRENDS

Population growth

The Kawerau population had fallen between the 2006 and 2013 census, however the 2018 census found growth of 17.3% in 5 years against all projections for the district. Into the future, it is projected to rise with medium

projections indicating a population of 8,000 by 2028.

Council is engaging in economic development initiatives to attempt to bolster this trend, and indeed the latest 2018 census for Kawerau was 7,460 that may indicate resurgence in the town.

As is the case with the rest of NZ, the population is aging with an increasing fraction of the population receiving state funded superannuation and employment benefits. The average income in respect to the national average is expected to continue to decrease and there will be an increased requirement for external funding to maintain the infrastructure in the future.

Table 9: Statistics NZ Population Projections – Kawerau District

Population Change 2006–2043 (NZ Stats)								
Projected Range	2006 *Census*	2013 *Census*	2018 *Census*	2023	2028	2033	2038	2043
High				8,110	8,410	8,650	8,830	8,970
Medium	6,921	6,363	7,460	7,910	8,000	8,020	7,970	7,860
Low				7,720	7,610	7,410	7,140	6,800

5.4. NEW CAPITAL REQUIREMENTS

There are no new significant capital requirements during the life of the Plan. Council will replace existing assets only.

Any new land developments in the industrial park or any future residential development would see additional wastewater infrastructure constructed by the developer and vested in Council or funded from Council's financial contributions policy.

SECTION SIX

Lifecycle Management

6.1. ASSETS

6.1.1. *Service Connections*

Service connections connect the domestic wastewater lines from residential properties and businesses to gravity reticulation pipes. Service connections may be Asbestos Cement (AC), glazed earthenware, Polyvinyl Chloride/Plastic (PVC), depending on when a property was developed. This pipe is generally the property owner's responsibility. Council's maintenance responsibility ends at the property boundary.

The service connections are typically 100mm pipes. The material is not recorded in Council's asset register, but it is assumed that those connected during the period from 1955 to 1980 are fibre cement or glazed earthenware and those connected post 1980 are PVC.

There is one trade waste connection from Waiu dairy factory with a limited consent to discharge to the Kawerau wastewater system.

Due to the minimal length of pipe that belongs to Council, having the incorrect material is not considered significant. However, as improved information becomes available the data will be updated. Currently the service connections are not recorded in AssetFinda.

6.1.2. *Gravity Reticulation Pipes*

The network pipes are typically between 100mm and 450mm in diameter. Most of the reticulation is in the range of 150mm to 200mm that collect effluent and feed them to trunk mains (300mm to 450mm).

Depending on location, the pipes are asbestos cement, concrete, concrete lined steel, PVC or glazed earthenware. The asset register holds pipe material. The accuracy of the split of different material types will be improved over time as records of material types are collected during repair operations.

A large percentage of the network pipes were installed in the period 1955 to 1975. This is expected to give rise to a significant increase of renewals as the pipes reach the end of their effective lives.

Wet to dry weather flows is an indicator of the network's condition. A typical benchmark for systems in very good condition is three. The ratio is based on peak daily flows divided by the low average (monthly) flow.

An extreme wet weather event has been known to increase peak wastewater flows to 250m^3 per hour. A more typical rainfall event gives an inflow of 180m^3 /hour. The average daily flow is around 85m^3/hour giving a ratio of 2.7. It is believed that most of this infiltration is due to illegal stormwater connections rather than pipe failures.

This assumption has been made because the flow increase occurs during the rainfall event and drops off quickly after the rain ceases which is different to groundwater infiltration that has a slow increase and slow drop off in flow.

The diameter profile and materials of all the reticulation is illustrated in the figures below:

Figure 1: Diameter Profile of Wastewater Pipes

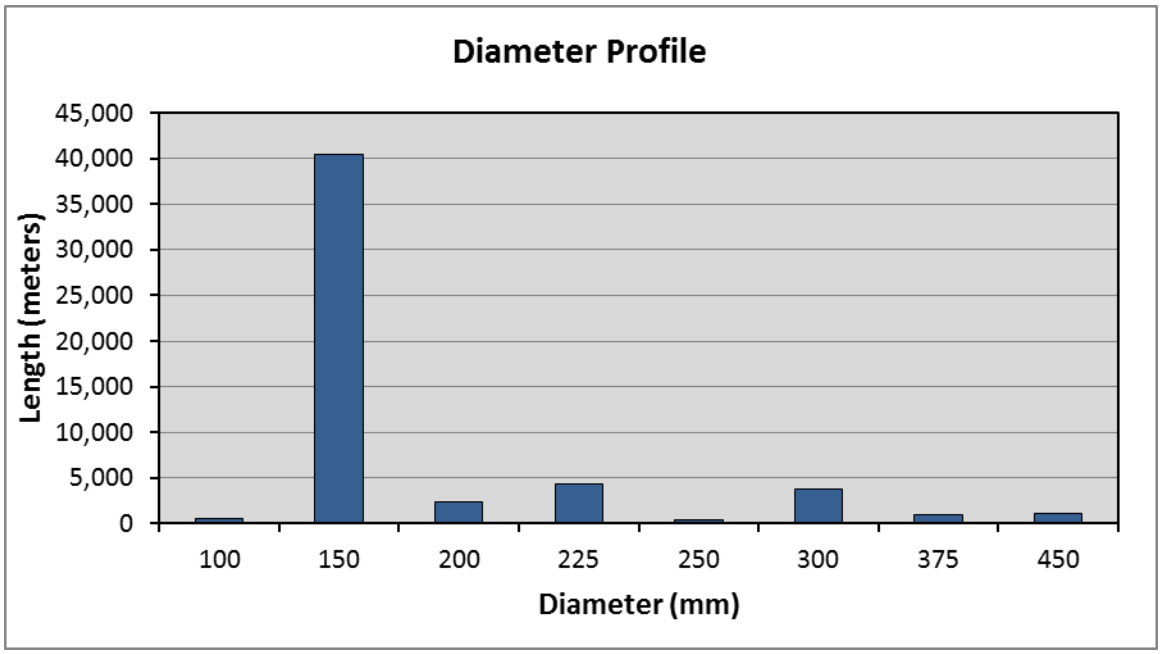
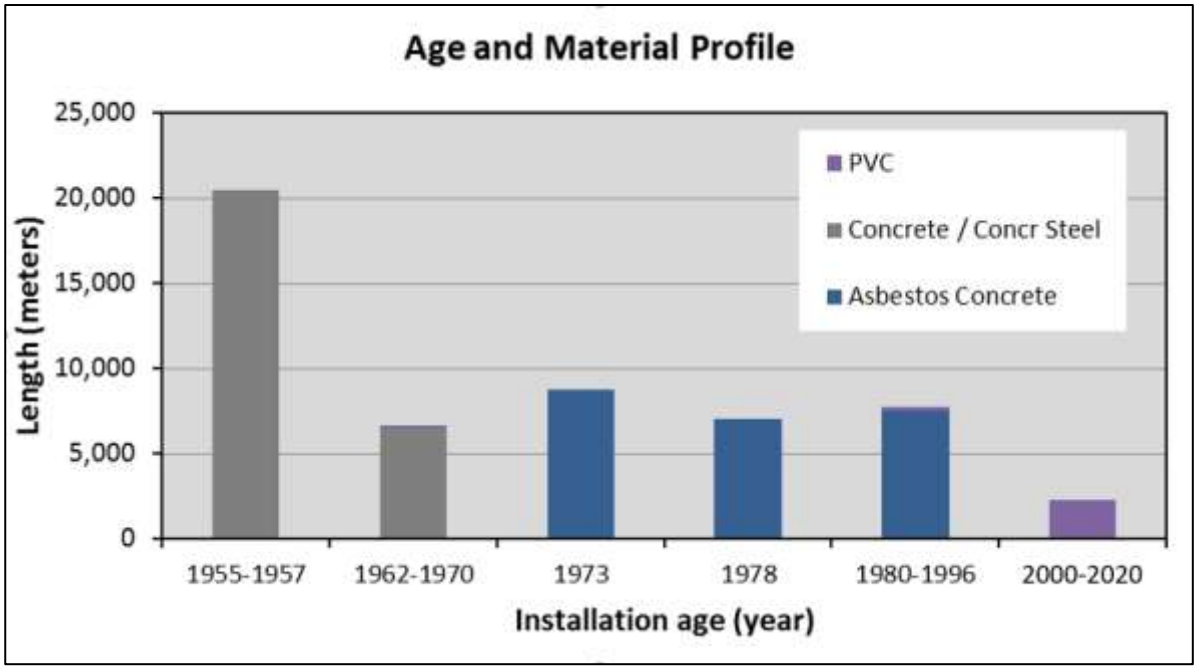


Figure 2: Age/Material Profile of Wastewater Pipes



The type of material used in the reticulation is based on the following assumptions:

- Pipes installed pre-1970 are concrete. This has been determined by random inspection of the pipes entering and exiting manholes.
- Pipes installed from 1970 onwards were fibrolite, asbestos concrete or Supertite as manufactured in New Zealand by James Hardie & Co Ltd. Some concrete and concrete-lined steel pipes were also used in larger trunk mains.
- The other materials encountered are glazed earthenware, HDPE, and various types of PVC. These materials were used in small quantities only.
- The installations since 2000 are PVC.

Issues with asbestos concrete materials include softening due to age, ground conditions and to attack and corrosion by sewer gases (e.g. hydrogen sulphide).

6.1.3. *Manholes*

Manholes are used at changes in pipeline gradient, direction, diameter or at multiple service connections. They are also spaced in order to ensure easy access to the full length of the pipe. They are generally constructed of circular reinforced pre-cast concrete. The concrete bases have benching or faring from inlet pipe/s to outlet pipe to improve effluent flow.

Manhole lids, generally pre-cast reinforced concrete, span the manhole and provide support for the cast iron frames and circular cast iron access covers.

The most likely location for deterioration in manholes is at pipe entry and exits. Thus failures can be rectified or modified while the asset is in service. The system operates in an aerobic state therefore damage to the underside of the concrete manhole lids except in the geothermal area is not occurring

6.1.4. *Pump Stations*

There are five pump stations.

1. Pumps effluent from the Tarawera Park buildings to the gravity main in Cobham Drive.
2. Pumps effluent from the Firmin Field lodge to the gravity main in River Road.
3. Pump station located at Blundell Avenue and pumps the wastewater from approximately 80 houses in the Valley Road area to the gravity main in Marshall Street.
4. Pump station located at the new residential development off Porritt Drive.
5. Pump station located on the site of the Waiu Dairy factory in the newly developed Putauaki industrial land off SH34.

The pump stations are reinforced concrete construction and house twin pumps (duty and standby). The stations can also be pumped out using portable pumps or sucker trucks in the event of a significant failure.

6.1.5. *Treatment Plant*

The treatment plant is a single modern plant that removes solids from the wastewater. The solids (30 tonnes per week) are disposed of by vermiculture and the effluent (1,800 to 2,400 m^3 per day) discharged to the Rapid Infiltration Basins.

Council owns and operates the treatment plant that consists of several processes. The processes are as follows:

Primary Screening Process – The process uses three primary pumps, two aerators, two screened wastewater pumps, large concrete tanks and two 1 mm slot size contra sheer screens. The wastewater from the town is passed through 1 mm slot size contra sheer screens to remove the coarse litter. The screened effluent is then stored in a buffer basin and transferred to the solids removal part of the plant at a constant rate. The coarse litter is disposed of through landfilling.

Solids Removal Process – The process uses four stainless vessels, chemical mixing equipment, four peristaltic pumps, centrifuge, and monitoring equipment. The screened effluent is dosed with both alum and a polymer. On passing through the clarifiers (two of the stainless vessels) the solids coagulate and settle.

The solids are then transferred to the other stainless vessels where they thicken and surplus water is decanted. The final thickened solids are processed through a centrifuge where the water content of the solids is lowered to approximately 20%. The solids are then transported to a worm farm where they are digested over 18 months into a usable soil conditioner.

Liquid Disposal Process – The process uses two pumps, a drain tank, 2km of 300mm HDPE pipe, 100mm soaker hoses and rapid infiltration basins. The clear liquid from clarifiers is pumped to rapid infiltration basins (RIBs).

The effluent is spread over the surface of the RIBs and soaks into the porous ground. As the water percolates to the ground water table any remaining solids are removed and also any remaining bacteria are destroyed (the soil acts as a purifier as the liquid percolates through it).

The significant components of the treatment plant; concrete tanks, buildings, stainless steel vessels, stainless steel pipes are made of made of durable material and will remain operational for many years.

The pumps, electrical connections, software and centrifuge will require maintenance and replacement in accordance with standard replacement and maintenance practices.

6.2. CRITICAL ASSETS

Asset criticality is the relative risk of a high cost arising from failure of that asset. Criticality is determined by the cost and risk of potential; failures and the relative importance on society and the environment. Evaluating the different failure modes of critical assets determines what maintenance, capital expenditure and conditioning monitoring needs to be planned.

In general, critical assets are maintained on risk management principles, whereas non-critical assets are maintained reactively (replace on fail).

Of the assets described in section 6.1, the following lists those that are critical:

- The section of gravity reticulation pipes and manholes between the wastewater treatment plant and State Highway 34
- The wastewater treatment plant
- Blundell Avenue pump station.

6.3. ASSET DATA

Material Type

Field inspections have been undertaken to determine if pipes are AC or Concrete. The town has been built in phases and the earlier constructions were concrete and then AC. The later developments have used PVC. The inspection and install date data have been used to determine with a reasonable level of accuracy the types of material installed.

Getting the types of material wrong is of significance if the life of Concrete and AC are significantly different. While it is impossible to guarantee that every pipe in AssetFinda has the correct material type it is considered that the material type would have 90% accuracy.

Pipe Diameter

The pipe diameters in AssetFinda have been taken from the existing as built plans. Various cross checks have been undertaken to visually asses for glaring errors in the location of pipe diameters and there is considered to be a high level of confidence that the diameter in AssetFinda match those in the ground. It is estimated that the size of pipes in AssetFinda are in excess of 95% accurate.

Asset Locations

The physical location of the manholes has been validated by viewing the as built plans and looking to see if the location in AssetFinda appears to be correct in terms of boundaries.

Incorrectly locating a manhole has very limited impact on the quantity of assets (it may impact on field staff locating the asset in the future but the physical location will be within a several meters of the AssetFinda location).

Significant impact only occurs where the diameter of pipes are inaccurate, thereby creating a financial impact on total asset values.

AssetFinda does not hold all the household connection drawn in therefore an arbitrary figure for the length of service lines has been assumed.

6.4. MAINTENANCE PLAN

6.4.1. *General*

Overall, the wastewater network is in a good state of repair. If it is maintained and renewed regularly and at the appropriate times, the existing levels of service can continue indefinitely.

Council intends to operate, maintain and renew the wastewater network on an ongoing basis so that it continues to provide the desired level of service required in the future.

Wastewater maintenance involves pump maintenance, electrical equipment servicing, videoing sewer lines and preventative clearing of sewer lines. A low level of equipment breakdown indicates that the correct level of maintenance is being undertaken.

A schedule of duties is performed daily, weekly, monthly or on an “as required” basis for various parts of the network. The duties include taking and recording plant performance measurements, maintenance undertaken and changes in operating practices. All maintenance, preventative maintenance and repairs are undertaken to a high standard.

6.4.2. *Service Connections*

Installation of new service connections into Council mains is undertaken to a high standard. Inspection of the connection occurs before the connection is covered. Blockages in the sewer line from the house to the main sewer can be either the responsibility of the owner or Council depending on whether the blockage is before or after the boundary of the property.

Local plumbers are familiar with who is responsible and few disputes take place. Plumbers contact Council early in the process if they believe that the blockage may be a Council responsibility.

6.4.3. *Pipes*

Maintenance is a mixture of reactive and preventative actions. Blockages and breaks are repaired when reported and a log of faults is maintained. Preventative maintenance is carried out as follows:

- Inspection of some known trouble spots using Close Circuit Television (CCTV).
- Water blasting of problem fat build-up areas.
- Removal of trees that are known to cause repeat blockages.
- Repair of pipes with poor connections that are detected during CCTV inspections.

The network averages 3-4 blockages per month (30-40 per year). They are the result of fat build-up, roots or other foreign material in the pipes, with none due to pipe failures. There are approximately 54km of pipes giving a blockage rate of 50 to 70 per 100km per year. Older networks report blockage rates of 30 per 100km per year. The Kawerau rate is higher than average and blockages are not related to pipe deterioration.

6.4.4. *Manholes*

Manhole maintenance involves replastering the invert, replacing rungs, replacing broken lids, raising lid levels and ensuring manholes in private sections are accessible.

6.4.5. *Pump Stations*

Pump blockages and breakdowns are repaired when they occur. Pump stations are checked daily to ensure they are working and pumps are lifted and serviced when performance declines.

6.4.6. *Treatment Plant*

Plant flows, wastewater quality and quantity are monitored continuously as it enters and leaves the treatment plant. Numerous plant checks are conducted daily to monitor plant performance and regular cleaning of the plant is undertaken. Pumps, valves, controls, mechanical devices and gas protection devices are maintained in accordance with manufacturer’s recommendations. Many of the pumps run continuously. For those areas where there are standby pumps they alternate weekly as the duty pump.

This ensures all pumps are working and because they have been replaced at various times previously ongoing replacement is spread over a number of years.

6.4.7. *Rapid Infiltration Basins*

The basins are used on a rotation basis to ensure the ground is not saturated, thereby negating the soils ability to sterilise the wastewater. Any solids in the wastewater left on the surface of the RIB are dried then removed. Mowing of some areas around the RIBs is undertaken for aesthetic reasons. Ground water is monitored to determine if there is any contamination due to the RIB operation.

6.4.8. *Worm Farm*

The solid material from the centrifuge is placed in windrows and covered immediately with wood fibre or sawdust to prevent odour. The worms eat the solids as it decomposes. The eating process removes harmful bacteria and converts the waste to a useable product: vermicompost. Once the vermicomposting has been completed, the vermicompost is taken off site for disposal or use as a soil conditioner for pasture or forests.

6.5. RENEWAL / REPLACEMENT

The network has been divided into six zones based on the estimated average date of development. Pipes and valves have a 70 year estimated life and each zone is given the same installation date and the same replacement date.

Renewal/replacement funding for each zone is averaged over eight years. This allows for the spread of installation dates and different rates of deterioration due to installation methods, material quality, water quality and tree roots.

Replacement decisions are based on information including the condition, reliability and maintenance cost of the asset as well as age. Council's objective is to maximise asset life without compromising service. Extending the asset life reduces the overall cost to the community and in sections of the network where the consequences of failure are minimal, the best strategy is to make sure replacement material is readily available and run the pipes to failure.

6.5.1. *Reticulation*

Concrete

The oldest of the pipes are approaching 65 years old (installed in 1957). There have been no collapses of wastewater pipe in Kawerau except in areas that are impacted by geothermal activity (Town Centre).

A section of 225mm concrete sewer pipe was removed in 2015 and tested in the Opus Lab in Christchurch. The pipe was assessed as Grade 3 - Moderate Condition. The pipe was assessed as having a further 40 years of life.

The section through the pipe that shows the level of cement that has leached from the pipe showed the following

External deterioration	0.0 to 2.6mm
Internal Deterioration	0.8 to 10.3mm

Based on the above test result, visual observations and lack of collapses in concrete sewer pipes it is recommended that a life of 100 years be assumed for the concrete pipes.

Visual inspections of sewer manholes that are all concrete (except those impacted by geothermal) show almost no sign of deterioration.

Therefore it is recommended that the life of the manholes be set at 100 years.

Asbestos Cement

Extensive testing of AC water mains has been undertaken and these show an increased level of leaching of the cement from the exterior of the pipe than that shown in the concrete sewer pipe tested. Because of the increased deterioration of the exterior of the pipe it is assumed that the sewage will have had an increased impact on the invert of the interior portion of the pipe compared to the concrete pipe as well.

There have been no collapses in the AC sewage lines. However AC was not used until around 1973 meaning that existing lines are less than 50 years old.

Based on this information it is recommended that the lives for AC pipes remain at the previously adopted 70years.

Glazed Earthernware

The Glazed Earthernware is located in the geothermal area. It was installed around 1957. It is showing no signs of deterioration. However there is only 400 meters of pipe.

While visual inspection shows no sign of deterioration due to the harsh environment and the small impact increasing the life beyond 70 years would have financially it is recommended that the life of the glazed earthernware remain at 70 years.

Plastics (HDPE, PVC, UPVC)

These pipes have been installed from 1995 on so there is no local experience on expected life from deterioration.

Lives used by other Council as to the expected life varies considerably. A report received from Project Max on installing a new pipe has advised that a structural design life of 50 years but from their experience suggests most Councils would adopt an expected life of 100 years.

6.5.2. *Pump Stations*

Pumps at the stations are rebuilt or replaced when they fail. A decision on rebuilding versus replacing is made on purely economic grounds.

6.5.3. *Treatment Plant*

The treatment plant is relatively new and built largely of stainless steel so no significant component replacement is anticipated during the life of the 10 year plan. Components (pumps, electrical sensors, etc.) will be replaced as they fail or/and in accordance with manufacturer's recommendations.

6.6. NEW ASSETS

The resource consent for the wastewater treatment plant expires in 2032. The treatment process is currently not impacting on the environment and provided legislation relating to water quality discharges doesn't change significantly between now and 2030, significant changes in the outputs from the treatment plant are not anticipated. Upgrading of the plant is therefore not anticipated during the life of the Plan.

6.7. Deferred Maintenance

Currently there is no known deferred maintenance with the water supply network and the full service potential of the asset is being maintained. Council policy is to avoid any deferred maintenance.

6.8. Disposal Plan

There are no specific disposals identified in the Plan. Pipes that are no longer required or are replaced due to failure will not be retrieved as they have no value. Normally old pipes will be replaced by new pipes in the same location. If pipes are not replaced, they will be made safe in situ.

SECTION SEVEN

Financial Forecasts

7.1. FUTURE REQUIREMENTS

Table 10: Estimated Financial Requirements

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Expenditure										
Personnel costs	225,481	230,879	234,346	238,332	243,088	248,433	254,150	260,239	266,996	274,181
Materials	408,936	419,218	427,742	436,490	445,649	456,511	464,411	475,159	486,143	495,950
Internal charges	304,000	310,330	316,560	322,660	328,630	334,650	340,600	346,730	352,980	358,880
Maintenance	105,200	108,770	111,060	113,610	116,560	119,240	122,810	126,870	131,060	134,600
Interest								1,930	6,770	10,570
Overheads	254,580	266,020	280,210	277,540	285,660	296,810	295,690	304,360	319,760	318,070
Depreciation	514,414	514,414	514,414	592,910	592,910	592,910	676,238	676,238	676,238	766,916
	1,812,611	**1,849,631**	**1,884,332**	**1,981,542**	**2,012,497**	**2,048,554**	**2,153,899**	**2,191,526**	**2,239,947**	**2,359,167**
Asset renewals	985,000	1,209,700	1,428,660	818,990	868,310	1,673,000	932,320	1,290,650	1,013,370	1,185,740
	2,797,611	**3,059,331**	**3,312,992**	**2,800,532**	**2,880,807**	**3,721,554**	**3,086,219**	**3,482,176**	**3,253,317**	**3,544,907**

7.2. FUNDING POLICY

The Revenue and Financing Policy sets out how Council's activities are funded. This policy has been developed to meet the requirements of the Local Government Act (LGA) 2002.

Council has broken its business down to activity level. In some cases, it has looked at activities from two points of view – availability of the service and use of the service. Activities have been broken into availability and use where they benefit different groups in the Community. In general, Council has assessed the availability of an activity as a public benefit and the use of an activity as a private benefit.

'Availability' relates to the costs incurred to keep a service or asset in such a condition that it can become operational within a short start-up period (e.g. maintaining the water network even if it wasn't used, renewing assets). 'Use' relates to costs incurred as a result of the asset being used (e.g. chemicals and electricity).

7.2.1. *Availability*

Distribution of Benefits

The availability of the wastewater network is a benefit to the District as a whole. The costs of having the network available for use is therefore 100% public good and recoverable as rates from all ratepayers.

When Benefits Accrue

Council has identified a substantial intergenerational component (i.e. benefits arise over time). The wastewater infrastructure has a long life, so more than the current generation of ratepayers benefit.

Therefore, Council wishes to ensure that future ratepayers meet some of the cost. This can be achieved by the funding of depreciation over the life of the assets.

Funding Sources

Wastewater is 100% funded from general rates.

As the Depreciation Reserves grow, increased interest revenue from the investment of these reserves lowers the amount of depreciation funding that is required from General Rates. Inflation is catered for though the revaluation of the assets in a three-yearly cycle.

7.2.2. *Use*

Distribution of Benefits

Use of the wastewater network meets the test of a private good. Council considers the use of this activity as being 100% private benefit.

Costs and Benefits of Separate Funding

Running a Council funding system has costs involved with assessment and collection of revenue. In making funding decisions, Council must consider whether the activity should be funded from a separate source (most commonly a user charge or targeted rate).

The Local Government Act specifically mentions cost efficiency and transparency (in other words, whether or not people will be able to relate the charge to the activity that it is funding). The benefits of a transparent charge to users of the wastewater network outweigh the costs of having a uniform annual charge for this activity.

Funding Source

Council has selected a combination of Uniform Annual Charge and General Rates to fund the wastewater activity. There is also income generated from users who dispose of septic tank waste predominantly from outside the District.

The mix of UAGC and General Rates is considered to reflect both the benefits to individual properties, that have an efficient and healthy collection and disposal system, and the community benefits of effluent being disposed of in a sanitary manner, with associated health benefits, by a system available for all properties to connect.

7.3. VALUATION

The wastewater network infrastructure is valued by a competent valuer on a three yearly valuation cycle. Assets are valued at fair value determined on a depreciated replacement cost basis. The most recent valuation is effective as at 30 June 2019.

7.3.1. *Asset basis of valuation*

Valuation of wastewater assets are done on the following basis:

Table 11: Valuation Basis – Water Assets

Asset Type	Valuation Basis
Land	Market value
Buildings	DRC
Plant	ODRC
Reticulation	ODRC

The Depreciated Replacement Cost (DRC) refers to today's cost of replacing the asset with the same or a similar asset and depreciated over the life of the asset.

The Optimised Depreciated Replacement Cost (ODRC) refers to today's cost of replacing the asset with another asset that provides the same level of service most efficiently and depreciated over the life of the asset to reflect its current value and remaining economic life.

The optimised replacement cost assigned to each asset has been determined by suitably qualified and experienced professional persons and has been peer reviewed.

7.3.2. *Expenses*

Maintenance costs and operating costs are expensed in the year they are accrued. The capitalisation threshold for wastewater assets has been set at $1,000 or the actual value of individual components where they are identified by AssetFinda.

7.3.3. *Changes in asset valuation*

The costs associated with renewing assets and providing new or improved asset infrastructure are capitalised and depreciated in accordance with the assessed economic life of each asset. This applies also where a developer provides infrastructure to be taken over as public assets by Council.

Assets are recorded at fair value determined on a depreciated replacement cost basis by an independent valuer. The most recent valuation is as at 30 June 2019.

7.3.4. *Capitalisation Threshold*

The following definitions are used for asset management purposes and the financial treatment is summarised below:

Maintenance is work done that is of an operational nature that can contribute to the asset life reaching its maximum potential but neither increases the value nor extends the remaining life of any asset. However, maintenance may enable the asset to perform at a higher level of service for a longer period of time and/or ensure that the maximum life of the asset is attained.

Renewal is work done to replace an existing asset. The cost of replacement must be recorded as a capital expenditure, be greater than $1,000 and recorded in the asset register as a new asset with a unique identifier.

If the asset replaced is discarded or sold it must be removed from the asset register and any residual value must be formally written off.

An addition to the asset register is required when a new asset is created with a value exceeding $1,000. A new asset must be uniquely identified, and recorded in the asset register. The record in the asset register requires an assessment of the asset's remaining life expectancy (based on straight-line depreciation or estimated remaining life).

Where the asset register recognises an individual component worth less than $1,000, or where a length of pipe greater than 12 metres is replaced, the threshold does not apply and the additional value is capitalised.

7.4. KEY ASSUMPTIONS

The current valuation and renewal profiles are based on data currently available.

7.4.1. *Asset condition*

In the case of wastewater pipelines, the condition is taken as being directly related to age, unless better information is available. The testing of samples from repairs on pipes that are approaching the end of their useful life provides additional information. While a more planned inspection would provide a more direct assessment of condition, the cost of such programmes is high.

7.4.2. *Replacement cost*

The projected replacement costs and depreciated values shown in Table 12 have been derived from Council's asset register. Further work identified in the improvement plan, will be carried out to verify the condition of the assets and the potential need for future replacement.

Council's practice for calculating pipeline replacement costs is:

- All pipeline replacement would be carried out using PVC pipe.
- The construction environment is brown field (replacement of existing rather than green field construction.
- Unit rates for replacement are derived from peer review.
- Replacement includes valves, fittings, and house connections. Unusual pipes will be replaced with the next size up.
- No optimisation or efficiencies in pipe size or lengths have been allowed for in replacement costs

7.4.3. *Depreciated value and life expectancy*

Straight line depreciation has been adopted for all above ground assets. The life expectancies shown in Table 13 were used to calculate depreciated values.

The town centre area of Kawerau has geothermal activity. The heat and chemicals present significantly shorten the fibre cement pipe life in this area. Pipes in the geothermal area have an estimated life half that of similar assets in other areas.

It is accepted that the above approach requires improvement, because for some assets, the actual need for replacement is out of step with the theoretical depreciation. The improvement plan includes steps to make the valuation and renewal projections more robust.

7.4.4. *Population*

Further sustained decline in population as predicted by Statistics NZ may seriously erode the rating base of the District, placing a higher burden on the remaining residents for any infrastructure upgrades and possibly affecting capacity to fund renewal works. Population trends must therefore be reviewed as frequently as reliable data can be obtained.

7.4.5. *Other assumptions*

- All expenditure is stated in 2019 values, with allowance made for the inflation over the planning period.
- All costs are GST exclusive.
- Operational costs are generally shown to increase in relation to inflation.
- Renewal costs are based on anticipated replacement requirements.
- The costs of insurance and risk mitigation are included in the forecasts.
- Climatic and other environmental trends are expected to continue as they have in the recent past.
- The plan provides scope for some growth in industrial/commercial demand.

7.4.6. *Development Contributions*

Section 106 of the Local Government Act 2002 requires local authorities to adopt development contributions or financial contributions policies.

Spare capacity in Council's infrastructure means it can cope with some growth. Therefore Council does not need to extend infrastructure to cope with increasing demand.

Council's policy is to not assess development contributions but to retain the provisions of the District Plan that allow the assessment of financial contributions.

7.4.7. *Financial Contributions*

New subdivisions or developments may require the extension of Council infrastructure networks for water supply, wastewater disposal and roading. Council's financial contributions policy provides that the cost of these extensions is the responsibility of those who create the demand.

Subdividers and developers may be required to make financial contributions to meet the full cost of additional infrastructure necessary to support their subdivision or development.

Table 12: Replacement Costs and Depreciated Values

Asset Type	Replacement value @ 30-6-2019	Depreciated value @ 30-6-2020
Pipelines	$16,757,792	$4,885,094
Laterals	$657,500	$338,736
Manholes	$2,608,670	$776,307
Pumping Station	$206,600	$227,301
Treatment Plant	$7,503,200	$4,938,246
Total	**$27,733,762**	**$11,165,684**

Table 13: Asset life expectancies

Asset Type	Life Expectancy
Buildings	80 years
Pumps, controls	25 years
Pipes – Concrete & PVC	100 years
Pipes – AC & Glazed Earthenware	70 years
Pipes (geothermal area)	35 years
Manholes	100 years

SECTION EIGHT

Asset Management Systems & Processes

8.1. Responsibilities for Asset Management Outcomes

The Asset & Contract manager is responsible for the development of this asset management plan, including maintaining the integrity of Council's asset information.

The Three Waters manager is responsible for the identification, budget, planning, programming and undertaking of works required for the maintenance and renewal of Council's Wastewater assets.

The Manager, Finance & Corporate Services is responsible for providing an overview of the development of this asset management plan, for ensuring that future projects are incorporated in Council's Long Term Plan and that there is consistency between these documents.

The Manager, Operations and Services is responsible for delivering the outcomes for the Wastewater activity. This includes ensuring that the assets are maintained and operated to Council's requirements, that adequate budgeting for maintenance, operating and improvement costs are provided.

8.2. Accounting and Asset Management Systems

8.2.1. *Billing/Accounting system*

Council uses the Ozone software for its accounting and billing systems. It does not store or compute asset management information, but can be used to determine the number of connections to the wastewater and the number of properties billed for separate wastewater rates.

Currently, all formal asset management financial reporting including valuation is held in Excel spreadsheets.

This will be migrated into the AssetFinda system.

8.2.2. *AssetFinda*

AssetFinda is the software used to manage and produce asset inventory reports. It is integrated with 'Map Info' data tables to permit input, querying, reporting and financial modelling using the asset register data. The spatial location of the wastewater assets can be laid over aerial maps, property boundaries and water and stormwater assets.

The software has yet to have financial data added to allow financial modelling for current replacement and depreciation value reporting.

New asset information (location, installation date, materials' construction etc.) is entered into AssetFinda at the time the asset is installed.

The default valuation process used by AssetFinda is capable of recognising asset condition, extending the life of an asset and recalculating revised depreciation value and annual depreciation.

The improvement plan proposes that the appropriate financial information be entered into AssetFinda.

8.2.3. *Hard copy plans*

Layout details of the pipes and structures are available for most of the wastewater asset.

Attaching information like pump performance, type etc. to assets is a desirable improvement. Also linking photographs and 'as built' drawing to the asset will improve the data.

8.3. Key Information Flows and Processes

Key information flows and process linkages include:

- Translating the Community Outcomes into detailed levels of service that can be embodied into Asset Management Plans
- Preparation of annual budgets, and ongoing reporting
- Updating asset data as information becomes available through maintenance and service repairs
- Ongoing compliance monitoring and reporting of environmental performance
- Ongoing management of the asset to ensure that service levels are maintained

8.4. Quality management

Management is governed by the requirements of the treatment plant consent. Programmed sampling of wastewater is undertaken at the treatment plant by electronic equipment and verified by manual sampling.

Sampling of the groundwater determines if there is any impact on groundwater quality from treated wastewater being discharged to the RIBs. The testing programme provides assurance that the treatment process is satisfactory and results are submitted to the BOPRC in accordance with resource consent requirements.

8.5. Maintenance

Maintenance is carried out reactively for most asset faults. The criteria resulting in renewal rather than further maintenance are:

- Is the asset important for maintaining service levels and have the service levels in the current year already been compromised by failures? If yes consider renewal.
- What has been the failure history? If the current failure is part of a series, then consider renewal.
- Is the cost of the maintenance comparable to the cost of renewal? Where repair costs are high (e.g. reinstatement of road pavement) then consider renewing a logical minimum quantity of asset to prevent further expensive repair costs.
- Will maintenance preserve asset life? If yes, then carry out maintenance.

8.6. Policies for renewing assets

Replacing network components with larger components to improve capacity is treated purely as renewal capital expenditure. This is because the additional cost of larger components is not material compared with the renewal cost of component of the same kind. Renewal of assets will occur in accordance with practice described earlier in document.

8.6.1. *Constructing new assets*

Following many years of no demand for additional capacity, recent land developments for industry and residential have resulted in the need for additional new assets. Funding to provide additional capacity would be treated on its merits, but in most cases the funding would be sought from the developers/subdividers.

8.6.2. *Assets vested in Council*

Subdivisions include wastewater networks. These are installed at subdivider's expense to approved Council standards and then vested in Council.

'As built' new works either occur due to subdivisions, or the installation of new assets. In both instances, detailed records of new works are obtained. These new assets are added to the AssetFinda database.

8.7. Asset disposal

Most of the components are essential to continuing provision of the service. Extensive decommissioning and disposal is very unlikely.

SECTION NINE

Monitoring Improvement Planning

9.1. Asset Management Performance Measures

The broad objectives of asset management are:

- To optimise the life of the assets
- To minimise life cycle costs
- To maintain agreed levels of service

Although it is possible to measure the success or otherwise of the asset management activity over the long term against the three criteria above, it will obviously be difficult to measure success or otherwise in the short term in a way that management control can be exerted. For example, it will be impossible to determine whether the life of a facility has been "optimised" until the actual age nears the expected life and a remaining life assessment can be meaningfully carried out.

An assessment of the asset knowledge and processes currently carried out, in terms of "best practice for a NZ authority of this size" provides an indication of how well Council is likely to be meeting these long term objectives. This assessment is therefore part of the Improvement Plan. It should include evaluation of the monitoring of operations and costs to provide information on the achievement of service level (both public measures and technical standards). It should cover previously-planned improvement actions, noting whether these have been achieved and how they are contributing to current processes. It should check how the initiatives undertaken are 'rolled out' from asset management staff to those carrying out the work, and how carefully field information is recorded and returned to add to the asset knowledge case.

9.2. Improvement Actions

Table 14: Improvement Actions

Improvement Item	Comment	By When	By Whom	Cost
Review population projections	Information will be provided by Statistics NZ	Census 2021	MOS	$0
Improve knowledge of AssetFinda making asset life/condition value reporting simple and repeatable	Training staff	30 June 2021	MOS	$3,000
Review asset life expectancy	Expert advice required.	June 2021 and 3 yearly thereafter	MOS & 3WM	Done
Add as built plan information to AssetFinda	Resources	Annually	ACM & 3WM	$2,000
Continue updating pipe material and condition into AssetFinda	Resource	Ongoing improvement	ACM & 3WM	$10,000
Input asset replacement costs to AssetFinda	Resource	June 2021 and 3 yearly thereafter	ACM & 3WM	$2,000
Conduct asset revaluations	Resource	June 2021 and yearly thereafter	MFCS	$5,000

ACM = Asset and Contract manager

3WM = Three Waters manager

MOS = Manager, Operations and Services

MFCS = Manager, Finance and Corporate Services

9.3. Monitoring and Review Procedures

The Leadership Team will monitor and review improvement items on a six monthly basis. This plan will be reviewed annually as part of annual plan development.

SECTION TEN

Appendices

10.1. APPENDIX A - DETAILED ASSET DESCRIPTION

ASSET Pipes	DESCRIPTION	MATERIAL	QTY	YEAR
WASTEWATER PIPES - ZONE 6	300	PVC	106	2009
WASTEWATER PIPES - ZONE 6	300	PVC	95	2018
WASTEWATER PIPES - ZONE 6	300	PVC	988	2018
WASTEWATER PIPES - ZONE 6	225	GLAZED EARTHENWARE	175	1962
WASTEWATER PIPES - ZONE 6	225	PVC	44	2019
WASTEWATER PIPES - ZONE 6	150	GLAZED EARTHENWARE	27	1962
WASTEWATER PIPES - ZONE 6	150	PVC	75	2006
WASTEWATER PIPES - ZONE 1	450	CONCRETE/EARTHENWARE	1107	1956
WASTEWATER PIPES - ZONE 1	375	CONCRETE/EARTHENWARE	1000	1956
WASTEWATER PIPES - ZONE 1	300	CONCRETE/EARTHENWARE	2846	1956
WASTEWATER PIPES - ZONE 1	225	CONCRETE/EARTHENWARE	2022	1956
WASTEWATER PIPES - ZONE 1	150	CONCRETE/EARTHENWARE	15482	1956
WASTEWATER PIPES - ZONE 1	150	PVC	86	2017
WASTEWATER PIPES - ZONE 1	150	PVC	184	2018
WASTEWATER PIPES - ZONE 1	150	PVC	14	2019
WASTEWATER PIPES - ZONE 6	150	CONCRETE/EARTHENWARE	61	1958
WASTEWATER PIPES - ZONE 6	150	PVC	90	2007
WASTEWATER PIPES - ZONE 6	150	CONCRETE/EARTHENWARE	80	1962
WASTEWATER PIPES - ZONE 2	225	CONCRETE	420	1965
WASTEWATER PIPES - ZONE 2	150	CONCRETE	8369	1965
WASTEWATER PIPES - ZONE 6	300	PVC	53	1995
WASTEWATER PIPES - ZONE 3	300	CONCRETE	497	1973
WASTEWATER PIPES - ZONE 3	225	CONCRETE	1788	1973
WASTEWATER PIPES - ZONE 3	200	CONCRETE	603	1973
WASTEWATER PIPES - ZONE 3	150	CONCRETE	6706	1973
WASTEWATER PIPES - ZONE 4	200	CONCRETE	781	1978
WASTEWATER PIPES - ZONE 4	150	CONCRETE	6318	1978
WASTEWATER PIPES - ZONE 5	300	CONCRETE	295	1985
WASTEWATER PIPES - ZONE 5	250	CONCRETE	443	1985
WASTEWATER PIPES - ZONE 5	225	CONCRETE	325	1985
WASTEWATER PIPES - ZONE 5	200	CONCRETE	365	1985
WASTEWATER PIPES - ZONE 5	150	CONCRETE	5167	1985
Piripiri / Tiwhatiwha Cres	150	PVC	700	2020
Laterals - District Wide	100	Lateral	2717	1966

ASSET Points	DESCRIPTION	MATERIAL	QTY	YEAR
Manhole		Concrete	263	1957
Manhole		Concrete	95	1965
Manhole		Concrete	150	1973
Manhole		Concrete	112	1978
Manhole		Concrete	113	1985
Manhole		Concrete	3	1996
Manhole		Concrete	10	2005
Manhole		Concrete	6	2008
Manhole		Concrete	1	2016
Manhole		Concrete	1	2017
Manhole	Piripiri / Tiwhatiwha Cres	Concrete	13	2020
Flushing tank		Concrete	3	1965
Flushing tank		Concrete	1	1985
Cleaning Eye		Concrete	6	1973
Lamphole		Concrete	11	1957

ASSET Pumping Stations	DESCRIPTION	MATERIAL	QTY	YEAR
Blundell Ave	CONTROLS	ELECTRICAL	1	1975
Tarawera Park	PUMPS	SUBMERSIBLE	3	1980
Tarawera Park	PUMPS	SUBMERSIBLE	1	2012
Tarawera Park	PUMPS	SUBMERSIBLE	2	2019
Tarawera Park	CONTROL	ELECTRICAL	1	1980
Blundell Ave	PUMPS	SUBMERSIBLE	2	2014
Blundell Ave	TELEMETRY	ELECTRICAL	1	1998
Blundell Ave	SECURITY FENCING	TIMBER	30	1975
Tarawera Park	CONTROL SHED	STEEL	1	1981
Blundell Ave	PUMP STRUCTURE - WET WELL	REINFORCED CONCRETE	2	1975
Tarawera Park	WET WELL	REINFORCED CONCRETE	4	1980
Tarawera Park	WET WELL - NEW PUMPS	REINFORCED CONCRETE	1	2016
Piripiri / Tiwhatiwha Cres	PUMPS	SUBMERSIBLE	2	2020

ASSET Treatment Plant Spencer Ave	DESCRIPTION	MATERIAL	QTY	YEAR
WASTEWATER PROCESSING	CONTROLS	ELECTRICAL	1	1988
WASTEWATER PROCESSING	CONTROLS - ADDITIONS	ELECTRICAL	1	2018
WASTEWATER PROCESSING	PUMPEX PX3-150 VORTEX (RAW WATER)	MECHANICAL	3	2013
WASTEWATER PROCESSING	PUMPEX PX3-100 (SCREEN WATER)	MECHANICAL	2	2019
WASTEWATER PROCESSING	TSURUMI TOS - 55 BER 2 SUBMERSIBLE EJECTORS	MECHANICAL	3	2018
WASTEWATER PROCESSING	CONTRA SHEAR 15/12 MILLISCREENS	MECHANICAL	2	2000
WASTEWATER PROCESSING	MILLISCREEN CONTROLS	ELECTRICAL	2	1988
WASTEWATER PROCESSING	PIPEWORK	STEEL	1	1988
WASTEWATER PROCESSING	STRUCTURE - SEWAGE PUMP STATION SUMP	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	SUMP VALVE CHAMBER	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	MILLISCREEN BUILDING	BUILDING	1	1988
WASTEWATER PROCESSING	SCREENED SEWAGE BUFFER TANK	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	TRANSFER PUMP SUMP	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	TPS VALVE CHAMBER	REINFORCED CONCRETE	1	1988
WASTEWATER PROCESSING	EARTHWORKS/ SITE DEVELOPMENT		1	1988

ASSET Treatment Plant Spencer Ave	DESCRIPTION	QTY	YEAR
WASTEWATER TREATMENT	ELECTRICAL CONTROL BUILDING - LOCKWOOD STYLE BUILDING	1	1989
WASTEWATER TREATMENT	EXTRACTOR FANS - CENTRIFUGE BUILDING	1	2018
WASTEWATER TREATMENT	WI-FI WASTEWATER TREATMENT PLANT	1	2017
WASTEWATER TREATMENT	COMPUTER EQUIPMENT	1	2021
WASTEWATER TREATMENT	PLC CONTROLS & STAINLESS STEEL CABINET	1	2005
WASTEWATER TREATMENT	DISTRIBUTION BOARD & STAINLESS STEEL CABINET	1	2005
WASTEWATER TREATMENT	MAIN CONTROL CABINETS, SWITCHGEAR & RETICULATED SERVICES	1	1985
WASTEWATER TREATMENT	VARIABLE SPEED DRIVES - THROUGHOUT (APPROX 12)	1	2,005
WASTEWATER TREATMENT	ELECTRONIC POWER FACTOR REGULATOR	1	2005
WASTEWATER TREATMENT	EMERGENCY GENERATOR - 150KVA	1	2005
WASTEWATER TREATMENT	UPS SYSTEM WITH 5 X GXT - 48V BATT BATTERY PACKS	1	2020
WASTEWATER TREATMENT	AIR CONDITIONING SYSTEM	1	1985
WASTEWATER TREATMENT	CLARIFIER A - STAINLESS STEEL CLARIFIER INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	CLARIFIER B - STAINLESS STEEL CLARIFIER INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	THICKENER - STAINLESS STEEL TANK INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	SLUDGE STORAGE TANK - STAINLESS STEEL TANK INCLUDING SUPPORT STRUCTURES	1	2005
WASTEWATER TREATMENT	BREDEL SP40 PERISTALTIC PUMP	2	2008
WASTEWATER TREATMENT	BREDEL SP50 PERISTALTIC PUMP	2	2008
WASTEWATER TREATMENT	RIB FEED - FIBRE GLASS TANKS	4	1990
WASTEWATER TREATMENT	TREATED EFFLUENT - FIBRE GLASS TANKS	4	1990
WASTEWATER TREATMENT	CENTRIFUGAL PUMPS WITH 3KW MOTORS	2	2019
WASTEWATER TREATMENT	ENCLOSED UV STERILISER - NOT IN USE	1	2008
WASTEWATER TREATMENT	AUTOMATED SAMPLING POINT INCLUDING TIMER, VALVES & REFRIGERATED CABINET	1	2,008
WASTEWATER TREATMENT	FABRICATED STAINLESS STEEL LABYRINTHS	1	2008
WASTEWATER TREATMENT	ROYCE 7011A SUSPENDED SOLID ANALYSER	4	2008
WASTEWATER TREATMENT	MISCELLANEOUS FLOWMETERS & INSTRUMENTS - THROUGHOUT	1	2008
WASTEWATER TREATMENT	STAINLESS STEEL PIPEWORK & VALVES - THROUGHOUT	1	2005
WASTEWATER TREATMENT	MISCELLANEOUS STEEL WALKWAYS & PLATFORMS	1	2005
WASTEWATER TREATMENT	CONCRETE HARDSTANDING FOR PLANT & EQUIPMENT	1	2007
WASTEWATER TREATMENT	CONCRETE BLOCK CONSTRUCTION WITH LONGRUN STEEL ROOF	1	2008
WASTEWATER TREATMENT	CLARIFYING DECANTER COMPLETE WITH CONTROL PANELS, VSD'S, ETC	1	2008
WASTEWATER TREATMENT	INCLINED SCREW CONVEYOR	1	2008
WASTEWATER TREATMENT	TRANSFER SCREW CONVEYOR	1	2008
WASTEWATER TREATMENT	CATIONIC POLYMER DOSING SYSTEM INCLUDING METERING PUMP, DOSING PUMP, DILUTE TANK & ANCILLARIES	1	2008
WASTEWATER TREATMENT	POLYMER RECIRCULATING PUMP	1	2008

WASTEWATER TREATMENT	POLYMER THICKENER DOSING PUMP	1	2008
WASTEWATER TREATMENT	POLYMER CENTRIFUGE DOSING PUMP	1	2020
WASTEWATER TREATMENT	CONTROL ROOM PRESSURISATION SYSTEM	1	2008
WASTEWATER TREATMENT	ALUM TANK - CONCRETE BUND	1	1990
WASTEWATER TREATMENT	ALUM TANK - FIBRE GLASS TANK	1	1990
WASTEWATER TREATMENT	ALUM METERING PUMP	1	2000
WASTEWATER TREATMENT	STATIC MIXERS	1	2005
WASTEWATER TREATMENT	PROCESS WATER CENTRIFUGAL PUMP INCLUDING PIPEWORK & VALVES	1	1990
WASTEWATER TREATMENT	RECYCLE SUMP - UNDERGROUND TANK	1	2000
WASTEWATER TREATMENT	SUBMERSIBLE PUMPS	2	2018
WASTEWATER TREATMENT	AGITATOR	1	2005
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 1	1	2005
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 2	1	1996
WASTEWATER TREATMENT	PIPEWORK & VALVES - THROUGHOUT 3	1	2009
WASTEWATER TREATMENT	RIB DISCHARGE CHAMBERS 1	1	1990
WASTEWATER TREATMENT	RIB DISCHARGE CHAMBERS 2	1	2009
WASTEWATER TREATMENT	STORAGE SHED WITH CONCRETE FLOOR	1	2019
WASTEWATER TREATMENT	PUMP - Backup	1	2020
WASTEWATER TREATMENT	OFFICE/LABORATORY - WEATHERBOARD CONSTRUCTION WITH LONGRUN IRON ROOF	1	1985
WASTEWATER TREATMENT	SEPTIC HOLDING TANK - 25,000 LITRE	1	1988
WASTEWATER TREATMENT	SECURITY FENCING	1	1986
WASTEWATER TREATMENT	SECURITY FENCING - ADDITION 2017	1	2017