

**THE WAIMAKARIRI DISTRICT SEWERAGE
PROJECT - OUTFALL INVESTIGATIONS**

FINAL SOCIAL ASSESSMENT

Report prepared by

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for the Waimakariri District Council

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1 INTRODUCTION

1.1 Project background

The Waimakariri District Council's Eastern Sewerage Project conducted investigations into an ocean outfall for disposal of sewage effluent from Rangiora, Kaiapoi, Woodend and the beach settlements. The Council proposes the ocean outfall, in addition to upgraded sewage treatment plants, as its long-term solution to the Eastern District's wastewater treatment and disposal, including the proposed Pegasus Bay Township.

Technical investigations were conducted in 2002 and the first half of 2003 to assist the Council to decide on a preferred location for an ocean outfall, its design and length. The technical investigations looked at two locations for the ocean outfall, one an area in line with Gladstone Road to the north and the other in line with Lees Road to the south. The Council then decided to apply for resource consents for an outfall 1.5 km in length in the southern investigation area - north of Pines Beach. Consultants URS prepared a draft assessment of environmental effects (AEE) for this proposal, with public consultation on the AEE in late September and early October 2003. Subsequently, the Council will apply for the necessary consents in November 2003.

The proposal is for an ocean outfall to 1.5 kilometres offshore, discharging wastewater from the Eastern Waimakariri sewage treatment plants connected by a system of pipelines. High quality effluent will be achieved by treatment of the wastewater from Rangiora and Kaiapoi through the constructed wetland at Kaiapoi, in addition to a series of primary treatments, ponds and constructed wetlands at each treatment plant. The ocean outfall will be a pipeline buried over its length, with diffuser outlets at the end protruding above the sea floor in order to disperse the effluent as much as possible.

This report¹ provides an assessment of the social effects of the ocean outfall as part of the full Assessment of Environmental Effects (AEE). Preparation of the AEE requires assessment of the potential social effects along with assessment of the potential bio-physical effects, as guided by sections 2 and 5, and schedule 4 of the Resource Management Act. Other technical related reports contribute to the AEE, including reports on the health impact assessment and on cultural effects. The social assessment evaluated alternatives and contributed to the technical investigations and Council's decisions throughout the planning process.

The technical investigations were organised into three phases, to:

- Phase 1: determine information required to make a choice between the various alternative locations, prepare the AEE, and proceed with investigations to collect the necessary information
- Phase 2: analyse the information collected and compare issues and likely effects between various alternatives, and confirm elements of the preferred proposal
- Phase 3: prepare an AEE on the preferred proposal.

¹ This report was prepared by Nick Taylor, Brigid Buckenham and Wayne McClintock

1.2 Approach

The approach taken by this social assessment is to consider the full range of potential social effects of the proposal, both positive and negative. A social effect is any alteration to the environment that has or could have a direct or consequential effect on a person or people. In practice, it is difficult to distinguish between many environmental effects and their social consequences. Social effects can be taken as indicators of the significance that a community attaches to an environmental effect. They reflect the amenity values and perceptions of affected people. For example, when people are concerned about water quality, they are usually relating water quality to its consequences for public health while bathing, recreational fishing or eating shell fish. A change in water quality could have consequential social effects such as reduced recreational use. The issue of water quality therefore requires technical and social analysis, including public consultation, to understand social effects.

For this project the social assessment and public consultation were closely integrated. The consultation activities assist the project team to identify issues for the technical studies to address. They also help to identify existing and potential effects from the disposal of treated effluent, and ways by which these effects might be mitigated or managed. The social assessment draws on results of this consultation throughout the report.

1.3 Public consultation

Each phase of the technical investigations outlined above included public consultation, based on a strategy agreed by the Council in October 2002. The strategy set out to ensure public consultation took place and supported each of the above three phases of project investigations by providing for community input. The strategy evolved on a phase by phase basis and full details of the strategy are provided here.

The purposes of the public consultation for each phase were:

- Phase 1: to explain the proposal at this stage, the consultation and assessment process, and the technical investigations commissioned, as well as to obtain community views on the proposal and investigations, identify information needs of stakeholders and interested parties, and ways to incorporate local knowledge
- Phase 2: to obtain location-specific information about patterns of human use of the coastline and proposed wetland areas, feed back information from the various investigations to the stakeholders and interested parties and obtain their views on the adequacy of the investigations, reconcile the findings of the investigations with local knowledge, and engage people in assessing the comparative effects and issues of different alternatives
- Phase 3: to provide information on the preliminary AEE and obtain feedback from a wide range of stakeholders and interested parties about it, confirm likely effects and impacts, and identify appropriate mitigation options.

Phase 1 consultation activities

After the Council confirmed the consultation strategy, a list of potential stakeholders and interested parties was compiled from the Council data base and discussions with Project Team members. The Project Team

prepared an information package that was included in a newsletter to the list of stakeholders (Update No. 5) and added to the Council web page.

From mid October 2002, stakeholders and interested parties were contacted by phone and informed about the consultation process. They were asked if and how they would like to take part. In some cases they were sent information in the form of Update No. 5. Contacts were checked against the data base and added to it where necessary for future mail outs. There was a public display on the sewerage project in the Council tent at the Rangiora AMP show on 26 October 2002.

Thirty-eight interested parties were contacted by phone and other people attended meetings with representatives of Taylor Baines and Associates and the Council during the first phase of this process of consultation. These interested parties included business groups, residents groups, surf lifesaving clubs, camp-ground managers, recreational groups, environmental groups and government agencies. Details of Phase 1 meetings are provided in Table 1.

Table 1: Phase 1 consultation meetings

Group	Date	Number attending
Waikuku community meeting	12 Nov 2003	18
Rangiora community meeting	13 Nov 2003	12
Woodend community meeting	20 Nov 2003	30
Kaiapoi community meeting	25 Nov 2003	6

Phase 2 consultation activities

Over the period February-March 2003, contact lists were checked again and stakeholders and interested parties recontacted by phone and offered meetings about the technical findings. Key informant interviews were conducted in the beach communities with schools, local businesses and recreational groups, to collect background information and to check the coverage of the consultation. Interested parties were sent periodic Project Update newsletters and the public also had access to project information via the Council website.

A series of meetings and open days were planned and conducted as shown in Table 2. Meetings were preceded by an article in the Northern Outlook, newspaper advertisements and leaflets delivered to local schools and shops.

Table 2: Phase 2 consultation meetings

Group	Date	Number attending*
Council workshop	4 June	10
Environmental and statutory organisations	5 June	11
Waimakariri River sailing and anglers	9 June	13
Beach user groups	12 June	2
Commercial fishers	19 June	6
Open display, Kaiapoi	21 June	30
Open display, Waikuku	24 June	15
Open display, Woodend	25 June	9
Open display, Rangiora	26 June	8
Marine farmers	3 July	9
Ngai Tuahuriri Runaka	6 July	5

* With the exception of the Council workshop excludes councillors and team members

A series of panels were used to display results of the technical investigations and these were available at the meetings. The open displays consisted of informal discussions with team members present to answer queries as well as a slide presentation. A comments form was available for participants at meetings to record additional comments. Nine forms were completed, one with comments from 14 people.

Phase 3 consultation activities

Phase 3 consultation consisted of a series of meetings, building on the Phase 2 activities. Details of the Phase 3 meetings are in Table 3.

Table 3: Phase 3 consultation meetings

Group	Date	Number attending*
Council workshop	24 Sept	17
Environmental and statutory organisations	25 Sept	7
Ngai Tuahuriri Runaka	30 Sept	6
Marine farmers	6 Oct	4
Commercial fishers	7 Oct	2
Community meeting, Woodend	6 Oct	8
Community meeting, Waikuku	7 Oct	9
Community meeting, Rangiora	8 Oct	5
Community meeting, Pines, Kairaki, Kaiapoi	9 Oct	12

* With the exception of the Council workshop numbers do not include councillors, council staff or consultants.

These meetings were preceded by a double-page insert in the Northern Outlook newspaper distributed free to households plus subsequent advertisements in the Press and Northern Outlook newspapers, along with posters in the small communities of Waikuku Beach, Woodend Beach and Pines Beach. Where possible, residents' group representatives were telephoned as well.

In all three phases, comments on issues and effects were recorded and analysed using keywords. Results of the Phase 1 and 2 consultation were incorporated in the preliminary AEE. The issues and questions from Phase 3 consultation were included in the Phase 3 AEE and this final social impact assessment technical report.

1.4 Recreation Observations

The investigation obtained information about patterns of recreation along the beaches between the Ashley and Waimakariri Rivers and in the estuaries of the Ashley and Waimakariri Rivers. Information came from:

- interviews with people involved in recreational organisations
- direct observations of recreational activity recorded on maps between January and October 2003
- data on counts of the numbers of people swimming and on the beach in the peak season, from the Canterbury Surf Lifesaving Association.

2 SOCIAL PROFILES

2.1 Waimakariri District

Waimakariri District lies to the north of Christchurch City, over the Waimakariri River. It is one of the fastest growing districts in New Zealand (Table 4). This growth arises from expansion of the main settlements of Rangiora, Kaiapoi and Woodend and the nearby rural areas, where there has been extensive subdivision of farm land into small holdings and rural residential properties. Further residential developments are allowed under the District Plan and related consents, including a 'new town' called Pegasus Bay, to be built north east of Woodend. Population growth has posed major issues for, urban, transport and infrastructure planning.

The number of people resident in Waimakariri District grew from 25,608 to 36,903 between 1986 and 2001 (Table 4). The rate of population increase in the district over this fifteen year period was over three times that of the national population (44 per cent cf. 14.5 per cent for NZ).

Table 4: Changes in Usually Resident Population of Waimakariri District 1986-2001

Census Year	Waimakariri District		New Zealand	
	Number	% change over five years	Number	% change over five years
1986	25,608	-	3,263,283	-
1991	27,873	8.9	3,373,926	3.4
1996	32,346	16	3,616,677	7.2
2001	36,903	14.1	3,736,095	3.3

Source: Statistics New Zealand

A number of people wanted assurance during public consultation that the Council is fully anticipating increased demand for sewage treatment and disposal arising from the expected growth in the district's population and visitors to the district. Especially as the system has not appeared to keep up with growth in the eastern areas of the district over recent years.

Waimakariri District has three 'beach' communities along its coast, Waikuku, Woodend Beach and Pines-Kairaki, with the two sites for outfall investigations lying between them. These communities are now discussed in turn. There are further demographic details in Appendix 1.

2.2 Waikuku

Waikuku community consists of houses near the beach plus clusters of housing off Kings Road and off the main highway (SH1). The school is on the main highway. In 2001 Waikuku had 738 residents.

Between 1986 and 1996 the population of Waikuku grew from 390 to 690. The area's population grew at a much faster rate than the population of Waimakariri District during this period. Over the next five years, however, the population of Waikuku grew at half the rate of the district's population (7 per cent cf. 14 per cent).

The age structure of the population of Waikuku was relatively younger than the district's population in 2001. The settlement had a higher proportion of children and a lower proportion of elderly people than

Waimakariri District. Furthermore, a relatively higher proportion of Waikuku's residents indicated they were of Maori descent (10 per cent of responses) compared with the district's residents (6 per cent).

Residents of Waikuku held relatively more tertiary qualifications than residents of Waimakariri District. Thirty-six per cent of the workforce of Waikuku in 2001 had higher status white collar occupations (cf. 32 per cent for the district), while another 17 per cent had service and sales occupations (cf. 13 per cent for the district). The proportion of residents of Waikuku who reported they were unemployed was much higher (6 per cent) than the rate for residents of Waimakariri District (3 per cent). Paid employees comprised just under 80 per cent of Waikuku's workforce. The main sources of employment for the residents of Waikuku were the community/social/personal sector (25 per cent), the wholesale/retail/hospitality sector (25 per cent) and the manufacturing sector (18 per cent).

Families of 'one parent' represented just under a fifth of all families at Waikuku in 2001. 'Couple only' families, however, were relatively fewer than was the case for the district (35 per cent cf. 43 per cent). There was a slightly higher proportion of 'one person' households at Waikuku (22 per cent) compared with Waimakariri District (19 per cent).

Just over two-fifths of Waikuku's households reported annual incomes between \$20,001 and \$50,000 at the 2001 census. The number of government benefits reported by residents as a proportion of the population of Waikuku aged over 14 years was 42 per cent (cf. 37 per cent for the district). About a fifth of Waikuku's dwellings were not owned by their occupants. Households at Waikuku had less access to motor vehicles than the district's households. Fifty-seven per cent of households at Waikuku had two or more vehicles compared with 62 per cent for Waimakariri District.

2.3 Woodend Beach

Woodend Beach is a settlement east of the main Woodend township. Woodend Beach had 195 residents in 2001. Its population grew at a faster rate than the population of Waimakariri District between 1986 and 1996, but over the following five years it increased at a rate considerably slower than the district's population.

The beach settlement had a more youthful population than Waimakariri District in 2001, with a higher proportion of children and a lower proportion of people over 65 years old. The ethnic composition of Woodend Beach's population was similar to that of the district.

Residents of Woodend Beach held relatively fewer tertiary qualifications than the district's residents. Just over a quarter (26 per cent) of Woodend Beach's workers were engaged in higher status occupations in 2001, and about a fifth (19 per cent) had service and sales occupations. The proportion of residents of Woodend Beach (6 per cent) who reported that they were unemployed was twice that of the district's residents (3 per cent). Woodend Beach's workforce had a comparatively higher proportion of paid employees than Waimakariri District's population (79 per cent cf. 74 per cent). The community/social/personal sector provided 29 per cent of the jobs for workers resident in Woodend Beach, while the manufacturing and wholesale/retail/hospitality sectors both provided 25 per cent of jobs.

Although 'two parent' families predominated at Woodend Beach in 2001, the proportion of 'one parent' families was relatively higher than for Waimakariri District as a whole (17 per cent cf. 13 per cent). 'One person' households comprised about 30 per cent of the total number of households at Woodend Beach, while they only represented 19 per cent of households in the district.

A third of households at Woodend Beach reported that their annual incomes were \$20,000 and under at the 2001 census. Households at Woodend Beach had relatively lower incomes than the district's households. The number of government benefits reported by residents as a proportion of the population of Woodend Beach aged over 14 years was 33 per cent (cf. 37 per cent for the district). Just under three-quarters of the dwellings at the settlement were owned, or partly owned, by their occupants. Households at Woodend Beach had access to a relatively fewer number of motor vehicles than their counterparts at the district level. Forty-six per cent of Woodend Beach's households had access to two or more motor vehicles compared with 62 per cent for the district's households.

2.4 Pines-Kairaki

Pines-Kairaki Beach is a settlement lying north of the mouth of the Waimakariri River and east of the town of Kaiapoi. Pines-Kairaki Beach had 669 residents in 2001. The population grew at a much slower rate than the district's population between 1991 and 2001.

People aged 15-64 years comprised over two-thirds of the population of Pines-Kairaki Beach in 2001. Children were a lower proportion of the population compared with Waimakariri District's population, whereas people aged 65 years and over were a slightly higher proportion of the population. The proportion of residents of Pines-Kairaki Beach indicating they had some degree of Maori ancestry was 13 per cent which was over double the proportion for the district (6 per cent).

Almost two-fifth's of residents of Pines-Kairaki Beach reported they held no educational qualifications in 2001. Overall the residents of Pines-Kairaki Beach had relatively fewer educational qualifications than the district's residents. Over half of the residents were engaged in blue collar occupations (cf. 43 per cent for the district), whereas only 23 per cent of them had higher status white collar occupations (cf. 32 per cent for the district). The settlement had a higher proportion of its residents (37 per cent) who indicated they were not in the labour force than the district (30 per cent). Moreover, the proportion of residents of Pines-Kairaki Beach who reported they were unemployed was much higher (6 per cent) than the district rate (3 per cent). The workforce of Pines-Kairaki Beach had relatively more paid employees and relatively fewer employers and self employed persons than the workforce of Waimakariri District. Over a quarter of jobs held by residents of Pines-Kairaki Beach were provided by the manufacturing sector. The wholesale/retail/hospitality sector (23 per cent) and the community/social/personal sector (20 per cent) were also important sources of employment for the township's residents.

Over half of the families at Pines-Kairaki Beach were of the 'couple only' category in 2001, while almost a fifth of families were of the 'one parent' type. 'Two parent' families were a lower proportion of families at the township than for the district as a whole (29 per cent cf. 43 per cent). 'One person' households comprised a third of the total number of households at Pines-Kairaki Beach (cf. 19 per cent for the district).

Twenty-nine per cent of households at Kairaki-Pines Beach reported annual incomes of \$20,000 and under in 2001. Households at the settlement had relatively lower incomes than the district's households. The number of government benefits reported by residents as a proportion of the population of Pines-Kairaki Beach aged over 14 years was 49 per cent (cf. 37 per cent for the district). Just under a quarter of dwellings at the township were not owned by their occupants. Households at Pines-Kairaki Beach had relatively less access to motor vehicles compared to the district's households. Forty-seven per cent of the settlement's households had two or more motor vehicles compared with 62 per cent for Waimakariri District.

2.5 Recreational users

Data on recreation shows a wide range of recreation activities undertaken from the Ashley River to the Waimakariri River. The locations of these activities are shown on the map.

Recreation activities are very heavily concentrated around the three beach communities and their main access points to the coast. Access is gained at Waikuku from the Ashley River mouth to the Surf club area, at Woodend Beach, and at Pines Beach to the Waimakariri River mouth and Kairaki Beach. A public walkway runs the length of this coast inland of the sandhills but it appears to have only limited use by walkers and horse riders.

Beach areas around the investigation sites for an ocean outfall, in line with Gladstone Road (between Woodend Beach and Waikuku) and Lees Road (between Pines/Kairaki and Woodend Beach) are used very lightly for recreational purposes, including walking, horse riding and 4WD vehicle driving.

Recreational activities include:

Beach walking - most activity is within a few hundred metres of each of the three main beach access points, with a few people walking to or past the investigation zones. (Peak numbers observed at one time were around 40 walkers at the Waimakariri Mouth-Pines Beach area.)

Swimming - is concentrated at the three patrolled beaches, Waikuku, Woodend and Pines. (See Table 5 for peak beach numbers, which includes information for Spencer Park).

Surfing and boogie boarding - are concentrated at the Waikuku Surf Club, Woodend Beach and the Waimakariri River bar to Pines Beach. (Peak numbers observed at one time were 14 surfing at the Waimakariri River bar).

Fishing - is in the lagoon at Waikuku to the Ashley River mouth and in the lower Waimakariri to the mouth. (Peak numbers observed at one time were 136 fishers from the Cam River to the Waimakariri River mouth.)

White baiting takes places in the season from 15 August to 30 November.

Horse riding - takes place up to 500 m in each direction from the three beach access points, with some riders using the length of the coast. (Peak numbers observed at one time were 3 riders).

4W driving - takes place along the length of the coast, with the most active zone around Pines Kairaki, including people using 4WDs to access salmon fishing, white baiting, surfing, walking their dog and passive watching.

Sand playing - includes building sand castles, drawing in the sand, and playing in the dunes, and usually takes place close to the access points for the three beach areas.

Watching - is usually close to the beach access points and takes place with people sitting on the beach and dunes, and also from cars at the Waimakariri River mouth at Kairaki and from 4WD vehicles (especially in cooler and windy conditions).

Figure 1: Activities on the beaches between Ashley and Waimakariri Rivers



Table 5: Peak numbers on the beaches at the height of the 2002-3 season

Date	Spencer	Pines	Woodend	Waikuku
26 Dec	65	24	111	101
27 Dec	134	27	63	12
28 Dec	17	4	29	12
29 Dec	140	35	120	41
30 Dec	200	12	91	40
31 Dec	325	55	186	155
1 Jan	700	33	260	170
2 Jan	500	27	142	160
3 Jan	215	28	92	10
4 Jan	80	140	95	60
5 Jan	80	46	107	83
6 Jan	60	57	125	39

Note: each number is the highest hourly head count each day at the patrolled beaches

Source: surf patrols counts given to the Canterbury Surf Lifesaving Association

Water skiing takes place on the Brooklands lagoon, whilst jet skiing is popular in the lagoon and around the Waimakariri River Mouth, including the surf zone.

Sailing takes place in the lower Waimakariri and Brooklands Lagoon.

Other activities observed included kayaking at the two lagoons, kite flying at Woodend Beach and kite surfing at the Waikuku (Saltwater) lagoon.

Recreation activity is noticeably higher in the weekends and holidays than during the working week. Activity is affected by tides in the lagoons and river mouths, and along the beaches for walkers, riders and vehicles at high tide, when there is less activity.

Weather also has an effect, with a marked increase in recreation during warm, sunny and nor'west conditions compared to cold, windy, easterly or southerly conditions.

Future recreational use

Future recreational use is important when considering the potential effects of an outfall on recreation. With further residential subdivisions and new housing in the Kaiapoi-Woodend- Rangiora area, plus use from Christchurch, increased recreational use of the beach areas between Waikuku and Woodend Beach is likely. The planned Pegasus Bay 'new town' includes a walking track for beach access between Waikuku and Woodend Beach. This access is likely to increase the recreational use of that part of the coastline. Development of the Tutaepatu lagoon is also proposed and that area could become an important wetland with more public access via the coastal walkway. The Te Kohaka o Tuhaitara Trust want to ensure their plans for wetland and walkway development between Waikuku and Woodend will not be disrupted by pipelines and any constructed wetlands.

2.6 Commercial fishing and marine farming

Several commercial fishing companies operate up to six trawlers each in the Pegasus Bay area specifically. The main fishing is for flounder, NZ sole, turbot, brill, red cod, rig, elephant fish, shark, and gurnard. Trawling is basically 'scratching the sea bed with large nets' as described by one fisher. It is a long slow process and boats can be in the area for whole days, especially in summer months. How close the boats come inshore depends very much on the weather as rough seas will drive the fish inshore. Some fishers pointed out they fish for brill and turbot within 300 metres of the shore at certain times of the year.

There are several marine farm proposals for Pegasus Bay. Two are by Ngai Tahu and one by Pegasus Bay Marine Farm Investments. There is another one proposed for the Motonau area. In the future farming seaweed is another possibility for the area. One large area suggested as an Aquaculture Management Area lies 11 to 20 kilometres directly off the Waimakariri River mouth.

2.7 Existing discharges

Discharges of urban and industrial (freezing works) effluent into the lower Waimakariri River form part of the social environment. There is community concern about existing discharges of treated effluent into Jockey Baker Creek (from Kaiapoi) and the Cam River (from Rangiora) because of their effects on water quality. While the effluent is discharged into the river system, there is a preference for it to be discharged into the main branch of the Waimakariri River. We 'do not want a drop in Jockey Baker' commented one person at an open day. Residents at Pines Kairaki also wanted reassurance that Saltwater Creek would not be used for discharge in an emergency. There is also wider concern about increasing ocean disposal of effluent from urban areas along Pegasus Bay (e.g. Amberley) in the future.

There is strong community support for removing the existing sewage effluent from the lower Waimakariri along with freezing works effluent. Any improvement is strongly supported by river users. The poor water quality in this area worries recreational fishers, who although they eat fish taken in the lower river, heed warnings not to 'clean' these fish in the river. Some simply do not fish in the lower river, choosing to go elsewhere because of the pollution.

There is some public confusion and lack of knowledge about human effluent currently in the lower Waimakariri and discharging into the sea, with negative comments made about the Council's proposal to put wastewater directly into the ocean seeming to be unaware of the existing problem where the discharge is into the ocean via the river, close to high-use beach recreation as well as users of the lower river.

Odour and insect problems (flies and midges) from the existing ponds at Kaiapoi were noted by local residents. There is also concern that the present treatment systems at Woodend and Waikuku do not always operate efficiently with the best environmental outcomes.

3 POTENTIAL EFFECTS OF AN OCEAN OUTFALL

3.1 Construction effects

The nature and source of the effect

Construction activity will include pipelines linking sewerage treatment facilities in the Eastern Sewerage system, and the ocean pipeline itself, including assembling the pipe and burying it through the sandhills and beach. The potential effects are likely to include noise, dust and visual effects, and disruption to traffic and farming activity such as stock movements.

Residents in Pines Kairaki were concerned about the proximity of the pipeline construction less than 500 metres from the nearest residence. The proposed construction hours of 6 am until 10 pm concerned residents given the amount of noise the project could produce. There was also some resistance to possible disruption of Beach Road during construction. Another issue raised was curtailment of walking on the beach in the construction area during the laying of the outfall pipe.

Consultation also raised the issue of damage to the sand-dune land forms and possible loss of trees during and after construction.

The Te Kohaka O Tuahitara Trust were concerned with the landward construction site in relation to the Pegasus walkway and there are ongoing discussions between the WDC and the Trust.

Commercial fishers asked for a thorough clean up after construction so that there is no debris left on the sea bed that trawlers might snag nets on.

The construction effects will be temporary in nature, covering a time period of up to nine months.

Those affected

These construction effects are likely to have consequences for a number of social groups including local residents, farmers, road users, beach and walkway users, and commercial fishers.

Possible mitigation

The Department of Conservation was keen to ensure that the construction road access be made as 'harmonious as possible' with the area and that the stability of the dunes be maintained after construction. Residents expected that any trees removed would be replanted and suggested a netting and tussock planting scheme similar to that used for rehabilitation at the Brighton dunes.

It was noted that the construction yard and associated activity need to be located so as to cause minimum disruption to the Pegasus Walkway.

A number of mitigation strategies are proposed for construction and these are covered in the specialist reports and AEE.

3.2 Effects of constructed ponds and wetlands

As noted above, the community consultation identified some local concern about the performance of ponds and wetlands at Woodend and Waikuku, problems of odour at Rangiora, and odour, flies and other insects at Kaiapoi. Some residents of Pines Kairaki, the closest residents to the Kaiapoi ponds, raised concerns about proposed effluent from Rangiora, with reduced time spent in the ponds, exacerbating existing effects. Another issue of concern to Pines Kairaki residents is the possible effects of wetlands on existing high water tables, increasing the risk of flooding - an occurrence already experienced in the area - and effects on potable water supplies. They also asked if there would be any future need to increase the size of the ponds and therefore increase the potential risk of these effects.

The community consultation raised questions about the justification, design, costs and operation of constructed wetlands, and their acceptability to Maori. Maori pointed out that the Council project team should be clear that constructed wetlands are for treatment purposes, not natural wetlands that might be used for food gathering. They also emphasised the need to distinguish between planted treatment areas and unplanted ponds. No new wetlands are included in the outfall proposal.

Those affected

Residents of Pines Kairaki, especially those with houses or wells for household supply within 500m of the ponds.

Possible mitigation

It was pointed out that wetlands need to be well designed and managed over time, to be most effective in terms of effluent processing, visual outlook and habitat created, and to have a long operational life. Wildlife benefits can be enhanced by management.

A potable water supply can be provided for households with supplies drawn from near the Kaiapoi constructed wetland.

3.3 Physical effects of an outfall and diffuser

The nature and source of the effect

There is community concern that the ocean outfall should not be visible to users of the beach and that a pipeline be buried in the coastal zone. However, the physical effects of the pipelines and outfall, once buried during construction, are expected to be minimal, with no social consequences. Construction effects are discussed above (3.1) and physical risks below (3.4).

The diffuser, designed to give maximum dispersal of effluent, will involve pipes rising above the ocean floor. These pipes could interfere with commercial fishers trawling traditional fishing grounds. Commercial fishers do not want to lose traditional fishing grounds and asked for the diffusers to be marked clearly on navigational maps with possible compensation for any damage to nets and trawl gear.

Possible visual effect of a plume was raised in the community during consultation. This effect is not assessed as at all likely or significant.

Those affected

Commercial fishing operators are most likely to be affected by the diffuser and any debris left on the ocean floor after construction.

Possible mitigation

Discussions with commercial fishers resulted in agreement between the Council and the commercial fishers to discuss the design of the diffuser and its physical protection, in order to minimise effects. It was concluded that a protective ‘cage’ was important and will be part of the design. Fishers did not require a buoy to indicate the outfall’s whereabouts but it will be marked on charts.

3.4 Water quality effects

The nature and source of the effect

Water quality and the healthy state of Pegasus Bay are of paramount importance for the majority of interested parties consulted. Concerns about water quality include pathogens, nutrients that could cause algal blooms, and sediments in the discharge. Some parties support an ocean outfall to solve these problems (through greater and more direct dilution), while others maintain that the region ‘cannot keep pushing waste out to sea’.

People want the best possible outcomes for water quality and some queried why the outfall might have a lesser standard of discharge than that currently going into the river system. There is a strong view that the Council should be aiming for the ‘highest possible standard’ of ocean discharge, as well as the cleaning up of other discharges into the Waimakariri River.

The primary human consequence of poor water quality is the health hazard posed by micro-organisms in the effluent for water-based recreationists and people who eat shellfish gathered on the beaches. The preliminary Health Impact Assessment assesses the risk of such effects as negligible due to the high dilution effect of disposal in the ocean.

Consultation found that impacts on health for people recreating in the water or eating shellfish are acknowledged as unlikely if the appropriate level of treatment is carried out prior to disposal. During Phase 3 consultation, some interested parties expressed concern about the ability of the existing sewerage system to cope with modern viruses. They asked how the system might accommodate more stringent standards for water quality in the future as more is learnt about health effects or as new viral diseases are found in New Zealand. Changing perceptions of health risk may necessitate more stringent measures of treatment.

One person noted that there has been an existing problem with algal blooms offshore from the Ashley River. Blooms can pose a health hazard and the concern is that a concentrated discharge of nutrients may exacerbate this problem. Biological assessments consider this risk is negligible so no social consequences are assessed here.

People want the best possible outcomes for water quality and some query why the outfall might have a lesser standard of discharge than that currently going into the river system. Others are concerned about the cumulative effects on the ocean environment of Pegasus Bay from two outfalls. For marine farmers

consulted, the ocean outfall is moving the health risk further out to sea, causing concerns for that industry, especially as they face very stringent quality standards in overseas markets.

There are questions in the community about the timing of current measurements, the limited time series of data used to develop the current models, and the model's ability to deal with worse-case scenarios such as a concentrated period of strong north easterly winds. A number of participants expressed concern about the lack of data for the summer months when the north easterly, the prevailing wind, is at its strongest and suggested the Council should make an attempt to gather more data for this period. Some compared the Waimakariri data series to the longer time the Christchurch City Council are taking to collect data for their outfall proposal. As a result, there are outstanding questions about the robustness of the oceanographic model and its ability to deal with worse-case scenarios such as a concentrated period of strong easterly winds with high levels of risky pathogens present in the effluent plume.

There is a general technical communication problem explaining how complex models are developed and calibrated, and their level of accuracy in relation to predicting environmental and health effects.

Residents pointed out that if strong currents and widest dispersal are mostly associated with southerly conditions, this is the type of weather when people are least likely to be swimming (note this comment may not apply to surfing). However, recreation observations also showed water-based recreation reduces in strong, cold, easterly conditions.

The closer the ocean outfall is to the Waimakariri River, the less room there is for error as the area around the River mouth is used extensively for recreation. This issue may largely be one of perceived risk and it is important these perceptions are dealt with, according to a number of participants. Similarly, some considered that although the ocean modelling demonstrated a very diluted sewage plume occasionally going onto the beach, this risk was still not acceptable for them.

Those affected

Water quality potentially affects recreational activity and fisheries, including gill fish, fish breeding areas, migrating fish, shell fish and marine farming. So people affected include water-based beach users such as swimmers and surfers, commercial fishers and Maori.

There is also an issue raised for future marine farming developers in Pegasus Bay, with the possibility related economic development in the district being restricted by an ocean outfall.

Possible mitigation

Mitigation of water quality effects will be determined by the quality of the effluent, design of the diffuser, and optimum length of the outfall to ensure that any pathogens do not return to the shore to affect recreational activities and shell fish, or move around the bay to affect fishing and marine farming. The community seek the best environmental outcomes by establishing clear and strong standards of water quality. A pipeline length of 1.5 km is generally accepted in the community as the best way of reducing perceptions of risks to public health. Some people request an outfall length in excess of two kilometres, others simply oppose an outfall.

There is support for maintaining or improving the present treatment quality, while recognising extra costs may be incurred. Natural UV through time in the constructed ponds and wetlands, and UV treatment,

are both mitigation options. A balancing point was noted, that treatment should be to a level sufficient to meet established and future standards while avoiding unnecessary expense to ratepayers.

3.5 Risks of system breakdown

The nature and source of the effect

During consultation, people asked if there is a contingency plan in the design for a serious malfunction of the system. They suggested risk assessment should include scenarios where there is more than one adverse event at a time. Public concerns are weather related and include the possibility of a 100 year flood in either the Waimakariri or Ashley Rivers, excess storm water runoff in the sewerage-system catchment, a period of extreme north easterly winds, and high tides. Other risks include possible damage to the diffuser or cracking in the outfall pipe through trawling activity, earthquakes causing liquefaction of sand under land pipelines and the ocean pipeline, or other sources of movement in the pipe, and a major power crisis.

Any of these events are seen as possible reasons that standards set for water quality might be breached. Residents expressed the view that the new system should be of a very high standard, with checks in place for crises, particularly if the waste water was not to be treated to the highest possible standard. Some residents were concerned that there was a risk that the system would not be effective given the 'Council's past track record'.

Those affected

The full range of people noted as affected by water quality could also be affected by a system breakdown. Residents in flooded homes could be affected by contaminated water. All households connected to the system could be affected by a major breakdown, as could any river users where there is emergency disposal.

Possible mitigation

Suggestions for mitigation of physical risks include thorough initial risk assessment and design, and contingency plans for natural hazards such as flooding of the wetlands and treatment plants. These plans may range from Civil Defence plans for moving residents, to mechanisms for warning residents, recreationists, fishers and marine farmers of a temporary health risk.

3.6 Costs

The nature and source of the effect

A number of questions and issues were raised about the detailed costing of the proposed system and the distribution of the costs amongst the ratepayers and settlements that will comprise the system. Questions raised about project costs covered the ease and expense of maintaining an outfall, and whether there are plans for its replacement due to general deterioration, or a breakdown arising from an earthquake or other natural hazard. The maintenance costs of the pumping stations is also an issue for some parties.

A single rating system for sewage disposal is seen by some residents as a potential source of inequity and cross 'subsidy' in the allocation of costs between source communities. Residents of some communities contend they have already paid for their sewerage system. There is also a concern that new residential areas, especially the new Pegasus Bay township, should pay fully for their part of any scheme.

There is a difference of opinion regarding the total costs of the project and its final components, including UV treatment and the length of the outfall itself. Some require sufficient expenditure to maintain water quality to the 'highest possible standard', others prefer costs are constrained to those sufficient to meet existing water quality standards.

Residents do not necessarily want the cheapest option at the expense of environmental outcomes. Some groups considered it 'inappropriate costing' to exclude UV treatment at the outset and then add it at a later date. Some suggested shortening the length of the outfall in order to reallocate funds saved to UV treatment.

The Council was asked if a fixed quote was to be required of a contractor in order to prevent them going over budget, whereby ratepayers may be asked to pay more. Residents were also wary of increasing rates in general and their effects on elderly people in the district. Mention was made of the lack of publicity by the Council for a rates relief scheme.

Those affected

Ratepayers of the Waimakariri District and residents of the source communities are affected.

Possible mitigation

There is general support for removing effluent from the river systems via an ocean outfall, with a recognition that this project will have a cost for ratepayers.

The general view is that treatment should take the discharge to the highest possible standard, if necessary beyond established requirements. Although people recognise there are financial constraints, the community believes the system has to 'be bullet proof' in relation to public health. An outfall length of 1.5 km was considered acceptable by the great majority, although it was suggested that if UV treatment could be guaranteed by shortening it, this action should be seriously considered.

The community want clear and full costings for the proposed system.

New residential areas can pay their full contribution to capital costs of the new system.

3.7 Other issues raised in consultation

The possibility of disposing Waimakariri District wastewater to land is still raised by a few people, perhaps indicating either a lack of knowledge about the earlier investigation of options, or dissatisfaction with the Council decision to pursue the outfall option. The possibility of recycling effluent was raised by one person.

A common question for interested parties remains the possibility of Waimakariri District and Christchurch City combining to use a single ocean outfall. The rationale and implications of two outfalls need to be clearly explained and communicated to the public. There is also a question of the extent to which the standards set for one outfall would set a precedent for the other.

4 MONITORING AND ONGOING CONSULTATION

4.1 Social monitoring

Community concern that the standard of the discharge should be kept as high as possible requires close monitoring of effluent quality along with the receiving environment (ocean, shellfish and beaches), with comparison to base-line conditions established by research.

Some residents wanted assurances that monitoring would be enforced by the appropriate authorities.

Another point raised is the possibility that standards for recreational use may change (to tighter levels) in the future.

Recreational patterns along the lower Waimakariri and the beach at Pines-Kairaki could be monitored, to see if there is any change in pattern after the removal of sewage effluent from the river. With disposal via an outfall, recreational patterns along the beaches could be assessed to see if there is any change.

4.2 Ongoing consultation and community liaison

The majority of people consulted were satisfied with the efforts of the project team to keep interested parties informed, and understand the Council's objective of avoiding an extended and costly consent process by getting the design and location right. Some indicated they want to be kept informed during the project consent and construction phases.

Experience with infrastructure projects shows ongoing community liaison is useful in both the construction and operational phases. The Council should consider the possibility of a Community Liaison Group of community representatives and interest groups, including commercial fishers and marine farm proponents. It is expected that there will also be ongoing consultation with the Runaka and Ngai Tahu.

Residents of the Pines Kairaki area were keen to be involved in ongoing discussion with the Council as were commercial fishers, marine farmers and the Te Kohaka O Tuahitara Trust.

A number of residents wanted to learn about other examples of ocean outfalls operating in New Zealand. Some wanted to be informed about the findings of the peer review.

5 CONCLUSIONS

5.1 Location, design and length of an outfall

Maori do not want development of the outfall or wetlands near Tutaepatu Lagoon (north of Woodend Beach) for reasons of cultural sensitivity. Comments at open days pointed to a Maori preference for the southern, Lees Road, site as it is further from areas of cultural significance.

Another group, the Te Kohaka o Tuhaitara Trust, want to ensure their plans for wetland and walkway development between Waikuku and Woodend will not be disrupted by pipelines and any constructed wetlands.

The commercial fishers noted that the southern outfall site was a better location than the northern one in that fish tend to gather either further north or further south of that area. They believed the composition of the ocean floor tends to be very similar in both areas.

Indications from the comments form at meetings, while small in number, indicated a preference for the Lees Road site.

An argument for a southern (Lees Road vicinity) site comes from the assessment of effects on recreational activity. Neither site has high recreational use in its vicinity. To the south, improvements to the water quality in the Lower Waimakariri from an ocean outfall should bring considerable benefits, perceived and actual, to the many and varied recreational users of the lower river and nearby beaches. In contrast, an outfall to the north, at the Gladstone Road site, would bring the effluent into a new receiving environment there, albeit with a very small potential effect on human health. There could, however, be a negative perceived effect for ocean users and residents in Woodend Beach and Waikuku.

The southern outfall zone is widely accepted, however during the Phase 3 meeting at Pines Kairaki, residents were concerned about the proposed proximity of the outfall to their community. The Council was asked if it could be moved 500 metres north, away from the houses and in a more discreet location. The possible impacts on property values and the noise from the construction period concerned some residents. It was also requested that the pipeline should not be referred to using the name 'Pines' They requested a name that disassociates the outfall from the immediate area.

The social assessment concluded that, while recognising the concerns of Pines Kairaki residents, on balance the Lees Road site is preferable to the site between Woodend Beach and Waikuku.

5.2 Final conclusion on social effects

This report provides a social assessment of the outfall proposal, to assist with assessment of its environmental effects. The assessment was carried out over three phases linked to the process of community consultation. The community consultation and social assessment assisted the Council with its decisions regarding a preferred site, and the design and length of the outfall. The results of the social assessment were part of the preliminary AEE presented to the public.

A wide range of issues were identified, and from these a number of potential social effects are assessed for the communities of Pines Kairaki and also beach and river users. These effects and their possible mitigation, are summarised in Table 6.

Table 6: Summary of issues, effects and mitigation

Source of the effect	Social effects assessed	Possible mitigation
Construction of outfall and pipelines	<p>Loss of dune systems/amenity</p> <p>Disruption to walkway access</p> <p>Disruption to beach users - 4WD, walkers and riders</p> <p>Construction noise for Pines residents</p> <p>Disruption to road users</p> <p>Debris on ocean floor</p>	<p>Rehabilitation planned</p> <p>Will be minimised as much as possible - temporary effect</p> <p>Most activity concentrated closer to River mouth, temporary effect - could require signage</p> <p>Restricted hrs for noisy activity, use of noise barriers</p> <p>Most construction will be have minimal effects on traffic</p> <p>Require contractor to clean up</p>
Ponds and wetlands at Kaiapoi take increased effluent	<p>Odour and insets from Kaiapoi STP</p> <p>Effect on groundwater quality</p>	<p>improved aeration in plant and ponds</p> <p>Potable supply for affected households</p>
Physical presence of an outfall	Possible snagging of trawl nets on diffusers	Install with a protective cage
Effluent plume in the ocean	<p>Effects on water-based recreation or gathering of shellfish, and human health</p> <p>Effects on marine farming, commercial fishing and general marine environment.</p> <p>Benefits for users of the Waimakariri river mouth and lagoon</p>	<p>High quality and dilution of effluent, plus regular monitoring of discharge and water quality</p> <p>No identifiable effect from discharge - monitoring as above</p> <p>N/A</p>
Risks of system breakdown	Effects on residents and beach users from major system failure due to earthquake, flooding or power crisis	Civil defence systems in place
Project costs	<p>Impacts on rates.</p> <p>Differential effects between settlements or long-term and new residents.</p>	<p>Construction of a cost effective sewerage system.</p> <p>Standard rate plus capital charges for new connections and subdivisions</p>

Appendix 1 Demographic profile of beach communities

These profiles of beach communities were compiled from census data for 2001. For Woodend Beach the data were compiled from meshblock numbers 2447700 and 2448102, while for Pines-Kairaki Beach and Waikuku data were obtained from the appropriate area units.

WOODEND BEACH

Population change (URP) 1986-2001

The population of Woodend Beach grew at a faster rate than the population of Waimakariri District between 1986 and 1996, but over the following five years increased at a rate considerably slower than the district's population. Woodend Beach had 195 residents in 2001.

Table A1: Changes in Usually Resident Population of Woodend Beach 1986-2001

Census Year	Woodend Beach		Waimakariri District	
	Number	% change over five years	Number	% change over five years
1986	135	-	25,608	-
1991	156	15.6	27,873	8.9
1996	189	21.2	32,346	16.0
2001	195	3.2	36,903	14.1

Source: Statistics New Zealand

Age structure

Woodend Beach had a more youthful population than Waimakariri District in 2001

Table A2: Age structure of the population of Woodend Beach - 2001

	Woodend Beach per cent of population	Waimakariri District per cent of population
0 - 14 years	25.0	23.6
15- 64 years	67.2	64.1
65 years & over	7.8	12.2
Total number of persons	192	36,906

Source: Statistics New Zealand

Dependency ratio: 0.49 (Woodend Beach), 0.56 (Waimakariri District).

Sex ratio (M/F): 0.97 (Woodend Beach), 0.97 (Waimakariri District).

Ethnic composition

The ethnic composition of Woodend Beach's population was similar to that of the district's population.

Table A3: *Ethnic composition of the population of Woodend Beach - 2001*

Ethnic Group	Woodend Beach per cent of responses	Waimakariri District per cent of responses
European	89.6	89.9
Maori	6.0	6.3
Pacific Island	-	0.5
Asian	-	0.8
Other	-	0.2
Ethnicity not specified	4.5	2.3
Total number of responses	201	38,538
Usually resident population	192	36,906

Note: Where people reported more than one ethnic group, they were counted in each applicable group.

Source: Statistics New Zealand

Education

Residents of Woodend Beach had relatively fewer tertiary qualifications than the district's residents in 2001.

Table A4: *Highest educational qualifications held by the residents of Woodend Beach - 2001*

Highest educational qualification	Woodend Beach per cent of residents	Waimakariri District per cent of residents
university & other tertiary	22.4	24.9
secondary	38.8	35.1
no qualifications	26.5	28.3
not specified	12.2	11.7
Total number of persons	147	28,191

Source: Statistics New Zealand

Occupational status

Just over a quarter (26 per cent) of Woodend Beach's workers were engaged in higher status occupations in 2001, and about a fifth (19 per cent) had service and sales occupations.

Table A5: *Occupational status of the workforce of Woodend Beach - 2001*

Occupational category	Woodend Beach per cent of workforce	Waimakariri District per cent of workforce
legislators/administrators/managers	12.9	11.1
professionals & technicians	13.0	20.8
clerks	9.7	11.6
service & sales	19.4	13.4
agriculture & fishery	6.5	11.0
trades workers/plant& machine/ elementary	38.7	32.0
Total number of persons	93	18,441

Source: Statistics New Zealand

Labour force status

The proportion of residents of Woodend Beach (6 per cent) who reported that they were unemployed in 2001 was twice that of the district's residents (3 per cent).

Table A6: Labour force status of residents of Woodend Beach - 2001

Labour force status	Woodend Beach per cent of residents	Waimakariri District per cent of residents
Employed full-time	45.8	49.4
Employed part-time	14.6	16.0
Unemployed	6.3	3.0
Not in labour force	27.1	29.9
Labour force status not specified	6.3	1.6
Total number of persons	144	28,188

Source: Statistics New Zealand

Employment status

In 2001 Woodend Beach's workforce had a comparatively higher proportion of paid employees than the Waimakariri District's population.

Table A7: Employment status of residents of Woodend Beach - 2001

Employment status	Woodend Beach per cent of workforce	Waimakariri District per cent of workforce
Paid employee	79.3	73.8
Employer	6.9	8.0
Self employed, not employing others	10.3	12.9
Unpaid work in family business	3.4	3.7
Employment status not specified	-	1.5
Total number of persons	87	18,441

Source: Statistics New Zealand

Employment by sector

The community/social/personal sector provided 29 per cent of jobs for workers resident in Woodend Beach, while the manufacturing and wholesale/retail/hospitality sectors both provided 25 per cent of jobs.

Table A8: *Sectoral employment of the workforce of Woodend Beach - 2001*

Sector	Woodend Beach per cent of workforce	Waimakariri District per cent of workforce
Agriculture, forestry & fishing	3.6	11.0
Mining	-	0.1
Manufacturing	25.0	16.6
Electricity/gas/water supply	-	0.4
Construction	3.6	7.4
Wholesale/retail/hospitality	25.0	22.7
Transport/communications	-	5.9
Finance/business	14.3	10.4
Community/social/personal	28.5	21.3
Not specified	-	4.5
Total number of persons	84	18,438

Source: Statistics New Zealand

Family and household types

Although 'two parent' families predominated at Woodend Beach in 2001, the proportion of 'one parent' families was relatively higher than for Waimakariri District as a whole (17 per cent cf. 13 per cent).

Table A9: *Family Types at Woodend Beach - 2001*

Family type	Woodend Beach per cent of families	Waimakariri District per cent of families
Couple only	38.9	43.3
Two parent family	44.4	43.6
One parent family	16.7	13.1
Total number of families	54	10,662

Source: Statistics New Zealand

'One person' households comprised about 30 per cent of the total number of households at Woodend Beach in 2001, while they only represented 19 per cent of households in Waimakariri District.

Table A10: *Household Types at Woodend Beach - 2001*

Household type	Woodend Beach per cent of households	Waimakariri District per cent of households
One family	63.0	76.4
Two families	-	1.1
Non family	3.7	2.5
One person	29.6	19.1
Not specified	3.7	0.9
Total number of households	81	10,662

Source: Statistics New Zealand

Household income

A third of households at Woodend Beach reported that their annual incomes were \$20,000 and under at the 2001 census. Households at Woodend Beach had relatively lower incomes than the district's households.

Table A11: Distribution of household incomes of Woodend Beach - 2001

Household income range	Woodend Beach per cent of households	Waimakariri District per cent of households
\$20,000 & under	33.3	19.0
\$20,001 - \$50,000	40.7	34.4
\$50,001 & over	18.5	31.4
Not specified	7.4	15.2
Total number of households	81	13,536

Source: Statistics New Zealand

Government benefits

The number of government benefits reported by residents of Woodend Beach in 2001 as a proportion of the population of Woodend Beach aged over 14 years was 33 per cent (cf. 37 per cent for Waimakariri District). The main types of government benefits residents of Woodend Beach received were national superannuation (38 per cent of total benefits cf. 43 per cent for Waimakariri District), the community wage for job seekers (13 per cent of total benefits cf. 11 per cent for Waimakariri District) and the community wage for sickness beneficiaries (13 per cent of total benefits cf. 4 per cent for Waimakariri District).

Dwelling tenure

The tenure of dwellings at Woodend Beach in 2001 was very similar to the pattern for Waimakariri District.

Table A12: Tenure of dwellings at Woodend Beach - 2001

Form of tenure	Woodend Beach per cent of dwellings	Waimakariri District per cent of dwellings
Owned or partly owned	74.1	78.6
Not owned	18.5	18.5
Not specified	7.4	3.0
Total number of dwellings	81	13,539

Source: Statistics New Zealand

Motor vehicles

Households at Woodend Beach had access to a relatively fewer number of motor vehicles than their counterparts at the district level. Forty-six per cent of Woodend Beach's households had access to two or more motor vehicles compared with 62 per cent for the district's households.

Table A13: Motor vehicles per household at Woodend Beach - 2001

	Woodend Beach per cent of households	Waimakariri District per cent of households
No motor vehicles	-	4.9
One motor vehicle	46.2	30.8
Two motor vehicles	34.6	42.5
Three or more motor vehicles	11.5	19.6
Not specified	7.7	2.1
Total number of households	78	13,539

Source: Statistics New Zealand

PINES-KAIRAKI BEACH

Population change (URP) 1986-2001

The population of Pines-Kairaki Beach grew at a much slower rate than the district's population between 1991 and 2001. Pines-Kairaki Beach had 669 residents in 2001.

Table A14: Changes in Usually Resident Population of Pines-Kairaki Beach 1986-2001

Census Year	Pines-Kairaki Beach		Waimakariri District	
	Number	% change over five years	Number	% change over five years
1986	561	-	25,608	-
1991	609	8.6	27,873	8.9
1996	648	6.4	32,346	16.0
2001	669	3.2	36,903	14.1

Source: Statistics New Zealand

Age structure

People aged 15-64 years comprised over two-thirds of the population of Pines-Kairaki Beach in 2001. Children were a lower proportion of the population compared with Waimakariri District's population, while people 65 years and over were a slightly higher proportion of the population.

Table A15: Age structure of the population of Pines-Kairaki Beach - 2001

	Pines-Kairaki Beach per cent of population	Waimakariri District per cent of population
0 - 14 years	18.6	23.6
15- 64 years	67.3	64.1
65 years & over	14.2	12.2
Total number of persons	669	36,906

Source: Statistics New Zealand

Dependency ratio: 0.49 (Pines-Kairaki Beach), 0.56 (Waimakariri District).

Sex ratio (M/F): 1.17 (Pines-Kairaki Beach), 0.97 (Waimakariri District).

Ethnic composition

The proportion of residents of Pines-Kairaki Beach indicating they had some degree of Maori ancestry was 13 per cent which was over double the proportion for Waimakariri District (6 per cent).

Table A16: Ethnic composition of the population of Pines-Kairaki Beach - 2001

Ethnic Group	Pines-Kairaki Beach per cent of responses	Waimakariri District per cent of responses
European	84.0	89.9
Maori	13.1	6.3
Pacific Island	0.8	0.5
Asian	0.4	0.8
Other	-	0.2
Ethnicity not specified	1.6	2.3
Total number of responses	732	38,538
Usually resident population	669	36,906

Note: Where people reported more than one ethnic group, they were counted in each applicable group.

Source: Statistics New Zealand

Education

Almost two-fifth's of residents of Pines-Kairaki Beach reported they held no educational qualifications in 2001. Overall the residents of Pines-Kairaki Beach held relatively fewer educational qualifications than the district's residents.

Table A17: Highest educational qualifications held by the residents of Pines-Kairaki Beach - 2001

Highest educational qualification	Pines-Kairaki Beach per cent of residents	Waimakariri District per cent of residents
university & other tertiary	17.6	24.9
secondary	30.2	35.1
no qualifications	39.0	28.3
not specified	13.2	11.7
Total number of persons	546	28,191

Source: Statistics New Zealand

Occupational status

Over half of Pines-Kairaki Beach residents were engaged in blue collar occupations in 2001 (cf. 43 per cent for Waimakariri District), whereas only 23 per cent of them had higher status white collar occupations (cf. 32 per cent for Waimakariri District).

Table A18: Occupational status of the workforce of Pines-Kairaki Beach - 2001

Occupational category	Pines-Kairaki Beach per cent of workforce	Waimakariri District per cent of workforce
legislators/administrators/managers	6.8	11.1
professionals & technicians	16.5	20.8
clerks	11.7	11.6
service & sales	13.6	13.4
agriculture & fishery	3.9	11.0
trades workers/plant& machine/ elementary	47.6	32.0
Total number of persons	309	18,441

Source: Statistics New Zealand

Labour force status

Pines-Kairaki Beach had a higher proportion of its residents (37 per cent) who indicated they were not in the labour force in 2001 than Waimakariri District (30 per cent). The proportion of residents of Pines-Kairaki Beach who reported they were unemployed was also much higher (6 per cent) than the district rate (3 per cent).

Table A19: Labour force status of residents of Pines-Kairaki Beach - 2001

Labour force status	Pines-Kairaki Beach per cent of residents	Waimakariri District per cent of residents
Employed full-time	46.2	49.4
Employed part-time	9.9	16.0
Unemployed	5.5	3.0
Not in labour force	37.4	29.9
Labour force status not specified	1.1	1.6
Total number of persons	546	28,188

Source: Statistics New Zealand

Employment status

The workforce of Pines-Kairaki Beach had relatively more paid employees and relatively fewer employers and self employed persons than the district's workforce in 2001.

Table A20: Employment status of residents of Pines-Kairaki Beach - 2001

Employment status	Pines-Kairaki Beach per cent of workforce	Waimakariri District per cent of workforce
Paid employee	84.3	73.8
Employer	3.9	8.0
Self employed, not employing others	8.8	12.9
Unpaid work in family business	1.0	3.7
Employment status not specified	2.0	1.5
Total number of persons	306	18,441

Source: Statistics New Zealand

Employment by sector

Over a quarter of jobs held by residents of Pines-Kairaki Beach in 2001 were provided by the manufacturing sector. The wholesale/retail/hospitality sector (23 per cent) and the community/social/personal sector (20 per cent) were also important sources of employment for the settlement's residents.

Table A21: Sectoral employment of the workforce of Pines-Kairaki Beach - 2001

Sector	Pines-Kairaki Beach per cent of workforce	Waimakariri District per cent of workforce
Agriculture, forestry & fishing	2.9	11.0
Mining	-	0.1
Manufacturing	25.5	16.6
Electricity/gas/water supply	-	0.4
Construction	9.8	7.4
Wholesale/retail/hospitality	22.5	22.7
Transport/communications	5.9	5.9
Finance/business	8.9	10.4
Community/social/personal	19.6	21.3
Not specified	4.9	4.5
Total number of persons	306	18,438

Source: Statistics New Zealand

Family and household types

Over half the families at Pines-Kairaki Beach were of the 'couple only' category in 2001, while almost a fifth of families were of the 'one parent' type. 'Two parent' families were a lower proportion of families at Pines-Kairaki Beach than for the district as a whole (29 per cent cf. 44 per cent).

Table A22: Family Types at Pines-Kairaki Beach - 2001

Family type	Pines-Kairaki Beach per cent of families	Waimakariri District per cent of families
Couple only	51.5	43.3
Two parent family	28.8	43.6
One parent family	19.7	13.1
Total number of families	198	10,662

Source: Statistics New Zealand

'One person' households comprised a third of the total number of households at Pines-Kairaki Beach (cf. 19 per cent for Waimakariri District).

Table A23: Household Types at Pines-Kairaki Beach - 2001

Household type	Pines-Kairaki Beach per cent of households	Waimakariri District per cent of households
One family	62.5	76.4
Two families	1.0	1.1
Non family	1.9	2.5
One person	32.7	19.1
Not specified	1.9	0.9
Total number of households	312	10,662

Source: Statistics New Zealand

Household income

Twenty-nine per cent of households at Kairaki-Pines Beach reported annual incomes of \$20,000 and under in 2001. Households at the settlement had relatively lower incomes than the district's households.

Table A24: Distribution of household incomes of Pines-Kairaki Beach - 2001

Household income range	Pines-Kairaki Beach per cent of households	Waimakariri District per cent of households
\$20,000 & under	29.4	19.0
\$20,001 - \$50,000	39.2	34.4
\$50,001 & over	16.7	31.4
Not specified	14.7	15.2
Total number of households	306	13,536

Source: Statistics New Zealand

Government benefits

The number of government benefits reported by residents of Pines-Kairaki Beach in 2001 as a proportion of the population of Pines-Kairaki Beach aged over 14 years was 49 per cent (cf. 37 per cent for Waimakariri District). The main types of government benefits residents of Pines-Kairaki Beach received were national superannuation (36 per cent of total benefits cf. 43 per cent for Waimakariri District), the community wage for job seekers (16 per cent of total benefits cf. 11 per cent for Waimakariri District) and the domestic purposes benefit (10 per cent of total benefits cf. 4 per cent for Waimakariri District).

Dwelling tenure

Just under a quarter of dwellings at Pines-Kairaki Beach were not owned by their occupants in 2001.

Table A25: *Tenure of dwellings at Pines-Kairaki Beach - 2001*

Form of tenure	Pines-Kairaki Beach per cent of dwellings	Waimakariri District per cent of dwellings
Owned or partly owned	71.8	78.6
Not owned	24.3	18.5
Not specified	3.9	3.0
Total number of dwellings	309	13,539

Source: Statistics New Zealand

Motor vehicles

Households at Pines-Kairaki Beach had relatively less access to motor vehicles in 2001 compared to the district's households. Forty-seven per cent of the settlement's households had access to two or more motor vehicles compared with 62 per cent for Waimakariri District.

Table A26: *Motor vehicles per household at Pines-Kairaki Beach - 2001*

	Pines-Kairaki Beach per cent of households	Waimakariri District per cent of households
No motor vehicles	4.9	4.9
One motor vehicle	45.6	30.8
Two motor vehicles	36.9	42.5
Three or more motor vehicles	9.7	19.6
Not specified	2.9	2.1
Total number of households	309	13,539

Source: Statistics New Zealand

WAIKUKUPopulation change (URP) 1986-2001

Between 1986 and 1996 the population of Waikuku grew at a much faster rate than did the population of Waimakariri District. Over the next five years, however, the population of Waikuku grew at a slower rate to 738.

Table A27: *Changes in Usually Resident Population of Waikuku 1986-2001*

Census Year	Waikuku		Waimakariri District	
	Number	% change over five years	Number	% change over five years
1986	390	-	25,608	-
1991	540	38.5	27,873	8.9
1996	690	27.8	32,346	16.0
2001	738	7.0	36,903	14.1

Source: Statistics New Zealand

Age structure

The age structure of the population of Waikuku was relatively younger than the district's population in 2001. The settlement had a higher proportion of children and a lower proportion of elderly people than Waimakariri District.

Table A28: Age structure of the population of Waikuku - 2001

	Waikuku per cent of population	Waimakariri District per cent of population
0 - 14 years	25.8	23.6
15- 64 years	65.4	64.1
65 years & over	8.9	12.2
Total number of persons	738	36,906

Source: Statistics New Zealand

Dependency ratio: 0.53 (Waikuku), 0.56 (Waimakariri District).

Sex ratio (M/F): 1.02. (Waikuku), 0.97 (Waimakariri District).

Ethnic composition

Maori were a relatively higher proportion of Waikuku's residents compared with the district's population in 2001.

Table A29: Ethnic composition of the population of Waikuku - 2001

Ethnic Group	Waikuku per cent of responses	Waimakariri District per cent of responses
European	86.3	89.9
Maori	9.5	6.3
Pacific Island	0.4	0.5
Asian	0.8	0.8
Other	0.4	0.2
Ethnicity not specified	2.7	2.3
Total number of responses	786	38,538
Usually resident population	738	36,906

Note: Where people reported more than one ethnic group, they were counted in each applicable group.

Source: Statistics New Zealand

Education

The residents of Waikuku held relatively more tertiary qualifications than the residents of Waimakariri District.

Table A30: *Highest educational qualifications held by the residents of Waikuku - 2001*

Highest educational qualification	Waikuku per cent of residents	Waimakariri District per cent of residents
university & other tertiary	26.2	24.9
secondary	35.0	35.1
no qualifications	26.2	28.3
not specified	12.6	11.7
Total number of persons	549	28,191

Source: Statistics New Zealand

Occupational status

Thirty-six per cent of the workforce of Waikuku in 2001 had higher status white collar occupations (cf. 32 per cent for Waimakariri District), while another 17 per cent had service and sales occupations (cf. 13 per cent for Waimakariri District).

Table A31: *Occupational status of the workforce of Waikuku - 2001*

Occupational category	Waikuku per cent of workforce	Waimakariri District per cent of workforce
legislators/administrators/managers	12.7	11.1
professionals & technicians	22.9	20.8
clerks	9.3	11.6
service & sales	16.9	13.4
agriculture & fishery	5.1	11.0
trades workers/plant& machine/ elementary	33.1	32.0
Total number of persons	354	18,441

Source: Statistics New Zealand

Labour force status

The proportion of residents of Waikuku who reported they were unemployed was much higher (6 per cent) than the rate for residents of Waimakariri District (3 per cent).

Table A32: *Labour force status of residents of Waikuku - 2001*

Labour force status	Waikuku per cent of residents	Waimakariri District per cent of residents
Employed full-time	50.3	49.4
Employed part-time	14.8	16.0
Unemployed	5.5	3.0
Not in labour force	27.3	29.9
Labour force status not specified	2.2	1.6
Total number of persons	549	28,188

Source: Statistics New Zealand

Employment status

Paid employees comprised just under four-fifth's of Waikuku's workforce in 2001.

Table A33: Employment status of residents of Waikuku - 2001

Employment status	Waikuku per cent of workforce	Waimakariri District per cent of workforce
Paid employee	79.7	73.8
Employer	6.8	8.0
Self employed, not employing others	11.0	12.9
Unpaid work in family business	1.7	3.7
Employment status not specified	0.8	1.5
Total number of persons	354	18,441

Source: Statistics New Zealand

Employment by sector

The main sources of employment for the residents of Waikuku in 2001 were the community/social personal sector (25 per cent), the wholesale/retail/hospitality sector (25 per cent) and the manufacturing sector (18 per cent).

Table A34: Sectoral employment of the workforce of Waikuku - 2001

Sector	Waikuku per cent of workforce	Waimakariri District per cent of workforce
Agriculture, forestry & fishing	3.4	11.0
Mining	-	0.1
Manufacturing	17.8	16.6
Electricity/gas/water supply	-	0.4
Construction	8.5	7.4
Wholesale/retail/hospitality	24.6	22.7
Transport/communications	5.0	5.9
Finance/business	9.3	10.4
Community/social/personal	25.4	21.3
Not specified	5.9	4.5
Total number of persons	354	18,438

Source: Statistics New Zealand

Family and household types

Families of the 'one parent' type represented just under a fifth of all families at Waikuku in 2001. 'Couple only' families, however, were relatively fewer than was the case for the Waimakariri District (35 per cent cf. 43 per cent for the district).

Table A35: Family Types at Waikuku - 2001

Family type	Waikuku per cent of families	Waimakariri District per cent of families
Couple only	35.3	43.3
Two parent family	45.6	43.6
One parent family	19.1	13.1
Total number of families	204	10,662

Source: Statistics New Zealand

In 2001 there was a slightly higher proportion of 'one person' households at Waikuku (22 per cent) compared with the Waimakariri District (19 per cent).

Table A36: Household Types at Waikuku - 2001

Household type	Waikuku per cent of households	Waimakariri District per cent of households
One family	72.6	76.4
Two families	-	1.1
Non family	3.2	2.5
One person	22.1	19.1
Not specified	2.1	0.9
Total number of households	285	10,662

Source: Statistics New Zealand

Household income

Just over two-fifths of Waikuku's households reported annual incomes of between \$20,001 and \$50,000 at the 2001 census.

Table A37: Distribution of household incomes of Waikuku - 2001

Household income range	Waikuku per cent of households	Waimakariri District per cent of households
\$20,000 & under	18.6	19.0
\$20,001 - \$50,000	41.2	34.4
\$50,001 & over	25.8	31.4
Not specified	14.4	15.2
Total number of households	291	13,536

Source: Statistics New Zealand

Government benefits

The number of government benefits reported by residents of Waikuku in 2001 as a proportion of the population of Waikuku aged over 14 years was 42 per cent (cf. 37 per cent for Waimakariri District). The main types of government benefits residents of Waikuku received were national superannuation (29 per cent of total benefits cf. 43 per cent for Waimakariri District), the community wage for job seekers (16 per cent of total benefits cf. 11 per cent for Waimakariri District) and the domestic purposes benefit (13 per cent of total benefits cf. 4 per cent for Waimakariri District).

Dwelling tenure

About a fifth of Waikuku's dwellings in 2001 were not owned by their occupants.

Table A38: Tenure of dwellings at Waikuku - 2001

Form of tenure	Waikuku per cent of dwellings	Waimakariri District per cent of dwellings
Owned or partly owned	74.7	78.6
Not owned	21.1	18.5
Not specified	4.2	3.0
Total number of dwellings	285	13,539

Source: Statistics New Zealand

Motor vehicles

Households at Waikuku had less access to motor vehicles than the district's households in 2001. Fifty-seven per cent of households at Waikuku had access to two or more vehicles compared with 62 per cent for Waimakariri District.

Table A39: Motor vehicles per household at Waikuku - 2001

	Waikuku per cent of households	Waimakariri District per cent of households
No motor vehicles	4.2	4.9
One motor vehicle	34.4	30.8
Two motor vehicles	41.7	42.5
Three or motor vehicles	15.6	19.6
Not specified	4.2	2.1
Total number of households	288	13,539

Source: Statistics New Zealand