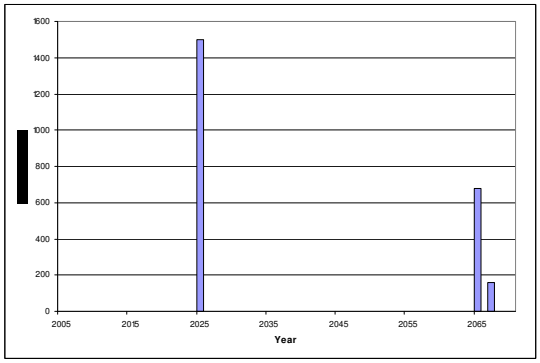
1.0 Lake Coleridge Sewage Scheme

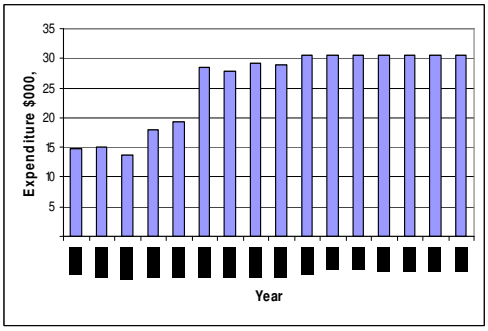
1.1 Executive Summary

Description		Quantity
Population Served		Up to 130 (estimate)
Deprivation Index		NA
Physical Statistics	Reticulation Length (km)	2.34
	Manholes	54
	Pump Stations	1
Value ($)	Replacement	$976,738
	Depreciated Replacement	$523,626
Flows	Annual average over last 7 years	4,705 m^3/day
	Average daily	12.9 m^3/day
	Peak daily	42.2 m^3/day
	Minimum daily	? m^3/day
Treatment	Imholf tank, wetland and UV	
Disposal	Overland flow and discharge to stream	
Infiltration		Unknown
Properties	Connected	40
	Not connected	13

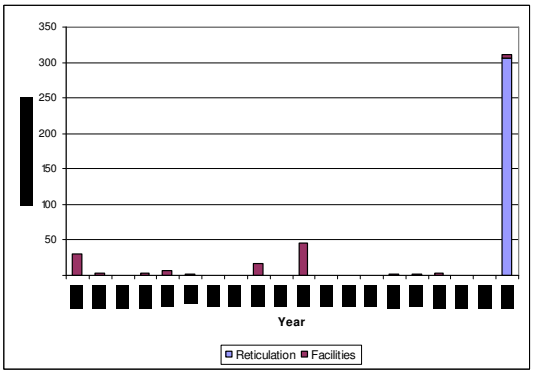
Pipework Replacement Dates



Operating and Maintenance Financial Requirements



Renewals Financial Requirements



New Capital Financial Requirements

There are no capital requirements

There are no key issues for the Lake Coleridge wastewater services

1.2 Introduction

1.2.1 Overview and History

The Selwyn District Council took over the sewage plant and associated reticulation for the township in 1992 from ECNZ. Prior to Council taking over the sewerage scheme, ECNZ upgraded the sewer system by:

- Installing new mains where required
- Stormwater from each individual property diverted from the sewer system
- The then Malvern County Council received $180,000 for the upgrade of the Sewage Treatment Plant
- ECNZ obtained a resource consent that would become operational in 2001 for a period of 6 years

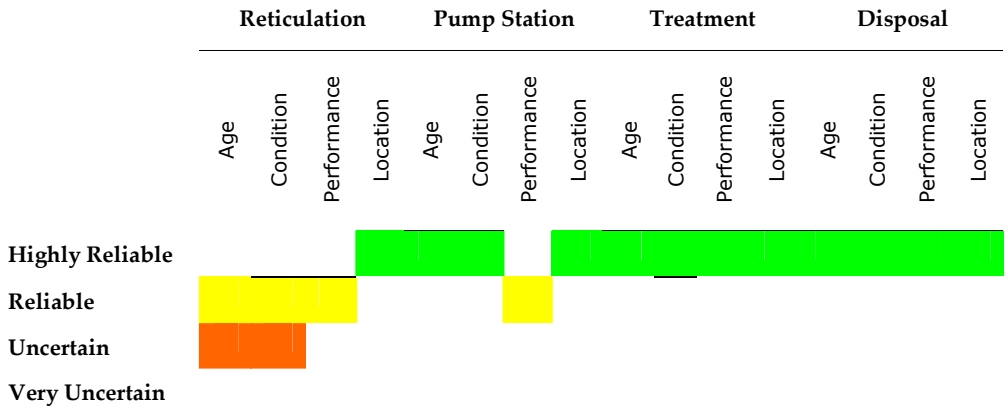
A resource consent was obtained in 2002 for an upgraded treatment plant with 25 year term. The treatment and disposal system was subsequently upgraded in 2004. This included diversion of the wastewater disposal outlet to a new wetland based disposal system.

Wastewater Map

1.2.2 Knowledge of Assets

The following table details the confidence in information for facilities and reticulation.

Table 1-1: Data Confidence



1.2.3 Design

The upgraded wastewater treatment plant (2004) was designed for wastewater generated by 110 residents.

1.2.4 Criticality

The following is a preliminary assessment of the critical assets within the scheme.

Table 1-2: Critical Assets

Facility or Main	Location	Reason
Pump station	At treatment plant	Failure of pump station will cause overflow to power station tailrace

1.3 Treatment and Disposal

1.3.1 Overview

Raw sewage from the village gravitates to the pump station at the treatment plant. From the pump station the sewage is pumped to the top of an Imhoff tank where the solids are separated. The partially treated wastewater then gravitates to the subsurface wetland where it passes through a natural treatment process prior to passing through the UV disinfection unit. The treated and disinfected wastewater then flows into a dosing chamber before it is pumped to the overland flow area where it passes through a denitrification trench and final natural treatment process. If necessary, (due to saturated ground conditions) water can then flow into Post Office Creek through the rock diffuser structure.

1.3.2 Treatment and Disposal

The following table is an overview of the treatment and disposal components.

Treatment & disposal	Description	Year installed or Upgraded	Condition	Performance	Criticality
Imhoff tank	Provides primary treatment for the raw sewerage	1965 & 2004	1	1	Medium
Subsurface wet land	The submerged vegetated bed wetland with a surface area of 500m². It has a working depth of 0.55m at the outlet producing a hydraulic retention time of approximately 2 days.	2004	1	1	Medium
UV disinfection	The UV unit is sized to accommodate the flow through the wastewater treatment plant with a design flow of 1.8 l/s.	2004	1	1	Medium
Overland Flow area	The overland flow area approximately 500m². The overland flow area is divided by a denitrification trench into two cells. The slope of the two overland flow cells is approximately 2%. It is planted with a variety of local grasses	2004	1	1	Medium

1 = Very Good (Industry Standard) 2 = Good 3 =Moderate 4 =Poor 5 =Very Poor

1.3.3 Treatment and Disposal

1.3.4 Issues

Issues with the operation of the UV system have resulted in not conforming to resource consent conditions. These issues have been rectified in early 2006. The UV plant now operates and performs as designed and required.

1.4 Pump Station

1.4.1 Pump Station Details

The following table is an overview of the pump station.

Table 1-3: Schedule of Pump Station

Pump Station	Description	Year installed or Upgraded	Capacity (m^3/day)	Condition	Performance	Criticality
At treatment Plant	Two pumps (1 submersible & 1 surface mounted)	1996	328	1	1	High
		1965		3	4	

1 = Very Good (Industry Standard) 2 = Good 3 =Moderate 4 =Poor 5 =Very Poor

1.4.2 Pump Station Issues

The standby pump is over 40 years old and its ability to provide the required level of service is unknown.

1.5 Supply Reticulation

1.5.1 Overview

A schedule of the pipe asset statistics is shown in Table 1-4 below.

Table 1-4 Schedule of Pipework Length (m)

Diameter	AC	Unknown	UPVC	Total
100	540	53	91	685
150	875	33	749	1,656
Total	**1,415**	**86**	**840**	**2,340**

1.5.2 Condition

The condition of mains installed in the 1960's is unknown but will be assessed in 2006/07. This will be undertaken by scoring the existing mains condition using the CCTV that was carried out in 2003.

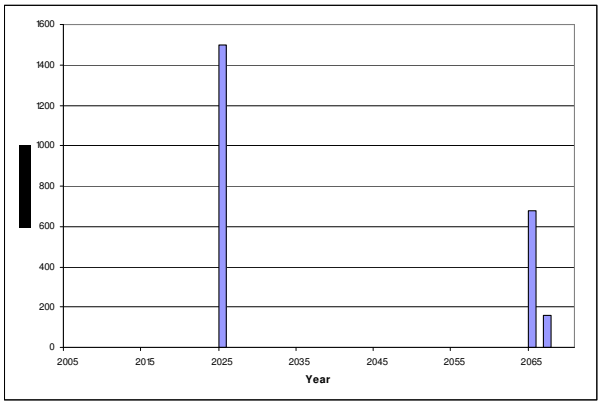
1.5.3 Performance

The performance of reticulation is considered by Council engineers to be moderate

1.5.4 Pipe Network Replacement Date

Table 1-5 details the expected year of mains replacement. These replacement dates may change following the condition assessment of mains that is proposed in 2006/07.

Table 1-5 Pipework Replacement Dates



1.5.5 Infiltration

In 1993 stormwater from individual properties was diverted from the sewer system (individual soakage pits installed as required) with every property inspected prior to Council taking over the sewerage scheme.

Ongoing monitoring of the system will be carried out using flow monitoring and SCADA to ascertain the extent of infiltration.

1.5.6 Property Inspections

The next property inspection is scheduled for 2007/08.

1.6 Environmental Management

1.6.1 Rights to Take and Discharge Permits

Table 1-6: Schedule of Resource Consents

Consent Number	Description	Date Issued	Expiry Date	Quantities		Compliance (last 12 months)	Comments
				Instantaneous (Lts/sec)	Daily (m^3/day)		
CRC012169	Discharge of treated domestic sewage to Post Office Creek	09-Jul-02	09-Jul-27		41		
CRC012170	Discharge treated domestic sewage to land	09-Jul-02	09-Jul-27		41	Non compliant UV system	UV system repaired March 2006
CRC012168	To undertake works on the banks of Post Office Creek	09-Jul-02	09-Jul-27				

1.6.2 Consenting Issues

The following is comments from Environment Canterbury[1] regarding compliance of effluent disposal resource consents.

"SDC generally has an acceptable level of compliance with the consents it holds to operate its community wastewater treatment plants. The council usually provides monitoring information within the required timeframes and SDC staff are responsive to requests for further information or clarification. Information provided is in a useful and clear format.

Environment Canterbury, however does have significant concerns about the recent performance of the SDC Coleridge WWTP, this is due to the historical effluent quality being discharged despite repeated minor non-compliant with some conditions. The accumulative effect of this over time has lead to a significant non-compliance with other conditions in the consent that will be difficult to address due to lack of early intervention."

Selwyn District has made a significant effort to ensure that the UV system is functioning correctly. This is now understood to have been achieved.

1.7 Maintenance and Operating

1.7.1 Maintenance Contract

Maintenance of the reticulation and general work around the treatment plant is carried out by SICON Ltd under Maintenance Contract 849. The Lake Coleridge system (including the treatment plant) Operation Manual has been assessed as good.

[1] CRC Memorandum of 20th October 2005

1.7.2 Maintenance Issues

The issues for the maintenance of the Lake Coleridge Wastewater scheme are:

- The physical distance of the plant from Council / contractor staff will result in higher maintenance costs including monitoring costs
- The installation of SCADA (as part of the WWTP upgrade) will provide assistance in insuring treatment plant operates correctly

1.7.3 SCADA

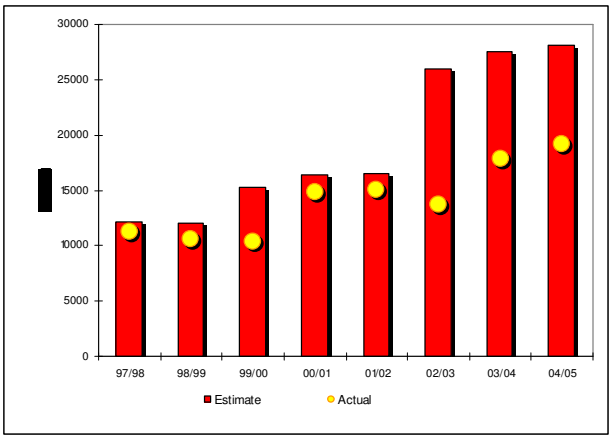
The pump station and treatment plant will be monitored by Council's SCADA system (installation to be carried out by June 2006) and will have the following alarm and monitoring capacity:

Site Name	Phase Failure	Pump Operation	Well Level and High Alarm	Total Outflow	UV
Treatment plant and pump station	Y	Y	Y	Y	Y

1.7.4 Actual Operating versus Estimated Costs

The following table details the comparison between annual estimates and actual annual costs.

Table 1-7: Actual Costs versus Estimates 1997/98 – 2004/05



- Costs in 2005/06 are expected to increase with UV plant issues being dealt with.

1.7.5 Future Maintenance Financial Programme

Table 1-8 details the maintenance and operating costs (excluding depreciation).

1.8 Renewals Capital Expenditure

1.8.1 Overview

Table 1-9 details the renewals programme for the period 2006/07 to 2026/27.

Table 1-8: Future Operating and Maintenance Financial Requirements 2006/16 ($'000)

Excluding: Depreciation and Loan Interest

	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Expenses										
Support Services	1949	3088	3036	3142	3157	3154	3233	3236	3210	3217
Consultants Fees	750	750	750	819	819	819	819	819	819	819
Consultants Fees - other	500	500	500	546	546	546	546	546	546	546
Insurance and Rates	168	168	168	168	168	168	168	168	168	168
Electricity	2160	2160	2160	2358	2358	2358	2358	2358	2358	2358
Maint - Reticulation	1800	1800	1800	1965	1965	1965	1965	1965	1965	1965
Maint. - Pump Stations	1700	1700	1700	1856	1856	1856	1856	1856	1856	1856
Maint. - Treatment	8100	8100	8100	8842	8842	8842	8842	8842	8842	8842
Routine Checks	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Monitoring Water Quality	5400	5400	5400	5400	5400	5400	5400	5400	5400	5400
Water Right Fees	400	400	400	400	400	400	400	400	400	400
Total Expenses	27927	29066	29014	30495	30510	30507	30586	30589	30563	30570

Scheme Improvements

Improvement Plan items	2,770									
IP I1 CCTV		10,000								
IP3 Pipe Performance/Condition Rating	1,500									
Property Inspections		1,500					1,500			
Total Scheme Improvements	4,270	11,500	0	0	0	0	1,500	0	0	0

Table 1-9: Future Renewals 2006/07 to 2026/27 ($000,)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Sewer Mains																				183
Service Lines																				27
MANHOLES																				96
CABINET	4																			
ELECTRICAL SWITCHBOARD PS	18																			
PROBE PS	1							1											1	
PUMP UNIT 1 PS					6															6
PUMP UNIT 2 PS	6																			
SHED									17											
FENCING				4																
AIR COMPRESSOR		3															3			
FLOW SWITCH AT PS	2														2					
UV CHAMBER/PAD WITH STEEL LID											6									
UV CONTROL AND MONITORING CABIN											4									
UV DISINFECTION UNIT											15									
UV MONITOR											3									
BACKFLOW PREVENTOR											1									
FLOAT SWITCH AT OVERLAND FLOW A						2										2				
SUMP PUMP FOR OVERLAND FLOW DOS											6									
SCADA SYSTEM											10									
SCADA RT											1									
TOTAL	30	3		4	6	2		1	17		45				2	2	3		1	312

Table 1-10: Future Operating, Maintenance Forecasted Cost Trends

Excluding: Depreciation and Loan Interest

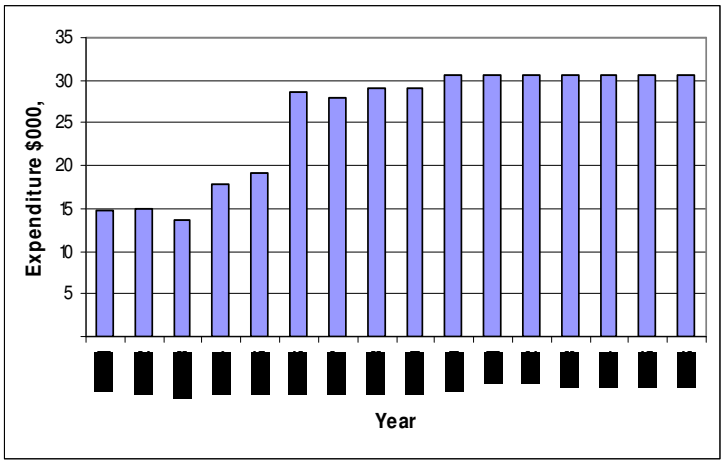
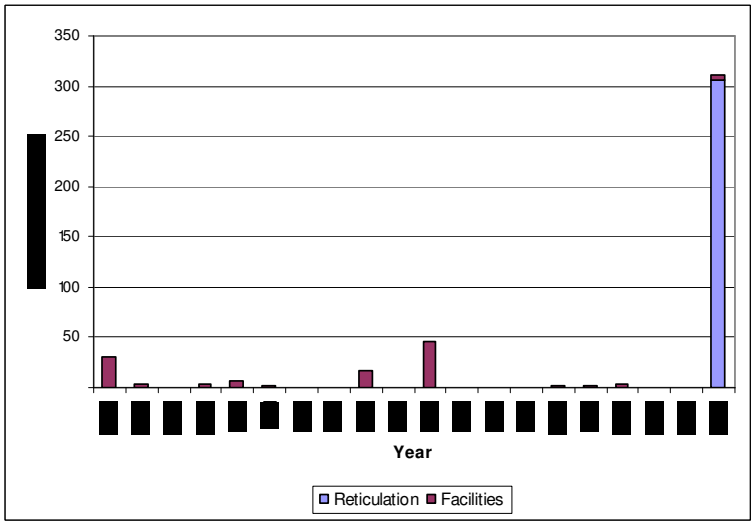


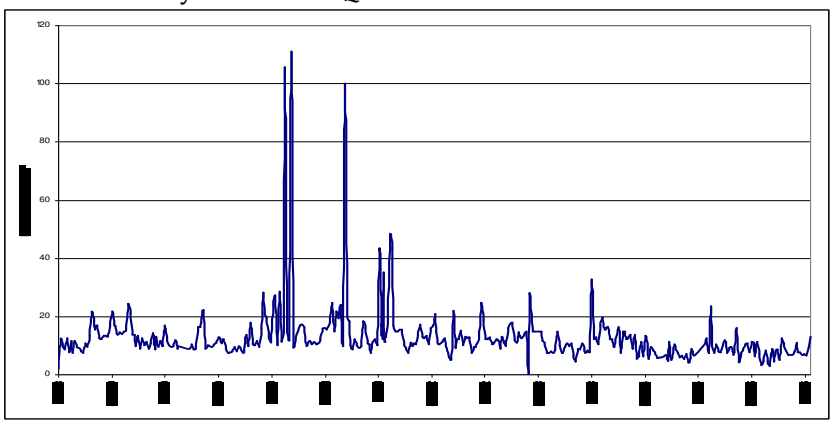
Table 1-11: Projected Renewals Expenditure



1.9 Daily Wastewater Quantities

The following table details the daily wastewater quantities for the Lake Coleridge sewerage scheme for the period July 1998 to July 2005. The high flows experienced in 2001 and 2002 was due stormwater flowing into a manhole. Repairs were subsequently carried out to ensure that this ingress of stormwater did not occur again.

Table 1-12: Daily Wastewater Quantities

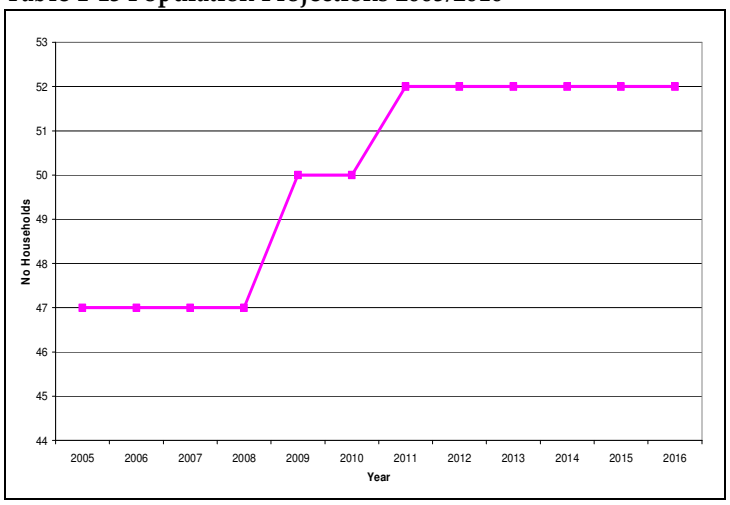


1.10 Future Demand

1.10.1 Population Projections

Population forecasts for all towns and selected rural-residential areas were developed by Max Barber (Planning Consultant) for the Asset Management Department in late 2005. These population predictions will be considered by Council in early 2006 as the official population predictions for the period 30th June 2005 to 30th June 2016. The following table details the population predictions for Lake Coleridge.

Table 1-13 Population Projections 2005/2016



1.10.2 Future Demand

A review of the plant capacity versus the population growth predictions will be completed in the second half of 2006.

1.11 Disposal Programme

No disposal of assets are considered necessary over the next 10 years