Appendix 2

Hastings Sewer Development Servicing Plan (DSP) May 2004

Hastings Council

Development Servicing Plan for Sewerage – Background Document

May 2004

Hastings Council

Development Servicing Plan for Sewerage Services – Background Document

May 2004

This plan was prepared for Hastings Council by
John Wilson and Partners Pty Ltd

ABN: 85 011 022 503
Level 11 Tenix House, 98 Arthur Street
North Sydney, NSW, 2060
Telephone: 02 8923 1555
Facsimile: 02 9460 1866
E-mail: g.azar@jwp.com.au

Document Control					
Revision	Author	Reviewer	Approved for Issue		
			Name	Signature	Date
1	A.Snel	G.Azar	G.Azar	G. Azar	13/4/04
2	A.Snel	R.Campbell	R.Campbell		6/05/04
3	A.Snel	G.Azar	G.Azar		14/05/04

Contents

Appendices

1 Introduction

This background document has been prepared to provide information additional and of greater detail to that presented in the Hastings Council Development Servicing Plan for Sewerage Services, May 2004.

It is expected that the two documents will be read simultaneously.

2 Population Projections

Table 1 lists the existing sewered areas (including Area 13 which is to be sewered by 2007) and their populations as equivalent population (EP) loading and equivalent tenements (ET).

Population projections are based on expected growth and include allowance for permanent residents, non-residential users and holiday loadings. These projections are from the present year to 2021, which is Council's planning horizon.

Table 1 – Projected Population of Sewered Areas

Village		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	EP/ET	2.3									
Kew/ Kendall	ET	390	394	398	403	411	420	429	437	446	455
	EP	896	906	916	926	946	966	986	1006	1026	1046
	% Growth		1.1%	1.1%	1.1%	2.2%	2.1%	2.1%	2.0%	2.0%	1.9%
	EP/ET	2.3									
Dunbogan	ET	2939	3000	3060	3121	3182	3243	3304	3365	3426	3478
	EP	6759	6899	7039	7179	7319	7459	7599	7739	7879	7999
	% Growth		2.1%	2.0%	2.0%	2.0%	1.9%	1.9%	1.8%	1.8%	1.5%
	EP/ET	2.4									
Lake Cathie/Bonny Hills	ET	2038	2163	2288	2413	2538	2663	2788	2913	3038	3163
	EP	4892	5192	5492	5792	6092	6392	6692	6992	7292	7592
	% Growth		6.1%	5.8%	5.5%	5.2%	4.9%	4.7%	4.5%	4.3%	4.1%
	EP/ET	2.3									
Wauchope	ET	2144	2179	2214	2249	2283	2318	2353	2388	2423	2457
	EP	4932	5012	5092	5172	5252	5332	5412	5492	5572	5652
	% Growth		1.6%	1.6%	1.6%	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%
	EP/ET	2.4									
Port Macquarie	ET	16570	16878	17187	17495	17803	18112	18420	18728	19037	19328
	EP	39768	40508	41248	41988	42728	43468	44208	44948	45688	46388
	% Growth		1.9%	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	1.6%	1.5%
	EP/ET	3.0									
Area 13	ET	140	210	280	350	430	510	590	670	750	870
	EP	420	630	840	1050	1290	1530	1770	2010	2250	2610
	% Growth		50%	33%	25%	23%	19%	16%	14%	12%	16%
Hastings Council TOTAL	ET	24221	24824	25428	26031	26649	27266	27884	28502	29119	29752
	EP	57667	59147	60627	62107	63627	65147	66667	68187	69707	71287
	% Growth		2.5%	2.4%	2.4%	2.4%	2.3%	2.3%	2.2%	2.2%	2.2%

Village		2013	2014	2015	2016	2017	2018	2019	2020	2021
	EP/ET	2.3								
Kew/ Kendall	ET	463	472	481	490	498	507	516	524	533
	EP	1066	1086	1106	1126	1146	1166	1186	1206	1226
	% Growth	1.9%	1.9%	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%
	EP/ET	2.3								
Dunbogan	ET	3530	3582	3634	3687	3739	3791	3843	3895	3947
	EP	8119	8239	8359	8479	8599	8719	8839	8959	9079
	% Growth	1.5%	1.5%	1.5%	1.4%	1.4%	1.4%	1.4%	1.4%	1.3%
	EP/ET	2.4								
Lake Cathie/ Bonny Hills	ET	3288	3413	3538	3663	3788	3913	4038	4163	4288
	EP	7892	8192	8492	8792	9092	9392	9692	9992	10292
	% Growth	4.0%	3.8%	3.7%	3.5%	3.4%	3.3%	3.2%	3.1%	3.0%
	EP/ET	2.3								
Wauchope	ET	2492	2527	2562	2597	2627	2657	2688	2718	2749
	EP	5732	5812	5892	5972	6042	6112	6182	6252	6322
	% Growth	1.4%	1.4%	1.4%	1.4%	1.2%	1.2%	1.1%	1.1%	1.1%
	EP/ET	2.4								
Port Macquarie	ET	19620	19912	20203	20495	20762	21028	21295	21562	21828
	EP	47088	47788	48488	49188	49828	50468	51108	51748	52388
	% Growth	1.5%	1.5%	1.5%	1.4%	1.3%	1.3%	1.3%	1.3%	1.2%
	EP/ET	3.0								
Area 13	ET	990	1110	1230	1350	1493	1637	1780	1923	2067
	EP	2970	3330	3690	4050	4480	4910	5340	5770	6200
	% Growth	14%	12%	11%	10%	11%	10%	9%	8%	8%
Hastings Council TOTAL	ET	30384	31016	31649	32281	32907	33534	34160	34786	35412
	EP	72867	74447	76027	77607	79187	80767	82347	83927	85507
	% Growth	2.1%	2.1%	2.0%	2.0%	1.9%	1.9%	1.9%	1.8%	1.8%

3 Description of Sewerage System

3.1 Service Area

Hastings Council area is shown on Figure 1.

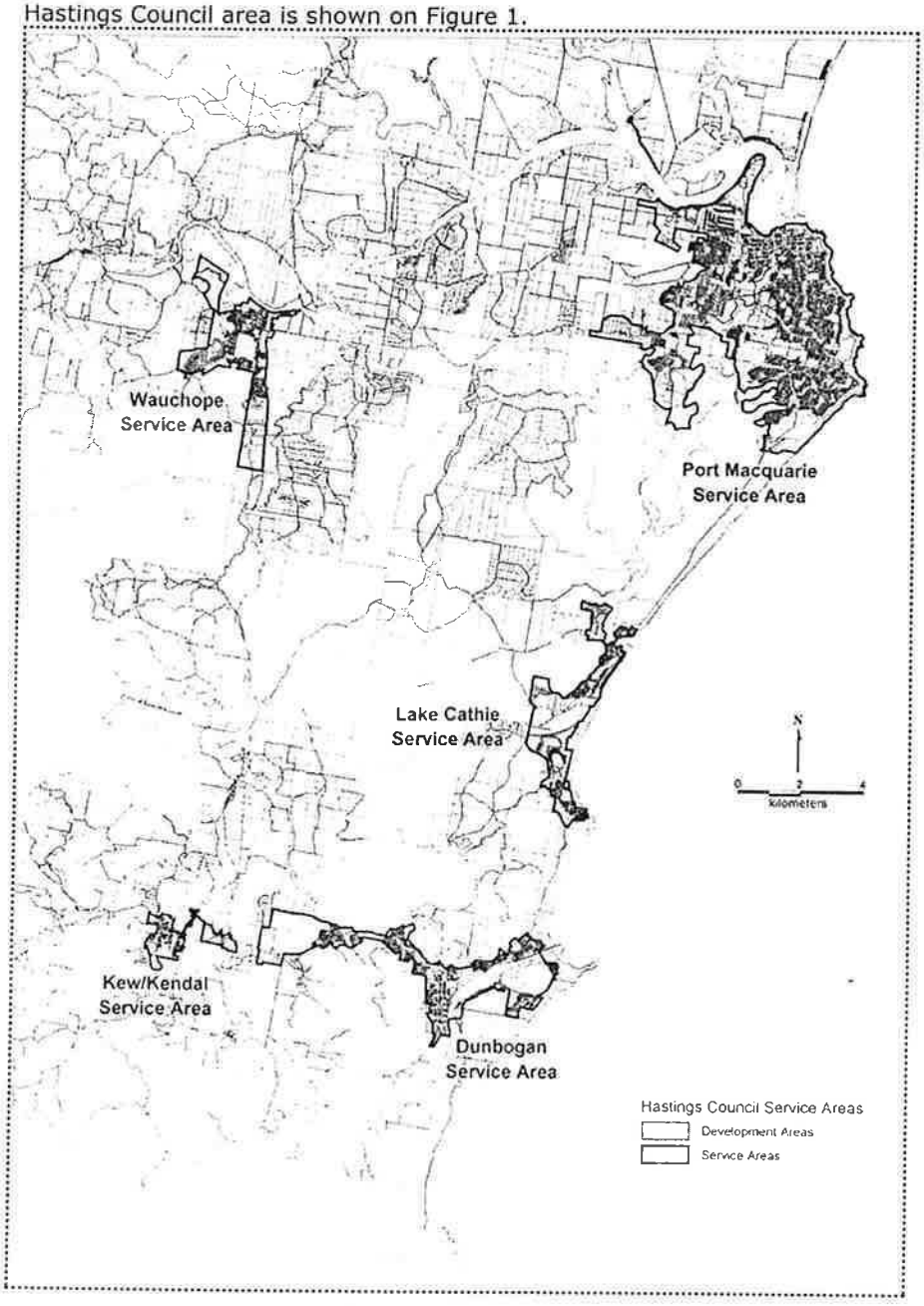


Figure 1 – Hastings Council

Maps of the areas covered by the DSP areas are located in Appendix A.

3.2 Existing Headworks

Hastings Council currently operates five (5) separate sewerage schemes to serve the urban areas of Kew/Kendall, Dunbogan, Lake Cathie/Bonny Hills, Wauchope, Port Macquarie and Lighthouse Beach.

3.2.1 Kew/Kendall

Kew/Kendall Sewerage Scheme is the most recent addition to the LGA, and comprises a system to serve 2,200 EP. Nine pumping stations have been included to serve the two townships with the STP providing effluent to the Camden Golf Course and surrounding forest plantation.

3.2.2 Lake Cathie/Bonny Hills

The Lake Cathie/Bonny Hills Sewerage Scheme was constructed in the 1980's. The collection system comprises a reticulation network and 17 pumping stations. The sewage treatment plant has three (3) 2,000 EP Pasveer Channels, with current loadings of approximately 4,000 EP. Recently a micro-filtration plant has been added to improve the quality of the effluent being discharged. A trench disposal system and wick drains dispose treated effluent by infiltration to the sand dunes.

3.2.3 Dunbogan

The Dunbogan Sewerage Scheme serves the areas of Camden Head, North Haven, West Haven, Laurieton and Lakewood. The collection system comprises 29 pumping stations and a network of pipes. A trickling filter plant with nominal capacity of 7,500 EP provides treatment to the effluent before disposal by a shoreline ocean discharge.

3.2.4 Wauchope

Wauchope Sewerage Scheme collection system comprises a network of pipes and 15 pumping stations. The sewage treatment plant was augmented in the early 1990s and comprises an 8,000 EP activated sludge plant, sufficient for the areas current adopted growth strategy. Some of the treated effluent is being reused on Wauchope Golf Course and a nearby farm, with the balance discharged to the Hastings River.

3.2.5 Port Macquarie

Port Macquarie Sewerage Scheme comprises a reticulation network of pipes and 75 pumping stations, delivering sewerage to the sewage treatment plant in Ocean Drive. The sewage treatment plant has nominal capacity of 52,000 equivalent persons (EP). Effluent from the sewage treatment plant is pumped to effluent ponds for detention and ultraviolet disinfection, then discharged to Kooloonbung Creek downstream of the Lake Road bridge.

Lighthouse Beach sewage treatment plant comprises a single 2,000 EP extended aeration tank. The reticulation system comprises six (6) pumping stations and a network of reticulation pipes. Negotiations are underway to again use effluent to irrigate the local golf course. Excess effluent is pumped to the Port Macquarie sewage treatment plant.

3.3 Future Sewerage Works

Council is planning for the establishment of a new township to the west of Port Macquarie currently known as Area 13 in the Hastings Urban Growth Strategy (HUGS), which will require the construction of a new STP with a capacity of 30,000 EP.

Augmentations of existing treatment plants are also required at Lake Cathie/Bonny Hills and Dunbogan. Growth in both these centres will require Council to increase the size of these schemes in the near future.

Council is also currently investigating the provision of sewerage facilities to six small villages in the LGA. The villages comprising of Herons Creek, Comboyne, Telegraph Point, Beechwood, Long Flat and North Shore are all eligible for funding under State Government programs. The schemes will serve an additional population of approximately 1,400 people currently connected to on-site disposal systems, many of which being considered defective.

3.4 Service Areas

Service Area	Areas Included
Kew/Kendall	The catchment of Kew/Kendall sewage treatment plant (STP) and distribution system.
Dunbogan	The catchment of Dunbogan STP and distribution system.
Lake Cathie/Bonny Hills	The catchment of Lake Cathie/Bonny Hills STP and distribution system.
Wauchope	The catchment of Wauchope STP and distribution system.
Port Macquarie	The catchment of Port Macquarie STP and distribution system.

4 Assets

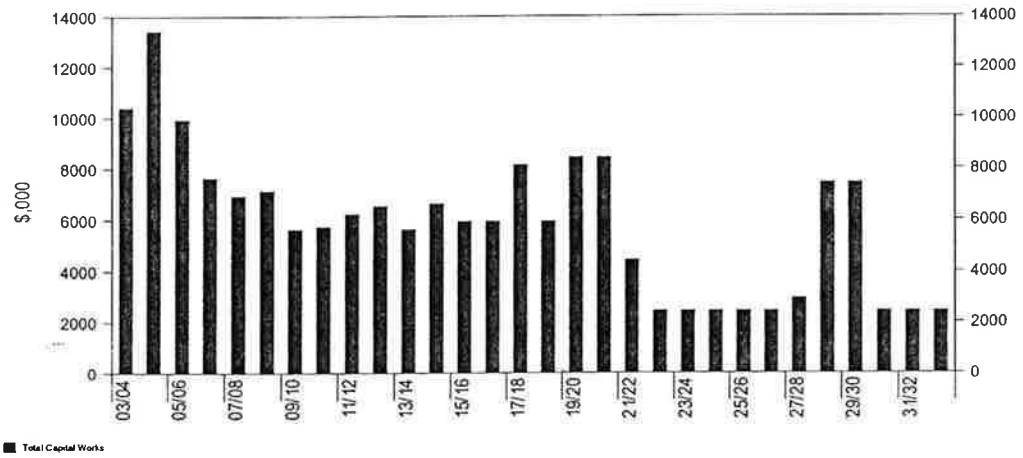
4.1 Existing Assets

Data for existing assets has been obtained from Council's TAMS register (as of July 2003). This includes all transport, pumping and treatment assets associated with the existing sewerage schemes of Hastings Council. Refer Appendix B for a detailed listing of all existing assets.

4.2 Future Works

Data for future assets has been obtained from Council's 30 year capital works program, formulated by Council (2004). It includes all growth, works to improve levels of service and renewals necessary to meet the demands of the growth of Hastings Council for the next 30 years (refer Appendix C for the detailed capital works program). Capital works of $177 M (2003/04 $) will be required over the next 30 years to provide sewerage services to Hastings (refer Figure 2).

Figure 2 – Hastings Council Sewerage Capital Works (2003/04 $)



Source: Hastings Council Financial Plan, 2004.

4.3 System Capacity

The capacities of components of the systems are provided in Table 2. Where the capacity is not known, it has assumed to be the population of the system in the year 2021, which is Council's current planning horizon. This is based on the assumption that the capital works planned allow sufficient assets to provide service to the expected population in 2021/22.

Table 2 – System Capacities

Component	Capacity (EP)	Capacity (ETs)
Kew/Kendall		
STP	2,200	957
Pumping and Transport	30 year growth	533
Dunbogan		
STP	12,000	5,217
Pumping and Transport	30 year growth	3,947
Lake Cathie/Bonny Hills		
STP	12,000	5,000
Pumping and Transport	30 year growth	4,288
Wauchope		
STP	8,000	3,478
Pumping and Transport	30 year growth	2,749
Port Macquarie		
STP	52,000	21,667
Pumping and Transport	30 year growth	21,828

4.4 Levels of Service

System design and operation are based on the following levels of service.

Table 3 - Levels of Service

Description	Unit	Level of Service				
		Port Macquarie	Dunbogan	Lake Cathie/ Bonny Hills	Wauchope	Kew Kendall
System Failures						
Pump Station Faults Effecting Customers	No per year	20	10	10	10	5
Sewer Chokes		50	40	10	40	10
Wet weather/system capacity		10	5	5	10	5
Response Times						
System Failures						
Staff response time	hrs			1		
Other Answer general complaints or inquiry						
written inquiry	weeks			3		
Oral inquiry	working days			1		
Time to provide junction in sewered area	working days			5		
Complaints						
Odour complaints	No. per year	20	20	20	20	20
Effluent						
DEC licence	compliance rate	100%	100%	100%	100%	100%

Source: Hastings Council, 2004.

5 The Developer Charges Process

5.1 The Net Present Value Approach

Developer charges are up-front charges levied to recover part of the infrastructure costs incurred in servicing new developments or additions/changes to existing developments. Developer charges serve two related functions:

- They provide a source of funding for infrastructure required for new urban development.
- They provide signals regarding the cost of urban development and thus encourage less costly forms and areas of development.

The Developer Charges calculation is based on the net present value (NPV) approach adopted by the Independent Pricing and Regulatory Tribunal (IPART) for the metropolitan water utilities. The fundamental principle of the NPV approach is that the investment in assets for serving a development area is fully recovered from the development. The investment is recovered through up-front charges (i.e. developer charges) and the present value (PV) of that part of annual bills received from the development in excess of operation, maintenance and administration (OMA) costs.

Developer Charge	=	Capital Charge (cost of providing the assets)	-	Reduction Amount (cost recovered through annual bills)

The Capital Charge and Reduction Amount are discussed further in the following sections. The developer charges process is described fully in the *Developer Charges Guidelines for Water Supply, Sewerage and Stormwater* (December 2002).

NSW local water utilities (LWUs) which propose to levy developer charges for water supply and/or sewerage need to prepare development servicing plans (DSPs). The DSP details the calculation of the developer charges and is required to be fair and transparent.

LWUs need to calculate and report developer charges in accordance with section 306 (3) of the *Water Management Act 2000* and the Guidelines, and to register their DSPs with DEUS by 30 June 2004.

Developer charges relating to a particular DSP should be reviewed by the water utility after a period of 5 to 6 years. If the review indicates that the developer charges in the DSP remain valid, the DSP will apply for a further 5 to 6 years after the utility releases a public notice to this effect. However, if it is considered that a new DSP is warranted a new DSP shall be prepared, exhibited and registered.

5.2 The Capital Charge

The capital cost includes the cost of providing, extending or augmenting assets required, or likely to be required, to provide services to a development area. The capital cost per equivalent tenement (ET) is the value of the relevant assets divided by the capacity of these assets (in ETs).
Typically, the capacity of an asset would not be fully utilised until some time after construction of the asset. The Return on Investment (ROI), also known as a holding charge, is based on the cost of early investment, and recovery of the

cost over time. The ROI factor is dependent on the period for take-up of the asset capacity, and the rate of return required for the asset.
The capital charge is calculated for each service area. Service areas are:

- An area served by a separate sewage treatment works.
- Separate small towns or villages.
- A new development area of over 500 lots.

Capital Charge	=	Capital Cost	×	Return on Investment (ROI) Factor

Where the capital charges for two or more service areas are within 30%, they are agglomerated into a single DSP.

5.3 The Reduction Amount

Hastings Council has adopted the NPV of Annual Charges method for calculation of the Reduction Amount. This method involves calculation of the present value (PV) of the difference between annual rates and charges revenue, and annual operating costs projected for new development over the next 30 years. This is divided by the PV of the new ETs over the planning horizon to give the reduction amount. The method involves 30 year forecasting of income and expenditures relating to new development.

6 Calculation of Developer Charges

6.1 Capital Charge

The capital charge was calculated separately for each of the sewerage catchments (Kew/Kendall, Dunbogan, Lake Cathie/Bonny Hills, Wauchope and Port Macquarie), based on the existing and future assets providing the services in those catchments. The capital charge for each area is calculated in the background document and summarised in Table 4.

Table 4 - Initial Capital Charges

Capital Charge Area	Capital Charge per ET (2003/04 $)
Kew/Kendall	$17,687
Dunbogan	$8,390
Lake Cathie/Bonny Hills	$6,459
Wauchope	$5,733
Port Macquarie	$4,875

6.2 Agglomeration of DSP Areas

The capital charges were then grouped into DSP areas of within 30% of the highest capital charge. The process of the agglomeration is shown in Table 5.

The weighted average capital charge is calculated on the proportion of growth in each DSP area shown in Table 5. The weighted average capital charge is used to calculate the reduction amount for the whole of Hastings Council.

Table 5 - Agglomeration of Capital Charges

DSP	Capital Charge (2003$ per ET)	DSP Area 1 (% of highest)	DSP Area 2 (% of highest)	DSP Area 3 (% of highest)	Prop-ortion of Growth %	Weighted Average Capital Charge
Kew/ Kendall	$17,687	100			1	$201
Dunbogan	$8,390	47	100		11	$954
Lake Cathie/ Bonny Hills	$6,459	37	77		23	$1,509
Wauchope	$5,733	32	68	100	7	$373
Port Macquarie	$4,875	28	58	85	58	$2,809
Weighted Average Capital Charge						**$5,846**

The outcomes of the agglomeration process are:

- Kew/Kendall has a capital charge significantly higher than the others, and was grouped in its own, DSP Area 1.
- The capital charges of Dunbogan and Lake Cathie/Bonny Hills are within 30% (100% and 77% of the Dunbogan capital charge), they have been grouped into DSP Area 2.
- The capital charges of Wauchope and Port Macquarie are within 30% (100% and 85% of the Wauchope capital charge), they have been grouped into DSP Area 3.

6.3 Reduction Amount

Council has adopted the NPV of Annual Charges method to calculate the Reduction Amount. The Reduction Amount is calculated for the whole of Hastings Council sewerage.

In order to calculate the reduction amount using the NPV of Annual Charges Method, it is necessary to make a 30 year projection of future annual charges for residential customers. Such projections were made using the NSW Financial Planning Model (FINMOD).

Key forecasts for the Financial Planning Model for Hastings Council include:

- 2.5% inflation,
- 6.5% pa borrowing rate, with 30 year loans, and
- 5.5% pa investment rate.

The reduction amount for Hastings Council developer charges was calculated as **$920** per ET (refer to the Background Document).

6.4 Developer Charges

The calculated developer charges for the DSP areas are shown in Table 6. These developer charges reflect the cost of assets for serving new development, and are the maximum amounts which may be charged by Council.

Table 6 - Developer Charges (2003/04 $)

DSP No.	DSP Name	Capital Charge ($ per ET)	Reduction Amount ($ per ET)	Calculated Developer Charge ($ per ET)	Adopted Developer Charge ($ per ET)
1	Kew/Kendall	$17,687	$920	$16,767	$3,500
2	Dunbogan, Lake Cathie/ Bonny Hills	$7,091	$920	$6,171	$3,500
3	Wauchope, Port Macquarie	$4,962	$920	$4,042	$3,100

6.5 Reviewing/Updating of Calculated Developer Charges

As required by the guidelines (section 2.5), the developer charges relating to these DSPs will be reviewed by Hastings Council after a period of 5 to 6 years. If the review indicates that the developer charges in any of the DSPs remain valid, that DSP will apply for a further 5 to 6 years after the Council releases a public notice to this effect. However, if it is considered that a new DSP is warranted, a new DSP shall be prepared, exhibited and registered.

If a major change occurs in the Hastings Council's circumstances such as the need for significant capital works that had not been included in these DSPs, Council may carry out a review in less than 5 years, subject to approval by the Department of Energy, Utilities and Sustainability. If the review results in a new DSP, the new DSP will be exhibited and registered in accordance with the requirements of the guidelines.

In the period between any review, developer charges will be adjusted on 1 July each year on the basis of movements in the CPI for Sydney, in the preceding 12 months to December, excluding the impact of GST. The first adjustment will take place on 1 July 2004.

6.6 Reticulation Works

The developer shall be responsible for the full cost of the design and construction of sewerage reticulation works within developments including subdivisions. The design and construction of the works shall be in accordance with Council's development specifications for sewerage services.

6.7 Cross Subsidy

As shown in Table 7, Council intends to levy developer charges that are lower than the maximum amounts which may be levied by Council. In order for Council to levy charges lower than the calculated amount, the Guidelines require the disclosure the cross subsidy by existing customers.

The impact of implementing the lower charges compared with implementing the calculated charge is displayed in Table 7, Table 8 and Figure 3. Table 7 shows the average cross subsidy in terms of developer charges. Table 8 shows the cross subsidy in terms of annual bills. Figure 3 is a pictorial representation of Table 8.

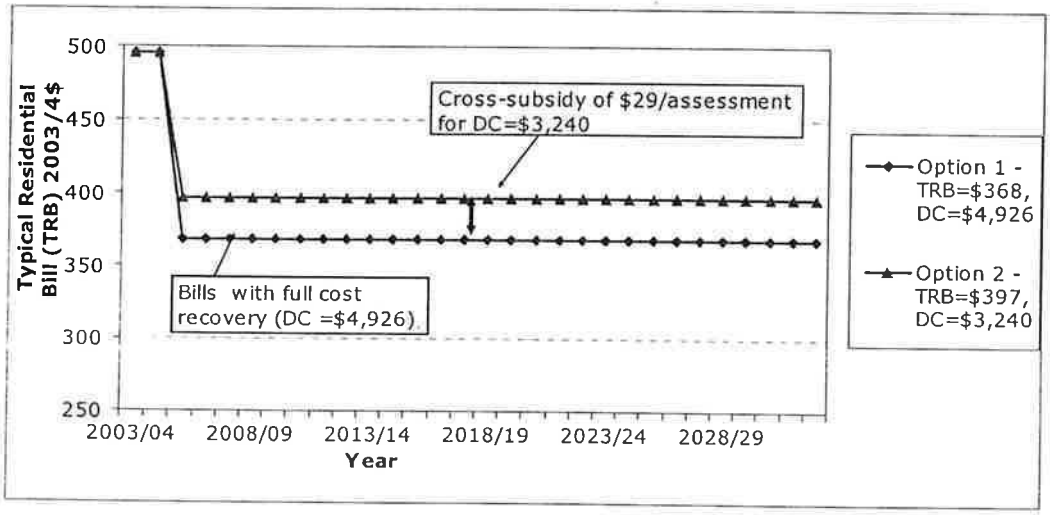
Table 7 – Developer Charges Options (2003/04 $)

Option	Weighted Average Developer Charge ($/ET)	Average Cross Subsidy to New Development ($/ET)	Comments
1	$4,926	-	Calculated charges are levied.
2	$3,240	$1,686	Kew/Kendall, Dunbogan, Lake Cathie/Bonny Hills $3,500 Wauchope and Port Macquarie $3,100

Table 8 – Cross-Subsidy (2003/04 $)

Option	Required Typical Residential Bill ($/ assessment)	Cross-Subsidy from Typical Residential Bills ($/ assessment)	Resulting Increase in Typical Residential Bills (%)	Resulting Cross-Subsidy over 30 years ($M)
1	$368	Nil	Nil	Nil
2	$397	$29	8	$11.4

Figure 3 – Comparison of the Impact of Developer Charges Options on Residential Bills



7 Glossary

ADWF	Average Dry Weather Flow
AWWF	Average Wet Weather Flow
BOD	Biochemical oxygen demand. Used as a measure of the 'strength' of sewage.
Capital Charge	Capital cost of assets per ET x Return on Investment (ROI) Factor.
Capital Cost	The Present Value (MEERA basis) of assets used to service the development.
DCP	Development Control Plan
DEUS	Department of Energy, Utilities and Sustainability
Developer Charge	A charge levied on developers to recover all or part of the capital cost incurred in providing infrastructure to new development.
Discount Rate	The rate used to calculate the present value of money arising in the future.
DLWC	Former Department of Land and Water Conservation
DSP	Development Servicing Plan
EP	Equivalent Persons
ET	Equivalent Tenement
HUGS	Hastings Urban Growth Strategy
IPART	Independent Pricing and Regulatory Tribunal
kL/d	Kilolitres per day
LEP	Local Environmental Plan
LGA	Local Government Area
LWU	Local Water Utility
M	Million
MEERA	Modern Equivalent Engineering Replacement Asset
ML/d	Megalitres per day
NHMRC	National Health and Medical Research Council
NPV	Net Present Value
Post 1996 Asset	An Asset that was commissioned by a local water utility on or after 1 January 1996 or that is yet to be commissioned.
Pre-1996 Asset	An Asset that was commissioned by a local water utility before 1 January 1996.
PS	Pumping Station

PV	Present value. The value now of money, or ETs, in the future.
PWWF	Peak Wet Weather Flow
Real Terms	The value of a variable adjusted for inflation by a CPI adjustment.
Reduction Amount	The amount by which the capital charge is reduced to arrive at the developer charge. This amount reflects the capital contribution that will be paid by the occupier of a development as part of future annual charges.
ROI	Return on investment. Represents the income that is, or could be, generated by investing money.
SS	Suspended solids, or the concentration of particles in sewage. Used as a measure of the 'strength' of sewage.
STP	Sewage Treatment Plant

8 References

- Hastings Council Strategic Business Plan for Sewerage Services, 2003/04.
- Hastings Council Financial Plan for Sewerage Services, 2003/04.
- Hastings Council Development Servicing Plan for Sewerage Services 2004/05.
- Department of Land and Water Conservation (now Department of Energy, Utilities and Sustainability) Developer Charges Guidelines for Water Supply, Sewerage and Stormwater, 2002.
- Hastings Council's Management Plan for 2003/04 – 2006/07.

Appendix A

Maps of DSP Areas

The red boundary indicates the area covered by the DSP.

Figure 4 – Kew/Kendall

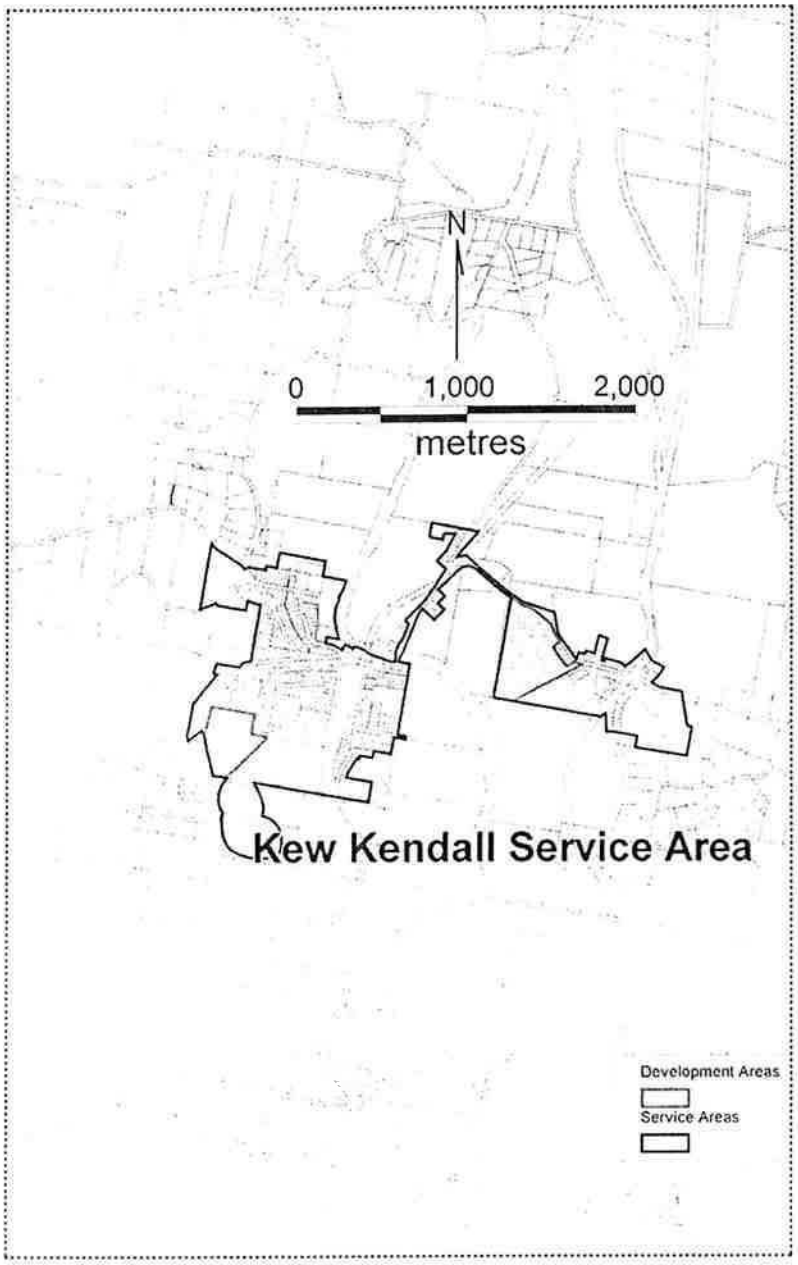


Figure 5 – Dunbogan

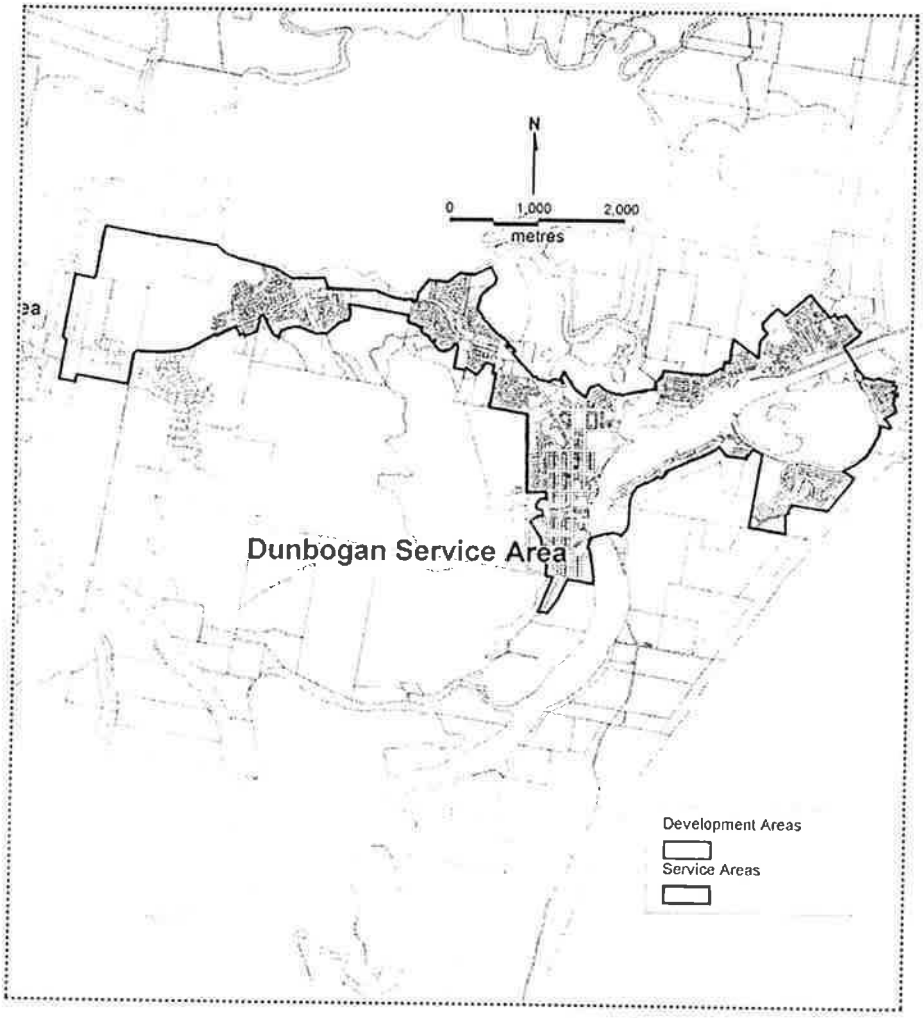


Figure 6 – Lake Cathie/Bonny Hills

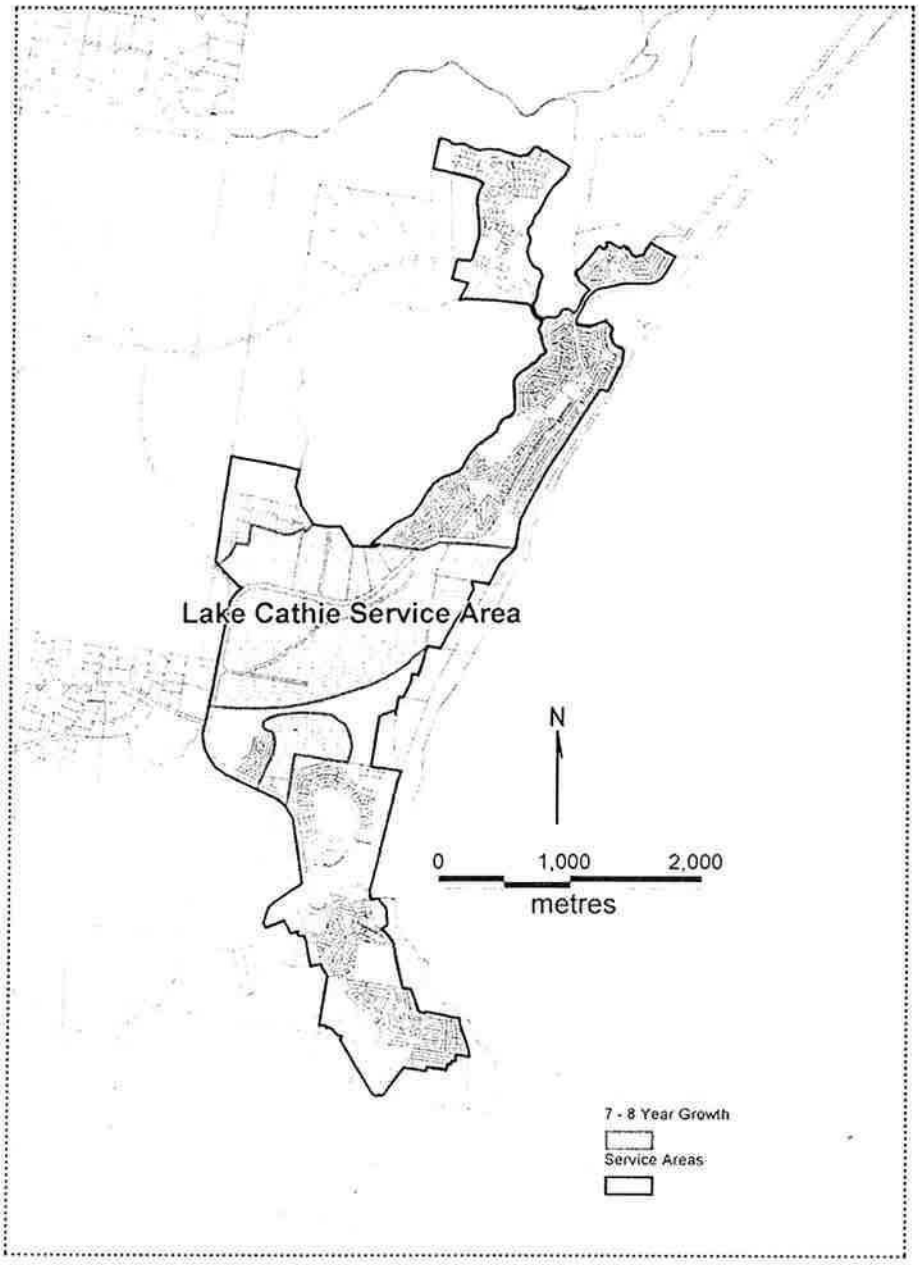


Figure 7 – Wauchope

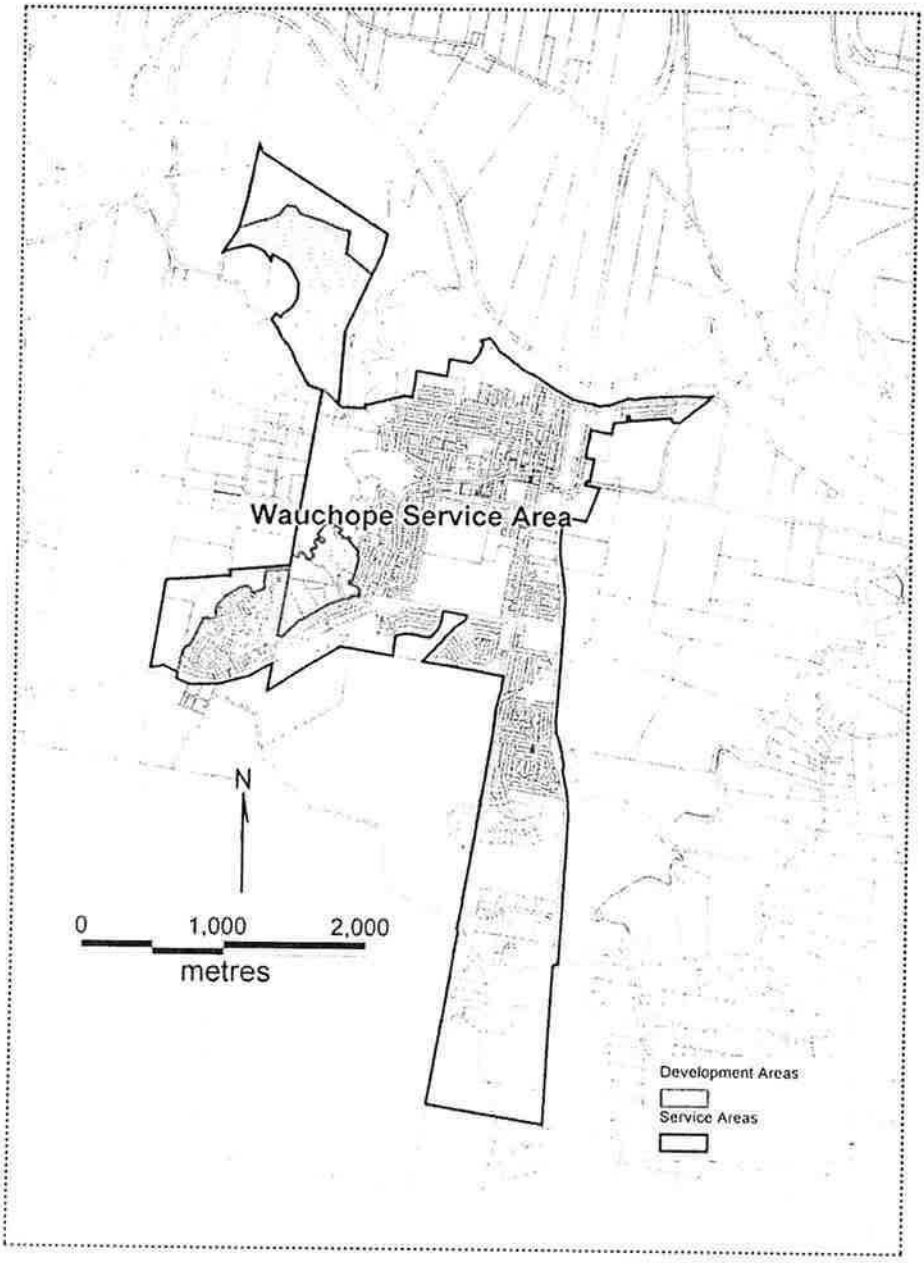


Figure 8 – Port Macquarie