

Host Communities: siting and effects of facilities

An analysis of host community experience of the Redruth landfill (Timaru District)

by

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Acknowledgements

This case study has contributed considerable knowledge that is important to a better understanding of the effects which host communities can expect to experience from the operation of a sanitary landfill. The research would not have been possible without the co-operation of all those who were interviewed. The level of willingness to co-operate is worthy of acknowledgement - the research team met with no refusals. The research team wishes to express its gratitude to all those who participated in this case study - the nearby residents, businesses and those enjoying recreational opportunities in the vicinity of the Redruth landfill; also to the other key informants, the operators and administrators of the landfill.

It is to be hoped that this case study may also lead to further improvements in the management of the Redruth landfill, and to building a positive working relationship between those responsible for operating and overseeing the facility and members of its host community.

The research team also expresses its gratitude to the Foundation for Research, Science and Technology for its financial support of the research programme.

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A: Introduction to this case study

Public Good Science Fund Research

The research team at Taylor Baines & Associates was contracted by the Foundation for Research Science and Technology to carry out a piece of social research concerning the siting decisions and community experience of solid waste facilities. The research has been funded out of the Public Good Science Fund.

Spread over three financial years - 1997 to 2000 - the research programme aims to assist the processes of urban and rural planning (as it applies to future solid waste disposal infrastructure) by developing a body of knowledge on social factors that are relevant to the siting and operation of solid waste facilities.

In total, the research programme is intended to answer three core questions -

1. Is there a systematic pattern of solid waste facilities siting in NZ. If so, how would you characterise this historical pattern from the social perspective of host communities?
2. How do actual effects compare with effects that were projected at the time of siting?
3. What have been the longer-term effects on host communities of solid waste operations?

This research on solid waste facilities is part of a longer-term research programme currently being funded by the Public Good Science Fund into the siting and social impacts of a range of facility types. During the period 1997 to 2000, research has been carried out on solid waste facilities - landfills and transfer stations. During 1998 to 2001 other research is focussing on waste water facilities. Please refer to the TBA website - www.tba.co.nz - for more information.

The research programme has received the strong endorsement of Local Government New Zealand, the New Zealand Water and Wastes Association, the Ministry for the Environment, as well as several territorial local authorities.

Reasons for this research programme on facilities and their host communities

It is a common experience that assessing the effects of solid waste facilities at the time of site selection is a contentious process. The debates that surround such assessment activities are often informed more by prejudice and a strategic selection of hearsay information than by well-founded evidence.

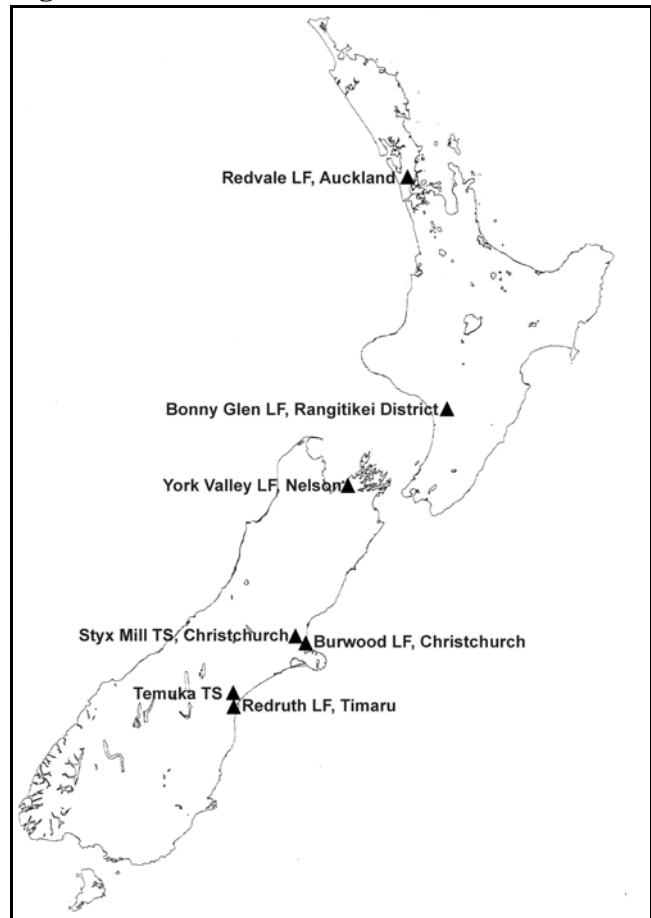
This research aims to address both questions of possible social bias in site selection and lack of experienced-based information relevant to New Zealand communities. It is to be hoped that these objectives will be served by carrying out the research in a setting which is removed from the tensions of resource consent applications, and by a team of independent researchers who have no organisational affiliation with either the developers of such facilities (usually but not always Territorial Local Authorities) or the host communities involved.

Purpose of the case studies

This case study on the Redruth landfill is one of seven such case studies being undertaken as part of this research programme¹, as shown in Figure 1. The case studies were selected to provide a range of relatively recent facilities, from large metropolitan landfills and a transfer station, to the kinds of facilities more familiar in smaller cities and rural areas. As a result, the experience documented in these case studies should provide useful insights into contemporary New Zealand experience.

Each case study has been conducted at a time which avoids conflicts with active resource consent proceedings. Care has been taken in the social assessment research method to provide accurate² and useful descriptions of the effects experienced by host communities, by canvassing a wide range of local observations, by accessing other relevant data sources where possible to corroborate the observations of neighbours, and by engaging in a process of feeding back preliminary findings for checking and validation by the research participants. As a result, the experience documented in these case studies should neither overstate nor understate the experience of the host communities involved. This is important, if the research is to assist participants in future planning.

Figure 1: New Zealand Case Studies



Nevertheless, the case studies each represent experience at a particular point in time. The research process itself, and the case studies resulting from the research, have the potential to trigger changes in the way the facilities are operated and managed. Thus it is important to interpret the findings of each case study in the context of the way the facility was operated and managed at the time of the case study fieldwork³.

It is also important to keep in mind the perspective of this research - the host community perspective. Primary emphasis has been put on capturing the experience of members of the host community - the nearby residents, businesses and those enjoying recreational opportunities in the vicinity of the Redruth landfill. It is their experience of the off-site effects such as odour, dust, litter and noise, and the impacts of such effects that will be useful to others contemplating the siting of a new solid waste facility. By the

¹ The full list of case studies includes Burwood Landfill, Redruth Landfill, Bonny Glen Landfill, Redvale Landfill, York Valley Landfill, Styx Mill Transfer Station, Temuka Transfer Station.

² The use of percentage figures in this case study is not intended to imply statistical analysis. Rather it should be interpreted for comparative purposes merely as indicating the proportion of respondents in any particular area of interviewing who gave a specified response.

³ The fieldwork dates are noted explicitly in the case study report. Furthermore, the report attempts to describe as fully as possible the operating regime at the time of the case study.

same token, there are likely to be some off-site effects such as risks to groundwater quality that will not necessarily be informed by a focus on neighbours' experience, simply because such phenomena are not often readily detectable to casual observation, even if they do occur.

Methodology for the case studies

The research method drew on the practical and theoretical approach to social assessment described in Chapter Four of "Social Assessment: theory, process & techniques" (Taylor et al., 1995). Stages in the research included scoping the particular cases to clarify the appropriate time frame and communities of interest, community profiling, a structured survey of nearby residents and business people, in-depth key informant interviews, and accessing a range of existing data sources.

A structured questionnaire was developed to gather detailed information about the experience of many individuals living in the host community. The questionnaire explored people's experience of day-to-day operational effects of the landfill, their perceptions of how the presence of the landfill has impacted on the longer-term development of the host community, and their knowledge of what has happened in their community during the years prior to and since the landfill was established. The detailed analysis is descriptive and sometimes quantitative, but not statistical in nature⁴.

In carrying out the comparative case assessments, the assessment team had to address several issues relevant to interpreting the results and their usefulness in providing valid comparative information. These included the debate about 'perceived' or 'real' effects, the need for corroboration, and the importance of timing or context as a potential influence on individual responses.

The assessments focussed on people's experiences of living or working near waste management facilities. The results are therefore based on a large body of individual perceptions of effects. In some feedback discussions, the distinction was made that these effects are "*only people's perceptions; they're not necessarily real.*" The question arises therefore as to what is the difference between a 'perceived' effect and a 'real' effect. Can 'perceived' effects ever become 'real' effects? In practical terms, the assessments identified clearly the proportions of those interviewed who experienced certain types of effects. Furthermore, wherever possible, the assessment sought to investigate these effects from other respondents and from independent sources (e.g. local key informants; secondary data records) or different perspectives (e.g. the facility operator)⁵. As researchers, it was pleasing to note how, in the great majority of cases, neighbours' experience was strongly corroborated by the perceptions and experience of the facility operator.

A number of factors have a bearing on individual experiences. Different people have different thresholds for noticing effects depending, for example, on their ability to hear or to smell, or on their perception of what is 'exceptional'. Increasing sample size addressed this factor. Different living or recreational patterns are likely to influence people's experience of effects - whether they are on the property all day, every day, or working off the property. Day-time interviewing addressed this factor by increasing the likelihood of including individuals with a relatively high rate of occupancy. People get used to effects

⁴ A statistically-based analysis would have increased the scale of field work and cost several fold.

⁵ As a matter of assessment methodology, we have adopted the stance that unless more than two individual neighbours reported and corroborated the same effect, or unless a neighbour's observation could be corroborated by an independent source, the effect would not be reported in detail, but simply noted. This reflects the stance that, while social assessment acknowledges the importance of individual observations, such observations still need to be subject to verification.

after a while - they can seem less exceptional. Following unprompted questions with prompted questions addressed this factor, by allowing interviewees ‘a second chance’ to respond.

Does the distinction between ‘perceived’ and ‘real’ effects matter? The primary purpose and value of comparative case assessment is to answer two types of questions - (i) if neighbours around a facility are experiencing certain effects, and finding that they have unacceptable impacts, what can be done to reduce or eliminate the effect, or make it less likely to happen? and (ii) if neighbours around Existing Facility A experienced certain effects and impacts from its operation, what is the likelihood that neighbours around Potential Facilities B, C or D will experience similar effects and impacts? In either situation, whether such effects are labelled as ‘perceived’ or ‘real’ is probably immaterial. However, from a “technical” perspective, replication of reported effects is important to their validation, while from a “political” perspective, the perceptions of just a few people affected can be sufficient to galvanise social action.

It is also important to remember that technical experts are not necessarily in a position to offer any more than assessments of ‘perceived’ effects. In the case of technical experts, their perceptions are derived with the aid of technical lenses (i.e. frameworks for analysis used by the technical expert). For example, an acoustical engineer can provide measures and predictions of likely noise levels at certain distances away from the source of the noise. The acoustical engineer is not usually in a position to draw any inferences as to likely social impacts associated with these levels of noise.

The tendency for potentially affected parties to distort or exaggerate the likelihood of effects when participating in EIA activities is not an uncommon experience for SIA practitioners. Indeed, in one of the comparative case studies, background documentation from an environmental tribunal declared this point explicitly. In these comparative case assessments, this factor was addressed by ensuring that all the case studies were carried out on facilities which had no consent applications or reviews in progress.

Outputs of this research programme

Outputs from this research have taken the form of public presentations and discussion sessions, as well as a range of hard copy formats.

The latter include a series of research Working Papers, conference papers, and an abbreviated summary document for each case study.

The research provider - Taylor Baines & Associates

Taylor Baines & Associates has been a private provider of research, consulting and training services since 1989. The firm specialises in social research and the application of social assessment methods to a wide variety of issues in community development.

B: History and description of the facility

Location

The Redruth Landfill has been the only refuse disposal facility for Timaru District since 1996 (see Figure 2). It is located near the coast, just south of Patiti Point, and inside the southern boundary of Timaru City. The current landfill site is immediately adjacent to several areas of land that have been used for refuse disposal since the 1940s (see Figure 3). Thus, this locality has a long history of use for refuse disposal.

Figure 2: Refuse disposal network for Timaru District

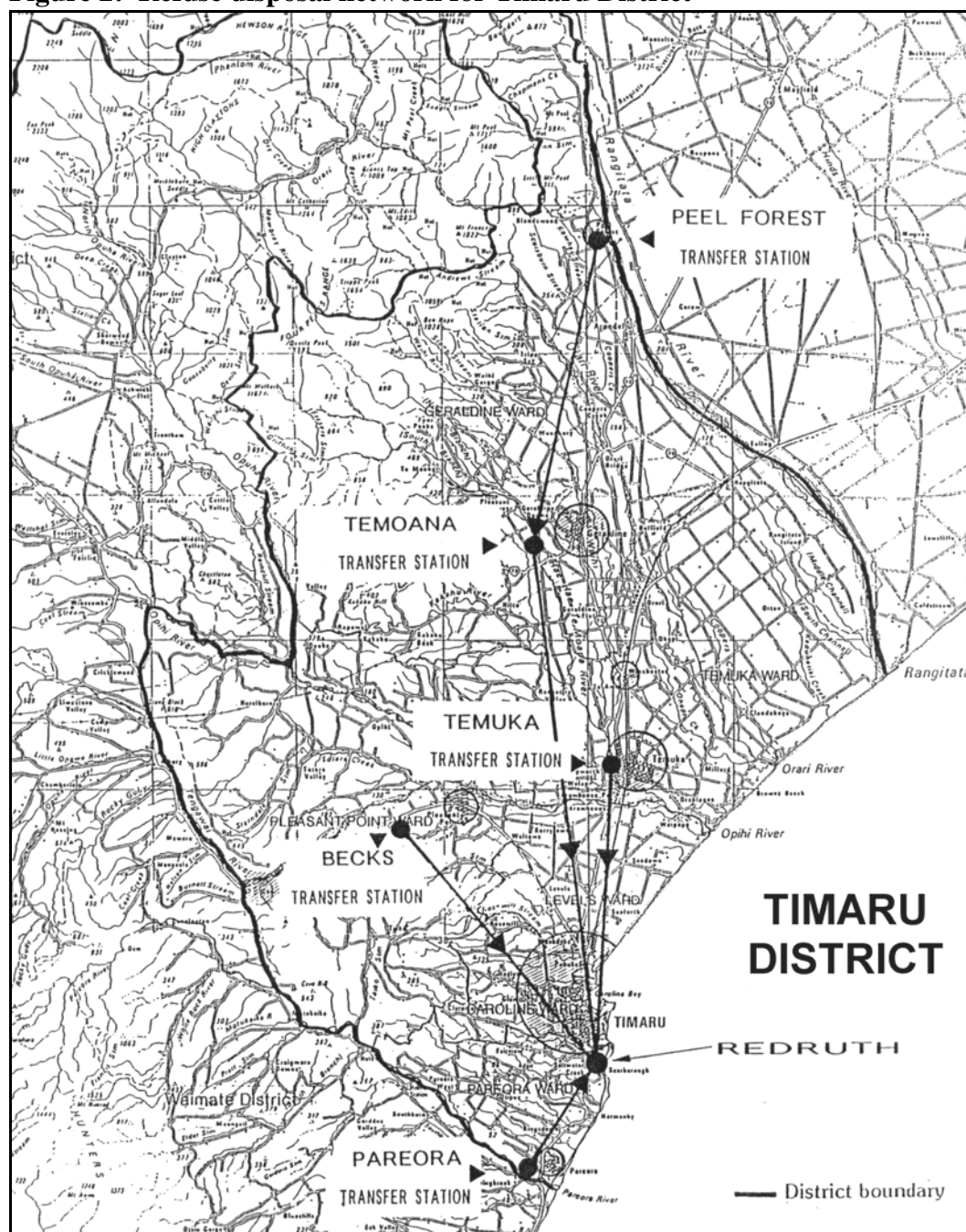
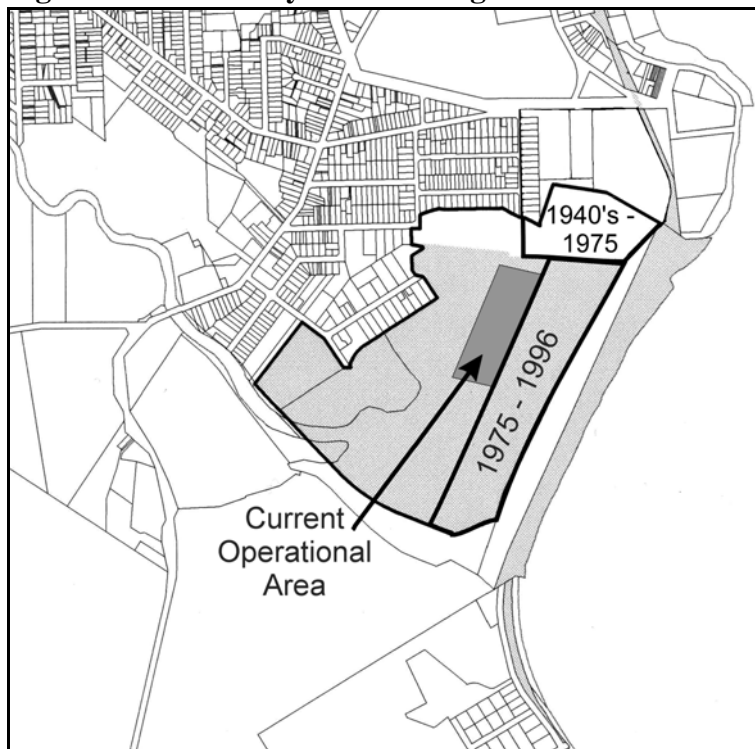
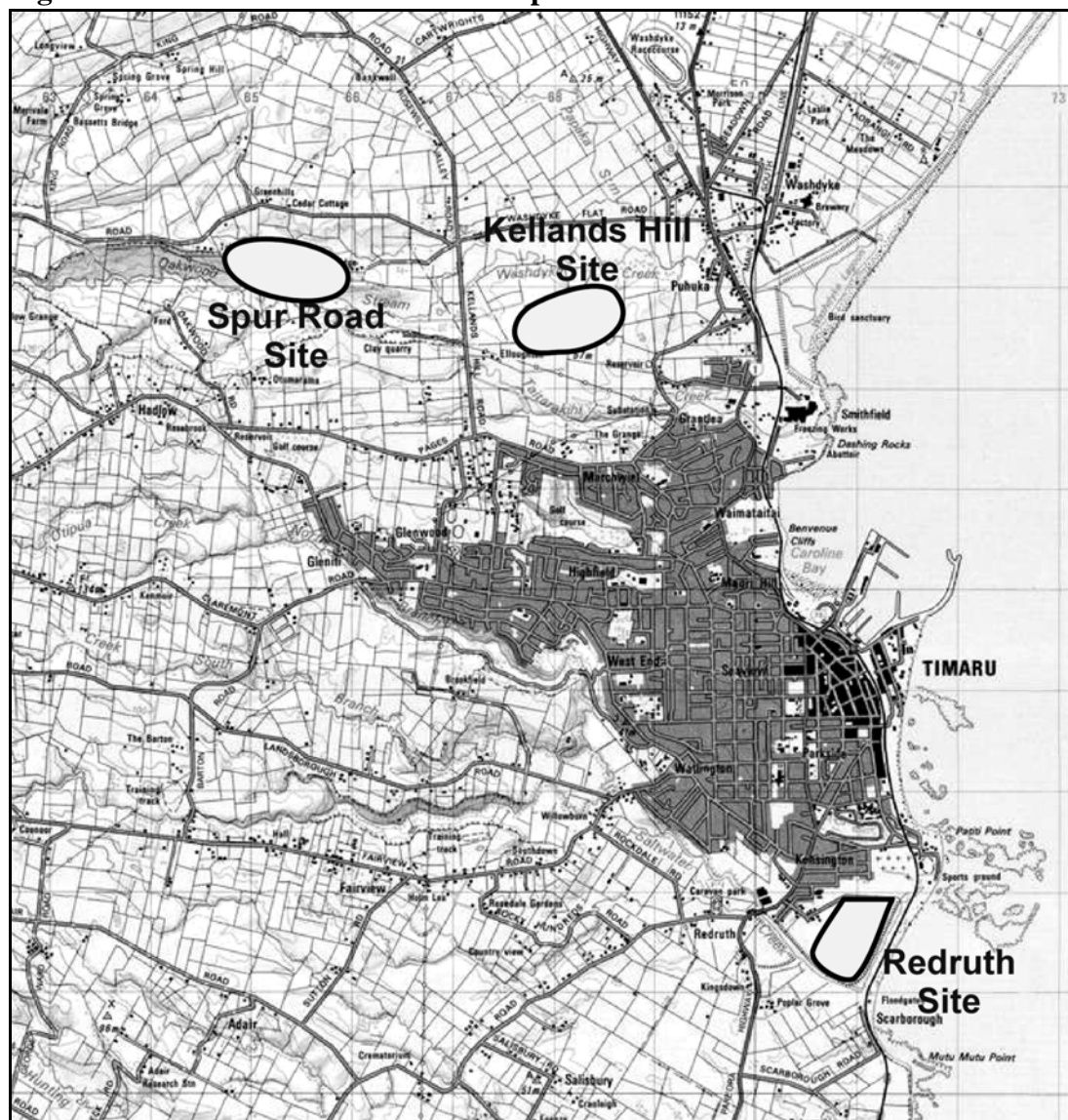


Figure 3 History of landfilling at Redruth

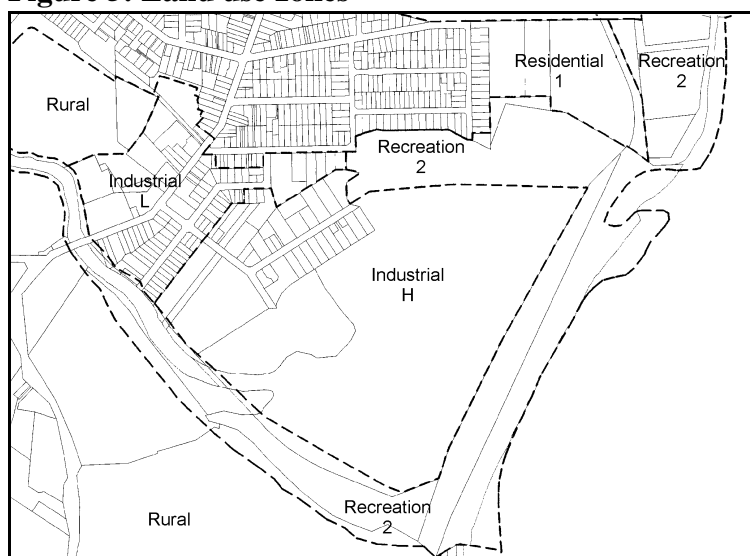
Planning

Planning by the Timaru City Council (TCC) began in late 1987, under the Town and Country Planning Act. Two alternative sites were short-listed, both on the north side of the City - referred to as Kellands Hill and Spur Road (see Figure 4). According to the technical assessment of the three sites⁶, the principal advantages of the Redruth site relate to protection of groundwater supplies, stormwater management and distance from Timaru Airfield. Other advantages recorded in planning documentation include the availability of ample cover material on site, the land not being in productive use and already in Council ownership, the ready availability of site services from the nearby industrial estate, and the fact that the locality was long familiar with land-filling operations. However, it was also noted that the Redruth site had by far the highest visual exposure to nearby residents of all three sites considered.

⁶ Royds Consulting (1988): Report on Solid Waste Management Investigations prepared for the Timaru District Council.

Figure 4: Sites short listed in selection process

The Redruth site was on land designated for Heavy Industrial Use (see Figure 5), surrounded on north, east and southern sides by a buffer of land and waterway with a recreational designation, and to the west by land designated for Light Industrial Use. The closest residential land was several hundred metres to the north, on a south-facing raised terrace - the suburb of Redruth.

Figure 5: Land use zones

The following environmental effects and issues related to landfill operations were projected at the time of site selection -

- *noise* from the site
- *dust* from the site
- *visual impacts* from the increased height of the proposed extension, and the *risk that landscaping obligations would not be honoured*
- *insufficient soil to provide adequate cover material*
- *offensive odours* from the landfill operation
- *windblown litter*
- *loss of residential amenity* including increasing *nuisances from vermin, birds and flies*
- *spoiling the rural (farming) ambience*
- *increased frequency of flooding* due to the loss of floodwater storage area and increased frequency of spilling over flood banks
- *reduced water quality in Saltwater Creek* as a result of increased siltation rates and reduced channel capacity
- *increased traffic volumes*
- the *risk of leachate escape*

The following longer-term effects and issues of using the Redruth site were projected at the time of site selection -

- *community stigma* associated with proximity to the landfill
- *depreciating land values*
- *preclude future industrial development* in the Redruth area

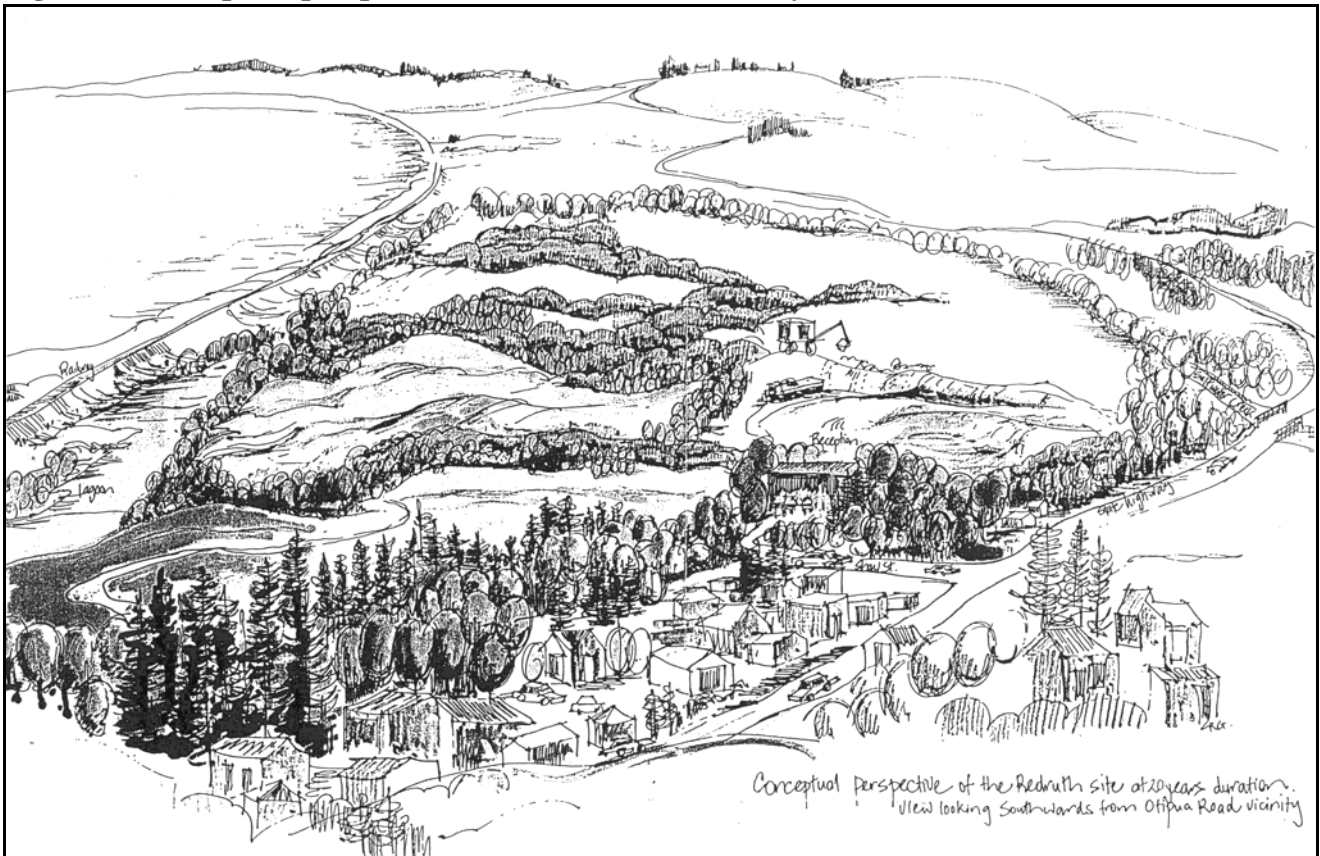
Under original TCC plans, the Redruth landfill was expected to have a 40-year operating life. When local authority amalgamation occurred, and the Redruth landfill became the disposal facility for the whole of Timaru District, the expected life of the landfill reduced to 30 years. Timaru District is now taking the solid waste for disposal from both Waimate District and Mackenzie District, reducing the expected life-span of the Redruth landfill to 20-23 years. A subsequent Solid Waste Strategy, which led to the establishment of a network of five transfer stations throughout Timaru District, proposed an objective of waste minimisation in order to extend the residual life-span of the Redruth landfill.

The transfer stations have been operating since 1995, prior to the opening of the most recent phase of landfilling at Redruth.

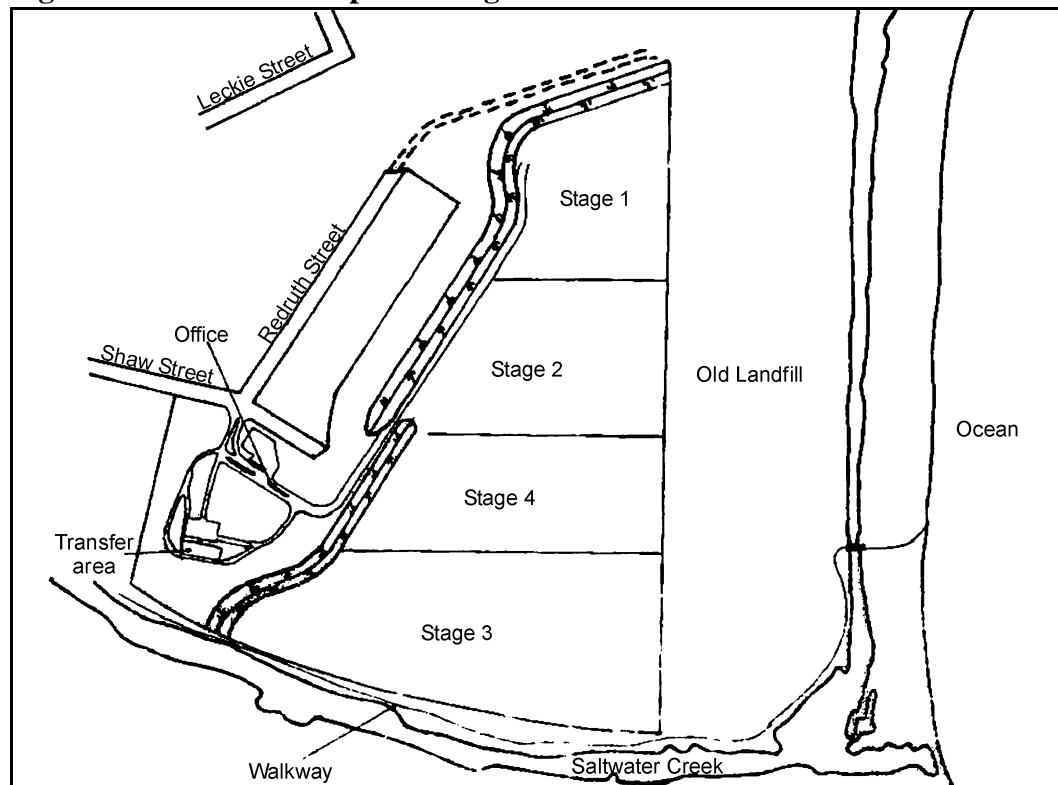
Site development and access

Site development began in 1994 with the construction of the environmental buffer embankment and the establishment of landscaping and irrigation systems to provide future visual screening. The intended long-term visual effect of this planting, when viewed from an elevated position to the north of the landfill (in the vicinity of Otipua Road) is indicated by Figure 6.

Figure 6: Conceptual perspective of Redruth site after 20 years



Site development is expected to proceed in four stages, as shown in Figure 7. Stages 1 and 2 have been designed in detail.

Figure 7: Landfill development stages

Members of the public are prohibited from access to the landfill. This is intended to allow better control of a smaller working tip face and more regular covering. Instead, they deliver waste to a transfer station at the Shaw Street entrance of the landfill.

The present situation (1999)

The Redruth Landfill is staffed on a full-time basis, and open six days a week.

Vehicle numbers bringing waste to the site have declined markedly from historical levels, due to the introduction of wheelie bin services and dumping charges. Records of historical vehicle numbers are compared with the most recent year - see Table 1. It should be noted that light vehicles (i.e. private cars) no longer access the tip face. Instead they dump their loads at the transfer station located at the entrance to Redruth Landfill.

Table 1 Trends in vehicle numbers bringing waste to Redruth

Year	# light vehicles	#trucks	# total	Average #/day
1987	79,581	11,476	91,057	294
1990	44,828	8,926	68,703	222
1999	18,317	14,759	33,076	107

Source: TDC records

It can be seen from Table 1 that vehicle numbers have actually fallen to approximately one third of their historical levels.

Approximately 2,200 tonnes/yr of garden and other organic waste material is currently being composted and stockpiled at the Redruth site, with some being used for landscaping and rehabilitation work around the new landfill boundary. Marketing and sales efforts await the finalising of the District's Solid Waste Strategy.

Liaison between the facility and the host community

While some consultation occurred during the planning phase for the facility, no formal liaison exists between operators or administrators of the Redruth Landfill and its host community. The TDC Solid Waste manager described '*informal contacts*' with the Southend Ratepayers Association.

Monitoring

Internal monitoring

'Internal monitoring' at the Redruth landfill is carried out by the operations staff and involves a series of Daily Checks⁷ and Weekly Checks⁸. The monitoring system is described as 'indicative' rather than completely 'accurate' - for two reasons. Firstly, the numbers recorded against each category do not refer to the total number of separate incidents, but rather to the number of days when problems arose that were not rectified by the end of that day. Secondly, operating staff complete the monitoring sheets; therefore it is possible that some incidents which might reflect badly on their performance may not be recorded. The purpose of this 'internal monitoring' system is described as "*to provide an indicative view of what are the problems and how long it takes to sort them out*". There is however a difference between internal and external perceptions of problems. It is notable that during the same period as that covered by the formal log of complaints described below, there is no correspondence with respect to the relative incidence of odour and litter problems. Internal monitoring suggests that litter control problems were many times more prevalent than odour problems, where as the log of complaints suggests the opposite pattern.

It is acknowledged by the waste management administrators that this system of monitoring and rectifying problems needs improvement.

Log of complaints

The computer-based log of complaints maintained by the Timaru District Council's Solid Waste Engineer Manager logged 17 complaints concerning the landfill operation at Redruth during a period of 20 months between November 1996 and August 1998. Of these 17 complaints, 12 relate to odour, 3 to litter, and 2 to seagulls. The log notes that two of the complaints were received via the Canterbury Regional Council, and one resulted from a telephone call to the Mayor of Timaru. The log provides a brief description of the nature of the complaint and the resulting action.

⁷ Daily Checks are made under the following headings - Safety; Uniform; Compactor shed doors; Site amenities; Security; Skips on site; Traffic; Roading; Leachate system; Stormwater system; Waste categorisation; Litter control; Fire; Odour

⁸ Weekly Checks are made under the following headings - Wash plant; Garage swept; Communication; Leachate system; Stormwater system; Sedimentation pond; Litter collection; Litter fence; Nuisances

Canterbury Regional Council

The Canterbury Regional Council operates a 24-hour hotline service which screens calls for complaints. A complaint call is dealt with by a monitoring officer who will determine whether to phone the complainant and then visit them, and if necessary will then visit the origins of the nuisance. CRC records have been stored on computer database during the past two years. In that time (till December 1998) three entries exist for odour complaints from the Redruth landfill.

Summary of the system for managing complaints

The existing (1999) system for logging complaints appears haphazard, and not well designed to achieve speedy and effective resolution of problems that arise at the Redruth landfill. It also does not encourage affected parties to communicate concerns in a timely and objective manner.

During enquiries made for this case study, four separate logs of complaints were provided - by the Solid Waste Manager, the Environmental Health Officer, and the Customer Service Department - all of the Timaru District Council, and by the Canterbury Regional Council. While there were some common entries, there appeared to be little consistency or coherency across all sets of records. Concerns were expressed by TDC staff about the lack of rigour achieved through internal auditing procedures and also about the apparent arbitrariness of decisions made on the telephone switchboard as to whom the complaints should be directed.

This represents a very honest appraisal of existing arrangements (1999), and the need for improvements was acknowledged. The Solid Waste Manager expressed the view that the TDC prefers to have complaints checked out externally to the Waste Management Section, either by the Environmental Health Officer or the regional council, so as not to be seen to be covering up any deficiencies in landfill operation.

C: The host community

Overview

Redruth is the southernmost suburb of Timaru City, with Saltwater Creek being the southern boundary of the City. Land further south is currently zoned for rural uses. Redruth is in a part of Timaru traditionally referred to as the South End, clearly demarcated in local perceptions as that part of the City south of North Street. The suburb of Redruth itself is separated from the neighbouring suburb of Parkside to the north by the Timaru Gardens. Its residential areas cover a broad, south-facing terrace which extends from the cemetery and Redruth Park, bounded by the coastal railway line in the east, across the State Highway (at this point called King Street) to merge with the suburb of Watlington in the west.

The locality of Redruth has a long association with solid waste disposal, dating back to the 1940s. Prior to that time, the flat land north of Saltwater Creek was the site of Timaru airfield. Originally, it was the Otipua Lagoon.

Land Use

The locality around the Redruth Landfill comprises a mixture of land uses, as shown in Figure 5. While the landfill itself occupies land that is zoned Industrial H and is also designated for a landfill site in the District Plan, there is land zoned for either recreational uses or residential occupation in close proximity.

Much of the flat land on the north side of Saltwater Creek is relatively low lying and has experienced flooding. This is compounded by drainage limitations, due to the fact the Saltwater Creek does not have a permanent opening to the sea. Consequently, flood control banks were put in place in the past. West of King Street, land is still low lying and a private contractor has been dumping hard-fill in an effort to raise the ground level and avoid further flooding.

Two sides of the landfill area are bounded by recreational space - the Saltwater Creek and nearby wetlands area to the south, and the coastal walkway which continues along the eastern edge to the mouth of Saltwater Creek. It is intended that the walkway, which currently begins at SH1 and takes people eastwards to the sea, will become part of a longer walkway extending westwards along Saltwater Creek. Another section of this walkway - from Mowbray Street to Coonoor Road - was developed in 1999. Saltwater Creek itself is used by the local rowing club. South Beach, which can be accessed by road either from the north near the Caledonian Sports Ground or from the south via the Parade at Scarborough, is popular for surfing.

Immediately to the north of the site is more land zoned recreational, including Redruth Park. In addition to this, land that is part of the landfill's northern and eastern buffer area is used for off-road motorbike riding. The Caledonian Sports Ground (soccer and pistol shooting) is less than one kilometre to the north east. The main Timaru cemetery is just north of Redruth Park, bounded on the north side by Domain Avenue. The southern parts of the landfill property remain accessible to several recreational clubs, including the Model Aeroplane Club.

On a south-facing terrace, the nearest residential areas (Cambridge and Hertford Streets) immediately overlook the landfill site. Residential areas further west on the same terrace (along Otipua Road) give some long-distance views of the landfill site.

Immediately west of the site (Redruth and Shaw Streets) is an area of industrial development, some of which has been in existence for many years. Heavy industry gives way to generally light industry moving further west (Rothwell, Leckie and King Streets) with a few residential properties (23) remaining in this area, and a foundry on the western side of King Street. Although the locality has flooded on rare occasions, supplies of fresh water are generally limited. Thus industries requiring large quantities of water have not located in Redruth.

The scope for industrial and commercial expansion in the vicinity of the Redruth landfill is limited also by the remaining land available. District Council planners envisage that future emphasis is more likely to be on developing recreational amenities in this area.

Community development - city and local perceptions

A number of Timaru key informants, as well as long-time residents of Redruth, discussed the issue of locality-based social stigma. The issue arose specifically in relation to the proximity of Redruth suburb with the landfill site, and these responses will be analysed and discussed later on in Section E. However, the issue also arose more generally in discussions about Redruth in its broader community context of the Timaru City and its development.

Numerous interviews made the point that the prejudice and distinction being discussed in the context of this case study of Redruth and its landfill, actually applies to the whole South End area of Timaru. It was suggested that this situation has deep-rooted origins in the early settlement of Timaru, when the north was settled predominantly by middle class Protestant English, while the south of the city was settled predominantly by working class Catholic Irish labourers and their families. It was said that in the early days Timaru actually had two town centres, although the city has since coalesced. Nevertheless, the social distinctions have always been reinforced by the topographical difference between north-facing and south-facing suburbs.

Several key informants expressed the view that these traditional prejudices - the notion that the south end is less desirable than the north end of the City - have continued to be reinforced over the years in the media, and in the real estate sector.

The history of the southern part of the city has been closely associated with 'the dump' for over half a century. The earlier, unsanitary dumps with their very obvious off-site effects, certainly did nothing to dispel negative connotations. However, community observers point to other factors as well. Timaru's main cemetery has always been on top of the hill near Patiti Point. Heavy industry such as the foundry is also located nearby. The locality has been occupied by industry for many years. Furthermore, until very recently, a second-hand dealer's yard was very prominent at the southern entry to the city on State Highway 1. Many have commented on the negative associations generated by this activity. Consequently, the area has had a long-term history of low-value property. Several real estate agents confirm that prices in the Redruth locality have always been adjusted downward because of the South End connection. However, they say that properties in this area are not typically slower selling than elsewhere in Timaru. First-home buyers often come to South End because residential property is more affordable. There are also many people who are now elderly, who have lived in the locality for many years⁹. Thus there are some who observe a steady turnover of residents as people trade up, but rather more who observe a stable community and family neighbourhood - "*Southenders are Southenders, and like to stay*

⁹ Almost half of the residential sample of interviewees who have lived at their present address for 10 or more years have in fact lived there for 30 or more years.

here". Quite a few interviewees referred to people owning their own homes rather than renting, which is reinforced by analysis of the sample of residents interviewed, of whom 86% owned their properties.

The principal areas of growth for Timaru City in the past 20 years have been to the north, which is also where increases in property value have been most marked. Urban growth to the north has been in the form of mixed commercial and industrial development on the coastal flats close to State Highway 1, and residential development on higher ground in the north west part of the city. Further urban development in the south is limited by the Saltwater Creek urban boundary. It was noted by many that, until very recently, retail shopping in the form of a good supermarket or multi-department store was very poorly provided for in the South End.

Despite the history of South End stigma, there are those who take a more positive view of the Redruth locality. As noted earlier, quite a few people have made positive choices to stay in Redruth over many years. They ventured views that from a local perspective, Redruth actually offered many amenities in closer proximity than other suburbs - a beach, public gardens and a public swimming pool, and the city's hospital nearby. There is a range of good recreational opportunities - playgrounds, parks, walkways and areas for bike riding and rowing, and facilities for pistol shooting and flying model aeroplanes. Others pointed out that one benefit from living on a south-facing hillside near the city boundary was the excellent views of rural countryside and open space.

The main primary school in the area - South School - has a large and buoyant roll of 300 pupils. The principal noted that the school attracts excellent staff, and the pupils do exceptionally well in comparison with other city schools¹⁰.

Recent developments in South End and Redruth

One event that signalled a change in the neighbourhood for some people was the closure of the prominent second-hand dealer's yard at the bottom end of King Street. Several people claimed that this had a beneficial effect in tidying up the southern entrance to the city.

Real estate agents backed up residents' observations that the last few years (since the new landfill opened) have seen little in the way of new housing or in-fill housing in the Redruth locality. While many properties are capable of sub-division, there is no apparent demand for this sort of development at the moment. The few blocks of flats at the north end of the suburb - along James Street - that have been built in the past decade have sold mainly to people who already lived in the locality.

New industrial development has occurred along Redruth Road and in Leckie Street in the last few years.

Planning is already underway to rehabilitate and improve the wetlands area on the south side of Saltwater Creek and raise its status as a conservation and recreational amenity. At the time of the feedback visit, a new lake had filled and significant planting had taken place.

Reflecting the lift in expectations for the wider South End area, many interviewees pointed to the recent opening of a Countdown supermarket and a branch of The Warehouse. One of Timaru's newest motel complexes had opened (just prior to the case study field work) on King Street, just north of Otupua Road.

¹⁰ The local "top School" competition has been won by South School for the previous three years.

Population change 1986-96

Table 2 summarises trends in usually resident population change between 1986 and 1996 and compares trends for the host community of Redruth with similar data for the statistical Area Units of Redruth and Timaru Gardens, and with the city and district as a whole. Table 3 compares similar trends for occupied dwellings.

Table 2 Trends in usually resident population

Area	1986 census	1991 census	1996 census	% change 86-91	% change 91-96
Redruth 'host'		1,719	1,647		-4.2%
Redruth/Timaru Gardens	1,882	1,796	1,621	-5%	-10%
Timaru City	27,857	27,786	27,323	0%	-2%
Timaru District	43,367	42,581	42,631	-2%	0%

Source: Statistics NZ (1997)

Real estate agents suggest that there has been more growth in rural parts of the district. Although the overall population of Timaru City has been static or falling slightly, areas in the north of the City have held their population (Highfield, Marchwiell) or grown (Maori Park, Gleniti).

Table 3 Trends in occupied dwellings

Area	1986 census	1991 census	1996 census	% change 86-91	% change 91-96
Redruth 'host'		699	651		-6.9%
Redruth/Timaru Gardens	702	717	722	+2%	+1%
Timaru City	10,191	10,400	10,551	+2%	+1%
Timaru District	15,518	16,107	16,708	+4%	+4%

Source: Statistics NZ (1997)

Changes in land use - 1991-96

There was little significant change in land-use patterns in the host community. The developments described above are consistent with existing patterns.

D: Coverage of consultation and interviews

Numbers and categories of interviewee

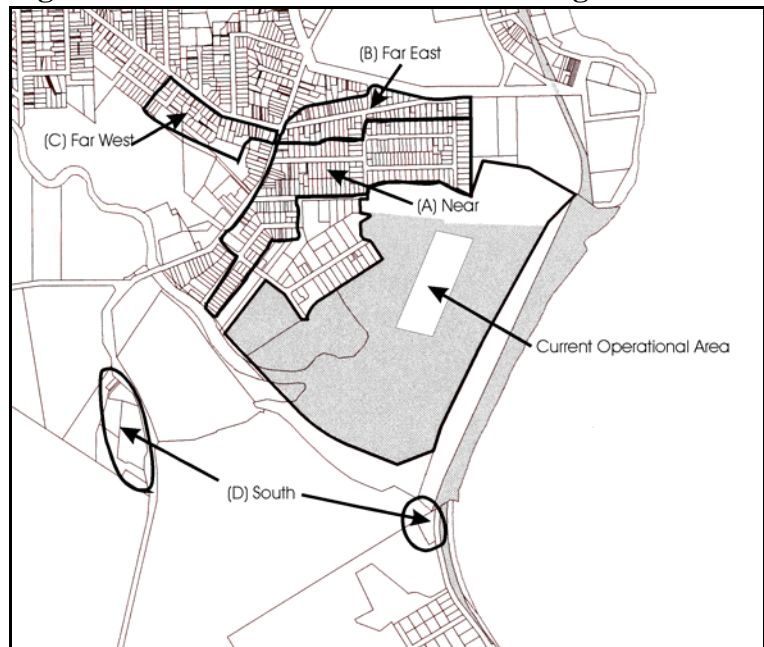
All interviews were conducted during the period 22-25 March 1999.

In all, 97 interviews were conducted, as follows -

- 49 residents - in four areas (see Figure 8),
- 30 businesses,
- 8 recreational users of the locality.
- 13 other key informants (see list below).

This case study sought to assess the effects of the new sanitary landfill operation (opened in May 1996) and not the effects of the older refuse disposal activities which had taken place for the previous fifty years on adjacent land. Of the 49 local residents interviewed, 32 (65%) have lived in the host community at their present place of residence since before the new operation commenced (i.e. for more than three years). Indeed, 17 (35%) have lived here for more than ten years. Of the 30 business operators interviewed, 25 (83%) have been at their present location for more than three years, and 21 (70%) have been here for more than ten years. Thus there is considerable experience of living or working in the neighbourhood of a landfill, and a good basis on which to make comparisons between the old and the new landfill operations.

Figure 8: Areas of residential interviewing



Areas of interviewing

Interviews with residents neighbouring the landfill site were structured to provide responses across a range of separation distances, labelled “near” and “far” (see Figure 8).

The nearest area of residential occupation lies in a 90-degree arc from north to west of the landfill site -

A - Near 300-500 m from the operational area

Two residential areas more remote from the landfill were also sampled, falling in an arc from north-east to north-west of the landfill site -

B - Far “East” 500-800 m from the operational area

C - Far “West” 700-1,000 m from the operational area

To the south, several interviews were conducted with people living in the rural area beyond the city boundary -

D - South 750-1,250 m from the operational area

Information about these interview areas is summarised in Table 4 following.

Table 4: Summary information for residential interviews

Sub-group	Inter-views	Streets	Distance to landfill operational boundary	Length of residence	Ownership status
A - Near	24	Collins St Cambridge St Hertford St Flinders St Royal St Leckie St Rothwell St	300-500 m	8/24: <3 years 8/24: 4-10 years 8/24: 11+ years	24/24: owned
B - Far East	14	South St Collins St Domain Avenue James St	500-800 m	5/14: <3 years 5/14: 4-10 years 4/14: 11+ years	12/14: owned 1/14: rented 1/14 d/k
C - Far West	7	Otipua Rd Richards Pl Brenda St	700-1,000 m	3/7: <3 years 1/7: 4-10 years 3/7: 11+ years	4/7: owned 3/7: rented
D - South	4	Main South Road The Parade, Scarborough	750-1,250 m	1/4: <3 years 1/4: 4-10 years 2/4: 11+ years	2/4: owned 0/4: rented 2/4: d/k
All areas	49			35%: <3 years 30%: 4-10 years 35%: 11+ years	86%: owned 8%: rented 6%: d/k

Business operators interviewed were located in an arc from west to northwest of the landfill site. The area included Redruth, Shaw, Rothwell, Leckie and King Streets, and therefore incorporated the main access road to the transfer station from SH1 - Shaw Street. Business premises ranged in distance from the landfill between 250 m and 900 m, although 24 out of 30 were no more than 700 m from the operational area of the landfill. Information about these interview areas is summarised in Table 5 following.

A small number of people (8) who were regular users of the vicinity of the landfill site for recreational purposes were intercepted for interviews, as time permitted during the field work. The sample included several who use Saltwater Creek (rowing and boating), several who visit recreational premises in the area

(pistol club and model aeroplane club), and others who walked or exercised their dogs along the walkway which passes along the south and east boundaries of the landfill site. All use the area at least once a week, and six out of the eight have been doing so for years before the new landfill stage commenced.

Table 5: Summary information for business interviews

Sub-group Street	Inter-views	Types of business	Distance to landfill operational boundary	Length of occupation
Redruth St	7	Joinery manufacture, plumbing, water blasting and septic tank cleaning	250-375 m	1/7: <3 years 1/7: 4-10 years 5/7: 11+ years
Shaw St	4	Pre-cut housing, car painters, auto-wreckers, upholstery manufacture	375-525 m	1/4: <3 years 0/4: 4-10 years 3/4: 11+ years
Rothwell St	3	Joinery manufacture, painting and panelbeating	230-550 m	0/3: <3 years 1/3: 4-10 years 2/3: 11+ years
Leckie St	2	Joinery manufacture, iron recycling	400 m	1/2: <3 years 0/2: 4-10 years 1/2: 11+ years
King St	12	Auto repairs and wreckers, general engineering, petrol retailing, food sales, clothing manufacture, coolstore, builders, accommodation	600-900 m	2/12: <3 years 2/12: 4-10 years 8/12: 11+ years
Other	2	farming, motor camp	500-1,300 m	0/2: <3 years 0/2: 4-10 years 2/2: 11+ years
All businesses	30			17%: <3 years 13%: 4-10 years 70%: 11+ years

List of other key informants

- Southend Residents Association
- Department of Conservation
- Solid Waste Manger TDC
- Planning Department TDC
- Environmental Health Officer TDC
- Manager and supervisor, contracted landfill operator
- Two Real Estate agents
- South End Primary School
- Rowing Club
- Model Aeroplane Club
- Pistol Club
- Marine Watch

Feedback meetings

Two feedback meetings were held for the purposes of discussing the preliminary findings of the field research.

The first meeting on 1 June 2000 was with three TDC administrators with responsibilities for waste management facilities. Discussions produced a consensus that the preliminary findings provided a balanced and accurate description of the effects currently experienced by neighbours of the landfill. The administrators expressed a firm commitment that they would respond to any complaints received.

The second meeting, also held on 1 June 2000 was with 10 residents, including two representatives from the South End Ratepayers Association. This meeting also endorsed the preliminary findings as accurate and balanced. Discussions about the noise environment noted that other potentially noisy industrial activities have recently arrived in the neighbourhood of the landfill, while one resident of Collins St described the noise nuisance experienced from motorbikes being ridden in the recreational area north of the landfill. (By sheer coincidence, while discussing the topic of noise, those present at the meeting had to evacuate the building for ten minutes when the fire alarm went off!)

E: Operational effects of the landfill on neighbours

Odour and litter are the most significant off-site effects at the Redruth Landfill, with noise, dust and seagulls causing minor impacts.

Numerous positive comments (22% of the whole sample) were made unprompted by business interviewees, residents and recreational users of the locality, regarding improvements they experienced with the operation of the new sanitary landfill, when compared with the previous dump on the Redruth site.

The effect observed by the greatest proportion of both neighbouring residents and businesses is unpleasant odours. Typical experience for the immediate residential neighbours of the Redruth landfill is that general landfill odour causes an occasional nuisance, sometimes to the extent of inhibiting normal residential behaviour (e.g. moving indoors and closing the windows). It can be noticed at distances up to 900 m. Current land-filling practices for the disposal of particularly smelly wastes at Redruth create extremely offensive odours in a very localised neighbourhood. The residents continue to find this off-site effect totally unacceptable. For nearby businesses, general landfill odour is a background condition of being in the industrial buffer zone around the landfill facility. Business premises are not subject to the impacts experienced by residents from the operation of the co-disposal pits, but they do sometimes notice the smelly wastes in transit. Recreational users - mainly of the walkway - sometimes encounter the extremely offensive odours from the co-disposal pits if they happen to be in the area during a pit-opening or tipping event. However, this does not appear to deter recreational use.

Litter is one of the more widely experienced off-site effects resulting from the landfill location. More people are aware of the rubbish dropped from loose loads being taken to the transfer station than from windblown litter around the landfill itself. The frequency and persistence of the roadside rubbish, and the more serious potential impacts in terms of danger to other road users underscores the concerns expressed about litter.

Noise from a variety of sources is experienced by local residents. It creates a minor nuisance for some within a distance of about 600 m. Noise is not a significant issue for people working on industrial premises nearby.

The effects of dust are localised, and in the case of business premises near streets leading to the landfill entrance, the effects are persistent. The current perceived level of attention to mitigation results in a relatively low level of acceptance by nearby businesses

The presence of seagulls, attracted by the landfill at Redruth is most commonly experienced as a long-distance visual phenomenon, with some associated noise. A few residents experience occasional minor nuisances from soiling, but nearby businesses are a little more inconvenienced by a range of direct effects - soiling and threats to young lambs. Against a background of some perceived improvement since the new sanitary landfill opened, it is generally accepted that seagulls have become established at the landfill, and indeed would probably have been unavoidable in a location so close to the sea. There is generally a relatively high level of acceptance of this off-site effect; reflected also in the fact that a high proportion of responses occurred only when prompted.

Visually, the new Redruth landfill is described as a significant improvement on the previous facility. Traffic-related impacts have generally improved through reduced numbers, although there are still times when safety concerns arise.

Twelve types of effect were reported unprompted in interviews in the vicinity of the landfill. When prompted, interviewees reported no additional types of effect, although more responses were obtained. These effects are listed below in Table 6, along with the percentages of interviewees who recorded NO effects.

Table 6: Summary lists of effects reported for Redruth landfill

	Residents	Businesses	Recreational	Total
Effects reported UNPROMPTED	odours seagulls noise litter dust leachate visual run-off vermin flies	odours seagulls noise litter dust leachate visual run-off traffic volume/safety frequency of flooding	odours seagulls noise litter dust leachate	
% of interviewees reporting NO effects UNPROMPTED	53%	57%	25%	52%
Effects reported PROMPTED	traffic volume/safety frequency of flooding	vermin flies	traffic volume/safety	
% of interviewees reporting NO effects when PROMPTED	24%	17%	13%	21%

Of the five landfill case studies, Redruth in Timaru is the only case where the decision was taken to extend the use of an existing site. In fact, Redruth has a history of landfill experience going back more than 50 years.

The purpose of all these case studies is to provide contemporary New Zealand case material on the effects and impacts experienced by host communities. The focus has therefore been on the effects and impacts experienced since the latest phase of landfilling began, with the new sanitary landfill in 1996. Nevertheless, field interviews naturally encountered spontaneous comparisons with the earlier waste dumping regime, even though this was not specifically invited.

Before beginning a detailed analysis of the impacts experienced from the landfill within the host community of Redruth, it is worth noting that a significant proportion of those interviewed (24%) expressed unprompted positive views about the current landfill operation when compared with its predecessor. These comments came from all sub-samples of interviews - residential (8 out of 49), business (8 out of 30) and recreational (5 out of 8).

Local residents made the following kinds of remarks -

- “Aesthetically better than the old site”*
- “Tidied up with landscaping”*
- “The transfer station is clean, well organised; it’s good to do recycling”*
- “Greatly improved compared with the previous landfill”*
- “Positive - planting of trees on the walkway by Saltwater Creek”*
- “Visually cleaner and tidier than it used to be”*
- “Very handy to go to”*

Local business people made the following kinds of remarks -

- “Tidier roads”*
- “Less smell in comparison”*
- “Waste disposal is easy now”*
- “Handy for rubbish disposal”*

“Looks better; improved odour”
“Cleaner”
“Better development”
“Positive - greater patronage”

Recreational users made the following kinds of remarks -

“The landfill has changed dramatically - grassed and paddocked; not as obnoxious as it used to be”
“Positive - improved walkway”
“Less litter in the Creek, less dust, less noise from the machinery, less seagulls, more walkers, more kayakers, no smell compared with the old tip - no smell at the club rooms”
“It’s allowed people to use the area”

It should also be noted from Table 6 the proportions of those interviewed who reported no effects unprompted (52%) and even after prompting (21%).

Odours

What effect do they notice? Source of effect?

All the residential areas (that is Areas A, B, C and D in Figure 8) had residents who responded with unprompted comments about odour. This occurred in about one-in-three cases (35% of all residents interviewed). A few more responded about odour when prompted, raising the total level of such responses to 43%.

It is clear that two sources of odour are evident, and that nearby residents distinguish between them. The most common odour is a general landfill smell which residents describe variously as *“a general unpleasant smell”*, *“a sickly sweet smell”*, *“like silage - unpleasant”*, *“the same smell as down at the face of a tip”*. This smell is generally noticed only out of doors.

The second odour comes from several particularly smelly types of waste - freezing works offal, the contents of the city’s grease traps, or milli-screenings from the sewage treatment plant north of Timaru - which are disposed off separately at Redruth. This odour is described distinctly as *“repulsive”*, *“a stink”* or an *“horrendous smell”*, and is so intense on occasions that residents report the smell permeating their houses, particularly if any windows are open. It is also described as permeating washing on the line.

This problem is no surprise to staff working at the landfill, which regularly receives loads of offal and sewage milli-screenings. The current practice for the disposal of offal, which arrives at Redruth five days a week, is to tip it directly into open holes - called co-disposal pits - in the old landfill area and then cover the holes over. Initially, sewage milli-screenings were tipped onto the working face of the new landfill. However, such close proximity became unacceptable to landfill operating staff - the smell permeated their clothes and their smoko room. The bulldozer and compactor used to become fouled with milli-screenings and it was extremely difficult to manage the tip face because of its consistency. Mechanics servicing these vehicles ultimately refused to continue - their clothing was contaminated, and the stench was noticeable when they returned home after work. The staff were concerned not only about the smell but about possible health implications from direct contact. Consequently, sewage milli-screenings are now tipped directly into 2m x 20 m open trenches, again in the old landfill area, thus avoiding any risk of contaminated clothing and vehicles. However, opening up these trenches and holes in the old landfill area is an activity which itself creates episodes of very offensive odour.

Thirty per cent (30%) of business interviewees mentioned odour without prompting, while the proportion increased to 47% with prompting. The two sources of odour described above are also observed by people in nearby business premises. Mostly, they refer to the general landfill smell coming from the facility. However, three respondents singled out occasions when they had experienced the more offensive smells. With their proximity to the landfill entrance, it is possible that these interviewees were responding to the smelly loads in transit to the landfill. People in business premises closer to the landfill - Redruth Street and Shaw Street - are most likely to notice the landfill smell inside their buildings. This can also be attributed to the fact that some industrial premises have large door openings, often left open during working hours.

Several people who use the perimeter walkway for recreation recorded a refuse smell - near the pedestrian bridge across the Saltwater Creek lagoon, and along the south and east boundaries of the site. Members of the model aeroplane club - using land which will be part of Stage Four of the landfill in years to come - notice general refuse smells on an easterly wind.

Spatial distribution?

Whilst general landfill odour is noticed throughout the closest residential area (A) and also in the more distant residential areas (B and C), the more penetrating smell from the co-disposal pits appears to have a very localised area of impact - affecting residents in three streets only. This was confirmed by prompted questioning, and explains why this small locality has been the principal area from which complaints have been received by the Council in the past.

Table 7: Percentage of interviewees who observe odour related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	45	
Residents - area A "near"	71	mostly general landfill odour from the site; outside only; a small group of dwellings experience foul odours from the site; permeates dwellings; effect is very localised
Residents - areas B,C "far-east"/"far-west"	14	general landfill odour only - from the site one resident experienced smelly wastes in transit to the landfill
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	75	mostly general landfill odour from the site; some inside open buildings; several also experience foul odours
Businesses - King Street + 'Other'	14	general landfill odour only - from the site;

With nearby residences, there is a clear distance-related trend in the likelihood of response, as shown in Table 7. Residents nearby in area A are five times more likely to notice the landfill odour as residents further away in areas B or C. From the survey we estimate that it is unlikely that the landfill or its operations are smelt at distances greater than about 900 m beyond the site boundary in any direction.

The businesses tend to be closer to the landfill than most of the residential areas - a result of the land-use zoning. Probably because some industrial premises themselves generate strong smells (e.g. from chemical solvents, glues, and wood processing, or a company in Redruth St which services septic tanks and cleans its trucks out in the yard, etc.), landfill-related smells do not appear to be experienced at the same distances as is the case for residential properties - 500 m to 600 m seems to be the general limit. Nevertheless, a distance-related trend is apparent for businesses as well.

Timing; frequency; trends?

To summarise responses about the frequency of experiencing odours, it is helpful to distinguish different frequencies of occurrence by relating some quantitative indicators to the qualitative descriptors used by respondents, as follows -

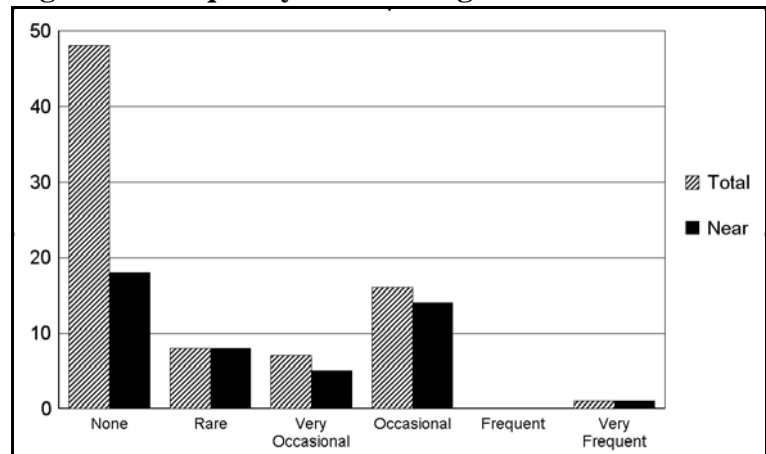
Table 8: Frequency bands for observing effects

Level - descriptor	Frequency range	Frequency on a monthly basis
0 No observations reported	Nil	Nil
1 Rare, irregular	Few times a year	<0.5x/month
2 Very occasional	Once a month	1x/month
3 Occasional	Twice a week to twice a month	2-8x/month
4 Frequent	Several times (>2x/week)	8-30x/month
5 Very frequent	Daily	30x/month

For all those interviewed who reported experiencing odour effects, the distribution of frequencies is shown in Figure 9. Corresponding data for the 'near' areas is included for comparison.

Residents notice the general landfill odour during day or night, and winds from a southerly/south westerly quarter seem to be a common factor for many people. Some of those interviewed also said that hotter weather tends to accentuate the smell. For this general, less penetrating odour, the frequency of experience is in the range from 'occasional' (2-3 times/month) to 'very occasional' (3-4 times/yr). Over the past three years, opinions on trend are divided evenly between those who have noticed an improvement and those who have noticed no change.

Figure 9: Frequency of observing odour effects



The foul smells from the co-disposal pits can also be experienced during both day or night, but the pattern is determined by the arrival of these particular loads of smelly wastes, and also whenever new co-disposal pits are opened up in the old landfill area. The episodes of intense odour tend to last for hours, until the smell has dissipated. The frequency with which these smells are noticed by residents is also affected by the incidence of wind and patterns of home occupation. Some are well aware of the arrivals of smelly wastes, while others notice it at more extended intervals, such as monthly. There is consensus that southerly or south easterly winds are a critical factor. The trend for these events contrasts with that for general landfill odour. Residents are well aware that this problem has arrived since the opening of the new Redruth landfill.

The explanation of events given by landfill operators confirms residents' experience.

The experience of people in business premises near the Redruth landfill is different from those of local residents, due to different orientation, shorter distances, proximity to the landfill entrance, and daytime-only occupation. It is easterly wind that brings odours to the business premises, and consequently some

people suggest that the odours are more noticeable in the afternoons, when the sea breeze arrives. General landfill odour is noticed typically once or twice a week. Those who believe there has been an improvement in odour experienced from the landfill outnumber those who believe the reverse by a factor of four to one.

Businesses are not in the area affected by the actual disposal of offal, or the opening of co-disposal pits.

Mitigation attempts?

Regarding the incidence of general landfill odours beyond the site boundary, current mitigation takes the form of tip-face covering procedures, and landfill operators exercising a right to turn away excessively smelly loads.

Since the period of research field work in March 1999, the landfill operators and TDC administrators have relocated the co-disposal pits further to the south, further away from the nearest residential neighbours, and have installed a wind anemometer as part of the landfill weather station so that information on wind speed and direction is available to operators and may be considered when deciding to dispose of offal. Neither the operator nor the TDC administrators had checked with the affected residents to see if these measures have improved the experience of related odours. However, the TDC received *“no formal complaints at all during 1999”*.

The TDC is also exploring various alternative disposal methods such as (i) creating specific bays within the landfill working face so that offal may once again be accommodated in normal operations on the tip-face, (ii) alternative treatment processes like “in-vessel” composting systems away from the landfill site, or (iii) industrial processing of some sort.

Impacts?

One way of summarising the responses on the impacts of off-site odours is to relate them to a spectrum of impact severity, based on respondents’ own descriptions, as follows -

Table 9 Spectrum of impact severity from odour effects

Level	Description	Illustrative comments
0	No observations reported	
1	No impact at all	
2	Noticeable, but not unbearable	- doesn’t really bother me - just know it’s there - not taken much notice
3	Loss of personal residential amenity; very unpleasant	- drives you indoors - unpleasant - repulsive (offal odours) - have to go out for a drive (offal odours)
4	Social discomfort or embarrassment	- visitors comment - embarrassing to have friends over (offal odours)
5	Impacts on personal health and well being	- can make me feel sick at times (offal odours)

For all those interviewed, the distribution of severity experienced is shown in Figure 10. Corresponding data for ‘near’ areas are included for comparison.

The two sources of odour lead to distinctly different sets of impacts on residents. The general landfill smell tends to have less extreme impacts than the smell from the co-disposal pits.

The odour from offal and sewage milli-screenings is very noticeable and can be extremely offensive -

“sometimes the smell is so bad, we have to go out for a drive”

“it can be repulsive - like something is dead”

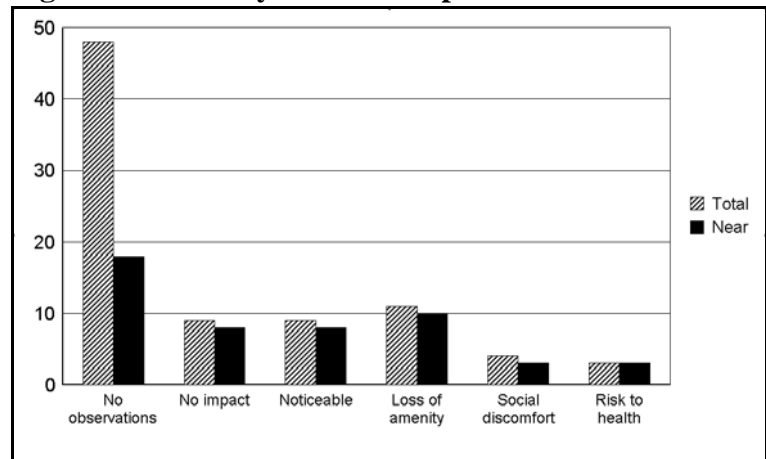
“I have learnt to tolerate it a bit, and my husband and children comment on it, and visitors comment on it - it can be embarrassing”

“It’s putrid - it drives me indoors”

“I have had to redo the washing”

“I can become desensitised - then at other times I can feel sick”

Figure 10: Severity of odour impacts



In contrast, residents experiencing only the general landfill smell were less impacted by it. Even in area A, almost half claimed no real impact, saying things like *“It doesn’t really bother me; it’s not offensive, I just know it’s there”*. However, there were some who find the smell *“slightly unpleasant”* and others who have been driven inside occasionally. In areas B and C, there is no real impact in terms of changed behaviours. A few people responded with comments like *“I catch a whiff every so often”*, *“it’s never been bad enough to worry about”*, or *“a hint every now and then; never noticed any really nasty smell”*, but most made no comment at all when asked about the impact.

Impacts from general landfill odour for people on business premises are similar to those experienced by nearby residents, although they drew comment less frequently. While there are some who experience no real negative impacts from the odour - they are aware of it - there are others who find it *“irritating”* and *“unpleasant”*, and are embarrassed when visitors comment on the smell.

A number of residents and businesses have complained directly to the Timaru District Council but the majority have not taken any action.

Members of the main recreational club tolerate the odour as they are grateful for the free access to the paddock adjoining the Redruth site. However they would like to think the offensive odour problem would be eliminated eventually.

Summary evaluation

There is always some risk of unpleasant off-site odours from a landfill, associated with either decomposing general organic matter delivered to the site, or particular types of wastes such as animal offals and sewage milli-screenings. Typical experience for the immediate residential neighbours of the Redruth landfill is that general landfill odour causes an occasional nuisance, sometimes to the extent of inhibiting normal residential behaviour (e.g. moving indoors and closing the windows). It can be noticed

at distances up to 900 m. Current land-filling practices for the co-disposal of particularly smelly wastes at Redruth create extremely offensive odours in a very localised neighbourhood. The residents continue to find this off-site effect totally unacceptable. It should be noted that the location of the tip face and co-disposal sites during the research period were the closest they will ever be to residences north of the landfill; subsequent stages of the Redruth landfill operation will occur at progressively more southerly parts of the site.

For nearby businesses, it is a background condition of being in the industrial buffer zone around the landfill facility. Business premises are not subject to the impacts experienced by residents from the operation of the co-disposal pits, but they do sometimes notice the smelly wastes in transit.

Recreational users - mainly of the walkway - sometimes encounter the extremely offensive odours from the co-disposal pits if they happen to be in the area during a pit-opening or tipping event. However, this does not appear to deter recreational use.

Seagulls

What effect do they notice? Source of effect?

Relatively few residents who were interviewed (10%) commented unprompted on the presence of seagulls in the vicinity of the landfill. However, when prompted, almost half the residents (43%) expressed awareness of the seagulls, and there is no doubt that the attraction for the birds is the source of food to scavenge from the landfill. Several interviewees also made the connection between weather conditions and the presence of flocks of seagulls - *“driven in by stormy weather”, “bad weather at sea”*. It should be remembered that the Redruth landfill is less than 500 m from the coastline; also that neighbouring farmland, when ploughed, can attract large flocks of seagulls as well.

For most people, it is the sheer numbers of seagulls that are present on occasions - *“a big swarm over the landfill”, “a heck of a lot of seagulls at certain times of the day”, “thousands of seagulls on the landfill”*. This means that they can be both very visible and very audible at times - *“hear them going nuts when there’s a wind”*. Residents’ comments indicate that the flocks of gulls are not always present - *“sometimes when there are hardly any birds, but sometimes big flocks”*.

While for the vast majority of residents, the sight of the seagulls is a distant phenomenon - *“see them in the valley”* - a few residents also observe more direct effects - *“dropping stuff from their beaks over the garden”, “seagulls shit on the roof”*. The contractor manager for the landfill operation acknowledged that *“gulls can sometimes be the culprits for spreading litter”*.

Interviewees from nearby business premises were only half as likely as residents to comment on seagulls (3% unprompted and 20% when prompted). They also noted the large numbers present. However, they were more likely to comment on seagulls in close proximity - *“perching on the roof”*- and the direct effects from the birds - *“soiling the roof and making horrific noises”*.

Spatial distribution?

Since most residents see the gulls in the distance and over the landfill, there is not such a marked difference in the level of observations coming from “near” and “far” residents. The difference for business interviewees is a little more marked, with seagull perching and soiling tending to be more evident on buildings nearer the landfill than on King St premises.

Table 10: Percentage of interviewees who observe seagull activity related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	32	
Residents - area A “near”	50	most notice the sight and sound of flocks of seagulls a few experience more direct effects (soiling of roofs/washing; dropped litter)
Residents - areas B,C “far-east”/“far-west”	33	
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	25	soiled roofs
Businesses - King Street + ‘Other’	14	

Timing; frequency; trends?

The farmers noted that the birds appeared particularly in August at lambing, although they appear to be around all of the time. Other residents also noted that the birds appeared to be around all the time no matter what the season, while one business interviewee commented on the birds roosting on the roof in the early morning and evening. A coastal resident remarked that rough sea conditions encouraged the birds to fly inland, an observation reinforced by several other neighbours of the landfill who linked southerly weather conditions with the presence of larger numbers of birds.

For many neighbours of the landfill, awareness of seagulls is on a daily basis. However, it is apparent from some comments that it is more like once a week or once a fortnight that they are really noticeable. A quarter of those who commented on seagulls have observed distinct improvements (reductions) in the last few years - “*much better than the old dump*”, “*not as bad as it used to be*”, “*less now because its contained*”, while another quarter responded that they have noticed no change. One resident suggested that they had become more aware of the seagulls since the new landfill site had begun operation, because it is much closer to them than the old tip face used to be.

Mitigation attempts

Several residents were aware of the bird scare gun, but had not heard it for a while prior to the case study field work. Both the landfill contractor manager and the on-site supervisor expressed little faith in the effectiveness of the scare gun technology, saying the gulls are immune to it¹¹. The supervisor acknowledges that seagulls are “*an everyday, all day occurrence*”; they arrive at 9 am expecting to feed. A smaller working tip face, and better tip-face cover has been effective in reducing the opportunities for seagulls to scavenge. In the supervisor’s view, this is reinforced by the fact that the seagulls are not present at night, when both the tip face and the co-disposal pit are covered, denying the birds any chance to feed. The manager does not favour the co-disposal pit operation on the old landfill area, since it is not kept covered during the day, although sawdust is put on top of each load of waste.

Impacts?

Half of the residents who responded with comments about seagulls at the landfill explained that the birds have no impact on them whatsoever, and were certain that they had never experienced any direct nuisance effects. Even in area A (the nearest residential neighbourhood to the landfill) such comments

¹¹ The supervisor confirmed the residents’ observations that the scare gun had in fact been out of operation for several months, due to a fault.

outnumbered those from residents who had noticed occasional soiling of the roof or washing on the clothes line.

Direct impacts experienced by several businesses include the inconvenience of having to wash cars in the display yard more frequently because of occasional soiling by seagulls, and the resources spent on cleaning the roof and unblocking drains. Several mentioned seagull noise and soiling as nuisances. A nearby farmer described the need to shoot a few seagulls during the lambing season in order to protect stock.

Summary evaluation

The presence of seagulls, attracted by the landfill at Redruth is most commonly experienced as a long-distance visual phenomenon, with some associated noise. A few residents experience occasional minor nuisances from soiling, but nearby businesses are a little more inconvenienced by a range of direct effects - soiling, and threats to young lambs. Against a background of some perceived improvement since the new sanitary landfill opened, it is generally accepted that seagulls have become established at the landfill, and indeed would probably have been unavoidable in a location so close to the sea and so close to open farmland. There is generally a relatively high level of acceptance of this off-site effect; reflected also in the fact that a high proportion of responses occurred only when prompted.

Noise

What effect do they notice? Source of effect?

Ten per cent (10%) of the residents interviewed mentioned hearing noise from the landfill site and operation without being prompted, while the proportion rose to 31% on prompting. They notice the noise from trucks driving along the elevated access road around Stage I of the site, the “*general whirr*” of the heavy machinery working on the site. More penetrating noises include the beeps of machinery and trucks reversing, the metallic banging associated with operations at the transfer station, and sound of the bird-scaring gun used to disperse seagulls from the site.

A much lower proportion of business interviewees commented on noise, probably because the industrial environment is itself generally noisier. Three per cent (3%) commented unprompted, while with prompting the proportion rose to 13%. The same sources of noise are evident, while a business person on King Street commented specifically on the landfill traffic noise.

No recreational users of the area commented on noise at all.

Spatial distribution?

It is very likely that the banging noises heard by residents on the west side of King Street (Far West area C) come from industrial activity closer at hand, such as the foundry.

With nearby residences, there is a clear distance-related trend in the likelihood of response, as shown in Table 11. Residents nearby in area A are three times more likely to notice landfill-related noise as residents further away in areas B or C. Furthermore, it is notable that a large majority of the residents in area A, who said they hear noises from the landfill, indicated that the noise could be heard inside the house as well as out. However, the noise catchment does not appear to extend more than about 600 m from the landfill boundary

In contrast, there is not such a distance-related trend for business responses. This is partly due to the higher levels of background noise from other sources in the industrial precinct, and partly due to the fact

that those businesses in the sample that are further away from the landfill operations are closer to the busiest section of the landfill traffic route.

Table 11: Percentage of interviewees who observe noise related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	23	
Residents - area A “near”	50	
Residents - areas B,C “far-east”/“far-west”	14	‘Far west’ noise sources are more likely to come from industrial activity closer at hand - e.g. metal foundry
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	13	Relatively low level of response.
Businesses - King Street + ‘Other’	14	King Street is part of SH1. A section of King Street, south of the intersection with Otipua Road and James Street, carries all the traffic visiting the landfill from the city of Timaru.

Timing; frequency; trends?

Residents reported hearing landfill noises at various times throughout the normal working day from 8am till 5pm. For residents in area A it tends to be on a daily basis, while for those further away in areas B and C it is very rare, perhaps a couple of times a year under very still conditions. The operator states that the compactor is used only as necessary. It usually requires four passes of the machine to achieve sufficient compaction, which is tested regularly with density checks by the District Council. He also pointed out that the truck-mounted, bird-scaring gun is on an automatic timing cycle - a random pattern throughout the day. He believes that the gun is ineffective in driving the birds away; they appear to be immune to its noise.

Generally, residents have not observed any change in the level of noise of the past three years, although a couple expressed the view that there was probably less traffic noise since the wheelie bins were introduced (with contractor vehicles substituting for householder vehicles). At the time of the fieldwork, the gun was not operating, as it had broken - a fact noted by several of the residents interviewed.

Several residents reported hearing operating noise on the landfill throughout the night for a period of about two months prior to Christmas 1998. These observations were corroborated by the Transfer Station supervisor, who described special arrangements that were made when Stafford Street (in the centre of Timaru) was being re-surfaced and large volumes of old roading material had to be dumped. To avoid dangers and nuisances to central city traffic throughout the day time, a fleet of trucks brought loads to the landfill between the hours of 10pm and 5am. While the TDC had placed notices in the paper about this activity, these notices did not mention the use of Redruth for disposal.

Businesses are aware of noise all day and every day, but particularly at lunchtime when other businesses are generating less noise.

Mitigation attempts?

It was suggested that there would be greater acceptance of such nuisances if those most likely to be affected were properly warned.

Impacts?

Only residents in area A experience any impacts from the landfill-related noise. Most commonly they describe this as “*annoying*”. Further comments include “... *especially when we are in the garden*” and “... *when the little girl was a baby sleeping during the day - not any longer*”. Several residents suggest it is “*not loud enough to be a nuisance*” although it becomes more noticeable when there is a change in pattern, as described above for the dumping of the Stafford Street rubble. Because this was both novel and at night, it did become more of a nuisance, with some disturbance of sleep.

There were no significant impacts for people in the noisier industrial environment - “*we get a bit desensitised*” but “*visitors notice the noise*”.

Summary evaluation

Noise from a variety of sources is experienced by local residents. It creates a minor nuisance for some within a distance of about 600 m. Noise is not a significant issue for people working on industrial premises nearby

Litter

What effect do they notice? Source of effect?

One-in-ten of all residents who were interviewed commented on litter unprompted, and they tended to be in Area A, near the landfill boundary. What they notice most often are plastic bags, blown by the wind from the landfill tip face and caught in the landfill fence, or carried over the fence and deposited on adjacent land, such as Redruth Park or the walkway around the landfill, or the Leslie St Reserve. One resident in Royal Street (close to the main road - King Street) described seeing domestic rubbish such as boxes, plastic and garden waste on the main road and in the gutters beside the main road; rubbish that had fallen off trailers on their way to the transfer station.

With prompting, more residents made the connection between landfill location and trailer trips to the transfer station, and the level of comment about litter increased to a total of almost one-in-three (29%). Most of these additional comments related to rubbish falling off insecure trailer loads, and quite a number of them came from residents living further away from the landfill itself - residents in areas B, C and D.

Very few business interviewees (3%) commented on litter unprompted. However more than one-third (37%) responded to a prompt about litter. Practically all of these responses came from businesses along Redruth, Shaw and King Streets, being the closest either to the landfill fence line or to the main thoroughfare for traffic delivering rubbish to the transfer station at the entrance to the landfill. One or two business interviewees reported “*plastic bags blowing over the top*” from the tip face, but most observations were of rubbish falling off insecure trailer and truck loads.

Recreationalists reported polystyrene, paper and plastic bags on the walkway and below the road bridge. Two visits to the walkway by the researchers during the fieldwork indicated very low levels of litter, some of which was very old litter, and some which may have been due to recreational activities as well.

Spatial distribution?

Windblown litter is observed in the immediate vicinity of the landfill - on the perimeter fence and deposited on adjacent land. Roadside litter is noticed on the main feeder roads in the neighbourhood - particularly King St and Otupua Road.

The Parade was described as “*a dumping ground*” by local residents, who notice trailer loads unlawfully deposited. This is sometimes seen on SH1 as well. The TDC administrators acknowledged that this had been known to occur very occasionally.

Timing; frequency; trends?

Windblown litter from the landfill tip face is strongly associated with particularly windy events, most notably southerlies and nor’westerlies. Residents are aware of this occasionally (from 1-2 times/month to 3-4 times/year). Recreational users of the area reinforced this pattern, noting particularly nor’westers in the Spring.

Those residents and business interviewees who observed rubbish falling off trailers were consistent in their views that it is very much a weekend-related phenomenon, although not everyone notices the rubbish every weekend. Some describe it as “*occasional*”, and the frequency for residents generally seems to be in the range from 2-3 times/month to once every two months, depending on location. Along King St and Shaw St, the frequency is greatest - “*every weekend*”.

Table 12: Percentage of interviewees who observe litter related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	34	
Residents - area A “near”	29	mainly windblown litter on the fence line and deposited on land adjacent to the landfill
Residents - areas B,C “far-east”/“far-west”	24	mainly loose rubbish off insecure trailers
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	31	mainly rubbish off trucks and trailers; some windblown litter
Businesses - King Street + ‘Other’	43	rubbish off trucks and trailers; occasionally rubbish dumped deliberately on the roadside to avoid waste charges

Several also commented on the persistence of litter in some locations, referring more to a lack of effective clean-up rather than to its continuous deposition.

Few comments were made about trends over time. Several recreational users of the area who pass in close proximity to the landfill boundary suggested that the amount of windblown litter had decreased since the new transfer station had opened and the perimeter fencing had been erected around the new landfill working area - “*decreased overall*”, “*rubbish has died out over the last eighteen months since the new facility*”.

Observations contrasted over trends for roadside rubbish, with several suggesting that this has become worse since fees were raised, while one suggested that the situation has been improved with the introduction of fines.

Mitigation attempts?

One new feature introduced to the latest stage of landfilling at Redruth was the erection of perimeter fencing, intended to contain as much litter within the landfill site. The fences are four metres, and litter is seen to escape in strong or gusty winds. The on-site supervisor acknowledged seeing such windblown litter travel up to 500 m from the fence-line. One resident estimated the netting prevents “90-95%” of the litter blowing over.

The manager of the company which holds the contract to operate Redruth landfill says the contract criteria require them to keep the land outside the perimeter fence clear of litter, with special efforts near Redruth Park. The clean-up effort is not a programmed activity each day, although it is viewed as being the responsibility of all staff working at the site. In practice, the clean-up effort is on an 'as necessary' basis, linked to weather conditions. The supervisor indicated that this occurs typically about twice a month, although the area to be covered is not precisely determined. The manager noted that in the previous three years (1996-99) they have received three calls from the Environmental Health Officer to carry out additional clean up outside the boundary.

Residents and business people are aware of the efforts by the contractor to clean up after a strong wind. Some also comment about community groups such as schools "*cleaning up occasionally*", while residents themselves clean up smaller amounts of litter.

The Council's Land Transport Unit has prepared and distributed leaflets about the importance of securing loads on trailers and trucks. The Unit is responsible for weekly street cleaning operations.

Impacts?

Not everyone who commented on litter claimed to experience a negative impact from its presence. However, those who did often expressed annoyance at feeling compelled to pick up someone else's rubbish. Windblown litter was described as "*an eyesore*", "*visually unattractive*", or "*visually awful*". One local resident also expressed concern for the well-being of wildlife, with the risks posed by plastic getting into Saltwater Creek. Of greater concern, however, are the impacts from rubbish falling off trucks and trailers. Several local residents described concerns about the dangers posed by this - "*driving behind someone when rubbish comes off*", "*can be a bit of a danger, particularly for kids on bikes - if a wind is blowing*", "*there is an increased risk of cars swerving to avoid rubbish - particularly large branches*". Business interviewees spoke of having to "*clean up the road and side walks*". Some expressed annoyance at the effort that is required every Monday morning - "*some-one has to pick it up - it's a pain*", "*the cleaner the road, the cleaner the business - and it's easier to conform to MAF requirements*".

Recreational users focussed just on the visual aspects - "*not nice visually*", "*displeasing to look at*". One expressed the view that "*it could be a really nice place*" noting however that at present "*it spoils the walking; it wouldn't stop me walking by with my dog, but it could stop me going there more often just for pleasure*".

Summary evaluation

Litter is one of the more widely experienced off-site effects resulting from the landfill location. More people are aware of the rubbish dropped from loose loads being taken to the transfer station than from windblown litter around the landfill itself. The frequency and persistence of the roadside rubbish, and the more serious potential impacts in terms of danger to other road users underscores the concerns expressed about litter.

Dust

What effect do they notice? Source of effect?

Six per cent (6%) of residents interviewed commented unprompted on the dust nuisance they experienced, whereas prompted questioning increased the response rate to 24% of residents interviewed. Practically all the comments came from Area A, immediately to the north of the landfill, while a resident on the southern side of the landfill was in a position to see the plumes of dust generated on the site in the distance. Several sources of dust were identified by the residents and confirmed by the landfill

supervisor. Dust is generated whenever trucks use the unsealed access road into the tip face in dry weather conditions. This was confirmed by a recreational user of the Saltwater Creek walkway. For those who live nearby the streets leading to the landfill entrance, dusty loads and dusty waste contractor vehicles are another source. A major source for residents to the north of the landfill site is the dusty material (top soil or fine sawdust) used as cover material on the tip face. Most of the residents in Area A who commented on dust noticed it indoors.

Overall response rates among business interviewees were lower, with 7% commenting unprompted, rising to 13% when prompted. Businesses in King Street commented on dust on the main road and near the road in courtyards, affecting vehicles and bikes displayed for sale. The cause of the dust was identified as traffic travelling to the transfer station, either from dusty loads in dry conditions, or as a result of mud falling off trucks and then drying on the road to produce dust. Businesses closer to the site in Redruth Street and Rothwell Street noticed dust in their premises resulting from the landfill trucks on “*a poorly maintained road*”. Dust was noted both inside and outside these business premises.

During the fieldwork for this case study, it was evident that large quantities of hard-fill and soil were being dumped on land 200 m west of King Street on the north side of Saltwater Creek, in order to build up the level of low-lying land which is prone to flooding. This material is also likely to be a significant source of dust in the neighbourhood, particularly in dry windy conditions.

Spatial distribution?

Those residents most likely to notice dust lived in closest proximity to the site (Area A). No residents in Areas B and C commented on the dust and one resident in Area D noted that it was visible over the site.

Businesses near the entrance of the landfill observed the dust, as did a number of businesses on King Street between James St and Saltwater Creek.

Table 13: Percentage of interviewees who observe dust related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	22	
Residents - area A “near”	42	occasional dust mainly from cover material and unsealed access road on site, linked to the incidence of southerly wind
Residents - areas B,C “far-east”/“far-west”	0	
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	13	dust more regularly from dusty loads and trucks on unsealed access road on site
Businesses - King Street + ‘Other’	14	dust regularly from dusty loads being taken to the landfill

Timing; frequency; trends?

The incidence of dust is generally dependant on the wind, notably a southerly for residents in Cambridge, Collins and Hertford Streets. Most residents comment on its occurrence a few times a year, although one in Rothwell Street believed it was constant - probably due to their proximity to the landfill entrance route. Businesses in King Street were aware of the dust problem daily and noted that the streets appeared to be cleaned less frequently than in the past.

Mitigation attempts?

There has always been a weekly street-sweeping regime in this area. Water carts are used to dampen down surfaces on the landfill site and unsealed access roads. However, the landfill roads cannot be sealed because they will shift over time; indeed the roads in the active landfill area can change every few weeks as the location of the tip face shifts.

Impacts?

Residents notice the visual effects - *“leaves the car dirty, the washing dirty, the windows dirty”*. Two residents discussed perceived impacts on asthmatics in their households. In one case, a young child was described as experiencing *“quite bad attacks”* while the other said there was *“no noticeable effect on a mild asthmatic”*.

Businesses experienced the dust levels as *“affecting the work environment”* with more cleaning effort required by their staff, especially in a local car yard - *“vehicles have to be cleaned; if they’re dirty, they don’t sell”*.

Summary evaluation

The effects of dust are localised, and in the case of business premises near streets leading to the landfill entrance, the effects are persistent. The current perceived level of attention to mitigation results in a relatively low level of acceptance for nearby businesses.

Flies

What effect do they notice? Source of effect?

The possible effect of the presence of the Redruth landfill on housefly populations was never mentioned without prompting. However, prompting did elicit comments from a quarter (24%) of the residents interviewed. One business interviewee (3%) and no recreational interviewees mentioned flies as a problem. Some simply observed *“flies around the property”* whereas several suggested there are more flies now than previously, and one noted *“especially in summer”*. One resident claimed there were no longer any flies around, since the re-siting of the landfill and the adoption of tip-face practices which avoid an open tip situation.

There was much uncertainty about making a strong link between flies and the landfill operation. At least half who commented on fly numbers had no firm ideas about the source. Some *“assumed it was the transfer station”*, while another suggested *“it’s not necessarily the dump”*.

Spatial distribution?

It is clear from Table 14 that people living closest to the landfill are more likely to associate any fly problems with the landfill. A cluster of residents with properties on the south side of Cambridge Street and the south end of Collins Street expressed the strongest association between flies and the landfill. The one business interviewee who commented on flies was located at the north east end of Redruth Street. All these respondents are in areas of closest physical proximity to the working area, at distances of some 300 m. Several rural residents mentioned increased numbers of flies. One of these is about 600 m from the transfer station, while the other is about 400 m from the old tip face.

Timing; frequency; trends?

Most residents indicated that the flies were more noticeable in the summer months. When asked to consider if there were any trends, residents views varied from *“more prevalent now”*, to *“flies have always been a problem in Timaru”*.

Table 14: Percentage of interviewees who observe flies related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	16	
Residents - area A “near”	38	
Residents - areas B,C “far-east”/“far-west”	0	
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	6	
Businesses - King Street + ‘Other’	0	

Mitigation attempts?

While there is a clause in the operator’s contract to control flies if a problem arises, there have never been any complaints or suggestions by neighbours that flies are a nuisance which stem from the landfill operation. Unlike the old dumps, where the tip face used to be sprayed to control flies, the current sanitary landfill practices of compaction and daily cover are much more effective deterrents.

Individual residents generally take their own measures to reduce flies, using traps or sprays.

Impacts?

Most residents who responded to the prompt about flies made no specific comments on their impacts. One business noted that the flies were *“a nuisance to the staff”*.

Summary evaluation

The pattern of responses suggests no strong connection between the current operation of the landfill and fly numbers in areas close to its boundary. The fact that no responses were unprompted, even though the fieldwork was carried out in late summer, indicates either that any fly problem is not considered serious, or it is not necessarily attributed just to the landfill operation¹².

Visual impact

What effect do they notice? Source of effect?

Overall, very few residents commented on any visual impact from the landfill. Only one resident on an immediately neighbouring property made an unprompted comment, referring to windblown litter - *“after a wind, shopping bags are noticeable on the fence”* - and to seagulls, both effects which have been discussed in some detail already. They also commented on being able to see the machinery working. Several residents in the rural area south of Saltwater Creek noted positive improvements since the new phase of land-filling had begun - *“the whole thing is tidier compared with before”*, *“it’s screened by roadside trees”*.

Only one business adjacent to the landfill entrance commented negatively on the visual appearance - *“unsightly end of the road”* - referring also to the litter that sometimes collects near the entrance. Another nearby business interviewee in Shaw Street expressed the opinion that *“hills and trees are blocking the view; it looks better; you wouldn’t know it was there”*.

¹²

Other localised sources of decaying organic matter typically found in gardens, on farmland or near the beach may also contribute as breeding places for flies.

Table 15: Percentage of interviewees who observe visual impacts related to the Redruth landfill

Interview sample	% Unprompted + Prompted	Comments
Whole sample	6	
Residents - area A “near”	13	positive and negative comments
Residents - areas B,C “far-east”/“far-west”	0	
Businesses - Redruth, Shaw, Rothwell and Leckie Streets	6	positive and negative comments
Businesses - King Street + ‘Other’	0	

Impacts?

None of the residents indicated any impacts from the visual effects, while the two business interviewees gave contrasting responses.

Summary evaluation

Visual impacts are now very low key.

Vermin

What effect do they notice? Source of effect?

Three residents and three business interviewees reported observing vermin, with only one report being unprompted. Residential respondents made no comments to suggest that these observations were in any way exceptional or particularly linked to the landfill. Three business interviewees reported seeing rats or mice occasionally, inside their premises.

Spatial distribution?

Two of the residents were in area A and one rural resident south of Saltwater Creek, while two of the businesses were in Redruth Street and one in Rothwell Street, near the intersection with Shaw Street. Thus five out of six observations come from locations within 500 m of the landfill or transfer station.

Timing; frequency; trends?

The only respondent to quantify observations stated “*a couple of times a year*”, suggesting that there is nothing exceptional.

Mitigation attempts?

Landfill compaction and covering appears to be satisfactory. The absence of complaints or any obvious vermin populations means that poisoning programmes have not had to be used.

Impacts?

No respondents described any specific impacts.

Summary evaluation

The Redruth landfill, as currently operated, does not appear to be a significant source of vermin for neighbouring properties.

Traffic volume/safety

What effect do they notice? Source of effect?

Only three per cent of all those interviewed thought (unprompted) to link the landfill and transfer station operations with the traffic that visits them. However, prompting raised the level of comment to 17%, most of whom were people interviewed in businesses.

Several distinct effects were reported. Whilst some interviewees believed there was less traffic accessing the Redruth transfer station as a result of introducing the Otto bins¹³, a number of other interviewees expressed the view that the new landfill had resulted in increased traffic - as a result of receiving rubbish from the whole of Timaru District. However, this is not supported by the record, which shows that transporting waste from the district's transfer stations accounts for about 5 trips per week and rural collections for two trips per day. The overall decline in vehicle numbers visiting the landfill is indicated in Table 1, Section B.

One recreational user of the area - who has typically used the Saltwater Creek walkway three times each week over the past 8 years - reported more joggers and walkers using the walkway and the beach area as a result of improved environmental conditions and better maintenance of the walkway¹⁴. This has led to more cars parked at the Rothwell Street entry to the walkway.

Spatial distribution?

Most observations about traffic came from businesses on King Street and Shaw Street particularly at the intersection between them. Only one resident commented on the effect of traffic in their street, Rothwell Street, a street of very few residents, which crosses the main entrance into the Transfer Station.

Timing; frequency; trends?

Observations suggest that the busiest times for traffic on the main transfer station roads are the weekends and weekday afternoons around 4pm.

Mitigation attempts?

The introduction of bins and other contractor collections have already reduced vehicle numbers substantially, while the overall strategic objective of waste minimisation can be expected to see vehicle numbers trending downwards in the long term.

Impacts?

Several businesses nearby¹⁵ believed their custom had increased as a result of transfer station users stopping to fill up with petrol or make EFTPOS transactions, whereas one vehicle spare parts dealer thought revenue had decreased since fewer private motorists were coming after the advent of Otto bins. Several business interviewees reported that at busy times there is congestion on the corner of Shaw and King Streets, which sometimes makes entries/exits for industrial premises more difficult. One suggested

¹³ A kerb-side service which provides for the removal of rubbish from homes.

¹⁴ Particularly keeping the grass short with regular mowing.

¹⁵ A petrol station, dairy and a vehicle repair yard.

that trucks might be a danger to cyclists in the area, although it is not clear how many cyclists use Redruth Street.

Responses from businesses, which make up most of the respondents on traffic effects, suggest that negative impacts are not seen as being dominant effects. No accidents were reported.

Summary evaluation

The development of the new sanitary landfill and transfer station facilities at Redruth, combined with the introduction of kerb-side Otto bins, has resulted in a shift in the number and types of vehicles visiting the site. Safety issues do not appear to have arisen, since the access routes follow the State Highway and a small section of side street through a predominantly industrial area.

Other effects reported

Single, uncorroborated observations about run-off and frequency of flooding were not analysed further. Three observations about leachate appeared to be associated with the old, unconfined tipping activities which preceded the current landfill operation. The legacy of the old tip has the potential to affect people's perceptions of current landfill operations.

Summary of responses

The following tables (16, 17 and 18) provide a summary of the proportions of those interviewed who discussed particular effects in their responses to the structured questionnaire. It is important to note that these percentages do **not** represent the proportions of neighbours who experienced significant off-site impacts. They allow a comparison of the relative experience of different effects, and also a comparison between different facilities.

Table 16: Summary of responses from residential neighbours (N=49)

Effect noticed	% Unprompted	% Unprompted + Prompted
Odours	35	43
Seagulls	10	43
Noise	10	31
Litter	10	29
Dust	6	24
Flies	2	27
Visual impact	2	8
Vermin	2	6
Traffic volume/safety		4

Table 17 Summary of responses from business neighbours (N=30)

Effect noticed	% Unprompted	% Unprompted + Prompted
Odours	30	47
Traffic volume/safety	10	40
Dust	7	13
Litter	3	37
Seagulls	3	20
Noise	3	13
Visual impact	3	3
Vermin		10
Flies		3

Four of the most commonly observed effects display a strong distance-related pattern. A fifth, seagulls displays some distance-related pattern, but less marked than the others due to the mobility of seagulls and their endemic nature in coastal areas. A sixth effect, litter, shows a different pattern, largely due to the two-fold source of the litter - falling off unsecured trailer or truck loads, and windblown from the landfill site. Comparative responses are summarised in Table 18 below.

Table 18: Spatial distribution of observed effects

Effect noticed	% Unprompted + Prompted		
	Total sample (N=87)	Immediate vicinity ¹⁶ of the landfill (N=52)	Further away ¹⁷ from the landfill (N=35)
Odour	45	65	14
Noise	23	29	14
Dust	22	31	9
Visual impact	6	10	0
Seagulls	32	37	26
Litter	34	35	30

¹⁶ Includes residential interviewees in areas A and D, business interviewees except those in King Street and 'other', and all recreational interviewees. Distances involved range from 100-500 m.

¹⁷ Includes residential interviewees in areas B and C, and business interviewees in King St and 'other'. Distance involved range from 600-1,300 m.

F: Longer-term effects of the landfill on settlement patterns and development in the locality

There is no doubt that the Redruth landfill is a significant activity and presence within the community of Redruth.

There is broad consensus that the new phase of land-filling represented by the current sanitary landfill operation at Redruth has already altered perceptions of the nature of these activities and altered expectations for its influence on development within the host community.

Little evidence exists yet of significant new residential development or re-investment in residential property. However, new business development has become evident in the last five years. Similarly, improvements in the recreational opportunities and experience since the new phase of land-filling began are generally acknowledged.

Stigma is perceived to be associated with living in this southern-most part of Timaru. However it arises as much from general South End associations as from a particular association with the landfill site. It is not an issue which greatly concerns the vast majority of local residents, but does influence a few enough to move on elsewhere.

In exploring the longer-term effects of the Redruth landfill, respondents in the host community were asked for their observations on -

- the major changes that have occurred in land use and the settlement pattern in the locality over recent years,
- the impact of the landfill on industrial development in the neighbouring industrial zone,
- whether extending the use of Redruth as a landfill site had influenced host community development, including recreational use of the surrounding area, since the new sanitary landfill operation had begun.

There was also comment on the related issues of stigma and effects on property values.

Major changes in land use and the settlement pattern

Land uses in the locality of Redruth were always diverse, reflecting the mix of land-use zones which covered residential, industrial and recreational activities. This diversity remains. Industrial and recreational uses in the area have increased slightly over the past few years, but there is little evidence of change in residential development. Details were provided in Section B.

Impact of the landfill on industrial development in the neighbouring industrial zone

The weight of opinion from business interviews clearly supported the view that the new Redruth landfill operation has been beneficial to business development. An absolute majority (60%) expressed positive views, while a much smaller minority (17%) expressed negative views. The remainder were non-committal.

Many referred to the fact that the new landfill is a much tidier operation -

“Tidied up the South End - better presentation”
“The cleaner image of the dump has given people confidence to develop properties”
“Made the area cleaner”
improved business development due to cleanliness”
“Cleaned up area; given it a higher profile”
“Otto bins have made the area cleaner”
“Visually acceptable - well planted with vegetation”
“As a dump, they’ve done a very good job of landscaping it; tidy, well controlled, reasonably attractive”

Others referred to ease of access and favourable conditions for investment -

“Businesses are attracted to the dump for easy access”
“More business investment in the area - cheap rentals and rates”
“The old dump depressed land values, making investment more attractive”
“Helped this business to develop (providing clean-up services)”
“Property development improved - traffic good for business”
“Handy to have close dump”
“The business has always benefited from work done at the facility”

Criticisms focussed on perceptions of physical risks and perceptions of crime -

“Slowed down business development because of hazard expectations”
“The need to construct buildings that will deal with flooding better”
“Some have voiced their concerns about security here”

The general mood was reflected in the following comments -

“It’s good to have people taking an interest and focussing on problem solving”
“It’s South End’s turn to develop - seen some signs recently (Countdown, Warehouse, renovated wool stores)”

Influence of the landfill operation on the way the community has developed in this part of Timaru

The focus for this question in the Redruth case study was the influence of the new sanitary landfill, rather than the influence of the previous fifty years of dumping.

Almost half the sample of residents interviewed (47%) ventured a categorical response to this question¹⁸. Most of these (17 out of 23) expressed the view that Redruth landfill was not having a negative impact on community development in the locality. Three expressed the view that it was still having a negative influence, while three said that they saw positive influences coming out of the upgraded facility and operations.

Those who said that the landfill was not a negative influence tended to advance the theme that the landfill had for a long time been only one of a number of factors. Quite a few saw the general 'South End' effect as the dominant influence - *"the northern end of Timaru gets all the development; this end is forgotten"* - where other negative associations (e.g. the cemetery or the second-hand dealer's yard) were more evident. One resident referred to the flood proneness of the low-lying flat land as a fundamental influence. Others referred to evidence of new industrial development occurring in the past few years, particularly in streets like Redruth, Leckie and Shaw Streets which are closest to the current operating areas. One pointed to rubbish removal businesses becoming established in the locality, while another expressed the belief that the new facility with its recycling depot had made progress in educating the community on the benefits of recycling.

Other residents described improvements in the recreational possibilities - *"there's more recreational use of the area now; good access for walks, fishing and biking round the dump"* and *"redevelopment of the walkway is very attractive - we chose to come here"*. These views were reinforced by recreational interviewees who, with one exception, noted positive associations between the landfill and recreational activities and potential - *"in the past it's been reclaimed for sports grounds"*, *"visually improved; more people are attracted to it"*, *"the wetlands are a positive area for the club"*, *"track is mown now; it was so unsightly in the old days, no one wanted to walk there"*, *"they helped us build up our facility - we bend over backwards to help each other"*.

Those who said the landfill was still a negative influence pointed to such things as run-down infrastructure - *"they've patched up the bridge; it was to have been a new one"*, *"signs and footpaths not getting attention"*, *"drains can't hold the stormwater"* - and the absence of some kinds of community amenities, such as a local *"family restaurant"*.

While there are some signs of positive development, it is still too early to see a real lift in the residential market from the new landfill operation, although there is sufficient comment from local residents and business people to suggest that this will occur in future. Some real estate agents see this part of town *"starting to move"*.

¹⁸ Three (6%) were not sure in expressing their views, while 47% (23 interviews) ventured no opinion at all.

Property values and stigma

Comments on perceived property value effects were far less frequent (8% of all interviews) than comments on stigma (22% of all interviews). In both cases, almost all responses were prompted.

Concerns about property value effects seem to show a spatial differentiation (10% response rate for ‘near’ compared with 6% response rate for ‘far’). However, as might be expected with a more pervasive effect, concerns about stigma show no spatial differentiation within the host community (21% response rate for ‘near’ compared with 23% response rate for ‘far’).

What effect do they notice? Source of the effect?

For perceived property value effects, it is difficult for most individuals to do more than speculate on how their property value might have been affected¹⁹. However, they were more explicit in describing their experience of stigma.

It is not uncommon for residents of Redruth to be on the receiving end of comments from others - friends and acquaintances, visitors from other parts of town - *“the dead end of town”*, *“oh, you live by the dump”*, *“you live down South End”*, or *“yes, houses are cheaper south of North Street, and down by the dump”*. Some report noticing looks of surprise on people’s faces on discovering where they live or where they bought.

Residents are more critical of the fact that they see such perceptions and prejudices being reinforced by real estate agents, and question the motives involved.

Most do not attribute the stigma exclusively to the dump connection, and certainly not to the latest landfill operation. Most commonly, it is the broader South End association, and some are well aware of its historical reasons. Proximity to the dump is definitely a factor for some, but so is proximity to the industrial area which has had a strong presence for many years.

Frequency, trends?

Residents’ experience of comments suggesting stigma is not an everyday matter; it is at most occasional, perhaps several times a year. Several interviewees noted that the incidence of such comments had declined with the new facility.

Impacts?

The majority of those who raised the issue of stigma are not worried at all by it - *“not a big deal”*, *“we like it here”*, *“stigma doesn’t worry me”*, *“not at all”*. Sometimes residents do find it irritating, particularly when the comments come from real estate agents who do not actually live in the community. One respondent mentioned wanting to shift, while one other said they had recently decided to move to the north of the city - *“the dump doesn’t cause us any harm, but it’s here; Gleniti’s got a better name”*.

¹⁹

The next stage of this research programme will involve analysis of actual valuation roll data over time for each of the case studies, and comparisons of data with interview responses.

Summary evaluation

Stigma is perceived to be associated with living in this southern-most part of Timaru. However it arises as much from general South End associations as from a particular association with the landfill site. It is not an issue which greatly concerns the vast majority of local residents, but does influence a few enough to move on elsewhere.

Figure 11: Map showing location of photos 1-4

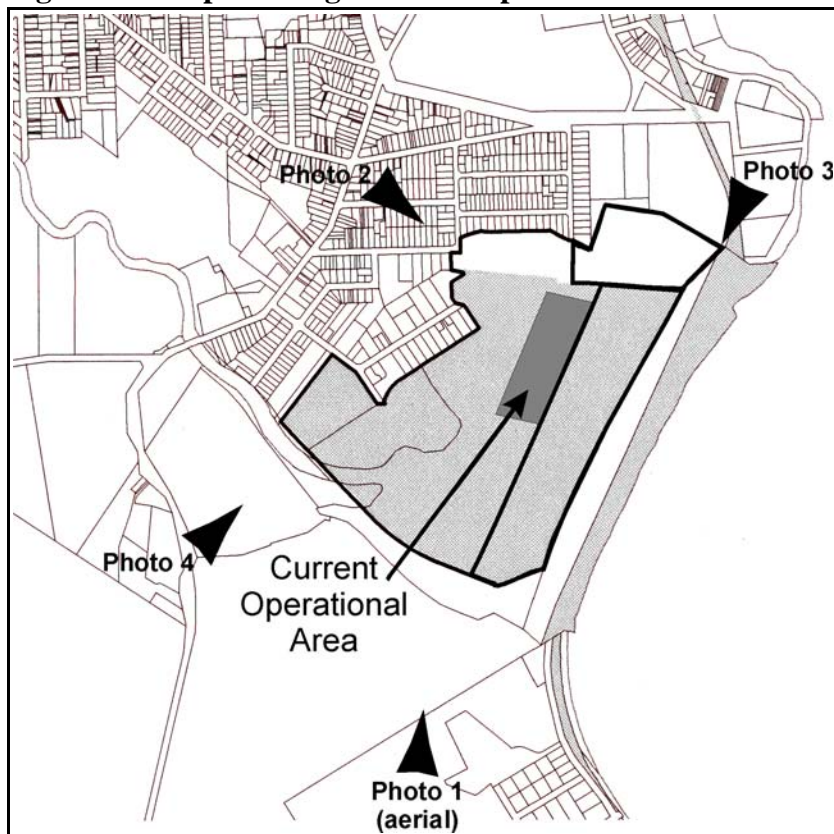


Figure 12: Map showing location of photos 5-9

