

WASTEWATER

ASSET MANAGEMENT PLAN

EXECUTIVE SUMMARY - WASTEWATER

Overview

This Wastewater Asset Management Plan (AMP) follows the format recommended by the National Asset Management Steering Group and is largely compiled from historic records and personal knowledge of Carterton District Council staff. It specifically sets out to;

- Demonstrate responsible Management
- Communicate and Justify Funding Requirements and
- Comply with Regulatory requirements.

It is an Asset Management Plan that meets the statutory and accounting requirements of Audit New Zealand. It puts in place systems that will improve documentation, maintain an asset register, asset condition assessment, and cost monitoring and control. This asset plan will be reviewed annually and updated by 30 November 2007, and revised every three years thereafter.

The Purpose of the Plan

The ultimate purpose of an asset management plan is to ensure that assets are operated and maintained in a sustainable and cost effective manner, so that they provide the required level of service for present and future customers. This wastewater asset management plan for Carterton District achieves eight major purposes, and these are described as follows:

- It meets the Council's legal obligations under the Local Government Act 2002 to define levels of service and how these levels of service will be provided with the supporting accounting and financial management requirements.
- It provides the linkage between the LTCCP Community Outcomes and Council's strategic goals for wastewater treatment and disposal and the levels of service, which are targeted performance objectives for the wastewater system.
- It defines the level of service the Carterton community requires from the wastewater asset. It defines performance measures and provides performance data, where available, to compare actual service provided with target levels of service.
- It provides a detailed description of all components of the wastewater asset, the condition of the asset or the assumed condition where data is lacking. Methods of assessing and monitoring and forecasting condition are developed.
- It provides financial forecasts of expenditure based on the condition and estimated future life of components, and includes maintenance, renewal, and capital expenditure.
- It provides a valuation of the complete wastewater asset as well as individual components.
- It identifies risks, which may cause failure of part of the wastewater system and sets up a framework with which to manage risks for the future.
- It identifies opportunities for improvements that will ensure financial resources are used wisely.

1.3 Asset Description

Carterton District Council wastewater asset consists of a reticulation network, pumping stations and a treatment plant. The plant is operated by Council's Works Department staff. This plant is located in Dalefield Road.

- Pipes range in diameter from 80mm to 380mm.
- The network consists of 30.8 km of underground piping.
- There are 7 pump stations at strategic locations throughout the town to lift sewerage from low lying areas up into the gravity network.

The current network has adequate capacity for normal flows, but experiences some surcharging during heavy and prolonged rainfall events. The surcharging results mainly from infiltration as extensive work has been completed on minimising inflow of stormwater. A hydraulic model of the network has been completed, but now requires calibration to confirm any areas of the network that may be under capacity. The model incorporates all areas of the town where it is known that either sub-division is planned or may occur in the future. Preliminary results indicate that the network can accommodate current dry weather flows but will require some upgrading to minimise the likelihood of surcharging during significant rainfall events.

While the plant can adequately treat dry weather flows, some overloading does occur during very prolonged rainfall events owing to infiltration. Some works are planned on the plant to increase its efficiency and its effectiveness. These works will ensure that the plant continues to meet the conditions imposed on the treated effluent by its existing resource consent.

Levels of Service

The levels of service determine the amount of funding that is required to maintain, renew and upgrade the wastewater infrastructure in order to provide the customers with the levels of service specified. Changes to the levels of service will impact on funding requirements.

Levels of service for the wastewater system consider the following:

- Environmental
- Reliability and Capacity
- Responsiveness

The asset management plan has considered a range of levels of service that the Council could set for the wastewater network. The target levels of service Council has chosen to meet are presented in the table below.

Community Outcomes

- 1) A buoyant local economy
- 2) Clean land, water and air for present and future generations.
- 3) A safe, healthy and educated community.

Sewerage Activity Goals (required Activity Outcomes)

No	Delivery Goals	Community Outcomes
1.	A cost effective sewerage system for customers in reticulated areas within the District.	1, 2, 3
2.	Safe, effective and reliable collection, treatment and disposal of wastewater in reticulated areas.	3
3.	Environmentally sensitive wastewater treatment and disposal systems.	2, 3
4.	Sustainable sewerage systems with flexibility for change and growth.	1, 2, 3

1.	Cost effective District wide sewerage systems.	Operational Level of Service Statements	Performance Measures
(i)	Control expenditure to complete all programmed works within allocated budgets.	Expenditure is within approved budgets for programmed works.	Annual Financial Report
(ii)	Review operation and maintenance standards and priorities to align with network conditions and District development to optimise costs.	Review maintenance standards and priorities three yearly in association with AMP updates.	Updated Routine Maintenance Plan in AMP document.
(iii)	Review future expenditure profiles for the sewerage activity with regard to affordability and cost/benefit assessment.	Review future expenditure profiles for the sewerage activity, with regard to affordability, at least triennially in association with AMP updates.	Updated Forward Work programme and capital works plan in AMP.
2.	Safe, effective and reliable collection, treatment and disposal of wastewater in reticulated areas.	Operational Level of Service Statements	Performance Measures
(i)	Operate sewerage systems to protect public health.	No significant issues in regard to public health risk raised by District Health Board or Ministry of Health in regard to sewerage systems within the District.	No unresolved health risk issues recorded.
(ii)	Monitor customer satisfaction with the standard of District sewerage systems.	75% residents' satisfaction level achieved for District sewerage systems.	Bi-annual customer survey.

2.	Safe, effective and reliable collection, treatment and disposal of wastewater in reticulated areas.	Operational Level of Service Statements	Performance Measures
(iii)	Maintain current standard of service of District Sewerage systems.	100% compliance with completion of programmed capital/renewal works. 95% compliance with agreed Maintenance response times. Not more than ten sewage overflows within reticulated networks per 1 in 20 year storm event, due to wet weather infiltration/inflow. Not more than one sewage overflow from a system pump station per fault type per annum. Not more than two validated odour complaints due to defects in the reticulation	Annual Report Operational Records.
3.	Environmentally sensitive wastewater treatment and disposal systems.	Operational Level of Service Statements	Performance Measures
(i)	Ensure sewerage systems are operated in accordance with resource consents.	100% compliance with resource consent conditions including compliance monitoring.	No unresolved non-compliance issues.

3.	Environmentally sensitive wastewater treatment and disposal systems.	Operational Level of Service Statements	Performance Measures
(ii)	Operate District Sewerage systems in a manner that is environmentally sensitive.	No significant environmental damage or risk issues raised by Regional Council in regard to sewerage systems within the District.	No unresolved environmental protection issues on record

4.	Sustainable sewerage systems with flexibility for change and growth.	Operational Level of Service Statements	Performance Measures
(i)	Identify, prioritise and action upgrade strategies to maintain sewerage systems.	<p>Annually review and prioritise upgrade strategies for sewerage systems to be included in FWP.</p> <p>Complete sewer network modelling of systems to optimise and prioritise system upgrades.</p>	<p>Forward Work Programme.</p> <p>Network model.</p>
(ii)	Manage Subdivision and Development works to provide for future growth.	Applications for Subdivision and Development works are approved in accordance with District Plan provisions.	Consent Application records.

4.	Sustainable sewerage systems with flexibility for change and growth.	Operational Level of Service Statements	Performance Measures
(iii)	Plan for sewerage infrastructure and land requirements to meet treatment capacity upgrades.	100% compliance with completion of any land purchases and option studies approved in annual budgets.	Annual Report.
(iv)	Continue to review options and opportunities for provision of sewerage networks to communities in the District	100% compliance with completion of any feasibility or option studies approved in annual budgets.	Annual Report.
(v)	Plan for and provide sewerage infrastructure to meet managed urban residential development.	Annually review sewer development works for FWP. Include development works in sewer FWP and budgets.	Forward Work Programme

Asset Management Systems

An asset management system is a combination of processes, data and software applied to provide the essential outputs for effective asset management. Carterton District Council utilise a number of these aspects for the effective management of their assets.

The primary asset management tool and data repository used by Council is a Geographical Information System (GIS) - ArcView. The level of confidence in the accuracy of the GIS database has improved over the last twelve months as modelling work has been completed and the data set has been updated as part of that exercise. It is anticipated that this project will be completed within the next twelve months as outstanding data is populated into the database that was re configured during the development of the water network hydraulic model. As routine and reactive maintenance works are completed, all changes will be captured in the field and incorporated into the database progressively.

Risk Management

The risk management process is defined¹ as *“the systematic application of management policies, procedures and practices to the tasks of identifying, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or Plans or from complying with its legal obligations”*.

A process has been established that will, once completed ensure risk management is an integral part of the culture of all parties associated with the management and operation of Council’s wastewater assets.

Council will formulate a risk management strategy and framework that is consistent with SNZ HB 4360:2000 Risk Management for Local Government and the joint Australian New Zealand Standard AS/NZS 4360:1999 Risk Management, to ensure risks are managed on a consistent basis.

The scope of risk management is to ensure that;

- Risk is understood and identified.
- Hazards and practices that could have financial implications, disruption to business goals, injury to people or damage to property or the environment are controlled as far as practicable, and
- Insurance or other financial arrangements are made to protect the community’s interests should a loss occur that is damaging to the finances of the Council.

The objective of risk management in Carterton District Council is to provide;

- Protection and continuity of the core business activities and essential services.
- Fulfilment of legal obligations.
- Safeguards for public and employee health.
- Environmental protection.
- Operation and protection of assets at lowest cost.
- Contingency Planning for foreseeable emergency situations.
- Protection of rate payer equity.

¹ SNZ HB 4360:2000 Risk Management for Local Government

Risk management is currently being practiced by Carterton District Council. For example, it has two independent water supply sources, it has provided an automated back up generator to operate the supplementary water supply system and it has a trailer mounted generator that can be used to operate the existing network of sewerage pumping stations. It has standardised on the type and capacity of pumps used in the pumping stations and maintains spare pumps that can be quickly changed if one pump fails unexpectedly. The preparation of an actual risk management document will be formalised into its own document as a priority 2 (within 3 years) project.

Asset Valuation

Valuation of the infrastructural assets was undertaken by Opus International Consultants as at 30 June 2005.

The valuation basis is depreciated replacement cost, which is in accordance with generally accepted accounting practice. Replacement cost is the cost of re-building the existing infrastructure using present day technology, but maintaining the originally designed level of service. Assuming present technology ensures that any additional cost of outdated and expensive methods of construction are not reflected in the valuation.

The value of the assets has been depreciated on a straight-line basis over their nominal working life.

The depreciated value of the Carterton District Council wastewater system is estimated to be \$3.86 million. This is summarised in the table below.

Waste Water Asset Valuations (as at 30 June 2005)

Asset category	Optimised Replacement Cost (\$)	Optimised Depreciated Replacement Cost (\$)	Annual Depreciation
Pipe Reticulation	\$5,639,065	\$2,104,638	\$75,533
Reticulation Fittings	\$1,800,642	\$749,118	\$22,508
Pump Stations	\$146,053	\$62,027	\$4,292
Sewage Plant	\$1,155,969	\$429,175	\$34,762
Waste Water Upgrade	\$547,000	\$517,517	\$29,483
TOTAL	\$9,288,728	\$3,862,475	\$166,578

Life Cycle Management

Assets have a life cycle as they move through from the initial concept to the final disposal. Depending on the type of asset, its lifecycle may vary from 10 years to over 100 years.

Life cycle management is a function of the following areas:

- Target level of service,
- Risk management,
- Demand management,
- Operations and maintenance (Routine Maintenance Plan), and
- Asset replacement (Renewal Plan)
- Asset Development and Augmentation (Capital Plan)

Demand Management

While the most recent population census figures indicate a small overall increase in the district population, most of this increase has been in the rural area. The urban population has grown by less than one percent. This is in contrast to a significant increase in the amount of sub-division occurring within the urban area. Further investigation will be required to understand the linkage between the movement in population and the number of sub-divisions being completed. Initial indications are that the population density per dwelling is reducing.

Preliminary, but un-calibrated information from the recently constructed hydraulic model of the network, including an allowance for areas of known sub-division and future possible sub-division confirm that the current network can handle the anticipated dry weather flows. The model has highlighted some areas under pressure during wet weather flows and the action plan has made provision to investigate and programme appropriate works in these areas.

There is currently very little Industrial and Commercial demand for the treatment of waste water, and it is anticipated that there will be no appreciable change in this demand.

As further sub-division and expansion of the existing Waingawa Industrial Estate is planned and implemented, a full investigation will be required to determine the most suitable options(s) for treating waste water from that site. This process is only just beginning and some funding has been allowed within the LTCCP for this. In the mean time, all waste water is piped into the Masterton District Council network as Carterton District Council has no facility in this area. The outcome of this investigation will provide data that can be used to determine any rating impact.

Routine Operational Plan

Routine and programmed maintenance is the regular on going day-to-day work necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again. Routine maintenance is carried out by the Carterton District Council Works Department staff.

The projected base line operating cost for this activity is \$112,338 per annum exclusive of financing and internal charges. This is the on-going cost using 1 July 2007 dollars.

Renewal Plan

Renewal expenditure is work that does not increase the assets design capacity but restores, rehabilitates or renews an existing asset to its original capacity. While CDC has not previously differentiated between operations and renewal expenditure, it will now be separately reporting maintenance and operational costs including material costs, and capital costs.

Capital Plan

Capital works are those works that create new assets, or works that upgrade or improve an existing capacity. They may result from growth, social or environmental needs. Projected capital costs are summarised in the table below:

Summary Table - Projected Capital Costs

Expense type	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17
Renewal	-	317,000	345,000	174,000	-	-	-	-	-	-
Upgrade	344,500	53,000	205,000	5,000	205,000	205,000	205,000	405,000	405,000	-
Capital-New	-	300,000	350,000	30,000	100,000	-	-	-	-	-
TOTAL (\$)	344,500	670,000	900,000	209,000	305,000	205,000	205,000	405,000	405,000	-

Disposal Plan

Redundant pipes may be demolished and taken to the landfill or left in the ground. If pipes are left in the ground they are sealed at the connections.

Mechanical equipment that has been replaced will be cannibalised for parts or sold as scrap metal unless it is considered to have genuine resale value.

Monitoring and Improvement

The effectiveness of the asset management plan will be monitored in various ways, including statutory audit, external audit and internal audit. Bi-annual customer surveys will be commenced during the new financial year. They will be carried out to monitor the performance of service delivery and the customer’s perception of the service being provided.

Key Assumptions

Significant assumptions and uncertainties in the preparation of this Waste Water Asset Management Plan are;

- The knowledge of the staff directly providing this activity, both on a day-to-day basis and historically, has been relied upon. This includes staff from Council’s Operations and finance Departments.
- The information from previous design reports and the recently completed sewer network hydraulic model have been incorporated into the action plan.

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- All new subdivision applications are assessed in accordance with the current District Plan and the New Zealand Standard NZS 4404:2004, "Land Development and Subdivision Engineering". All designs are in accordance with these standards, they are checked and agreed to by Council's engineers before construction commences and are inspected during construction, including witnessing of the relevant quality assurance tests. The developer is expected to meet all costs of the works including the connection to Council's existing network.
 - There will be an ongoing requirement for the provision of this activity.
 - The demand for this activity will increase, and not reduce.
 - The operational requirements for this activity will remain similar for the next ten years.
 - Typically maintenance works will be completed by Council's Works Department staff, while renewal, upgrade and new works will normally be completed by contractors selected by competitive tender or day work rates.
 - Funding will be required to provide this activity as described in this Asset Management Plan. That funding of operational works will be by annual rates charges, while funding for all capital works including renewal, upgrade and new works will be from depreciation funds and loans as appropriate.
 - The dollar values shown in this Plan are as at 1 July 2007 dollars. It is assumed that each year following 2007 the dollar amounts will be adjusted for, at least, the rate of inflation applicable to this activity.
 - Some capital and renewal costs are rough order of cost estimates that will need to be further researched and refined.
 - The forecasts are based on the best available knowledge of asset condition and performance, and on the levels of service that are being delivered. More detailed evaluation of asset renewal requirements will be undertaken as proposed works are completed and the knowledge gained including actual costs and conditions are fed back into the information loop.

Action Plan

Throughout this wastewater asset management plan, objectives, targets, capital works maintenance and improvements to general business processes are referred to. The table below brings all of these initiatives together to clearly identify the actions required for the successful implementation of the asset management plan.

Summary Table - Stormwater Action Plan

Description	Priority	Cost	Year											
			1	2	3	4	5	6	7	8	9	10		
Complete as built information recording and feed back into GIS database by works staff.	On going													
Monitor subdivision activity and ensure integration of any additional stormwater needs.	On going													
Analyse and integrate agreed actions from bi-annual customer surveys.	On going													
Formulate risk management strategy in conjunction with investigation works	2													
Wastewater Treatment Plant upgrade of Head works	1	25,000												
Wastewater Treatment Plant Digester Upgrade	1	80,000												
Telemetry Upgrade - Sewer Pumping Stations	1	99,500												
High Street CBD SH2 Upgrade - Park to Wakelin Street	1	183,000												
Calibrate Sewer Model	1	15,000												
Victoria Street Upgrade (Garrison to Rail)	2	101,000												
Pembroke to Victoria Street Upgrade (Carter Court)	2	61,000												
Grout Manholes	1	45,000												
SH2 High Street upgrade from treatment plant to Wakelin and Park to North end of town.	3	600,000												
Lincoln Road: Treatment Plant to Victoria Street upgrade.	3	800,000												
Dissolved Oxygen meters for sewer ponds	1	12,000												
Wastewater Treatment Plant - Extend treatment area	1	600,000												
Wastewater Treatment Plant for Waignawa - Investigation	2	50,000												
Wastewater Treatment Plant for Waignawa - Implementation	3	100,000												
Sewer condition performance assessment using NZWWA guidelines	3	30,000												
Garrison street south replacement	1	44,000												
Kent Street (West of railway line)	1	130,000												
Kent Street extension replacement	1	39,000												

Description	Priority	Cost	Year											
			1	2	3	4	5	6	7	8	9	10		
Wyndham Street replacement	1	104,000		■										
Belvedere Road west of High Street, replacement	2	60,000			■									
Park Road east of High Street, replacement	2	53,000			■									
Broadway replacement (3 sections)	2	94,000			■									
Taylor Street replacement	2	68,000			■									
Rhodes Street replacement	2	70,000			■									
Garrison Street north replacement	3	48,000						■						
Kent Street east replacement	3	46,000						■						
Tasman Crescent	2	56,000					■							
Noble Street replacement	3	24,000						■						
Road cones and Signage upgrade	1	11,000	■	■	■									

This action plan has been prepared based on the following criteria;

- Each activity action plan has been developed on its own merits with some consideration for the other activities such as resources, total costs and ability to get works completed.
- When Councils' full budget is determined by consolidating all the separate activity plans, some adjustment of priority may be required to fit within the overall budget to reflect affordability and the community's ability to pay.
- Works have been prioritised as 1, 2 or 3. Works of priority 1 are the most urgent and should be completed initially. Works of priority 3 are the least urgent, while works of priority 2 fit between these. Priority 2 works would also be priority 1 works that must be deferred to ensure overall budget constraints are met. Urgency has been determined after reviewing all sources of information and assessing field observations during prolonged or heavy rainfall. As works are completed, actual costs and ground conditions will be feedback into the information loop and used to update budget estimates.