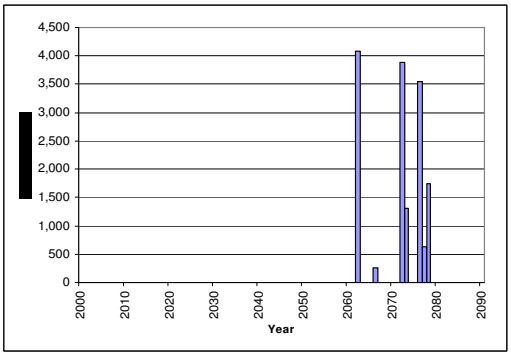
1.0 Prebbleton Sewage Scheme

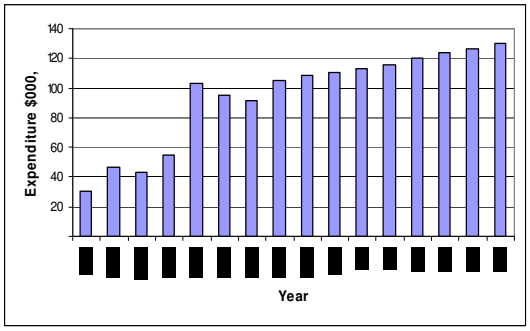
1.1 Executive Summary

Description		Quantity
Population Served		1660 (estimate)
Deprivation Index		2
Physical Statistics	Reticulation Length (km)	15.45
	Manholes	193
	Pump Stations	4
Value ($)	Replacement	$3,937,614
	Depreciated Replacement	$3,542,349
Flows	Annual average over last 3 years	119,000 m^3/day
	Average daily	254 m^3/day
	Peak daily	397 m^3/day
	Minimum daily	- m^3/day
Treatment	Nil	
Disposal	Via Christchurch City	
Infiltration		Unknown
Properties	Connected	533
	Not connected	104

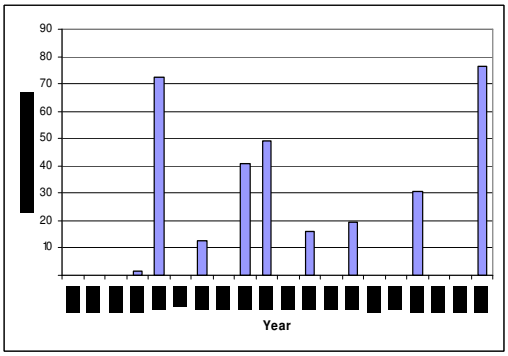
Pipework Replacement Dates



Operating and Maintenance Financial Requirements



Renewals Financial Requirements



New Capital Financial Requirements

There are no capital requirements

The key issues relating to the management of the Prebbleton Sewerage scheme are:

- Ensuring infiltration is monitored and minimised
- Treatment and disposal options for expansion of the Township

1.2 Introduction

1.2.1 Overview and History

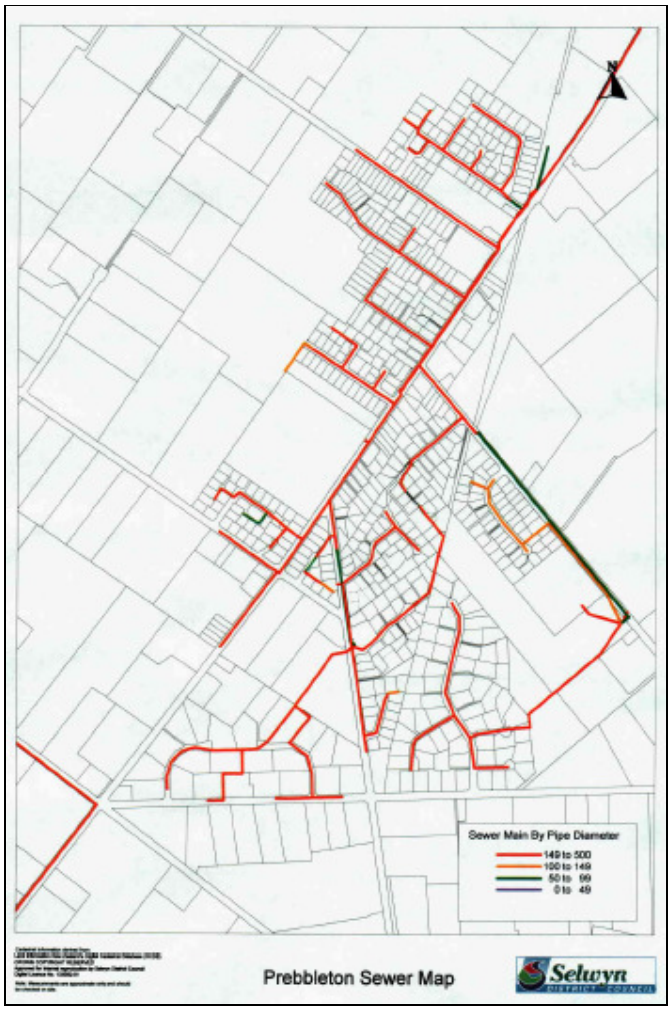
The reticulated sewerage scheme for Prebbleton had been proposed in the 1980s by the then Paparua County Council. Costs for reticulation and treatment were not acceptable to the residents at that time. Development of the township could then not occur due to restrictions placed by the Regional Council.

In the 1995/96 agreement with Meadow Mushrooms helped facilitate the installation of a reticulation system by guaranteeing 84 future lots on the Meadow Mushroom site and paying the cost of the "existing Townships share" of costs for the pump station and rising main. This coupled with Christchurch City's agreement to take untreated sewage (up to a maximum of 25 l/sec) allowed the scheme to proceed. The scheme was commissioned in 1996.

The growth within the Township and surrounding areas meant that by early 2003 sewer allocations of 2,000 pe were taken up.

In October 2004 the Selwyn District Council agreed to allow the design population to increase to 2540 (an addition of 192 connections) but still keeping within the Christchurch City Councils 1995/96 agreement.

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

	Reticulation				Pump Station			
	Age	Condition	Performance	Location	Age	Condition	Performance	Location
Highly Reliable								
Reliable								
Uncertain								
Very Uncertain								

1.2.3 Criticality

The following is a preliminary assessment of the criticality of the scheme components.

Table 1: Critical Assets

Facility or Main	Location	Reason
Main Pump Station	Springs Rd	No standby generator for pump station services all the Prebbleton community
Rising main to Christchurch	Springs and Shands Roads	Single main over 2.8 Km long serving the Prebbleton community

1.2.4 Design

The SDC/CCC 1995/96 Agreement for Prebbleton sewerage allows for the following:

Nature of Discharge	Raw Sewage and Trade Waste
Permitted Hours of pumping	24 hours/day
Maximum Flow Rate	25 Litres/sec
Maximum Flow of Discharge	250,000m3 in each financial year

The 1995/96 design for Prebbleton was 270 litres/person/day with a peaking factor of 4 and a population of 2.8 people/house that gave an allocation of 714 houses (2,000 people).

In October 2004 the Selwyn District Council agreed to allow the design population to increase to 2540[1] (an addition of 192 connections) but still keeping within the Christchurch City Councils 1995/96 agreement. An assessment of flow data had indicated that the peaking factor could be reduced to 3 which allowed an increase of 540 pe.

Investigations have shown that the upper limit of capacity in the Prebbleton sewage rising main is 45 litres/sec. To obtain this flow additional pumping, control and storage capacity would be required at the Springs Road pump station. The spare capacity of the rising main of 20 litres/sec gives the ability to increase connections within Prebbleton by 617 properties (1,728 pe).

Discussions between Christchurch City and Selwyn District Councils in late 2002 gave clear indication from Christchurch City Council that any further allocation of the wastewater disposal would not be available.

1.3 Treatment and Disposal

1.3.1 Overview

No treatment is carried out with all wastewater pumped to Christchurch City.

1.3.2 Issues

The issues for Prebbleton Treatment and Disposal are:

- Agreement for disposal of wastewater to Christchurch is now limiting possible development of Prebbleton community
- Investigations to ascertain future wastewater disposal options for the eastern area of the District (including Prebbleton) are programmed for 2006/07 and 2007/08
- High cost of disposal requires ensuring infiltration levels are low

[1] Prebbleton Sewerage Available Capacity Assessment - Council minutes date 6th October 2004

1.4 Pump Stations

1.4.1 Overview

The township reticulation is gravity mains (some very deep) to a main pump station on Springs Road. There are 3 small to medium sized pump stations within the reticulation, these are:

- A small pump station on Tosswill Road serves the Domain and future development in surrounding area.
- A medium sized pump station is located on Birches Road to serve the southern area.
- A medium sized pump station is located on Springs Road to serve the Elms subdivision

The main pump station located on Springs Road pumps the wastewater via a 2.8 km pipeline to Christchurch City for treatment.

1.4.2 Pump Station Details

The following table is an overview of the four pump stations.

Table 1-2: Schedule of Pump Stations

Pump Station	Description	Year installed	Capacity (L/sec)	Condition	Performance	Criticality
Springs Rd	Three submersible pumps pumping to Christchurch	1996	25	1	1	High
Tosswill Rd	Three submersible pumps pumping to reticulation via twin mains	1996	-	1	1	Low
Birchs Rd	Two submersible pumps pumping to reticulation	-	-	1	1	Low
The Elms	Two submersible pumps pumping to reticulation	2003	-	1	1	Low

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

1.4.3 Pump Station Issues

There are no issues for the Prebbleton pump stations.

1.5 Supply Reticulation

1.5.1 Overview

A schedule of the pipe asset statistics is shown in Table 1-3below.

Table 1-3: Schedule of Pipework Length (m)

Diameter mm	PE-MD	UPVC	Total
75	117	0	117
80	0	1,582	1,582
100	0	926	926
150	0	5,633	5,633
160	0	3,397	3,397
175	0	2,759	2,759
200	0	322	322
225	0	362	362
250	0	353	353
Total	**117**	**15,335**	**15,451**

1.5.2 Condition

The condition of the reticulation installed from 1996 is considered to be very good. Hydraulic modelling of the reticulation is programmed for 2006/07 and 2007/08 to ensure future development can be facilitated.

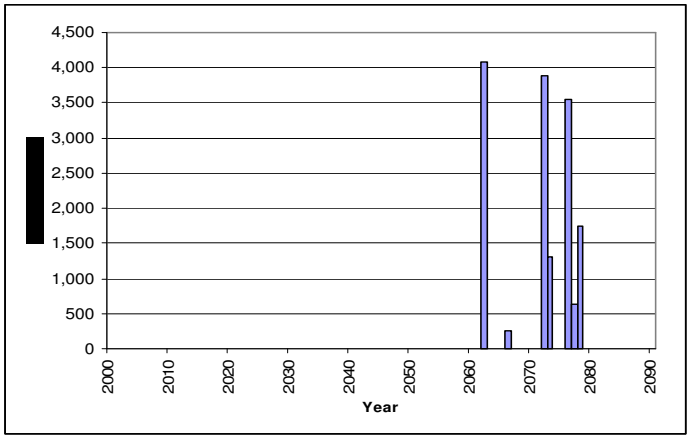
1.5.3 Performance

Performance of reticulation is considered by Council engineers as very good[2].

1.5.4 Pipe Network Replacement Date

Table 1-4 details the expected year of mains replacement.

Table 1-4 Pipework Replacement Dates



1.5.5 Infiltration

The extent of infiltration is unknown and investigations into the level of infiltration have been included in the annual maintenance costs on an ongoing basis.

1.5.6 Property Inspections

Property inspections were to be carried out in 2003/04 but due to constraints in resources these inspection has now been programmed for 2006/07.

1.5.7 CCTV

No CCTV is required in the foreseeable future as system is very new.

1.6 Environmental Management and Agreements

1.6.1 Consenting Issues

There are no requirements for resource consents.

[2] Infrastructure Asset Guidelines 1999

1.6.2 Agreements

An agreement between Selwyn District Council and Christchurch City Council was signed in 1995 allowing pumping of untreated wastewater from Prebbleton to Christchurch City's Sewer reticulation at a maximum rate of 25L/sec.

1.7 Maintenance and Operating

1.7.1 Maintenance Contract

Maintenance of the reticulation and general work around the pump stations is carried out by SICON Ltd under Maintenance Contract 849. The Prebbleton wastewater scheme (including the treatment plant) Operation Manual has been assessed as moderate. Enhancement of the existing manual is programmed for 2006/07.

1.7.2 Maintenance Issues

The issues for the maintenance of the Prebbleton wastewater scheme are

- Longer term, increase maintenance of the system may be required to ensure infiltration is kept within tight control

1.7.3 SCADA

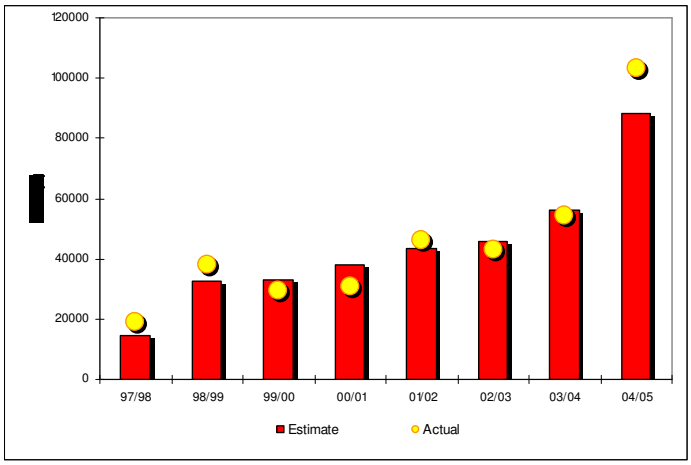
All pump stations are monitored by Council's SCADA system and have the following alarm and monitoring capacity:

Site Name	Phase Failure	Pump Operation	Well Level / High Alarm	Total Outflow	Generator Operation	Dissolved Oxygen
Prebbleton - Toswill Rd Pump Station	Y	Y	Y	-	-	-
Prebbleton - Birches Rd Pump Station	Y	Y	Y	Y	-	-
Prebbleton - Springs Rd Pump Station	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 1-5: Actual Costs versus Estimates 1997/98 – 2004/05



1.7.5 Future Maintenance Financial Programme

Table 1-6 details the maintenance and operating costs (excluding depreciation).

Renewals Capital Expenditure and Depreciation

Table 1-7 details the renewals programme for the period 2006/07 to 2026/27.

Table 1-6: Future Operating and Maintenance Financial Requirements 2006/15

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	17405	26552	27199	27447	28372	29131	30844	31846	32566	33610
Consultants Fees	4136	4380	4540	4646	4753	4867	5011	5156	5300	5445
Consultants Fees - other	775	821	851	871	891	913	940	967	994	1021
Insurance and Rates	532	532	532	532	532	532	532	532	532	532
Electricity	5170	5475	5675	5808	5941	6084	6264	6445	6625	6806
Maint. - Pump Station	9823	10403	10782	11035	11288	11559	11902	12245	12588	12932
Maint. - Reticulation	3102	3285	3405	3485	3565	3650	3759	3867	3975	4084
Routine Checks	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
CCC Disposal Fees	48596	51468	53344	54595	55846	57186	58884	60582	62279	63977
Total Expenses	91538	104917	108328	110420	113188	115922	120136	123639	126861	130406

Scheme Improvements

Operations Manuals & Procedures	5,000									
Improvement Plan items	15,500									
Property Inspections					3,000					4,000
Infiltration study (Growth)	1,500	1,500	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400
IP I1 CCTV		10,300								
Total Scheme Improvements	22,000	11,800	1,700	1,800	4,900	2,000	2,100	2,200	2,300	6,400

Table 1-7: 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
Birches Rd PS	PUMP UNIT SUBMERSIBLE 2									6											
	LEVEL PROBE				1										1						
	HIGH LEVEL ALARM FLOAT				1										1						
	FLOW METER									5											
	BACK FLOW PREVENTER									1											
	PUMP UNIT SUBMERSIBLE 1									6											
	SCADA SYSTEM									10											
	SCADA RT									1											
	ELECTRICAL SWITCHBOARD														18						
Springs RD PS	SCADA RT					1															1
	FLOW METER					5															5
	ELECTRICAL SWITCHBOARD										27										
	SOFT STARTER										4										4
	SCADA SYSTEM					10															10
	PUMP UNIT 1					20															20
	PUMP UNIT 2					20															20
Tosswill Rd PS	ELECTRICAL SWITCHBOARD										18										
	PUMP UNIT 1					6															6
	PUMP UNIT 2									6											
	PUMP UNIT 3									6											
	SCADA SYSTEM					10															10
	SCADA RT					1															1
The Elems PS	SWITCHBOARD																	18			
	FLOW METER												5								
	SUBMERSIBLE TRANSDUCER							3										3			
	FLOAT SWITCH - HIGH LEVEL							1										1			
	SCADA SYSTEM												10								
	PUMPSET 1							4										4			
	PUMPSET 2							4										4			
	SCADA RT												1								
	TOTAL				1	72		13		41	49		16		19			31			76

Table 1-8: Future Operating, Maintenance Forecasted Cost Trends

Excluding: Depreciation and Loan Interest

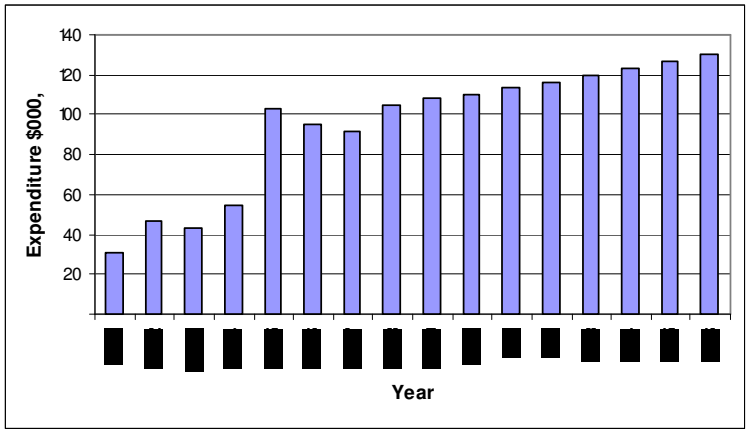
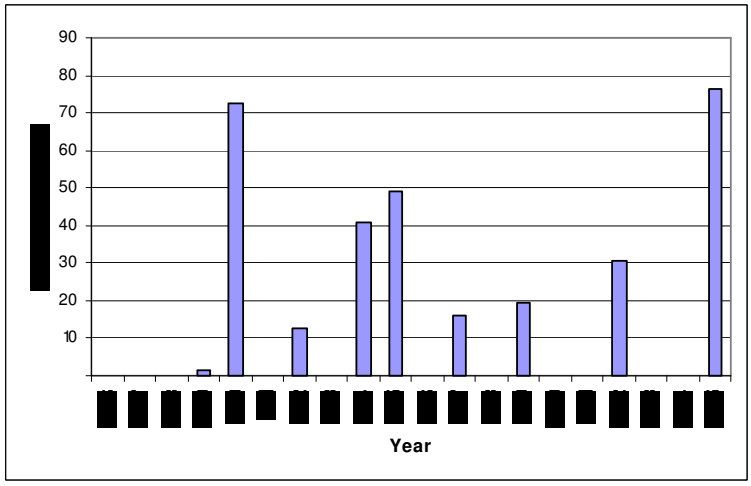


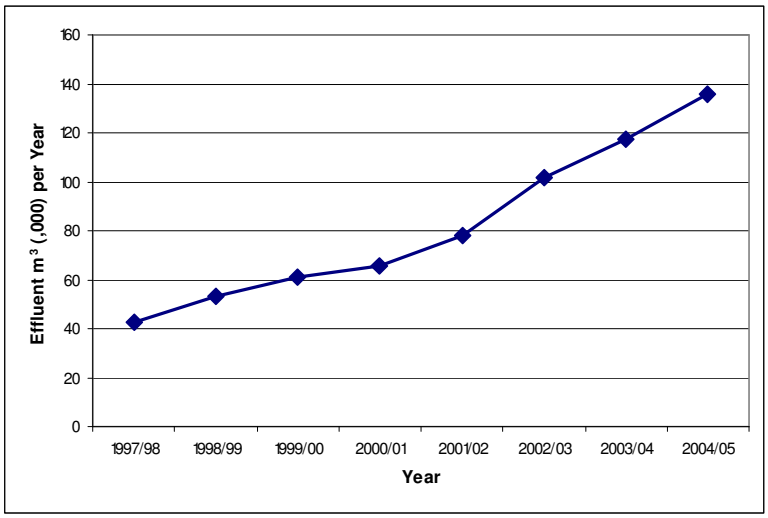
Table 1-9: Projected Renewals Expenditure



1.8 Annual Wastewater Quantities

Table 1-10 details the annual wastewater quantities for the Prebbleton sewerage scheme.

Table 1-10: Annual Wastewater Quantities

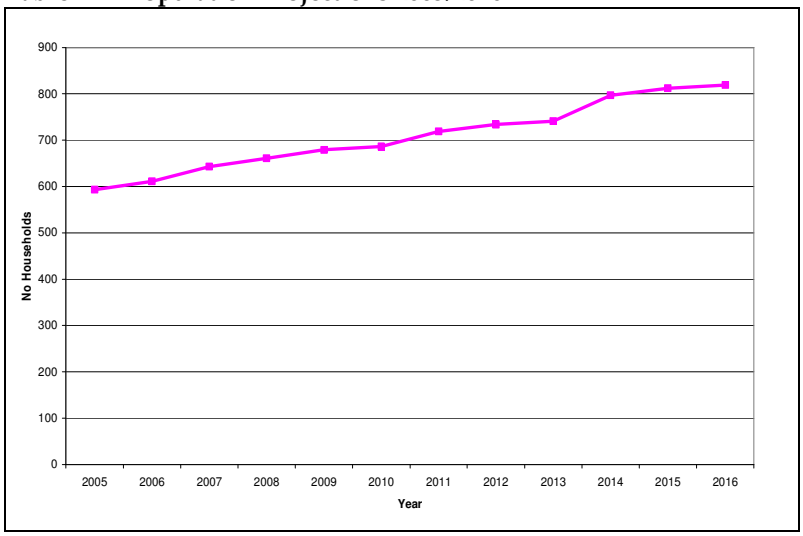


1.9 Future Demand and New Capital Expenditure

1.9.1 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. Table 1-11 details the population predictions for Prebbleton.

Table 1-11 Population Projections 2005/2016



1.9.2 Future Demand

Capacity has been allocated to all areas where connections to the existing main can be made ie to service the underlying laterals established when the scheme was installed.

1.9.3 New Capital Expenditure

Future capital requirements will be dependent on the outcomes of the Treatment and disposal investigations for expansion of the Township

1.10 Disposal Programme

No disposals of assets are considered necessary over the next 10 years.