

Draft Report

Mangawhai Community Wastewater Scheme (MCWWS)

Wastewater Network Extension

Identified Projects

December 2014



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QUALITY SCHEDULE

PROJECT MANAGER	
Chandra Dissanayake	
PREPARED BY	08/12/2014
Rohit Srivastava (RS)	
CHECKED BY/...../.....
Chandra Dissanayake	
REVIEWED BY/...../.....
Chandra Dissanayake	
APPROVED FOR ISSUE BY/...../.....
John Burt (JB)	

42 Hokianga Road, Private Bag 1001
Dargaville, 0340, New Zealand
TEL +64 9 439 3123, FAX +64 9 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or Typed Name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
0	Dec 2014	1 st Draft	RS	CD	CD	JB
1						
2						
3						

Executive Summary

To improve the return on investment already made in the Mangawhai Community Wastewater Scheme (MCWWS) by maximising the number of connected and connectable properties, options for extending the coverage area have been investigated.

To extend the system to enable most of the current properties in the urban area to be classed as serviceable is estimated to cost in order of \$2 million. By investing \$2 million however a high proportion of properties would be classed as serviceable.

Twenty individual projects have been identified and a prioritisation matrix has been prepared to assist in preparing an expenditure plan that will maximise return on investment.

The report provides the planning that has been done with respect the MCWWS to develop a possible extension program of the piped wastewater network that would maximise the number of properties that are classed as connectable and ultimately lead to most properties in the urban zoned area connecting to the scheme and hence maximising its viability.

The MCWWS provides a state of the art public wastewater collection and beneficial reuse system that has been designed and largely built with sufficient capacity to service the current urban zoned area of Mangawhai.

The system provides a sustainable solution to protect public health and the environment in this growing urban centre.

Build out of this area is expected to take many years. Under the Local Government Act only properties within 30 metres of the Public Wastewater Piped Network can be required to connect to that network.

At present there are a large number of large lot properties that are subdividable but the wastewater network is not within 30 metres of the properties.

A potential extension strategy for the network has therefore been prepared which consists of some 20 projects.

Without an extension strategy many of these remote large lots are subdividing but proposing private onsite waste water systems rather than connecting to the public network. With the proposed pipelines depicted on plans and an implementation program budgeted for annually, property owners/ subdividers would recognise possibility of connection and respond accordingly.

While an extension program has been developed based on Economic, Environmental, Strategic, Social and Cultural drivers a degree of flexibility is required with the ability to respond to requests for extensions in areas outside of the program.

The implementation of this program is planned to be supported by the connections policy that will assist property owners to connect and seeks to provide consistency across the Scheme area recognising that individual properties are serviced by a range of methods including on site grinders and gravity systems.

Planned future Capital Works programme based on priority matrix given above is presented below. The programme needs to be in line with the actual growth in the region and needs to be verified by due field work before finalising. The Capital Works programme gives a broad roadmap with regards to budgeting and planning.

Capital Works Programme – Wastewater Extension MCWWS

Project No.	Project Name	Total Project Cost \$ (NZD)	Priority	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
1	69 Moir Street	16,000	7							
1a	73 Moir Street	5,000	1							
2	104 Moir Street	18,688	4							
3	Mangawhai Beach School	12,219	3							
4	Molesworth Drive	21,563	5							
5	62-86 Molesworth Drive	58,219	2							
6	Old Waipu Road	326,313	5							
6a	Old Waipu Road (McCarthy and Others)	N/A	6							
7	Estuary Drive (Parklands)*	52,181	5							
8	Estuary Drive (Ogilvy)	90,563	2							
9	Estuary Drive	48,156	4							
9a	Moir Point Road (102-120 Moir Point Road)	385,969	7							
9b	Moir Point Road (Hermes-III)	N/A	6							
10	Estuary Drive (Estuary Drive/Moir Point Road Intersection)	116,294	1							
11	Devon Street (Paper Road)	N/A	7							
12	Ti Tree Place	172,356	6							
13	Quail Way	18,469	7							
14	Greenview Drive	350,000	5							
15	Wintle Street, Heads Limited	25,000	4							
16	Cullen Street	44,563	5							
17	Mangawhai Heads Road/Cullen Street Intersection	28,031	3							
18	Mangawhai Heads Road	34,500	3							
19	Molesworth Drive, Estuary Estates	N/A	6							
20	Jack Boyd Drive	N/A	7							
TOTAL		1,824,084		173,475	148,782	74,750	418,157	416,126	172,356	420,438

*Project 7 to complete early then its priority to enable Project 10 to connect to the wastewater network.

1 Mangawhai - Area Profile

Mangawhai lies on the eastern edge of the Kaipara District with Ruakaka and Whangarei to the North; Matakana and Warkworth to the south. Mangawhai has been divided into Heads and Village areas.

Mangawhai is a beachside community with about 20-25% of the houses permanently occupied. Peak load occurs at New Year and is of relatively short duration.

Figure 1 below shows the location of Mangawhai in the Kaipara District (highlighted)

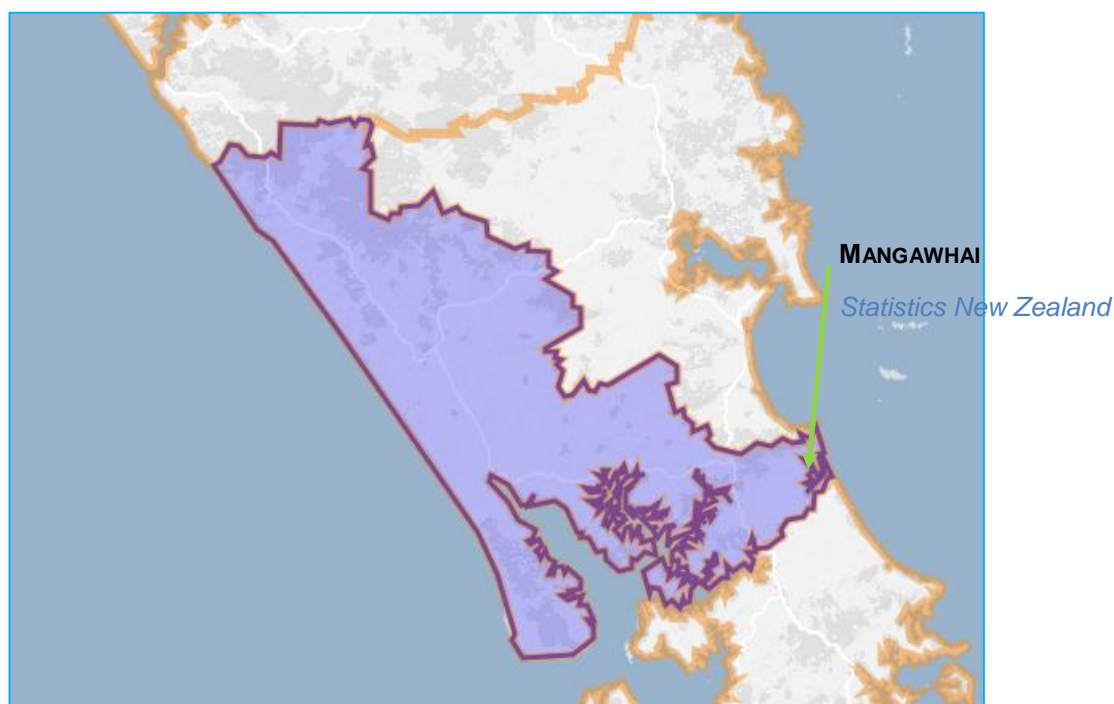


Figure 1: Location of Mangawhai in Kaipara District

2 Current Population and Growth Potential

As per Statistics New Zealand, the population of Mangawhai in the year 2013 was 2,600 and it is expected to increase up to 2,900 in the year 2031. Considering per capita wastewater generation at 180 litres per day, the volume of wastewater generated in Mangawhai is presented in **Table 1**.

Table 1: Mangawhai – Volume of wastewater

Year	Connection to Wastewater Treatment Plant	Per capita wastewater generation* (litres/day)	No. of persons per property	Wastewater generated (litres/day)
2013	1,700 approximately	180	3	= 1,700*180*3 = 918,000 or 918m ³ /day
2031	2,900	180*	3	= 2,900*180*3 = 1,566,000 or 1,566m ³ /day

Note: It has been assumed per capita wastewater generation & No. of persons per property will remain same over the period of time

As per the population growth shown above, there will be about 1,200 properties (2,900-1,700) that would likely contribute to the wastewater scheme by the year 2031.

The scope is to get more properties connected to the wastewater system are from two scenarios:

- 1 Connection to houses built/being built within sewerage network;
- 2 Extending sewerage network to cover future growth

There are some properties which are under the coverage areas but are not connected to the wastewater network. Council has started public consultation to gauge the opinion of public on such properties – whether Council should force them to be connected or it must be left of property owners to take a decision of wastewater connection.

3 Wastewater Network

The Mangawhai Community Wastewater Scheme is a state of the art collection treatment and reuse system. The collection system is a mix of low pressure and traditional gravity system built to minimise the potential for infiltration.

As at November 2014 the Mangawhai Wastewater Treatment Plant had about 1,700 properties connected.

Sewage is collected via a mix of grinder pumps and gravity sewers and is delivered to the treatment plant located in Mangawhai Park via a network of pump stations. There are no significant industrial wastes. A summary of sewerage network is presented below in a **Table 2**.

Table 2: Mangawhai – Summary of wastewater assets

Community	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Points (Manholes and Inspection Chambers)	Connections
Mangawhai	1	13	5.5	57	798	1,700 approximately

4 Mangawhai Wastewater Treatment Plant (WWTP) and Disposal System

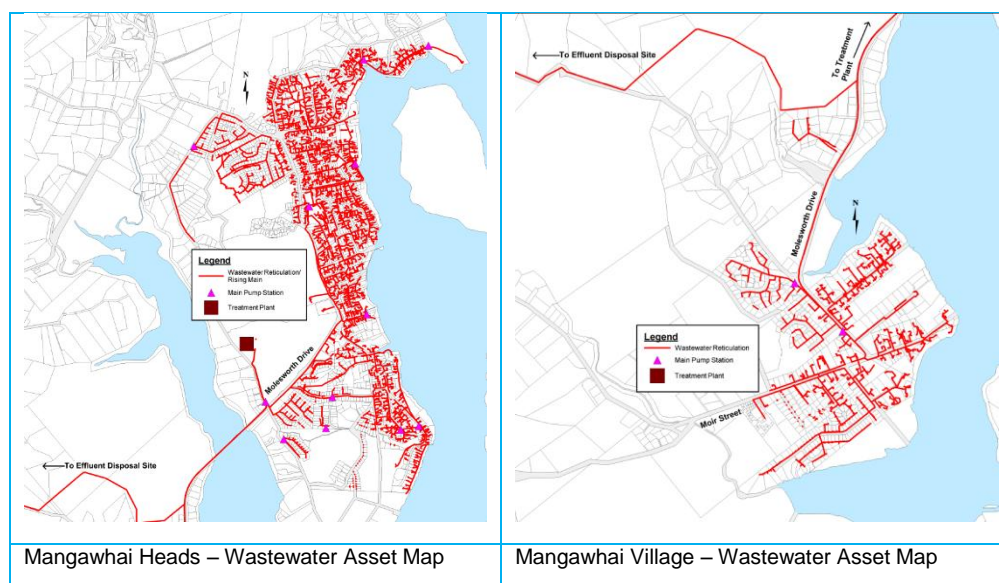


Figure 2: Mangawhai – Wastewater Asset Maps

The existing WWTP consists of fine screens and dual SBR aerobic treatment plant, packaged pressure sand filters followed by chlorine dosing. UV disinfection equipment is also provided, though currently it is not in use due to maintenance issues with cleaning and replacement of the lamps.

From the plant, treated effluent is stored in a covered 400m³ storage tank and then pumped some 10 km to the Lincoln Downs farm on Brown Road where it stored in a large earth dam capable of holding 170 MI constructed for the purpose. The irrigation system draws water from this dam.

At the Lincoln Downs Farm, an effluent pumping station conveys the stored lagoon effluent to approximately 25ha of existing irrigation. The irrigation area can be increased to at least 60ha, and possibly to 65ha. Although the total area of the farm is 200ha, a large parts of the farm are not suitable for irrigation (too steep or covered in bush).

The WWTP is designed to meet the conditions imposed in the resource consent by the Northland Regional Council as mentioned under **Table 3**.

Table 3: Resource consent conditions: WWTP at Mangawhai

Parameter	Units	Performance Requirements		
		Median	Average	90 th percentile
E. coli	MPN	10		100
Total Dissolved Solids	Mg/l		500	
Total Nitrogen	Mg/l		30	
Phosphorus	Mg/l		15	
Total Suspended Solids	Mg/l		10	
Carbonaceous Biochemical Oxygen Demand	Mg/l		10	

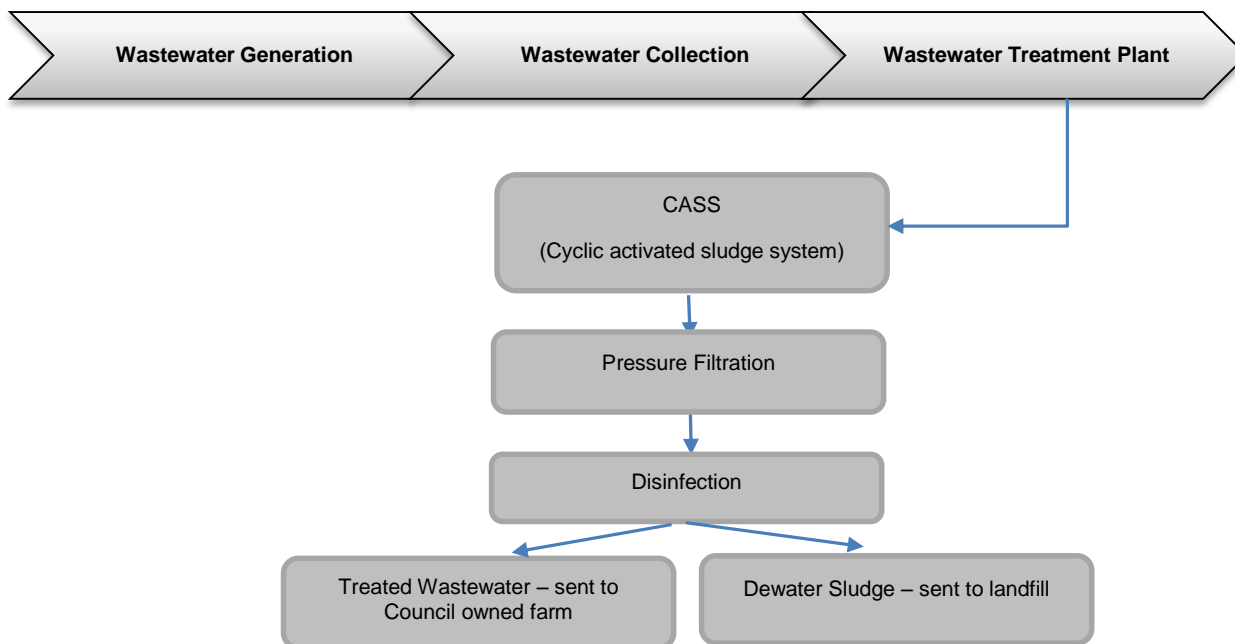


Figure 3: Mangawhai – Wastewater Generation to Disposal

The WWTP utilises a CASS system with 2 CASS tanks followed by pressure filtration and disinfection. Sludge is dewatered via belt press and disposed of the landfill. A broad flow diagram of wastewater treatment is shown in **Figure 3** above.

The WWTP has a current design capacity of 1,380¹m³/day and has a potential to extend the capacity to accommodate future growth.

5 Mangawhai – Extension Of Wastewater Network and Projects Identified

After careful desktop study and field investigation, the project team has identified 20 projects covering about 1,000² properties (247 existing but not connected and 721 potential properties). These identified projects cover existing properties which can be connected with minimum cost to the Council, properties/potential subdivisions which can be covered by extension of wastewater network.

The current capacity of the Mangawhai WWTP is about 1,380m³. Following assumptions have been made to calculate potential for further properties to be connected to the wastewater network without overloading the wastewater treatment plant.

Assumptions

- Wastewater generation per capita per day at Mangawhai: 180 litres

¹ Project Deed, Schedule A section 6.1

² The 20 projects identified have capacity to cover future growth in the area. These projects cover 1,000 properties as per the current development plans. However, the scheme has a potential to cover further future development as well.

- Number of persons/property: 3

Capacity calculations of Mangawhai WWTP:

- Capacity of Mangawhai WWTP: 1,380m³/day
- Currently connected properties to the Mangawhai WWTP: 1,700
- Wastewater generation per day from these properties: 1,700*3*180 = 918,000 litres/day or 918m³/day, say 920m³/day

Potential to connect further properties: 1380m³-920m³=460m³ or [(460m³*1,000)/(3*180lit)], say **850 properties**

The above calculations show potential of connecting about 850 more properties to the Mangawhai WWTP. The current treatment plant is comprised of 2SBRs capable of treating 1,380m³ (2,550 properties). This existing additional capacity of 850 properties will take up the majority of the 20 identified projects. In order to connect balance 150 properties (1,000-850), 3rd SBR would be required to be added to the treatment plant at later stage, i.e. the WWTP would have additional capacity to serve over and above 150properties.

Accordingly, to connect all identified properties to the wastewater network, Council will need to make an investment and upgrade the following:

- Wastewater Treatment Plant; and
- Treated Effluent Disposal Options

Council has initiated a process to identify alternate disposal methods to discharge treated wastewater. The growth expected in the identified 20 projects will happen over a period of 7-10years. Council would require to upgrade the Mangawhai Wastewater Treatment Plant if the growth expected in all the identified projects happen as expected.

Figure 4 below presents the growth trend of the Mangawhai as expected through 20 identified projects. Kaipara District Council will need to upgrade WWTP and associated infrastructure in the year 2022 when properties connected to the system will overload the treatment capacity of the WWTP.

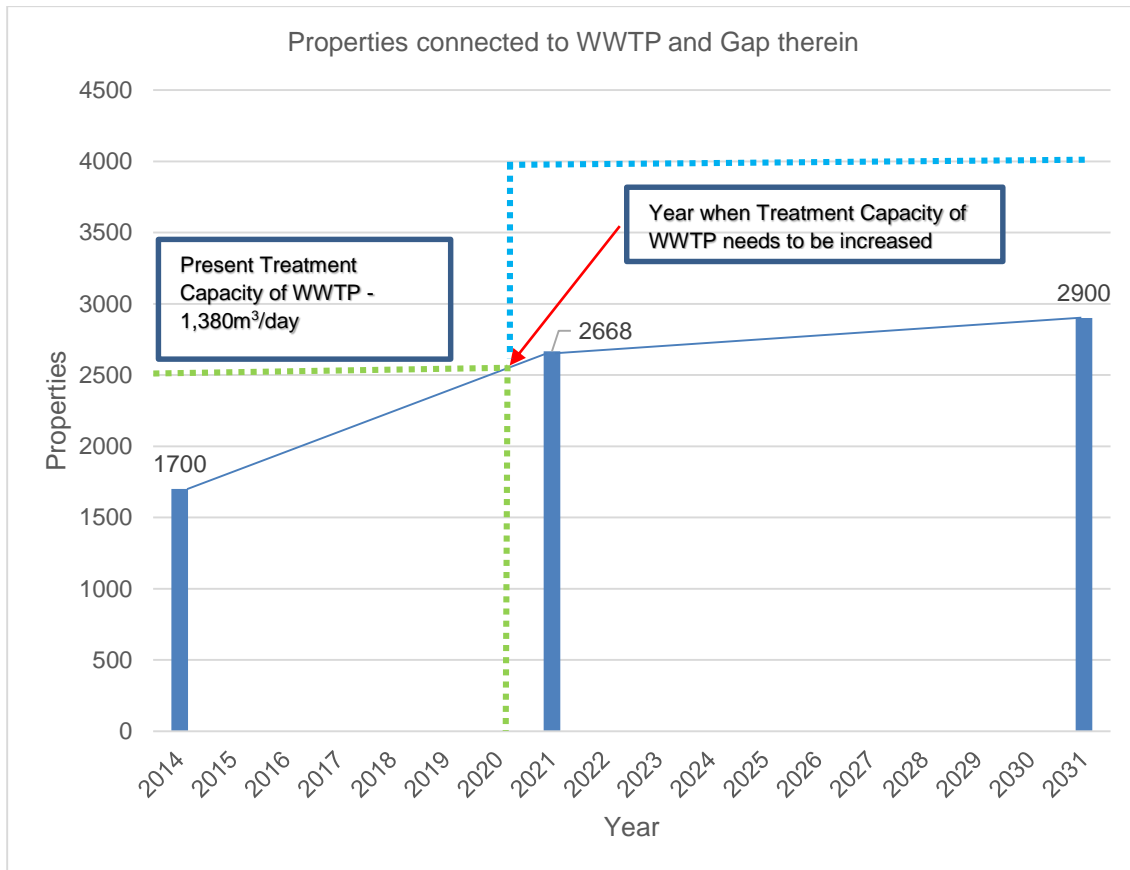


Figure 4: Properties connected to wastewater network and future projections

The current capacity of 1,380m³ is being served by 2SBRs. Once 3rd SBR is also added, the likely capacity of the WWTP would be 2,070m³ [1,380 + (1,380/2)] or 4,000 properties approximately.

Figure 5 below highlights the proposed wastewater extensions (in yellow) in the Mangawhai Wastewater Scheme covering 20 identified projects.

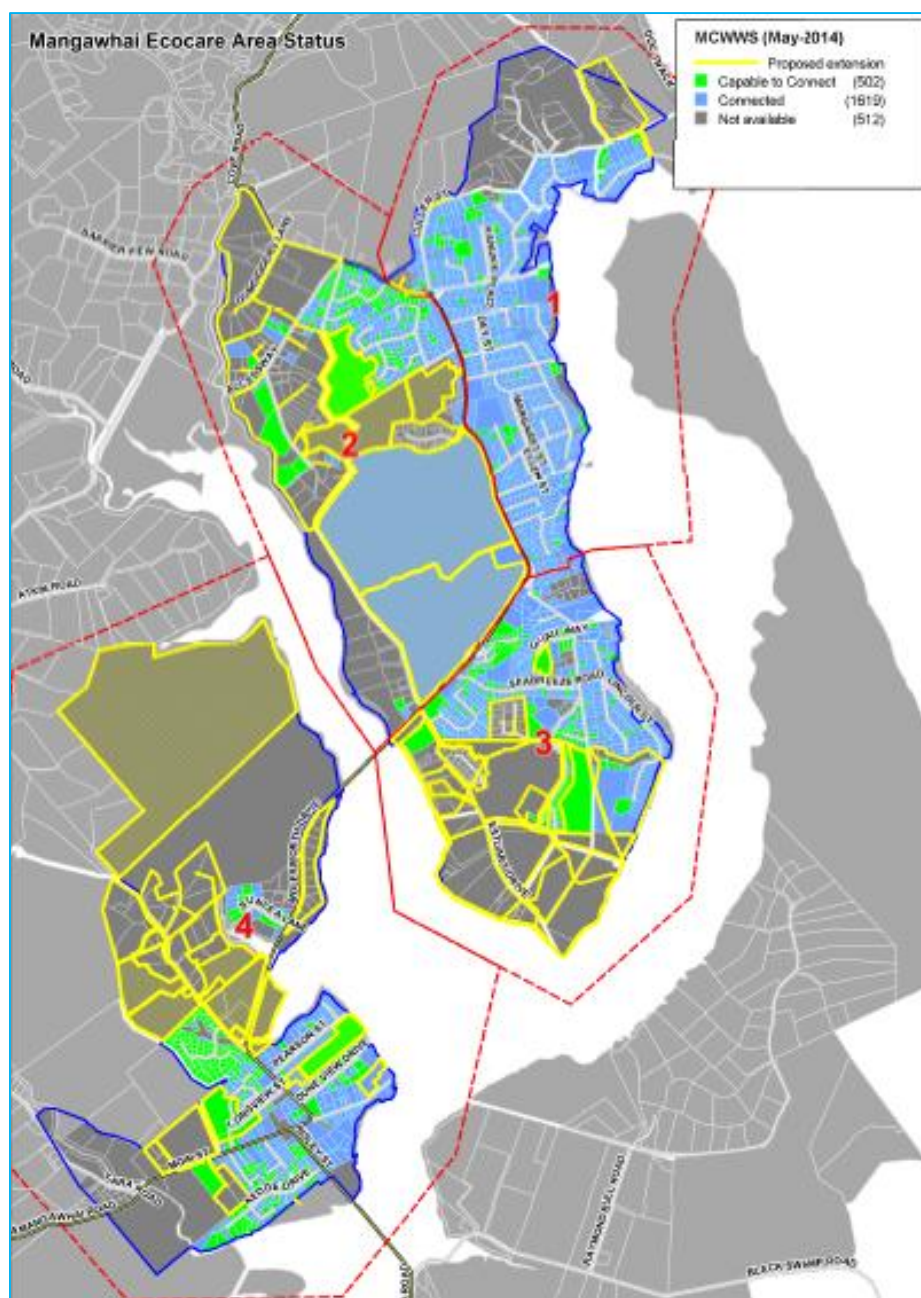


Figure 5: Wastewater Proposed Extensions

6 20 Identified Wastewater Network Extension Projects

This section presents summary of all identified projects in **Table 5** below. While calculating *Return Period*, following assumptions have been made:

- All connectable/targeted properties will connect to the KDC wastewater network once network is within 30 metres;
- All properties will contribute Development Contribution of \$NZ 21,000 (as per the Annual Plan 2014/2015). It has been assumed the Development Contribution will remain same for the period of these projects;

- All connected/targeted properties will pay annual wastewater charges of \$NZ1,055/property (as per the Annual Plan 2014/2015)
- For calculation of Return Period only existing properties have been considered;
- Future development potential is not part of the Return Period;
- Project/s where there is no cost to the Council, beneficiary contribution has not been included.

7 Details of Identified Projects

A detailed project sheet for each 20 project is provided separately in the report. The report contains:

- **Appendix 1:** Each identified project along with location map, brief description of the area, cost estimate and cost-benefit analysis.
- **Appendix 2:** Shows details (location map) of identified projects on a larger scale.
- **Appendix 3:** Presents score and priority matrix of each identified project.

Table 5: Summary of identified projects

Project No.	Project Name	Properties Targeted (Number)	Potential Targeted Properties (Number)	Total Project Cost (NZD)	Return Period (Time)	Priority
1	69 Moir Street	3	-	16,000	Immediate after completion	7
1a	73 Moir Street	1	-	5,000	Immediate after completion	1
2	104 Moir Street	4	-	18,688	Immediate after completion	4
3	Mangawhai Beach School	1	-	12,219	Immediate after completion	3
4	Molesworth Drive	2	80	21,563	Immediate after completion	5
5	62-86 Molesworth Drive	12	12	58,219	Immediate after completion	2
6	Old Waipu Road	33	232	326,313	Immediate after completion	5
6a	Old Waipu Road (McCarthy and Others)	-	75	N/A	N/A	6
7	Estuary Drive (Parklands)	4	21	52,181	Immediate after completion	5
8	Estuary Drive (Ogilvy)	11	95	90,563	Immediate after completion	2
9	Estuary Drive	-	-	48,156	N/A	4
9a	Moir Point Road (102-120 Moir Point Road)	11	-	385,969	14years	7
9b	Moir Point Road (Hermes-III)	-	63	N/A	N/A	6
10	Estuary Drive (Estuary Drive/Moir Point Road Intersection)	22	61	116,294	Immediate after completion	1
11	Devon Street (Paper Road)	5	37	N/A	N/A	7
12	Ti Tree Place	30	-	172,356	Immediate after completion	6
13	Quail Way	4	-	18,469	Immediate after completion	7
14	Greenview Drive	47	-	350,000	Immediate after completion	5
15	Wintle Street, Heads Limited	32	-	25,000	Immediate after completion	4
16	Cullen Street	2	45	44,563	2years	5
17	Mangawhai Heads Road/Cullen Street Intersection	10	-	28,031	Immediate after completion	3
18	Mangawhai Heads Road	8	-	34,500	Immediate after completion	3
19	Molesworth Drive, Estuary Estates		-	N/A	N/A	6
20	Jack Boyd Drive	5	-	N/A	N/A	7
TOTAL		247	721	\$NZ1,824,084		

Appendix 1: Details of Identified Projects

Project N° 1: 69 Moir Street

Key Project Features			
Project Area:	69 Moir Street	Project Type:	WW Connection
Pipe length:	163 metres	Pipe Size:	63mm OD
Pipe Material:	PE		

Brief description of the project area

The current wastewater network in the area is up to 67 Moir Street. The properties targeted to cover in the area are 67a, 67b and 71. It is proposed to extend the wastewater network in the right of way of property 69 and provide three boundary kits (as shown in *Figure 1*).

Location map

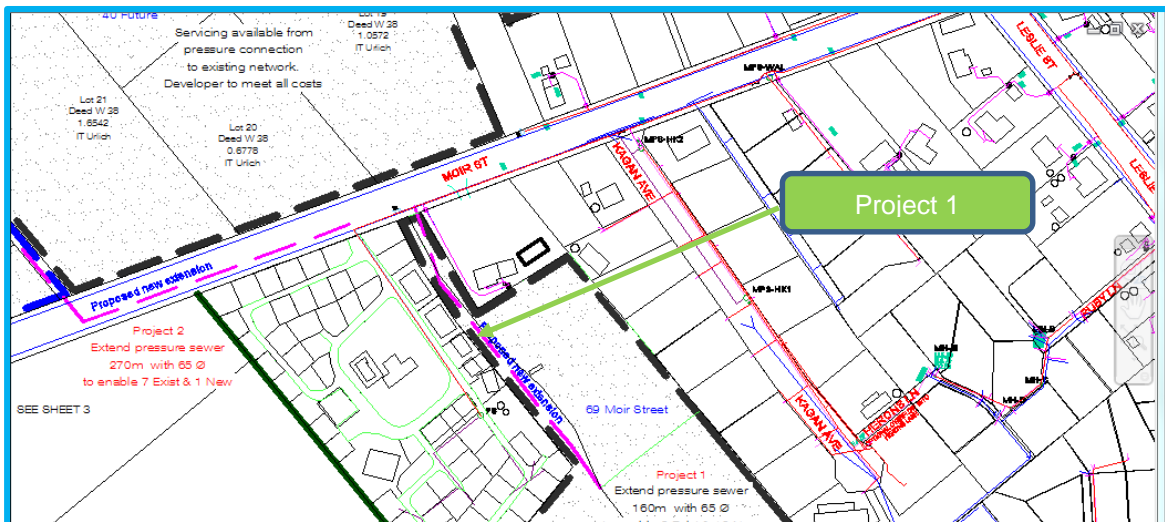


Figure 1: Location map of Project 1

Project Cost

The approximate project cost is mentioned below:

69 Moir Street		
Properties targeted		3
Description	Rate \$	Cost \$
160 metres 63 OD 16 bar dia pressure sewer	50	8,000
Boundary kits	500	1,500
Connection to existing WW network	2,000	2,000
	Subtotal	\$11,500
Plus 25% contingency		14,375
Plus 15% Design and Supervise	Total Cost	\$16,100

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*3= NZD 63,000

Cost of Project 1 will be recovered with Development Contribution from the three targeted properties.

Project 1 is not needed if we extend the line and complete Project 1a. Project N° 1 enters in the right-of-way (we generally do not extend until that point).

Project N° 1A: 73 Moir Street

Key Project Features			
Project Area:	73 Moir Street	Project Type:	WW Connection
Pipe length:	30 metres	Pipe Size:	63mm OD
Pipe Material:	PE		

Brief description of the project area

The current wastewater network in the area is up to 67 Moir Street. It is proposed to extend the wastewater network in front of 73 Moir Street and cover the main camp ground (73 Moir Street) (as shown in *Figure 1a*).

The camp ground has about 50 cabin sites. It is proposed to extend wastewater network further 20 metres from 69 Moir Street and cover 73 Moir Street.

Location map

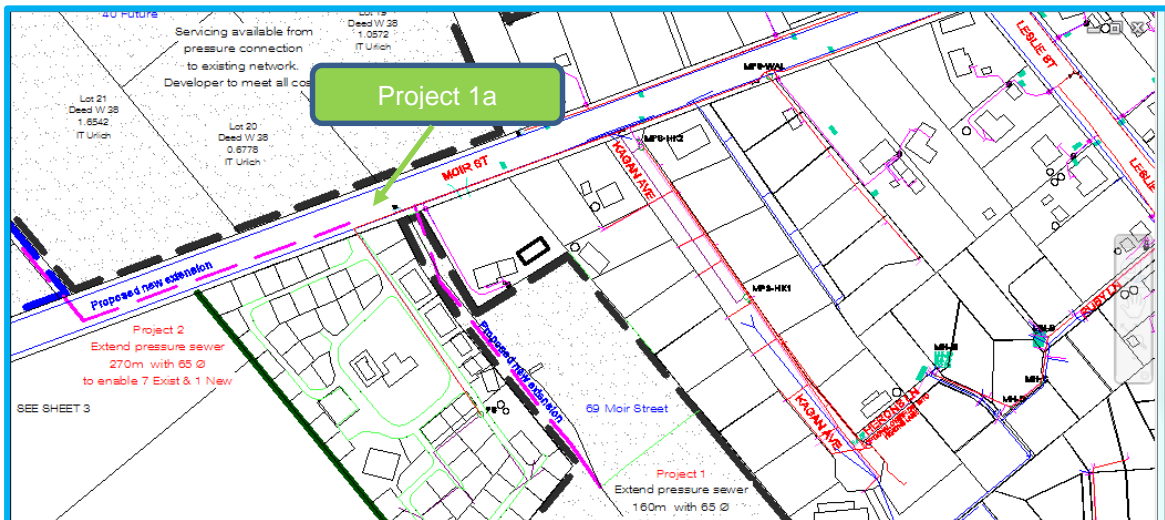


Figure 1a: Location map of Project 1a

Project Cost

The approximate project cost is mentioned below:

73 Moir Street		
Description	Rate \$	Cost \$
Properties to be connected		1
30 metres 63 OD 16 bar pressure sewer	50	1,500
Boundary kits	500	500
Connection to existing WW network	2,000	2,000
	Subtotal	\$4,000
Plus 25% contingency	Total Cost	\$5,000

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*1= NZD 21,000

Cost of Project 1a will be recovered with Development Contribution from the targeted property (camp ground).

Project N° 2: 104 Moir Street

Key Project Features			
Project Area:	104 Moir Street	Project Type:	WW Connection
Pipe length:	160 metres	Pipe Size:	63mm OD
Pipe Material:	PE		

Brief description of the project area

The current wastewater network in the area is up to 67 Moir Street. It is proposed to extend the wastewater network in front of 104 Moir Street and inside the right-of-way to cover four properties - 104, 104a, 104b and 104c (as shown in *Figure 2*).

These properties are at the KDC Zone Boundary and *could include property 112 if we go outside the zone boundary.*

Location map

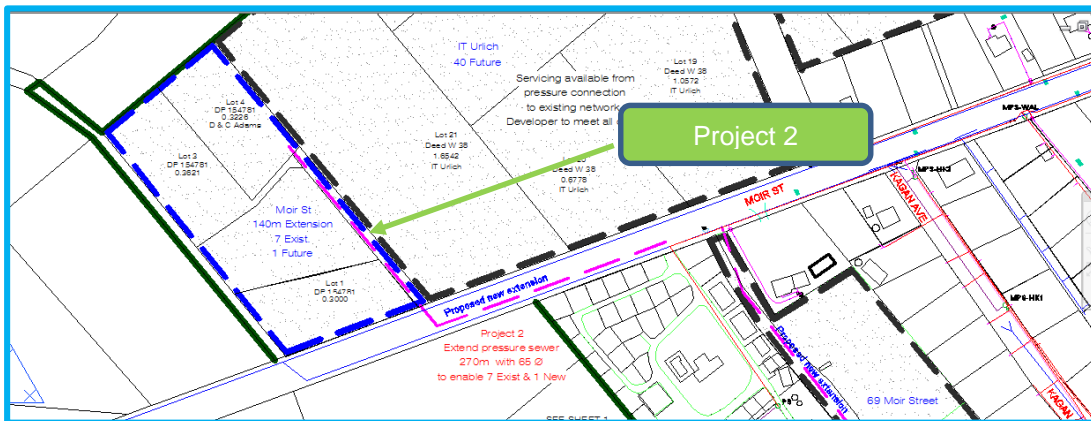


Figure 2: Location map of Project 2

Project Cost

The approximate project cost is mentioned below:

104 Moir Street		
Properties targeted		4
Description	Rate \$	Cost \$
160 metres 63 OD 16 bar pressure sewer	50	8,000
Flushing point	1,000	1,000
Boundary kits	500	2,000
Connection to existing WW network	2,000	2,000
	Subtotal	\$13,000
Plus 25% contingency		16,250
Plus 15% Design and Supervise	Total Cost	\$18,688

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*4= NZD 84,000

Cost of Project 2 will be recovered with Development Contribution from the four targeted properties.

Project N° 3: Mangawhai Beach School

Key Project Features			
Project Area:	Mangawhai Beach School, Insley Street	Project Type:	WW Connection
Pipe length:	110 metres	Pipe Size:	63mm OD
Material:	PE		

Brief description of the project area

The current wastewater network in the area is up to 26 Insley Street. It is proposed to extend the wastewater network further about 110 metres in front of the school for wastewater coverage (as shown in *Figure 3*).

The school will have to provide a suitable pumping station at their property for connection.

Location map

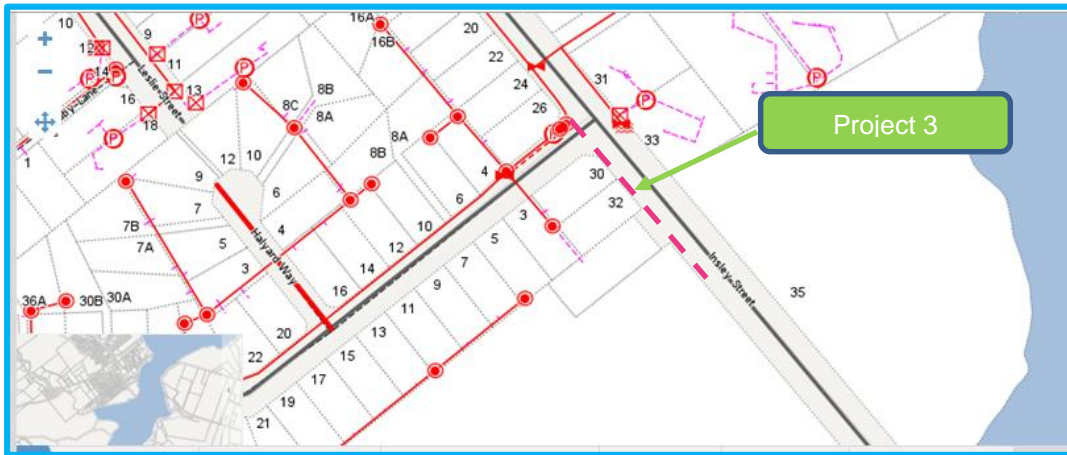


Figure 3: Location map of Project 3

Project Cost

The approximate project cost is shown below:

Mangawhai Beach School, Insley Street		
Properties targeted		1
Description	Rate	Cost \$
110 metres 63 OD 16 bar pressure sewer	50	5,500
Body kit special		1,000
Connect to existing WW network	2,000	2,000
	Subtotal	\$8,500
Plus 25% contingency		10,625
Plus 15% Design and Supervise	Total Cost	\$12,219

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*1= NZD 21,000

Cost of Project 3 will be recovered with Development Contribution from the targeted school.

Project N° 4: Molesworth Drive

Key Project Features			
Project Area:	Molesworth Drive Lot 2- DP 456143 Lot 4- DP 316050	Project Type:	WW Connection
Pipe length:	80 metres	Pipe Size:	110mm OD
Pipe Material:	PE		

Brief description of the project area

The proposed two lots have potential of about 80 sections. Lot 2 has existing wastewater network at the front but considering the number of sections, it is proposed to provide multiple connection points to both the Lots as shown in *Figure 4*.

Lot 2 will have three potential wastewater connections once Project N° 4 and Project N° 6 are implemented. Lot 4 will have two potential wastewater connections once Project N° 4 and Project N° 6 are implemented.

Location map

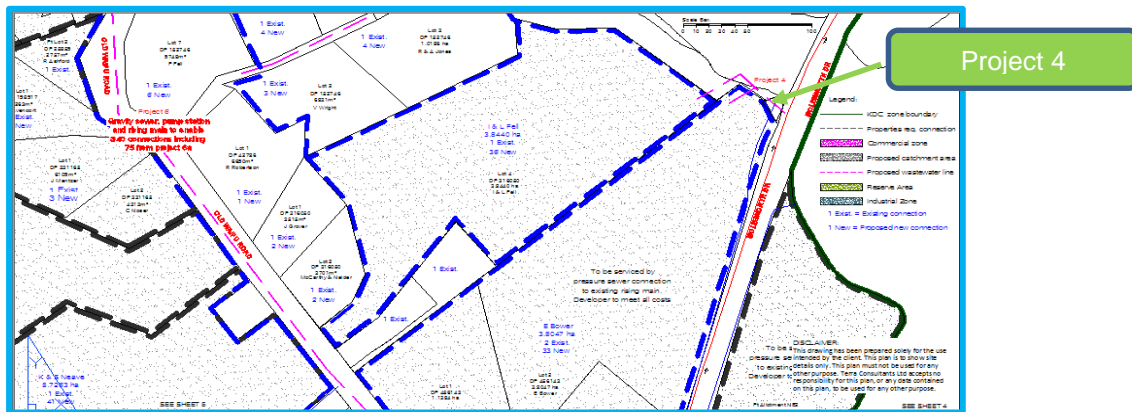


Figure 4: Location map of Project 4

Project Cost

The approximate project cost is shown below:

Molesworth Drive			
Properties targeted			2
Description	Rate \$	Cost \$	
80 metres 110 OD 16 bar pressure sewer	100	8,000	
Connection to existing WW network	5,000	5,000	
Boundary kit special	1,000	2,000	
	Subtotal	\$15,000	
Plus 25% contingency		18,750	
Plus 15% Design and Supervise	Total Cost	\$21,563	

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*2= NZD 42,000
- Potential Contribution from future development of 80 sections: NZD 80*21,000= 1,680,000

Cost of Project 4 will be recovered with Development Contribution from the targeted two lots.

Project N° 5: 62-86 Molesworth Drive

Key Project Features			
Project Area:	62-86 Molesworth Drive	Project Type:	WW Connection
Pipe length:	550 metres	Pipe Size:	63mm OD
Pipe Material:	PE		

Brief description of the project area

Currently we have wastewater rising main on the other side of the Molesworth Drive. It is proposed to cover properties 62-86 Molesworth Drive and have a single connection to the Council's rising main to cover 12 existing and 12 to be developed properties.

Location map

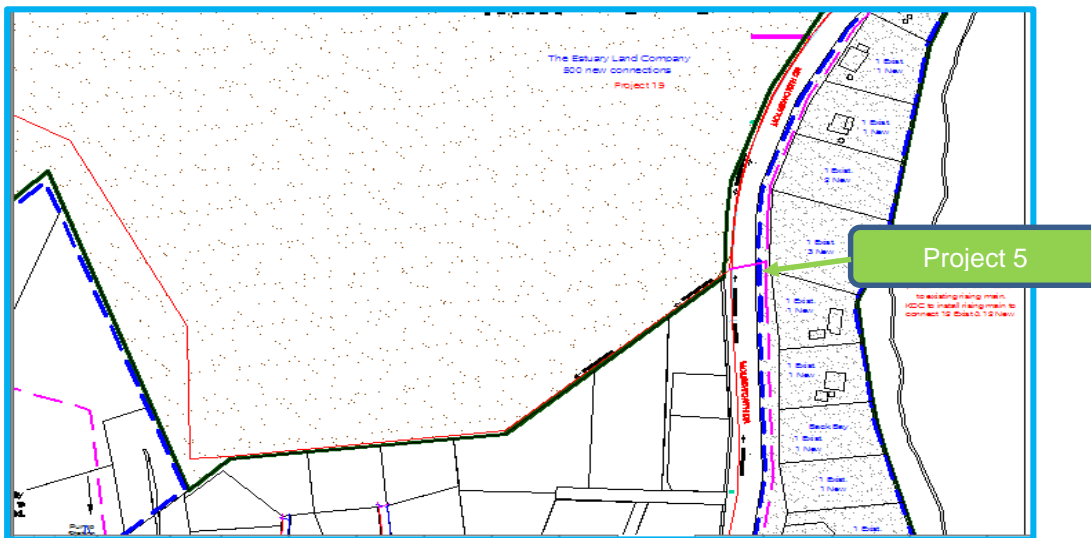


Figure 5: Location map of Project 5

Project Cost

The approximate project cost is shown below:

Molesworth Drive Rider main		
Properties targeted		12
Description	Rate \$	Cost \$
550 metres 63 OD 16 bar pressure sewer rider main	50	27,500
Boundary kits	500	6,000
Flushing point	1,000	2,000
Connection to existing WW network	5,000	5,000
	Subtotal	\$40,500
Plus 25% contingency		50,625
Plus 15% Design and Supervise	Total Cost	\$58,219

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*12= NZD 252,000
- Potential Contribution from future development: NZD 21,000* 12= NZD 252,000

Cost of Project N° 5 will be recovered with Development Contribution from the targeted properties.

Project N° 6: Old Waipu Road

Key Project Features			
Project Area:	Old Waipu Road	Project Type:	WW Connection
Pipe length:	800 metres and 10 metres	Pipe Size:	150mm and 110mm OD
Pipe Material:	PVC		

Brief description of the project area

There are potentially 265 sections in the area, out of which 33 are already developed. It is proposed to run the wastewater line under gravity from the top of Old Waipu Road to the intersection of Molesworth Drive. The intersection is to have a pump station which will pump the sewage to the rising main.

Location map

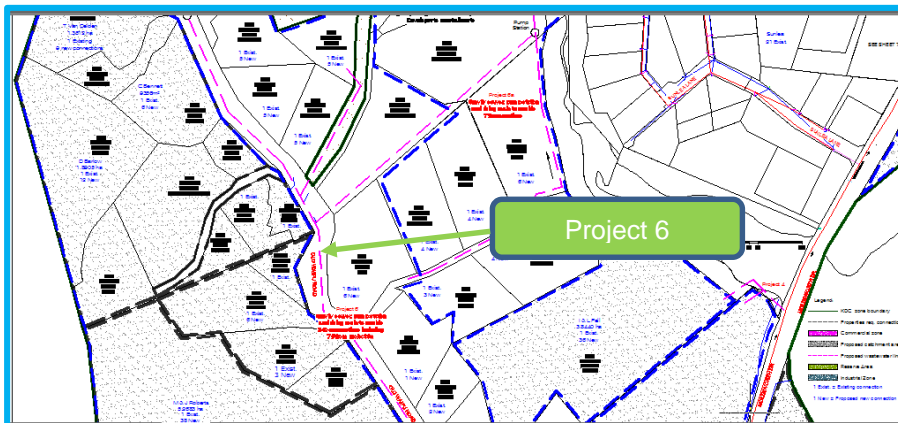


Figure 6: Location map of Project 6

Project Cost

The approximate project cost is shown below:

Old Waipu Road		
Properties targeted		33
Description	Rate \$	Cost \$
800 metres 150mm nominal bore gravity main	100	80,000
10 metres 110 OD 12.5 bar rising main	100	1,000
Manhole	3,500	21,000
Pump station		150,000
Power connection		10,000
Storage		25,000
20 connections	1,000	20,000
	Subtotal	\$227,000
Plus 25% contingency		283,750
Plus 15% Design and Supervise	Total Cost	\$326,313

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*33= NZD 693,000
- Potential Development Contribution from (265-33=232 sections): NZD 21,000*232=
NZD 4,872,000

Cost of Project N° 6 will be recovered with Development Contribution from the targeted properties.

Project N° 6a: Old Waipu Road (McCarthy And Others)

Key Project Features			
Project Area:	Old Waipu Road <i>McCarthy and others</i>	Project Type:	WW Connection
Pipe length:		Pipe Size:	
Pipe Material:			

Brief description of the project area

There are potentially 75 sections in the area. Project N° 6a requires Project N° 6 to be completed first as the connection of Project N° 6a will be on Old Waipu Road as shown in *Figure 6a*.

The developer will need to make the wastewater connections of all the sections to the Council's network on Old Waipu Road. *This project has no cost to the Council as long as Project N° 6 is complete.*

Location map

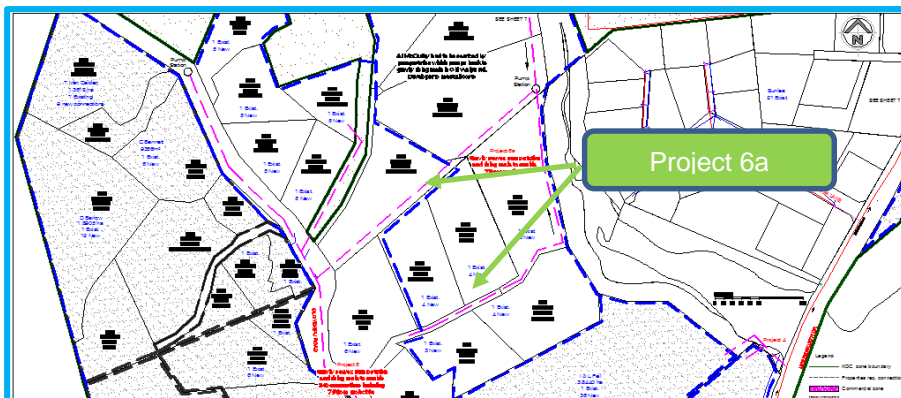


Figure 6a: Location map of Project 6a

Project Cost

The project has no cost to the Council.

Cost-Benefit Analysis

N/A

Project N° 7: Estuary Drive (Parklands)

Key Project Features			
Project Area:	Estuary Drive <i>Parklands</i>	Project Type:	WW Connection
Pipe length:	180 metres	Pipe Size:	175mm NB
Pipe Material:	PVC		

Brief description of the project area

There are about 75 sections in the project area. Parklands have about 25 sections under Phase-I as shown in *Figure 7* and there are 4 existing properties. Parklands will need to pump the sewage in the rising main.

Location map

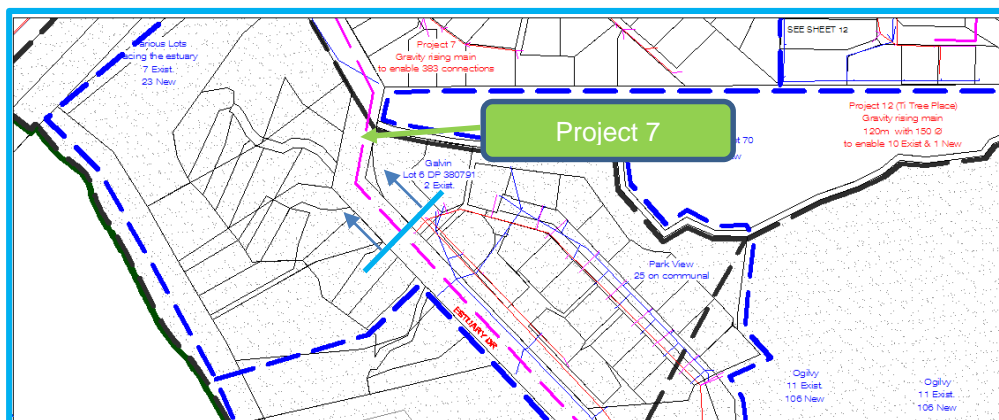


Figure 7: Location map of Project 7

Project Cost

The approximate project cost is shown below:

Estuary Drive – Parklands		
Properties targeted		4
Description	Rate \$	Cost \$
180 metres 175 SN8 PVC	140	25,200
Manhole	3000	3,000
Connection to existing WW network	2500	2,500
Pressure main 40m 150 PN9 PVC or PE	140	5,600
	Subtotal	\$36,300
Plus 25% contingency		45,375
Plus 15% Design and Supervise	Total Cost	\$52,181

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*4= NZD 84,000
- Potential Development Contribution from (25-4=21 sections)= NZD 21,000*21= NZD 441,000

Cost of Project N° 7 will be recovered with Development Contribution from the targeted properties.

Project N° 8: Estuary Drive (Ogilvy)

Key Project Features			
Project Area:	Estuary Drive <i>Ogilvy</i>	Project Type:	WW Connection
Pipe length:	400 metres	Pipe Size:	150mm OD
Pipe Material:	PVC (or PE)		

Brief description of the project area

There are about 11 developed sections and potential for further about 106 in the project area. It is proposed to have all the wastewater connections on the Estuary Drive wastewater network.

Location map

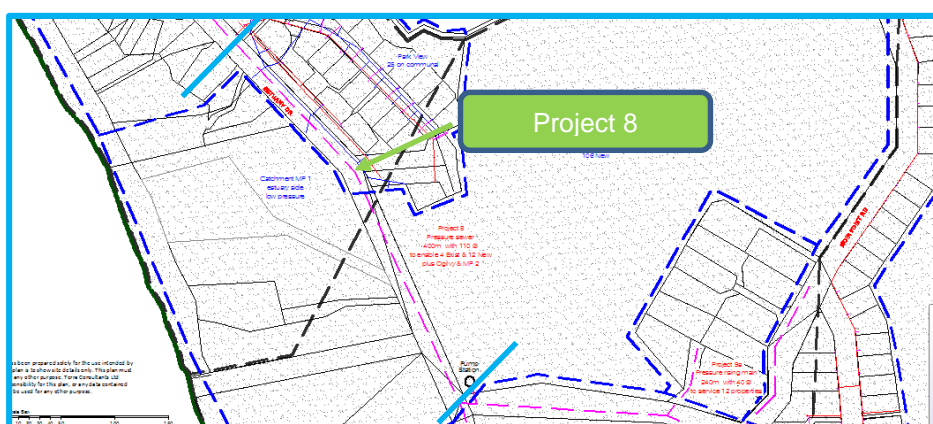


Figure 8: Location map of Project 8

Project Cost

The approximate project cost is shown below:

Estuary Drive – Ogilvy		
Properties targeted		11
Description	Rate \$	Cost \$
400 metres 150 PVC PN9 pressure main to Moir Point Road.	140	56,000
Termination valve	5,000	5,000
Connection to existing WW network	2,000	2,000
	Subtotal	\$63,000
Plus 25% contingency		78,750
Plus 15% Design and Supervise	Total Cost	\$90,563

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*11= NZD 231,000
- Potential Development Contribution from (106-11=95 sections): NZD 1,995,000

Cost of Project N° 8 will be recovered with Development Contribution from the targeted properties.

Project N° 9: Estuary Drive

Key Project Features			
Project Area:	Estuary Drive	Project Type:	WW Connection
Pipe length:	250 metres	Pipe Size:	110mm OD
Pipe Material:	PE		

Brief description of the project area

The project area is from the intersection of Estuary Drive/Moir Point Road to 118 Moir Point Road. Project N° 9 is dependent of Project N° 8 to complete. Project N° 9 involves laying of 250m of rising main. Project location and proposed wastewater line is shown in Figure 9 covering 9 existing properties.

Location map

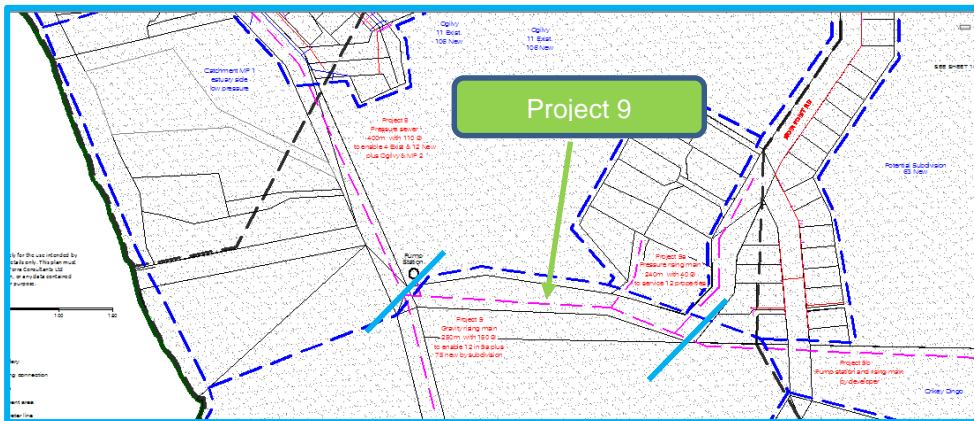


Figure 9: Location map of Project 9

Project Cost

The approximate project cost is shown below:

Estuary Drive		
Properties to be connected		9
Description	Rate \$	Cost \$
250 metres 110 OD PN 12.5 pressure pipe	100	25,000
3 access points (valved)	1,500	4,500
Connection to existing WW network	1,000	1,000
Connections	1,500	3,000
	Subtotal	\$33,500
Plus 25% contingency		41,875
Plus 15% Design and Supervise	Total Cost	\$48,156

Cost-Benefit Analysis

Project N° 9 enables Project N° 9a and N° 9b to connect to connect to the Estuary Drive. Cost of Project N° 9 has been taken in Project N° 9a.

Project N° 9A: Moir Point Road (102-120 Moir Point Road)

Key Project Features			
Project Area:	Moir Point Road 102-120 Moir Point Road	Project Type:	WW Connection
Pipe length:	300 metres	Pipe Size:	63mm OD
Pipe Material:	PE		

Brief description of the project area

There are about 11. properties in the project area as shown in *Figure 9a*. Project N° 9a is dependent on completion of Project N° 9. The project involves laying of 2 pipes totalling about 300metres.

Location map

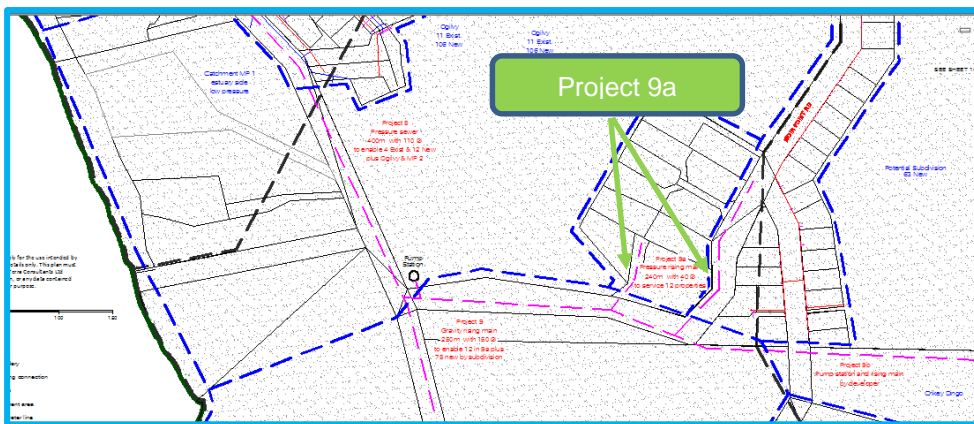


Figure 9a: Location map of Project 9a

Project Cost

The approximate project cost is shown below:

Moir Point Road, 102-120 Moir Point Road		
Properties targeted		11
Description	Rate \$	Cost \$
300 metres 63 OD 12 BAR rising main	100	30,000
Connection to existing WW network	2,500	2,500
Air valve	2,500	2,500
Pump station		150,000
Power		25,000
Storage		25,000
	Subtotal	\$235,000
Plus 25% contingency		293,750
Plus 15% Design and Supervise		337,813
Plus cost of Project N° 9		48,156
	Total Cost	\$385,969

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*11= NZD 231,000
- Calculation of recovery of scheme cost is shown below:

Completion of Year	Annual wastewater charges per Property (NZD)	No. of Properties	Total Annual wastewater charges (NZD)	Development Contribution (NZD)	Total Cost Received (NZD)
1	1,055	11	11,605	231,000	242,605
2	1,055	11	11,605	231,000	254,210
3	1,055	11	11,605	231,000	265,815
4	1,055	11	11,605	231,000	277,420
5	1,055	11	11,605	231,000	289,025
6	1,055	11	11,605	231,000	300,630
7	1,055	11	11,605	231,000	312,235
8	1,055	11	11,605	231,000	323,840
9	1,055	11	11,605	231,000	335,445
10	1,055	11	11,605	231,000	347,050
11	1,055	11	11,605	231,000	358,655
12	1,055	11	11,605	231,000	370,260
13	1,055	11	11,605	231,000	381,865
14	\$1,055	11	\$11,605	\$231,000	\$393,470

Note: It is assumed that annual wastewater charges will remain same for calculations

Cost of Project N° 9a is expected to be recovered after 14 years of completion from the targeted properties.

Project N° 10: Estuary Drive (Estuary Drive/Moir Point Road Intersection)

Key Project Features			
Project Area:	Estuary Drive (Estuary Drive/Moir Point Road Intersection to the end of Estuary Drive)	Project Type:	WW Connection
Pipe length:	620 metres	Pipe Size:	110mm OD
Pipe Material:	PE		

Brief description of the project area

There are about 22 existing properties and about 61 sections (to be developed) in the project area. This project is dependent on Project N° 7 and N° 8 to complete.

Location map

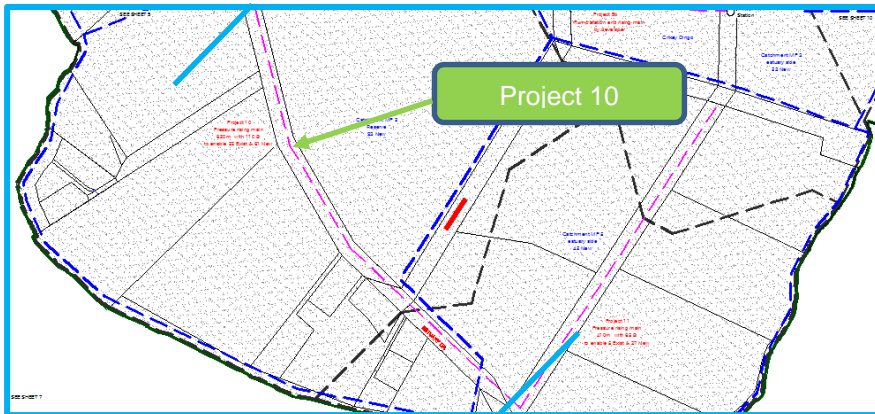


Figure 10: Location map of Project 10

Project Cost

The approximate project cost is shown below:

Estuary Drive - Estuary Drive/ Moir Point Road Intersection		
Properties targeted		22
Description	Rate \$	Cost \$
620 metres 110 OD 16 BAR pressure pipe	120	74,400
Flushing point	1,000	1,000
Air valve	1,500	3,000
Connection to existing WW network	2,500	2,500
	Subtotal	\$80,900
Plus 25% contingency		101,125
Plus 15% Design and Supervise	Total	\$116,294

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*22= NZD 462,000
- Potential Development Contribution from future 61 sections: NZD 21,000*61= NZD 1,323,000

Cost of Project N° 10 will be recovered with Development Contribution from the targeted properties.

Project N° 11: Devon Street (Paper Road)

Key Project Features			
Project Area:	Devon Street (<i>Unformed Road</i>)	Project Type:	WW Connection
Pipe length:		Pipe Size:	
Pipe Material:			

Brief description of the project area

There are about 5 existing properties and potential for about 37 sections in the project area. This project has no cost to the Council. The developer will connect all the sections to Project N° 10 (as shown in *Figure 11*).

Location map

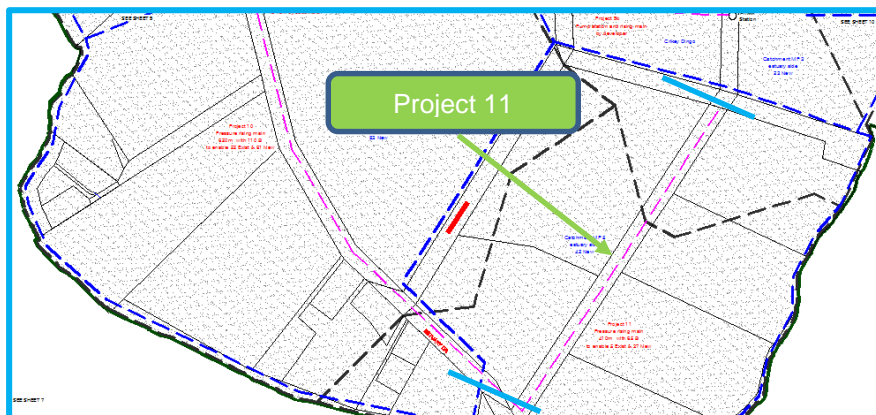


Figure 11: Location map of Project 11

Project Cost

The project has no cost to the Council.

Cost-Benefit Analysis

N/A

Project N° 12: Ti Tree Place

Key Project Features			
Project Area:	Ti Tree Place	Project Type:	WW Connection
Pipe length:	130 metres	Pipe Size:	Various
Pipe Material:	PVC & PE		

Brief description of the project area

There are about 30 existing properties in the project area. The properties have their own existing wastewater management system onsite. The proposed project will connect the existing system to the Council's wastewater network (as shown in *Figure 12*).

Location map

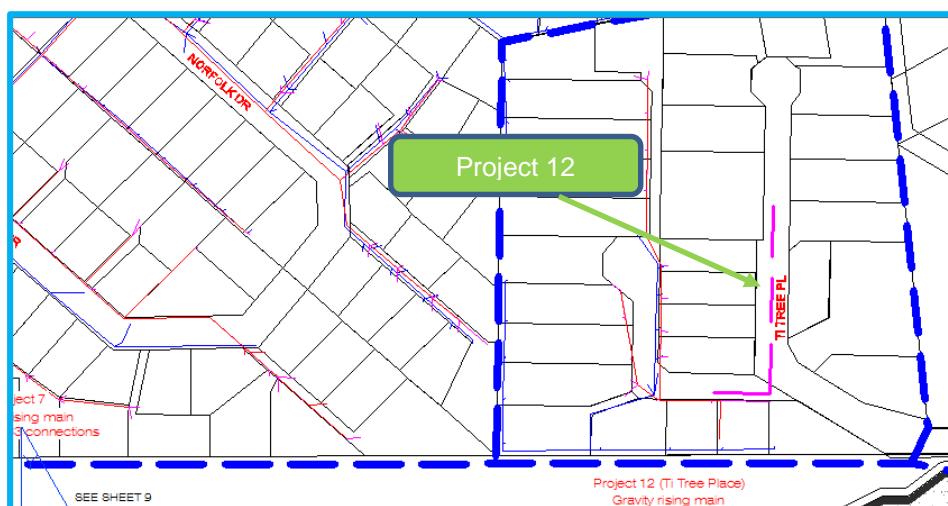


Figure 12: Location map of Project 12

Project Cost

The approximate project cost is shown below:

Ti Tree Place		
Properties targeted		30
Description	Rate \$	Cost \$
2 mini pump stations to be installed	27,000	54,000
Electrical	5,000	10,000
Commissioning	2,000	2,000
Rising main DN 63 PN 16	50	20,000
Connection to existing WW network	2,000	2,000
Replace gravity mains (130m)	70	9,100
2 Manholes	4,000	8,000
3 Inspections	800	2,400
1 manhole	4,000	4,000

Ti Tree Place		
3 inspections	800	2,400
12 connections to existing	500	6,000
	Subtotal	\$119,900
Plus 25% contingency		149,875
Plus 15% Design and Supervise	Total Cost	\$172,356

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*30= NZD 630,000

Cost of Project N° 12 will be recovered with Development Contribution from the targeted properties.

Project N° 13: Quail Way

Key Project Features			
Project Area:	Quail Way	Project Type:	WW Connection
Pipe length:	100 metres	Pipe Size:	150mm
Pipe Material:	PVC		

Brief description of the project area

There is wastewater network on the Quail Way. Currently properties 1, 3, 5, 7-11 are not connected to the wastewater network. The project proposes to connect these 4 properties to the wastewater network (as shown in *Figure 13*). 13-17 Quail Way can be connected to the wastewater network once developed as the line is right in front of the lot.

Location map

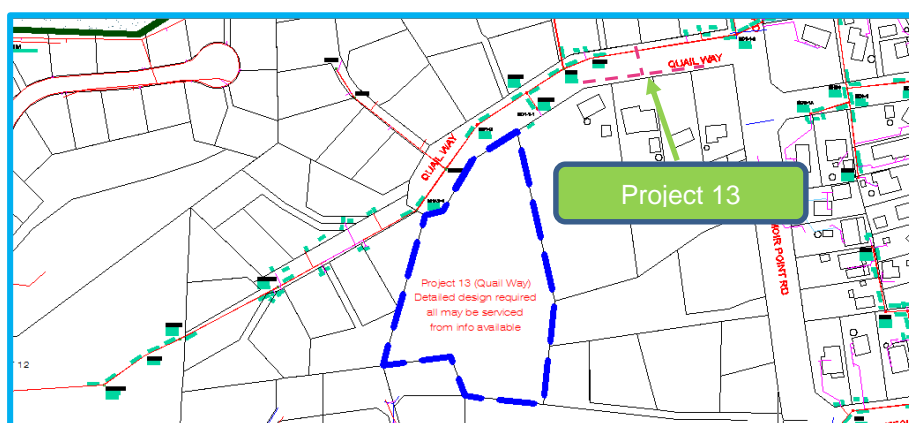


Figure 13: Location map of Project 13

Project Cost

The approximate project cost is shown below:

Quail Way		
Properties targeted		4
Description	Rate \$	Cost \$
100 metres 150 DWV line	70	7,000
1 Manhole	3,000	3,000
1 Inspection	1,000	1,000
4 Property connections	500	2,000
	Subtotal	\$12,500
Plus 25% contingency		15,625
Plus 15% Design and Supervise	Total	\$18,469

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*4= NZD 84,000

Cost of Project N° 13 will be recovered with Development Contribution from the targeted properties.

Project N° 14: Greenview Drive

Key Project Features			
Project Area:	Greenview Drive	Project Type:	WW Connection
Pipe length:	-	Pipe Size:	-
Pipe Material:	-		

Brief description of the project area

There are about 47 properties in the project area. There is an existing private wastewater management system. It is proposed to connect the existing system to the Greenview/Molesworth Drive intersection pressure line (as shown in *Figure 14*). Specific design may be required to consider existing private wastewater management system.

Location map

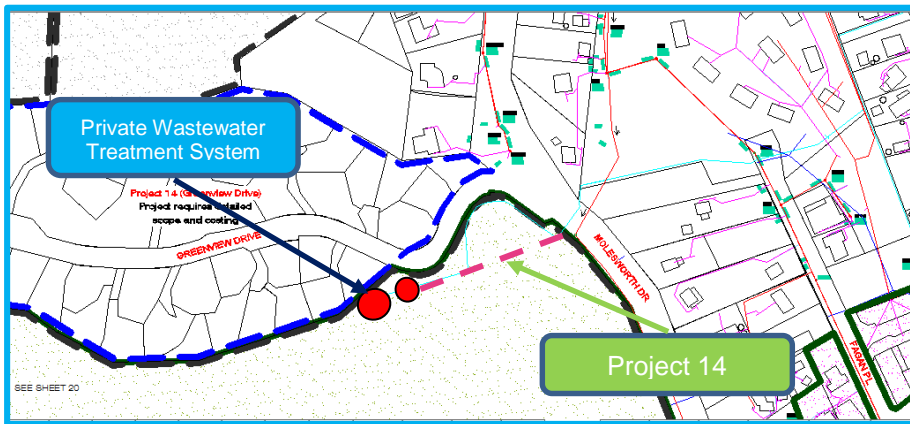


Figure 14: Location map of Project 14

Project Cost

The approximate project cost is shown below:

Greenview Drive		
Properties targeted		47
Description	Rate \$	Cost \$
Specific design required to connect 47 sites.	Total cost	350,000

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*47= NZD 987,000

Cost of Project N° 14 will be recovered with Development Contribution from the targeted properties.

Project N° 15: Wintle Street, Heads Limited

Key Project Features			
Project Area:	Wintle Street, Heads Limited	Project Type:	WW Connection
Pipe length:	60 metres	Pipe Size:	160mm
Pipe Material:	PE		

Brief description of the project area

There are about 32 properties in the project area. The project site is outside urban zone but they have a drain to the community gate. The proposed project is to connect this private drain to the Council Manhole (Asset Id- 20100701011212) which is about 60 metres on Wintle Street (as shown in Figure 15).

Location map

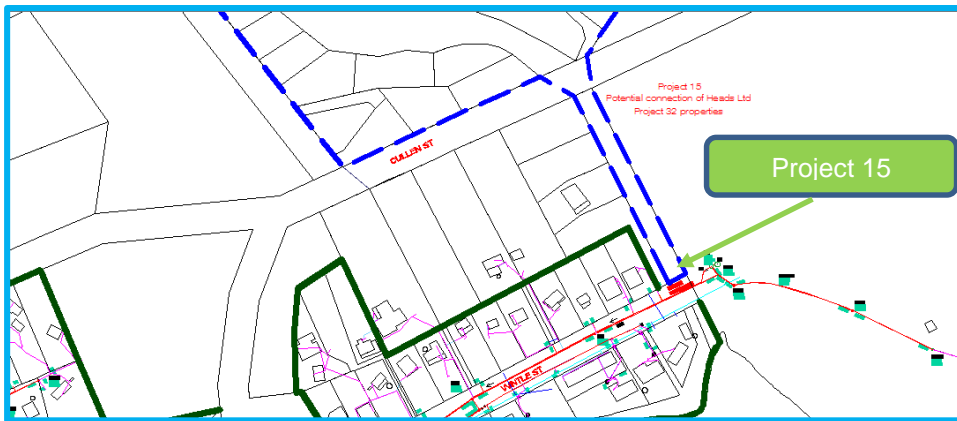


Figure 15: Location map of Project 15

Project Cost

The approximate project cost is shown below:

Wintle Street, Heads Ltd		
Properties targeted		32
Description	Rate \$	Cost \$
Connection of 32 properties out of urban zone but with private drain in common within 60 metres of the public system	Total cost	\$25,000

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*32= NZD 672,000

Cost of Project N° 15 will be recovered with Development Contribution from the targeted properties.

Project N° 16: Cullen Street

Key Project Features			
Project Area:	Cullen Street	Project Type:	WW Connection
Pipe length:	120 metres	Pipe Size:	150mm
Pipe Material:	PVC		

Brief description of the project area

There are currently 2 existing properties and potential for about 45 new sections. The proposed project is to extend our wastewater network from existing 43 Cullen Street to 51 Cullen Street (as shown in *Figure 16*).

The project is dependent on the progress and works of subdivision of Lot 3 DP 343058.

Location map

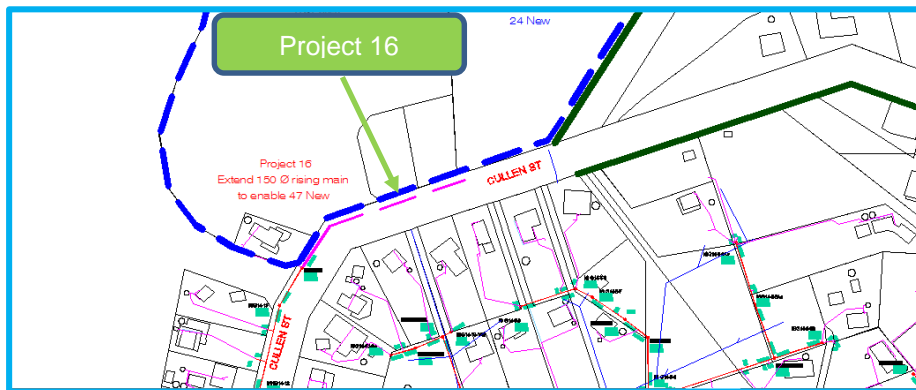


Figure 16: Location map of Project 16

Project Cost

The approximate project cost is shown below:

Cullen Street		
Properties targeted		2
Description	Rate \$	Cost \$
120 metres 150 dia gravity sewer	150	18,000
3 Manholes	3,000	9,000
install 4 connections to properties	1,000	4,000
	subtotal	\$31,000
Plus 25% contingency		38,750
Plus 15% Design and Supervise	Total	\$44,563

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*2= NZD 42,000
- Calculation of recovery of scheme cost is shown below:

Completion of Year	Annual wastewater charges per Property (NZD)	N° of Properties	Total Annual wastewater charges (NZD)	Development Contribution (NZD)	Total Cost Received (NZD)
1	1,055	2	2,110	42,000	44,110
2	1,055	2	2,110	42,000	46,220

Note: It is assumed that annual wastewater charges will remain same for calculations

Cost of Project 16 will be recovered after completion of second year from the targeted properties.

- Potential Development Contribution from 45 sections: NZD 21,000*45= NZD 945,000

Project N° 17: Mangawhai Heads Road/Cullen Street Intersection

Key Project Features			
Project Area:	Mangawhai Heads Road/Cullen Street Intersection	Project Type:	WW Connection
Pipe length:	230 metres	Pipe Size:	63NB
Pipe Material:	PE		

Brief description of the project area

Phase-I of the project has already been completed and there is a crossing from Manhole (Asset Id- 20090827115011) to the other side of the road. A couple of properties are already connected, the proposed project will connect about 10 properties to the wastewater network (as shown in *Figure 17*).

Location map

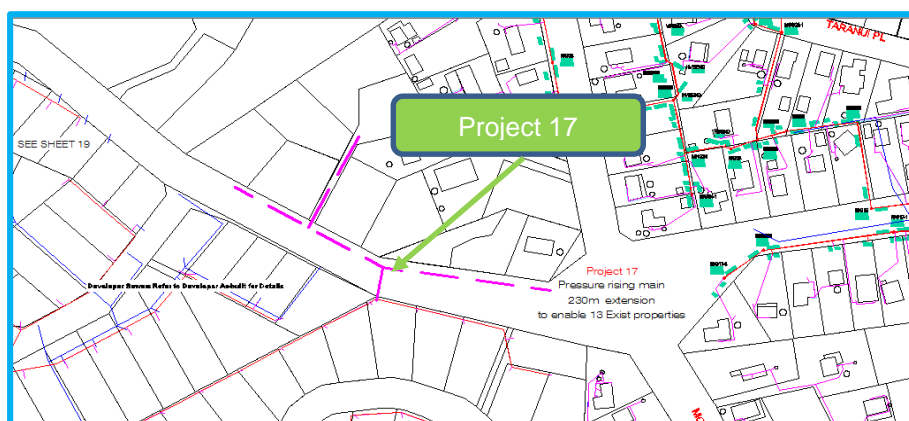


Figure 17: Location map of Project 17

Project Cost

The approximate project cost is shown below:

Mangawhai Heads Road/Cullen Street Intersection		
Properties targeted		10
Description	Rate \$	Cost \$
230 metres 63 OD Pressure Sewer	50	11,500
Flushing point		1,000
10 Connections	500	5,000
Connection to existing WW network		2,000
	Subtotal	\$19,500
Plus 25% Contingency		24,375
Plus 15% Design and Supervise	Total	\$28,031

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*10= NZD 210,000

Cost of Project 17 will be recovered with Development Contribution from the targeted properties.

Project N° 18: Mangawhai Heads Road

Key Project Features			
Project Area:	Mangawhai Heads Road	Project Type:	WW Connection
Pipe length:	400 metres	Pipe Size:	63OD
Pipe Material:	PE		

Brief description of the project area

The project proposed will lay wastewater line from the front of 123 Mangawhai Heads Road to a Manhole (Asset Id – 20090630124952) on Jack Boyd Drive covering about 8 properties (as shown in Figure 18).

Location map

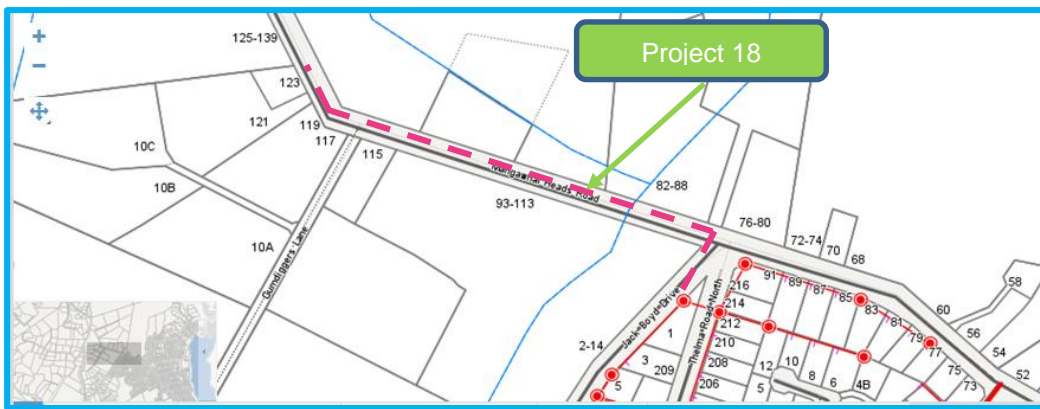


Figure 18: Location map of Project 18

Project Cost

The approximate project cost is shown below:

Mangawhai Heads Road		
Properties targeted		8
Description	Rate \$	Cost \$
400 metres 63 OD PN 16 Pressure Sewer	50	20,000
2 Flushing points	1,000	2,000
Connection to existing WW network		2,000
	Subtotal	\$24,000
Plus 25% Contingency		30,000
Plus 15% Design and Supervise	Total Cost	\$34,500

Cost-Benefit Analysis

- Development Contribution: NZD 21,000/property
- Total Development Contribution: NZD 21,000*8= NZD 168,000

Cost of Project N° 18 will be recovered with Development Contribution from the targeted properties.

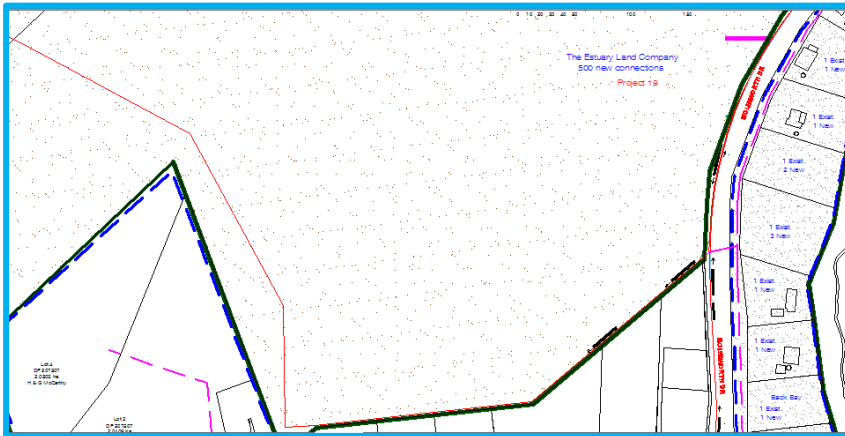
Project N° 19: Molesworth Drive, *Estuary Estates*

Key Project Features			
Project Area:	Molesworth Drive, <i>Estuary Estates</i>	Project Type:	WW Connection
Pipe length:		Pipe Size:	
Pipe Material:			

Brief description of the project area

Developer to connect to the existing wastewater network on the Molesworth Drive. There is no cost to the Council (as shown in *Figure 19*).

Location map



Project Cost

The project has no cost to the Council.

Cost-Benefit Analysis

N/A

Project N° 20: Jack Boyd Drive

Key Project Features			
Project Area:	Jack Boyd Drive	Project Type:	WW Connection
Pipe length:		Pipe Size:	
Pipe Material:			

Brief description of the project area

The developer has subdivided and has laid a line connecting to a pressure sewer on Jack Boyd Drive. There are about 4-5 existing properties which can be connected to the wastewater network at no cost to the Council (as shown in *Figure 20*).

Location map

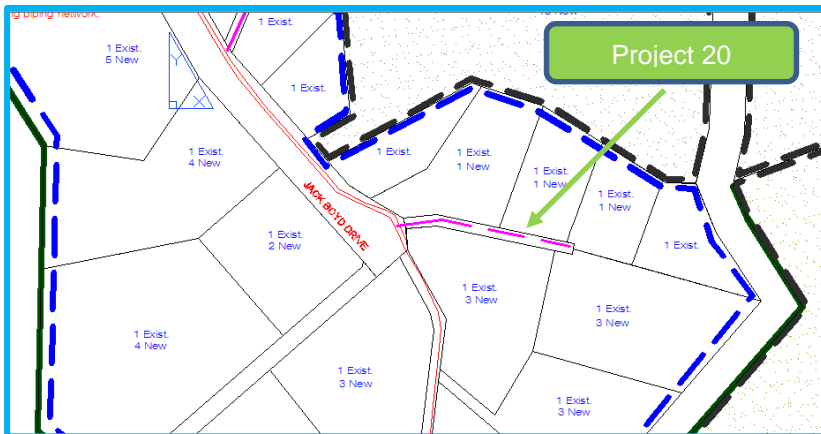


Figure 20: Location map of Project 20

Project Cost

The project has no cost to the Council.

Cost-Benefit Analysis

N/A

Appendix 2: Location of Identified Projects

Appendix 3: Priority Matrix (Scorecard)

Project Scorecard and Priority Matrix

Project No.	Project Name	Properties Targeted	Potential Targeted Properties	Total Project Cost \$	Expected Immediate Return \$	Expected Potential Return \$	Score			Total Score	Priority
							Environmental	Economic	Strategic		
1	69 Moir Street	3	-	16,000	63,000	-	1	4	2	7	7
1a	73 Moir Street	1	-	5,000	21,000	-	5	5	3	13	1
2	104 Moir Street	4	-	18,688	84,000	-	2	5	3	10	4
3	Mangawhai Beach School	1	-	12,219	21,000	-	5	2	4	11	3
4	Molesworth Drive	2	80	21,563	42,000	1,680,000	4	2	3	9	5
5	62-86 Molesworth Drive	12	12	58,219	252,000	252,000	4	5	3	12	2
6	Old Waipu Road	33	232	326,313	693,000	4,872,000	3	3	3	9	5
6a	Old Waipu Road (McCarthy and Others)	-	75	N/A	-	-	2	2	2	6	6
7	Estuary Drive (Parklands)	4	21	52,181	84,000	441,000	3	2	4	9	5
8	Estuary Drive (Ogilvy)	11	95	90,563	231,000	1,995,000	5	3	4	12	2
9	Estuary Drive	-	-	48,156	-	-	5	2	3	10	4
9a	Moir Point Road (102-120 Moir Point Road)	11	-	385,969	231,000	-	3	1	3	7	7
9b	Moir Point Road (Hermes-III)	-	63	N/A	-	-	2	2	2	6	6
10	Estuary Drive (Estuary Drive/Moir Point Road Intersection)	22	61	116,294	462,000	1,323,000	5	4	4	13	1
11	Devon Street (Paper Road)	5	37	N/A	-	-	2	3	2	7	7
12	Ti Tree Place	30	-	172,356	630,000	-	3	4	1	8	6
13	Quail Way	4	-	18,469	84,000	-	2	5		7	7
14	Greenview Drive	47	-	350,000	987,000	-	4	3	2	9	5
15	Wintle Street, Heads Limited	32	-	25,000	672,000	-	3	5	2	10	4
16	Cullen Street	2	45	44,563	42,000	-	2	1	2	5	5
17	Mangawhai Heads Road/Cullen Street Intersection	10	-	28,031	210,000	-	3	5	3	11	3
18	Mangawhai Heads Road	8	-	34,500	168,000	-	3	5	3	11	3
19	Molesworth Drive, Estuary Estates		-	N/A	-	-	2	2	2	6	6
20	Jack Boyd Drive	5	-	N/A	-	-	2	3	2	7	7
TOTAL		247	721	\$1,824,084	\$4,977,000	\$10,563,000					

References

- Mangawhai Community Wastewater Scheme- Deed Document;
- Mangawhai Wastewater Scheme- Potential Effluent Disposal Options;
- Statistics New Zealand;
- KDC Development Contribution Policy, 2012;
- KDC Annual Plan, 2014/15