Environmental Compliance Monitoring Report

2007/08

Report by –
Environment Southland
Compliance Division

Environment Southland Publication No 2008-07

Foreword

The Compliance Division has had another busy year, with 955 incidents responded to - an increase of 32% from last year.

The people of Southland are becoming increasingly intolerant of environmental pollution and they look to Environment Southland as the key agency in responding to, and acting on, complaints.

The Compliance Division has successfully responded to some major issues in the last year. These include stock truck effluent spillage, odour complaints at the Clifton Wastewater Treatment Plant, poor compliance with surface water consent monitoring conditions in Fiordland and successful prosecution through the District Court of recidivist dairy farmers in breach of their discharge consents.

A large part of the Compliance team's work involves monitoring of the many and varied resource conditions.

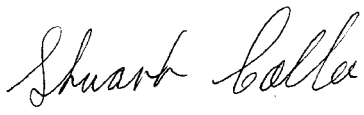
Recent Environment Southland policy changes for dairy farm discharge consents have resulted in consent conditions requiring large effluent storage ponds and low application rates of dairy shed effluent to pasture. Our dedicated Dairy Liaison Officer does vital work with dairy farm conversions to ensure farmers put the optimal system in place before the first cow is milked.

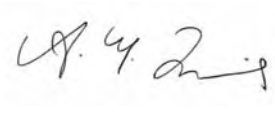
Another innovative initiative is the appointment of a Pollution Prevention Officer. This position will see improvements to our environment through the strengthening of relationships, particularly with major industries operating in Southland. The Council are pleased to see this "fence at the top of the cliff" approach being taken.

The Compliance Division has again experienced a large increase in workload, which the Council has responded to by employing two new staff, taking the division to 12 staff in total.

Mark Hunter successfully leads this team of dedicated professionals; their job is often difficult and requires unique skills.

The Council congratulates the Compliance team for their work over the past year and for continuing to adopt and respond to the high standards of environmental compliance now being required in Southland.





D S Collie
Chairman
Environment Southland

A M Timms
Chairman
Environmental Management Committee

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1.0 Air

1.1 Air Quality Incidents

Nuisance Burning

Nuisance smoke incidents involving the burning of vegetation have been on the increase, with the public becoming less tolerant of this practice.

Figure 1 - Vegetation being burned on the side of the road

The main reasons for the nuisance smoke appear to be poor management, timing of the burning (burning on still days) and non-notification of neighbours.

Contractors enter an area to trim or cut vegetation. The foliage is then pile up and burnt "green", resulting in a poor fire that can smoke or smoulder for hours and, in some cases, days.

Environment Southland staff have attended incidents, and warned offenders that this practice is not permitted. The officers have then required the offender to stop the activity and followed up by offering advice on best management practices, such as ensuring the materials are dried out thoroughly before burning.

One of the more significant incidents involved a contractor who had felled a row of large trees and started burning them immediately. Smoke was evident throughout north Invercargill, with a number of complaints received from members of the public and from landowners in the general vicinity where smoke and ash were causing problems. The contractor was issued with a warning letter, required to pay the costs associated with the investigation and asked to clean the ash from two of the affected roofs.

It is a permitted activity to burn tree trimmings under the Regional Air Quality Plan, provided that the adjoining neighbours are notified in advance.

Failure to notify neighbours is a breach of Section 15 (2) of the Resource Management Act 1991, together with every person's duty to avoid, remedy or mitigate any adverse effects on the environment. The burning can be stopped, usually by way of an abatement notice. Any breach of the notice can result in further enforcement action.

Other incidents relating to burning of balage wrap, tyres, plastic coating on electrical wire and waste oil have also been investigated and dealt with. An example was a complaint received from a member of the public about black smoke being emitted from a commercial garage workshop. The investigation revealed an elaborate self feed system (tank on the wall) where all the used oil was being drip fed into a wood burner!

1.2 Air Discharge Permits

Environment Southland employed a contractor to monitor air discharge permits throughout Southland during 2008. A total of 61 sites were inspected.

Thirty-five sites complied fully with consent requirements, while 26 sites required some form of follow up action. Of these, 18 failed to supply data required to demonstrate compliance or the consents needed to be surrendered.

Eight sites were required to provide more in-depth information, such as bio-filter monitoring, site management plans, particulate and formaldehyde monitoring, contingency plans and/or had unauthorised discharges to air (across property boundary).

2.0 Water Education

2.1 Living Streams

Phase 2 - Pollution Source Investigation (PSI)

During the 2007/08 financial year, several Phase 2 investigations were instituted. These were:

- Spurhead Creek - boundary samples and "hot spot" investigation;
- Invercargill stormwater - catchments and drains;
- Morton Mains - ancillary area.

Spurhead Creek is the second sub-catchment to be focused on in the larger Waihopai catchment. Twenty boundary sites were sampled on two occasions - normal (dry) and rain event (wet).

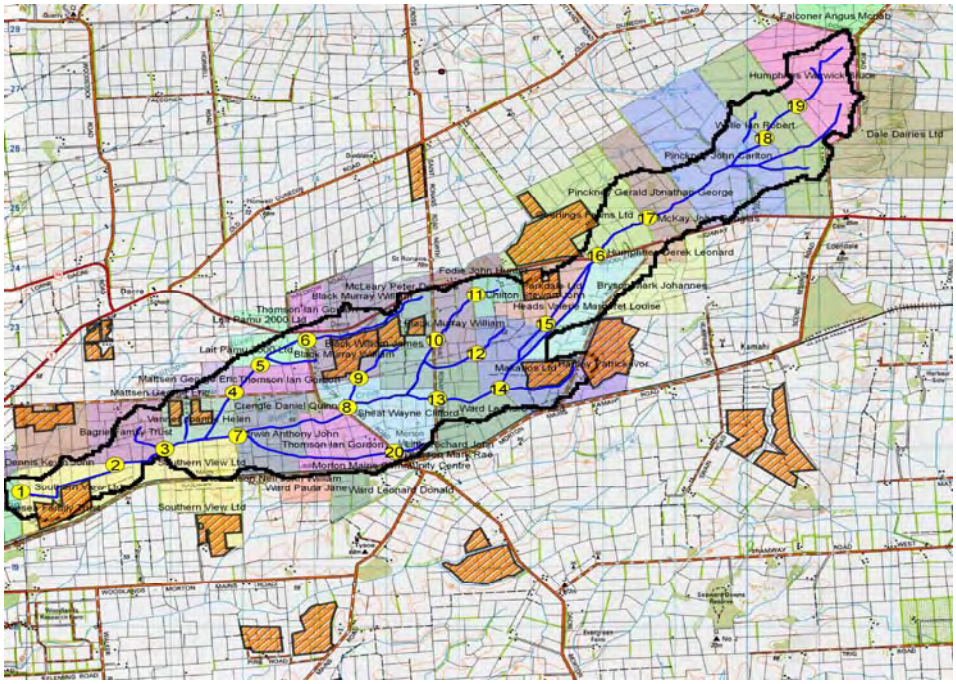

Figure 2 - Map of Spurhead Creek sub-catchments showing boundary sampling sites

Sampling results showed there were five areas of concern after the second (wet) sampling results were analysed. These sites were at locations 9, 12, 15, 19 and 20.

The results at location 9 confirmed effluent disposal problems on a dairy farm upstream of the sampling site that was subsequently involved in an Environment Southland prosecution. In addition to the prosecution, the consent holder on this property has been advised that Council intends to review the conditions of the consent.

Location 12 has been a "one off" result and may be associated with an intermittent discharge (see location 20).

Location 15 has been the subject of an ongoing "hot spot" investigation, with nothing substantive to date. Investigations will be continued in 2008/09 financial year.

The poor results at location 19 were found to be the result of unrestricted cattle access to a shallow, slow-flowing waterway and will be fixed by the landowner fencing the waterway.

A poor result at location 20 was traced to a septic tank problem on two adjacent properties and is presently being dealt with.

Invercargill

The Invercargill stormwater investigation involved a programme where sampling took place at a number of points between the Waihopai dam and the Victoria Avenue bridge. There were 14 sampling points in total. Nine of these were placed at predetermined points along the length of river being sampled and the remaining five were collected at stormwater drain outfalls to the river. The 14 sites were sampled on two occasions, with two drains (3 and 5) showing elevated contaminant levels.

As a result of the sampling programme, the stormwater pipe network above drain 3 is to be investigated, in conjunction with the Invercargill City Council (ICC), as a pilot study. This study will ascertain any obvious problems with regard to the ICC residential stormwater pipe network. Sampling will take place in the 2008/09 financial year.

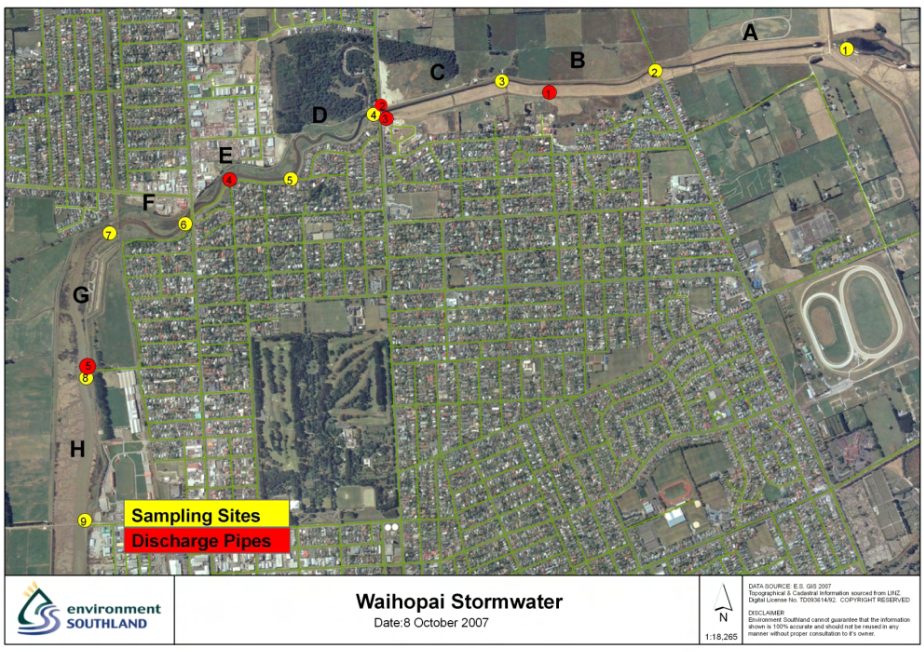

Figure 3 - Map showing river catchments and stormwater drain sites

Morton Mains

The Morton Mains area is immediately upstream of Morton Mains-Kamahi Road. When initially analysing the longitudinal sample results in 2006, there was no indication of any significant pollution above sample point 7. This area was left out when boundary sampling in Morton Mains began.

At a community meeting in the area it became apparent that, with no information available from a sampling programme, the landowners had difficulty seeing the need for concern about water quality within waterways on their properties.

Subsequent boundary sampling, conducted in April and May 2008, showed one site had elevated levels of contaminants. The cause was later identified by a Land Sustainability officer and steps are being taken to fix this situation.

Figure 4 - Map showing the three additional sampling sites

3.0 Water Irrigation

3.1 Water Abstraction Permits

There are 973 current water abstraction permits in place and a further 99 applications being processed, as well as 15 that have not been commenced by the consent holder, or are under appeal/variation at 1 September 2008. This is significantly up from the 752 that were current at 1 August 2007.

The Proposed Southland Regional Water Plan requires that all water takes of more than 20,000 L per day and/or >2 litres per second from groundwater, or 10,000 L per day from surface water, require resource consent unless they are exclusively for stock drinking water, domestic use, or have an existing use right.

The various aquifers have allowable abstraction volumes. It is important for the management of groundwater resources on a national and regional level that an account is kept of actual known takes from the resource.

Of the consents for water takes, 62% are for dairy purposes and these are addressed in the Dairy Monitoring section of this report and 30% are for sundry, territorial local authority or industrial purposes, such as municipal water supplies, back-country huts and significant industries. Many of these are existing water rights with no reporting requirement at present, or are reported to Council as part of an inclusive annual report and are assessed separately. The remaining 8% are for crop or pasture irrigation purposes, and these are discussed below.

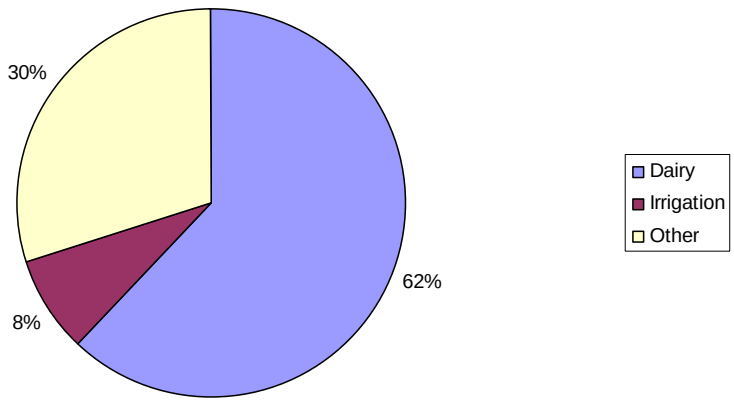

Figure 5 – Proportions of water permits by purpose

Irrigation water takes

The majority of irrigation consents are for irrigation of pasture. The balance includes permits to take water for horticulture (for example, bulb washing),

crop irrigation and golf courses. Twelve consents are for surface water takes and 63 are groundwater takes.

Most of the 75 water permits issued for irrigation purposes are required to submit reports of water volumes taken and/or water level gauging. Sixty-four have a requirement to report annually, one is required monthly and six are required at least once a day (electronic reporting). In general, these consents allow for large volumes of water to be taken and it is particularly important that usage records are supplied so they can be assessed against allocation limits and any perceived adverse environmental effects. These consents have differing reporting requirements due to the inconsistent length of time of the takes, the quantity involved, or Council's information requirements at the time the consent was issued.

Water abstraction reports have become a more important issue over the last few years, with increasing pressure on regional councils from central government to gather sufficient, good quality information, to effectively manage the resource.

A generic reporting form for irrigation water takes is available for download from www.es.govt.nz, under the "Compliance" section in "Compliance Monitoring Forms".

This year, Council has provided the opportunity for consent holders to send the data in electronic format directly into our database via File Transfer Protocol (FTP). This method was adopted after considering other options, such as telemetry. Farms using depth probes, soil moisture sensors and electronic flow-meters can store the data continuously on data loggers and upload it to Council at the specified intervals from the farm computer.

Several electronic suppliers offer the information management services to take care of this process on the farmer's behalf, providing real-time access to the information via a site-specific web page for farm management purposes.

As mentioned above, this electronic data reporting is now required on most new and replacement water permits to take large volumes of water, particularly in fully allocated aquifers. Other consent holders are welcome to use this method also, to cut down on the end of season paperwork and avoid the risk of losing the information during the season. Email alarmist@es.govt.nz for further information.

Irrigation Reporting Compliance

In the 2006/07 report, 26% of irrigation consent holders were noted as having failed to report their water take, including six who had notified us of commencement. Following a few very late reports, 12 consent holders were issued with an Abatement Notice before the commencement of the 2007/08 irrigation season. These notices required full reporting on time in future.

Unfortunately, three of these abated parties have again failed to meet their reporting requirements in the 2007/08 season. The details have been forwarded for consideration of further enforcement action.

A further 16 consents also failed to report this year, despite a reminder letter and extension of time. Of these, 12 had either reported commencement of irrigation, or were known to have irrigated based on field observations by Council staff. In one case, one member of a consent holding partnership had duly notified commencement early in the season, but another partner had reported that irrigation did not occur following receipt of the reminder letter! These situations have been recommended for an Abatement Notice. Consent holders should note that if their consent requires a report, that report must be filed by the due date, even if it is to report that the consent was not exercised.

Taking into account consents known to be not in use or with no requirement to report, the overall reporting compliance rate this season was 75%, very similar to last year. However, it was disappointing to note that the proportion of consents that were either late or failed to report all data required by their permit increased. This could be an artefact of increased scrutiny of records this season, implying under-reporting of less than satisfactory consent holder reports in the previous season.

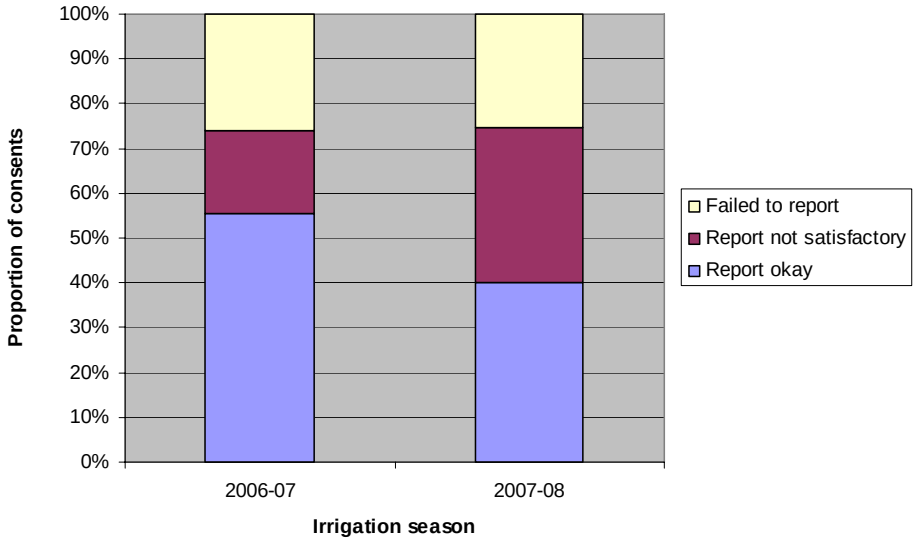

Figure 6 – Comparison of reporting performance by season

The data supplied by consent holders is collated and analysed by the Environmental Information Division and is made available on the Environment Southland website. For the reader interested in Southland's groundwater resources, a useful source of information is the Groundwater Information page. Click on "Environmental Information", then "Groundwater" in the left hand side menu at www.es.govt.nz .

Due to the continuing poor compliance rate and several instances where data was reportedly recorded but the records subsequently defaced, lost or destroyed, a pre-season inspection round of all irrigation water takes has been scheduled for this season. Part of this will be to record pre-season meter

readings. In the event of a failure to report at the end of the season, a follow-up meter reading inspection will provide at least some information about water usage.

The inspections will also audit other consent conditions, such as bore location and construction details, fitting of back-flow prevention devices and appropriate meters, and the like.

The near-drought conditions last summer resulted in a number of consents reaching restriction or cut-off flow or level limits in a reference waterway or bore, based on a consent condition monitored by the Alarmist programme. This programme alerts Council staff and nominated farm contacts by email when the cut-off conditions occur. These sites were inspected to confirm compliance during the cut-off or restriction period and were found to be meeting their consent requirements at the time they were inspected.

4.0 Compliance Monitoring

4.1 Truck Effluent Spillage

Council and the general public have become increasingly concerned about effluent being deposited onto Southland roads during the carriage of stock, mainly to winter grazing blocks and slaughtering facilities.

An operation was undertaken by Compliance staff during May 2008 to identify stock truck operators that were discharging effluent to land (namely roads) in an unauthorised manner during their day-to-day activities. The methodology undertaken included surveillance at intersections, roundabouts, hills and sweeping corners frequently used by operators, and included taking details of vehicles and photographs. This operation identified numerous incidents, but not always an offender.

Two examples of reported incidents were from local landowners who contacted Environment Southland about effluent on the road around the Blackmount Hill, which was making driving hazardous. Compliance staff investigated the scene and confirmed that effluent was running down the road at Blackmount Hill at the time of inspection and that, as a result, the road was hazardous to drive on. The police were also notified of this incident.

A total of three trucking companies have received Infringement notices for the unauthorised discharge of stock effluent onto land in circumstances where it could enter water. This was a breach against Section 15(1)(b) of the Resource Management Act 1991.

It was noted that one offender had accepted stock for cartage without adequate effluent storage capacity for the planned journey. There have been unconfirmed reports of trucks that do not have storage tanks at all.

Figure 7 - Effluent leaking from a stock truck

Trucking operator representatives have raised concerns that they are the "meat in the sandwich". Unfortunately, when they accept the stock for cartage, they accept the responsibility to deal with any waste products associated with that activity.

The trucking company representatives expressed concern about farmers not emptying out stock, not permitting them to empty their tanks on farms at the end of the trip and the lack of effluent dump stations throughout Southland.

The Council has made the disposal of stock truck effluent a permitted activity on all properties, subject to a few simple rules. This means any property in Southland can be used to dispose of effluent legally. The need for managed systems is almost non-existent.

Environment Southland arranged temporary effluent dump stations at Lumsden and the Centre Bush truckwash facilities. Environment Southland staff are also in the process of investigating possible sites throughout Southland for more permanent facilities.

4.2 Aerial Monitoring

Aerial monitoring is an exercise usually undertaken between June and September to ascertain compliance with rules and consent conditions for a range of wintering activities.

Up to three flights can be undertaken each year. Areas of concern are photographed and a Global Positioning System (GPS) is used to obtain the co-ordinates of non-complying activities identified during the inspections. The co-ordinates are used at a later date to identify landowners.

Some of the activities that staff are looking for are:

- three metre waterway buffer for mob stocking/wintering;
- location of wintering and feed pads in relation to waterways;
- unauthorised works, such as instream activities;
- stock with unrestricted access to waterways;
- silage pits adjacent to waterways.

Fourteen possible issues were identified during the two flights completed to date. Compliance action is planned for two of these incidents and advice/education and a warning has been applied to the remainder.

Figure 8 - Degraded waterway identified during July flight

4.3 Expired Consents

When a resource consent expires, Council has an obligation to be satisfied that the activity was performed in accordance with the conditions of the permit and has ceased, or is lawfully authorised to continue.

In the case of one-off activities, such as the construction of a bore, it is also important to know if it was not exercised, or was attempted unsuccessfully, so that records can be maintained. There is a community expectation that Council is able to provide information on request regarding matters such as bore depths and locations, and to gather information that will define the extent of aquifers.

Each day an email alerts Compliance staff to permits that expired the previous day. The more significant consents, such as water, discharge or coastal activity permits are initially assessed within a few days. If no replacement permit has been issued or timely application received, then contact is made, usually by letter, explaining that the activity must cease.

In addition, a periodic review of all expired consents is undertaken from time-to-time. There were 364 expired consents reviewed and followed up in some way during the 2007/08 year. In most cases, a review of correspondence on file is sufficient to satisfy that all requirements have been met. In many others, consent holders can avoid the cost of a formal inspection by supplying records and photographs of the completed works for assessment.

Where records or notification required by the permit have not been provided, a fee for failing to supply the information is usually issued. This fee is set in the Annual Plan, and will be $250 per occasion for the 2008/09 financial year.

It is important for all resource consent holders to ensure they are familiar and comply with all conditions of their permits.

All reporting forms for things such as gravel extraction and water permits can be downloaded from our website (www.es.govt.nz) in the "Compliance" section, under "Compliance Monitoring Forms". Consent holders are welcome to call the officer responsible for expired consents at the Compliance Division to check the compliance status of their permits before expiry.

For those wishing to continue an activity, Section 124 of the Resource Management Act 1991 allows for continuance only if the replacement application is accepted more than six months before expiry, or between three and six months at Council's discretion. There is no provision in the Act to continue past the expiry date if application is made less than three months before expiry of the existing permit. Reminder letters are sent at three, six and 12 months before expiry for permits regarding ongoing activities, to the last known contact address held by the Consents Division.

5.0 Dairy Monitoring

5.1 Dairy Liaison

Environment Southland, with some financial assistance from Dairy New Zealand and Fonterra, has recently appointed a Dairy Liaison Officer to work closely with farmers and staff within the dairy industry.

The key responsibilities of this position are to assist farmers who are converting to dairying, or changing their existing consents, to work through the consents process and to understand the requirements of their consent conditions.

Dairy farmers and those converting need to be aware of the requirements for the area needed for effluent disposal. A good way to deal with this is to make them aware of the nutrient value of the effluent and, at the same time, what the effects are on animal health if the consent conditions are exceeded. By using this approach, the farmer gets a positive financial return and, at the same time, the environmental outcomes are very good.

Environment Southland requires low application systems to be used for the disposal of farm dairy effluent. These requirements are applied when a farm is being converted to dairying, or when consents on existing properties are renewed. Staff spend a considerable amount of time promoting these systems and, where necessary, information is provided to farmers on who is available to be contacted for professional advice with regard to design and construction. Sludge separation beds and storage ponds for "deferred" irrigation must be constructed to standards that, to all intents and purposes, will not leak.

Information is supplied about "best management practices" for the collection and disposal of effluent and leachate for wintering pads, feed lots, silage pads, underpasses, lanes and their location, with due regard to the proximity of waterways. Advice and information has also been given on the positioning and disposal of effluent from wintering pads, stand off areas, feed lots and silage bunkers. These structures should be positioned close to the dairy shed and effluent pond where possible, so that the effluent and any leachate can be collected in one system and disposed of in an appropriate manner.

Enquiries about the possibility of dairy conversion totalled 148 for the year. A number of these enquiries did not proceed any further than an initial farm visit. Some of these enquiries have been deferred until a planned supply date of August 2009, with one planned for 2010.

Visits to 158 farms were undertaken for advice and information for consent renewals and farmers who want to change their effluent systems. These enquiries have led to increased storage for deferred irrigation and, in many instances, changes away from travelling irrigators to low rate application systems and increased effluent disposal areas.

During these farm visits discussions have taken place with regard to other best management practices, such as location of lanes and tracks and fencing in relation to waterways, the practice of winter grazing and winter cropping and the relatively new three metre rule.

Approximately 35 consents on existing farms were due for renewal and many of these were visited with a view to changing effluent disposal systems to a "low application" system. The initial reaction from many of the farmers (both new conversions and existing operators) was to stay with the traditional method of travelling irrigators, but when the reduced environmental impacts of using a low rate effluent application system, along with the nutrient value of the effluent as a fertiliser, are explained the farmers are more readily convinced of the benefits of low application systems.

Three workshops were run at the South Island Dairy Event (SIDE) with the topic being low application rate effluent systems. These workshops were run in conjunction with Vaughan Templeton, a dairy farmer from Riverton.

The participants were asked to complete an appraisal form for these workshops, and the table below is a summary of the results.

Table 1 – Appraisal form results

	Scoring rate (5 being excellent)				
	5	**4**	**3**	**2**	**1**
Presenter's knowledge of topic	75	56	13	3	2
How useful is the knowledge you have gained from the workshop?	55	63	29	3	0
How likely are you to use the knowledge gained?	57	52	30	9	1
Would you recommend this workshop to a friend?	Yes: 146 No: 4				

Presentations were also made at the PGG Wrightsons dairy conversion seminar, which was attended by approximately 240 people, and at an evening seminar organised by the Northern Southland Veterinary Service at Balfour, with an attendance of between 80 and 90 people. On-farm staff training was undertaken on 15 farms.

5.2 Dairy Water Take Monitoring

Since the Proposed Regional Water Plan for Southland was officially launched, the taking of more than 20,000 L of groundwater, or 10,000 L of surface water per landholding, per day for dairy purposes has required a water permit. Currently, about 600 of the consented dairy farms hold water take permits. The remainder act under existing use rights and will be required to

obtain a water permit upon renewal of their discharge permit. For the purposes of this report, there is no distinction made between groundwater and surface water takes.

All but the earliest water permits require the fitting of a suitable water meter, and an annual report to Council of water taken. For the last few seasons, all dairy water take holders have been required to provide an annual report, regardless of consent wording. These reports can be of three types:

- readings daily for a continuous two week period once a season;
- readings weekly for the entire season;
- readings monthly for the entire season.

The appropriate forms for recording water takes are posted annually along with the "Dairy Pack" to all dairy consent holders and are also available on our website on the "Compliance Monitoring Forms" page at www.es.govt.nz.

Obviously, the more complete the records, the more suitable the data is for managing the resource. For this reason, the weekly or monthly reports are preferred. Many absentee owners of dairy farms also prefer these, because filling them in can become part of a scheduled routine for their staff. This reduces the likelihood of the records being lost or forgotten, which results in a fee for failure to provide data. A common reason for high reported usage rates is a leak in the system, which of course costs money. Weekly meter checks would result in early discovery of such a problem.

Those who persistently fail to report this information are sometimes found, upon follow-up, to have also breached other conditions of their consent. For example, failure to install a meter, or taking the water from a point not allowed by the permit. In future, it is likely that these consent holders will be issued with an Abatement Notice, requiring that the data be continually recorded and supplied electronically to Council. This is already required in the case of some recent pasture irrigation permits.

The reporting performance for the 2007/08 dairy season is summarised in Figure 9, below. The information is converted into average volume taken per cow per day, based on the maximum numbers of cows reported on farm during the season. This is to normalise the data between the different report types, and generally results in a representative figure for the property, if slightly underestimated.

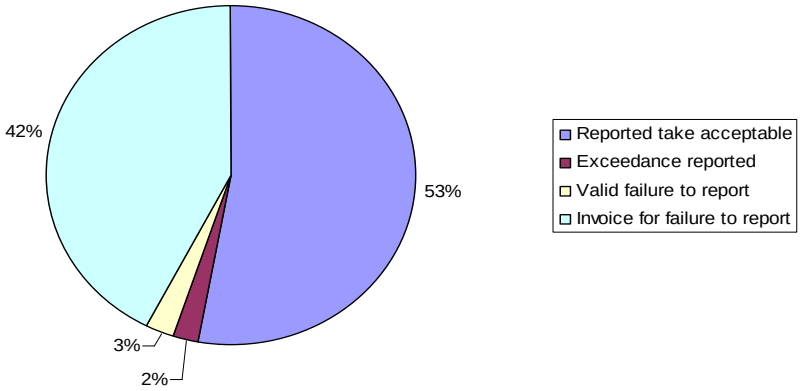

Figure 9 – Dairy water take reporting performance 2007/08

Number Crunching

The overall average water take was 102.39 L per cow per day for the 2007/08 dairy season, up from 100.44 L/cow/day in 2006/07. Note that this is, in most cases, water use for both dairy shed purposes and stock drinking water combined. A likely cause for the increase was the unusually dry conditions that occurred late in the summer.

Of the reliable data, the lowest take reported was 14.29 L/cow/day. This property is known to use rainwater collection from an extensive covered area to supplement the take. However, such low figures on other properties may indicate non-compliance, for example that not all extraction points are metered, or that the meter has been misread. Many meters require the reading to be multiplied by 10, and this is clearly marked on the face of the instrument.

The highest take was 239.20 L/cow/day. In this case, the consent holder had, as with last year's maximum, increased the herd size for the discharge permit, but had declined to vary the water permit. Another initially very high rate was due to a farmer who owned adjacent properties linking the hoses after the failure of one farm's bore. The sharemilker on the reporting property had failed to take into account the herd across the road, so the per cow take appears very high. When adjusted, however, the usage was slightly below average. No action was taken on this occasion as the farmer believed that as he held sufficient consented volume in total, there was no need to advise Council. However, consent holders should note that water permits are issued for a take from a specified location. If this changes, then Council should be advised, as a variation to the consent may be necessary. If the intended aquifer is already fully allocated, then other options may need to be pursued.

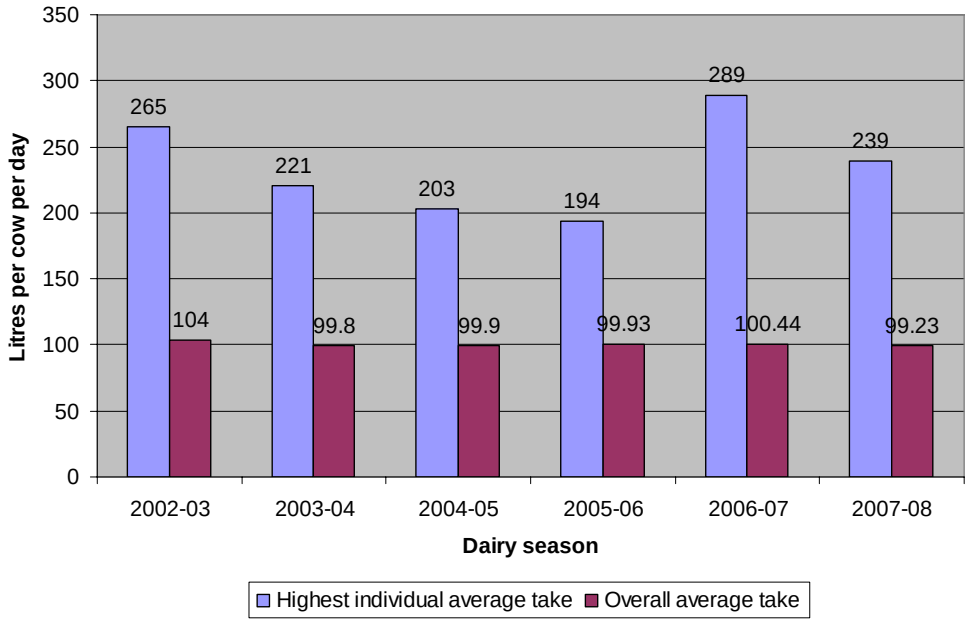

Figure 10 – Dairy water takes 2002-08

Figure 11 below illustrates that the proportions of average daily water takes shifted towards the upper end of the distribution compared with the previous season. Again, this is likely to be an artefact of the near-drought conditions experienced.

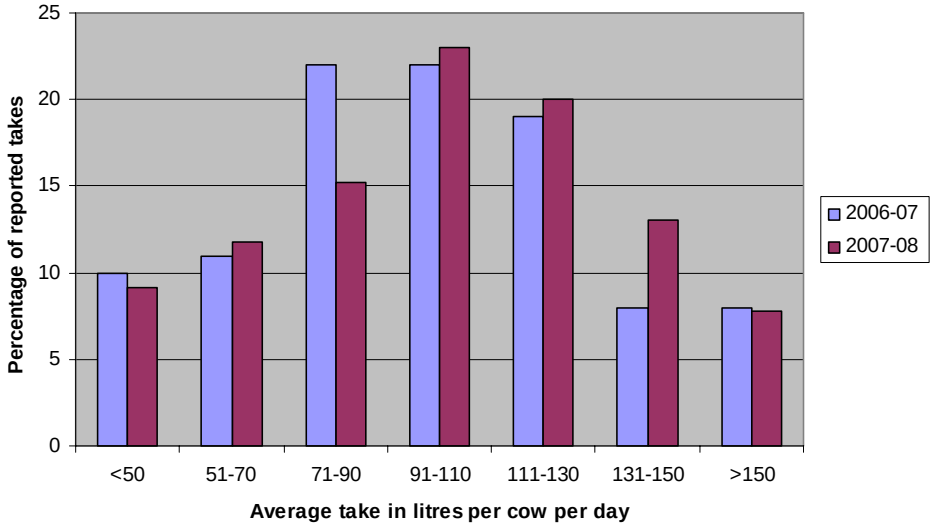

Figure 11 – Distribution of average daily per cow water take

Figure 12 below shows that, again, the majority of farms took less than their consented limit. In fact, this year over half reported taking less than 60% of the volume permitted by their permit.

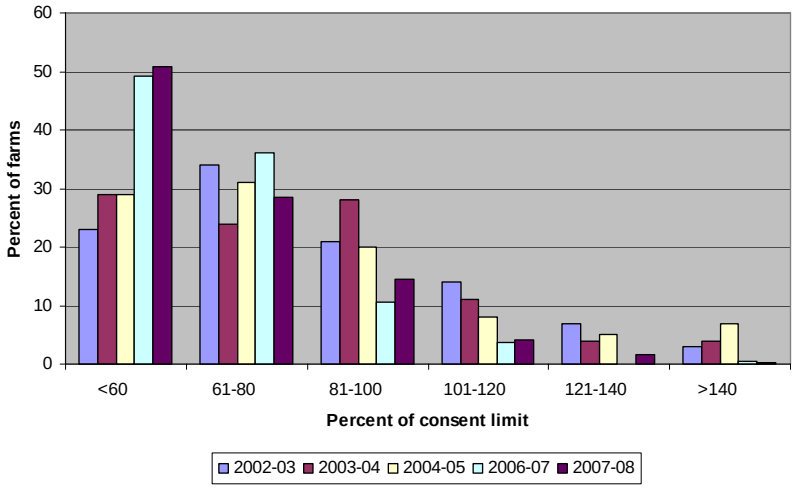

Figure 12 – Proportion of consented volume actually taken (by daily average)

Figure 13 presents the same data, but more clearly shows the change over time in proportion of consented water take volume actually reported as used. The chart indicates that in recent years it has become more common to secure sufficient consented water volume to accommodate future herd expansion.

It is pleasing to note that the proportion of farms taking water in excess of limits has declined markedly, and grossly excess takes have approached zero over the last two seasons.

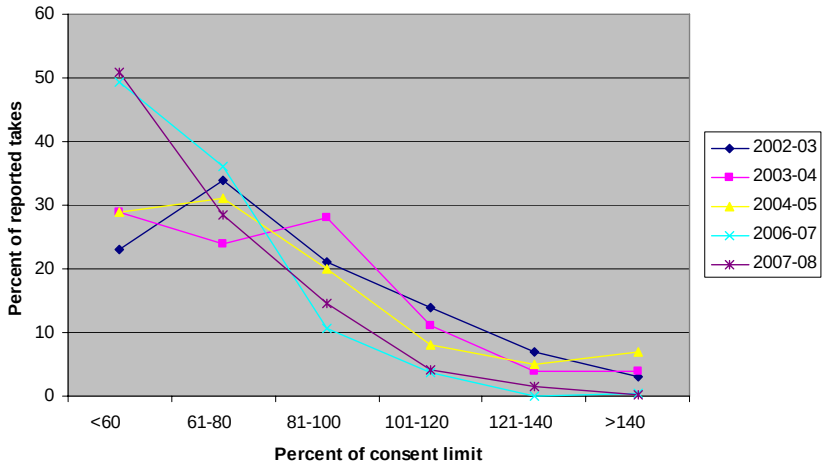

Figure 13 – The changing trends of dairy water takes over time

5.3 Effluent Discharges

During the 2007/08 dairy season, 884 inspections were carried out on 704 dairy farms.

Inspections were carried out between September 2007 and May 2008, by four staff and one contractor.

Of the 930 inspections that were carried out:

- 355 (38%) achieved a "1" rating on first inspection;
- 344 (37%) achieved a "2" rating on first inspection;
- 140 (15%) achieved a "5" rating on first inspection;
- 9 (2%) achieved a "7" rating for over consented cow numbers;
- 78 (8%) were re-inspected - a "10" rating equates to failure to meet consent or plan standards.

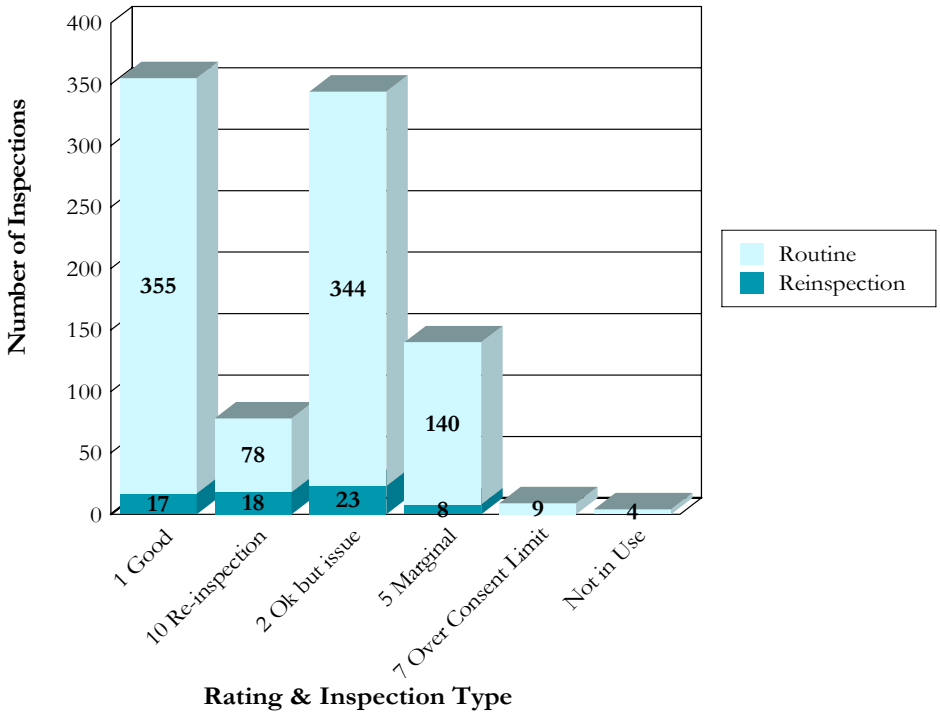

Figure 14 – Rating and inspection type

The provision of the "Dairy Liaison" position has been a success and has resulted in a marked increase in the number of deferred effluent storage ponds and low application rate effluent systems. This is in line with Environment Southland's "best practice" guidelines and current consent condition policy.

Helicopter Inspections

Following on from the effectiveness of last year's more than 600 helicopter inspections, this year 224 farms were inspected during 13-16 May 2008.

The five criteria of the inspections were:

- pond/sump;
- irrigator;
- silage stack;
- waterways;
- three metre "mob stocking" rule.

There were a number of possible dairy related problems identified from the air. On the ground, inspection revealed only eight of these were in fact non-compliant.

Figure 15 - A waterway has been fenced to allow stock access from both paddocks

5.4 Groundwater & Surface Water Quality Monitoring

Groundwater Quality Monitoring

Groundwater monitoring is intended to detect possible contamination of groundwater from farming activities. Groundwater samples are collected from the water table near the effluent disposal field.

At the end of the 2007/08 dairy bore monitoring season, there were 160 dairy discharge consents that required groundwater monitoring. Eighteen new consents issued since March 2008 included a bore sampling condition and, in several cases, also required surface water monitoring where environmental risk was considered high.

Many resource consents specify a particular bore to sample, others specify an acceptable area where the bore should be located. The samples are collected by a contractor on behalf of Council (twice a year generally), which was instituted a few seasons ago due to the failure of many consent holders to collect or report samples. A discussion with the contractor prior to the 2007/08 season revealed that previous work instructions had been *ad hoc* or unclear, which was resulting in variability in the method of selecting sampling points. Historical samples had been collected from the bore indicated by the farmer and not the most suitable bore for assessing environmental contamination. This approach had resulted in the sampling point usually being the bore marked on the consent map, which was usually the dairy shed

supply bore. In most cases, the consent holders had failed to confirm the suitability of the bore for environmental monitoring with the Compliance Manager, as required by their consent.

Last years water quality results indicated that many samples were coming from confined or semi-confined aquifers. This year, instructions were given to not collect a sample if the bore depth or location was not suitable, or the sampling point could not be confirmed as providing a representative sample of groundwater (for example after storage or treatment). Following this, 95 farms were required to install a sampling tap, either for the above reasons or because sampling the tank inlet was considered a health and safety risk.

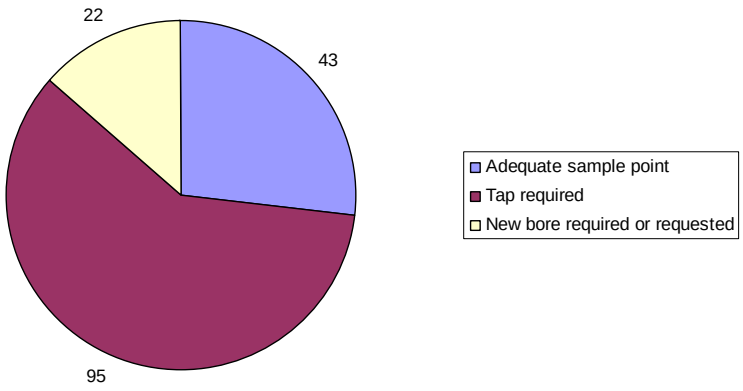

Figure 16 – Sampling point suitability

A review of all consents in the programme was undertaken, which revealed a high level of discrepancy with consent conditions. In many cases, the consent required that the monitoring point be approved by the Compliance Manager, and there was no documentation to support that this had occurred. In other cases, the consent specified a particular bore or bore location, but samples were being collected elsewhere. This resulted in a lot of data requiring re-labelling in our databases and identified that a lot of previous samples had been from inappropriate bores. It is hoped that Council will be able to institute a system of permanent labelling of bores in future. This is a cross-divisional project that is in its early stages.

The contractor collected additional data during her visits this year, including identifying any bores not known to Environment Southland on those farms where the existing bore was identified as being inappropriate. Although resource consent has been required for all new bores or wells since 2004, many pre-existing bores were not recorded. On at least one farm new bores were identified, and failure to obtain a permit for these bores is being followed up.

Information gathered to date suggests that 12% of farms require further on-site investigation to assess compliance. Where bores have been defined as marginal this is generally because they are located correctly, but they are more than 15 m deep. Ideally, monitoring bores should be less than 10 m deep.

Consent holders have been informed in a letter summarising the seasons results whether or not a bore has been confirmed as satisfactory for on-going monitoring, and any steps they need to take within a specified timeframe, if not.

Where a location has been confirmed, the co-ordinates have been linked to the sampling database with the bore number, to avoid misrecording of data in future.

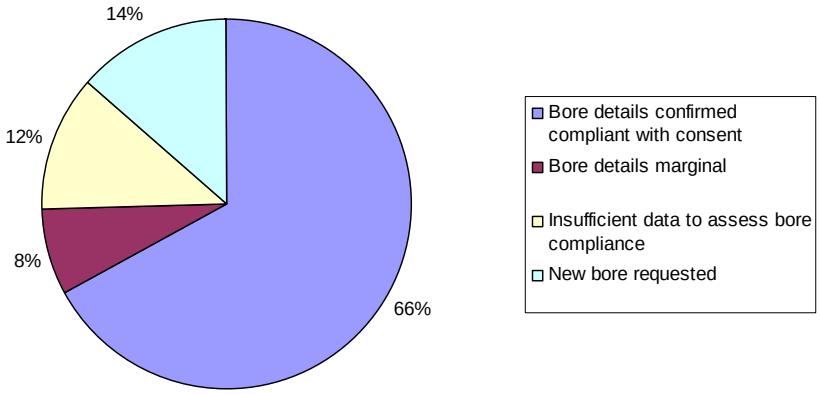

Figure 17 – Monitoring bore depth and location compliance at April 2008

Grading of groundwater sample results

Over the 2007/08 season, there were 313 sampling visits undertaken. Because of the review, for the first time there were 93 "no sample" events recorded, where the bore or sampling point were unsuitable or the specified bore could not be located. Of the others, 175 results were graded "good", 41 were graded "marginal" and three were graded "unsatisfactory".

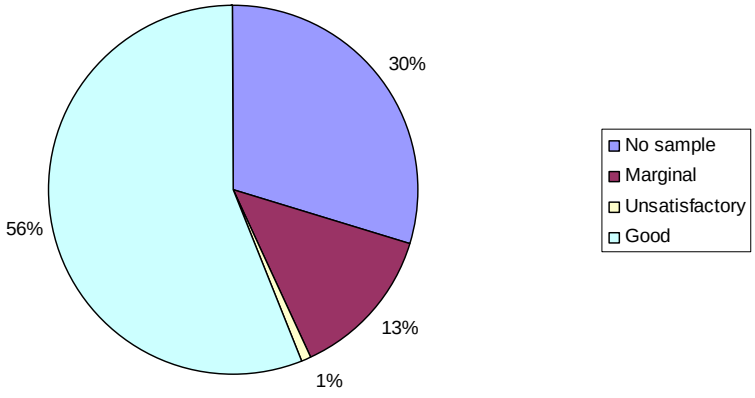

Figure 18 – Performance gradings 2007/08 season based on groundwater quality

In the 2006/07 season for comparison, 287 samples were collected, 24% of which were graded marginal and 76% as good.

These ratings are based solely on results (including trends over time) and disregard other compliance matters, such as well-head protection or suitability of the bore itself with respect to consent conditions.

The rating of "Unsatisfactory" was issued to three properties, due to a combination of persistent bacterial contamination and increasing trends in nitrate and electrical conductivity levels, or spikes in contaminant levels.

Of the "Marginal" samples, most were from very shallow bores where the groundwater is likely to be affected by surface activities. Some with very high bacterial counts were clearly the result of direct contamination and these consent holders have been advised to check their well-head protection. Often a failure to seal or bund the bore or well, to exclude stormwater infiltration is identified as the problem.

As in previous years, a small number of bores sampled revealed nitrate nitrogen levels in excess of the ANZECC Drinking Water Standard of 11.3 mg/L. This continues to be of concern, and the affected consent holders have been advised that the water should not be used for domestic purposes. High nitrate nitrogen levels in drinking water can in some cases result in "Blue Baby Syndrome". There were also a few farms where the monitoring indicates increasing nitrate nitrogen levels over time, and if this exceeded 8 mg/L–N they were advised to pay particular attention to nitrogen inputs on the property.

Seven farms with repeat bacterial contamination were recorded, however, in most cases field notes and photographs indicated the source was likely to be poor well-head protection rather than a generalised effect on the aquifer. This is still of concern, and the affected parties have been required to bring the bores or wells up to standard by November 2008.

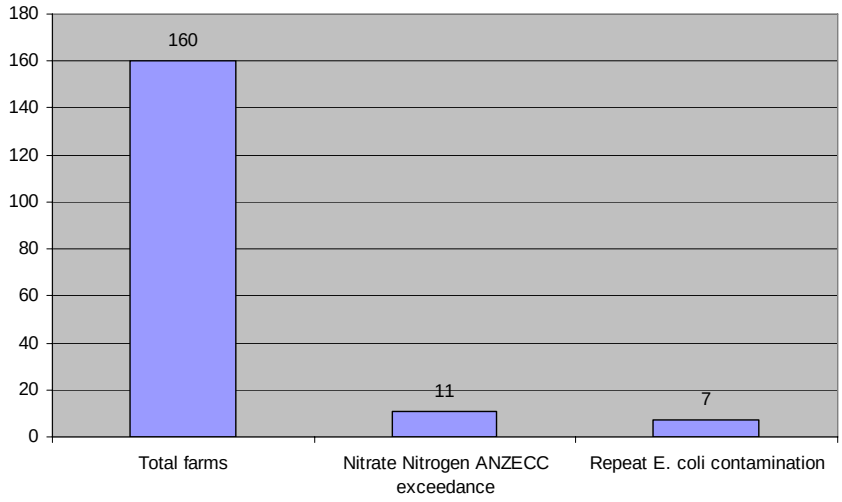

Figure 19 – Proportion of contamination 'hotspots'

Because of the review process and changes in our sample data management system, the reporting of groundwater sampling back to consent holders was delayed this season. However, the nature of groundwater effects from discharges to land is such that there tends to be a lag between activities and measurable changes in groundwater analyte levels. Interpreting both sets of results at once was found to have some value. Accordingly, it is likely that in future seasons an annual summary of results will be reported to consent holders, rather than separate letters after each sampling round.

Surface Water Quality Monitoring

As at the end of the 2007/08 dairy season, 322 dairy effluent disposal consents required surface water monitoring (Figure 20). The number continues to increase with the present surge in conversions to dairy farming and with sampling regularly being added to replacement and varied discharge permits. A number of recently granted permits, where the risk of leaching is identified as moderate to high, have required both groundwater and surface water monitoring.

Increasingly sampling three or four times per year is being specified, where twice a year was once common. Each consent specifies the frequency and location of sampling (specified points, outfall of drain, or upstream and downstream of waterway most likely to be affected). The tests to be performed on the samples also vary and are specified in each individual consent.

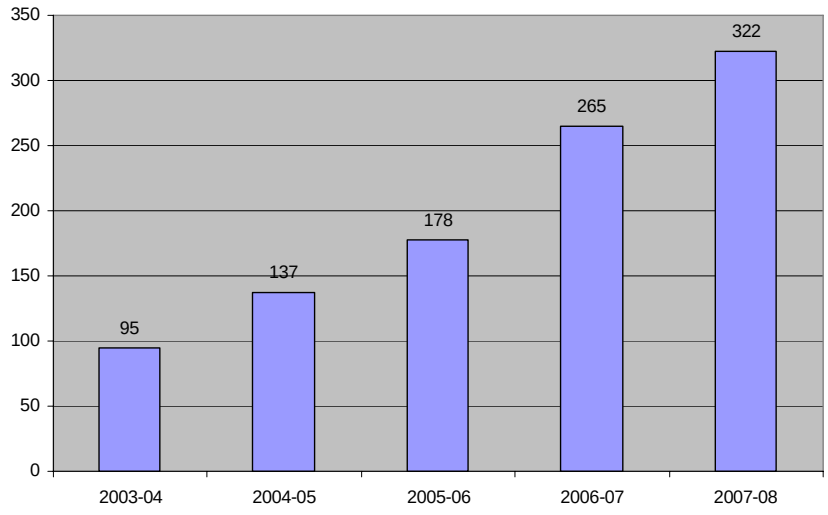

Figure 20 - Number of dairy consents requiring surface water monitoring by season

At 1 September 2008, 1,056 surface water sampling visits were scheduled for the 2008/09 season at 366 farms. By comparison, 772 sampling visits were undertaken in 2007/08 and 538 over the 2006/07 season. These figures include wintering pad monitoring samples, so the season is considered to run from 1 July in one year to 30 June in the following year. This is in line with most dairy water permit reporting and also approximately coincides with "Gypsy Day".

Of the 772 surface water monitoring inspections that occurred this season, four were to confirm a status of "not in use" (a small number of properties that in recent years had been not in use appear to have re-commenced milking this season). Samples were collected on 563 visits. The remaining 205 visits were "no sample" events. This is because the sampling conditions in the consent could not be met, usually the specified waterway or drain was not flowing (a large proportion during the near-drought last summer) or a specified rainfall or cow number was not reached. These "no sample" events are classified as having complied with the consent.

Results are interpreted with reference to national standards and guidelines, trends over time for the property or waterway concerned, soil and weather conditions and other relevant factors such as the presence of waterfowl. Samples are then graded as either "Good", "Marginal" or "Unsatisfactory" (Figure 21).

It should be noted that these grades are based on water quality alone. If a non-compliance is identified by the contractor, the event is investigated and usually resolved separately through the incident process.

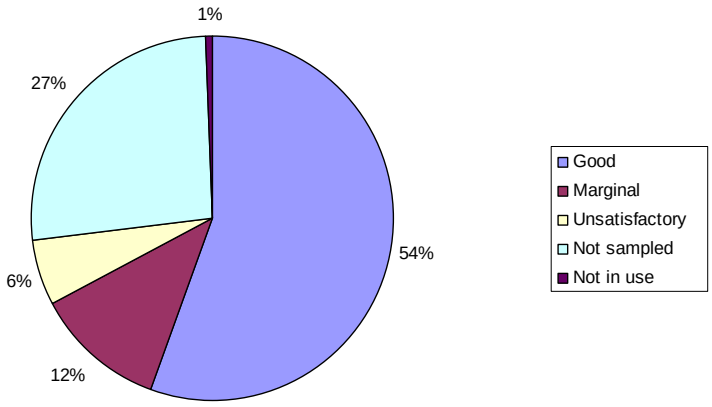

Figure 21 – 2007-08 Dairy season surface water monitoring grades

A comparison of surface water monitoring grades over the last four dairy seasons in the following figure indicates that the proportions of "Marginal" and "Unsatisfactory" grades is steadily declining. This is very pleasing. The decline in standards apparent between the 2002/03 and 2004/05 seasons is possibly attributable to a shift from smaller family-run farms to the more "industrial" scale dairying prevalent today. This period also coincides with the progressive change from self-reporting of water quality, towards the 2006 decision that Council collect all samples.

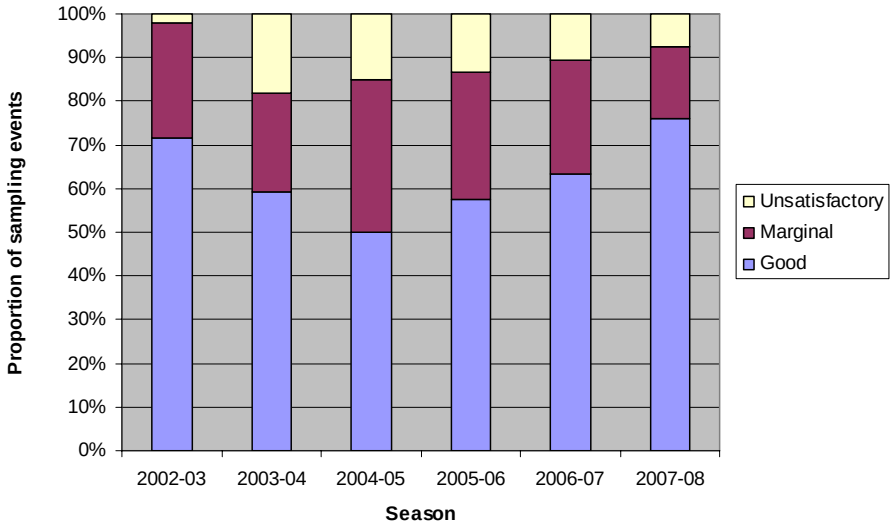

Figure 22 – Proportional surface water monitoring grades by season

It was pleasing that compared with previous seasons, incidents of visibly "green streams" discovered during routine sampling were noticeably fewer. The contractors reported a higher number of less serious incidents this year, such as irrigating outside of the consented area and sundry matters, such as unauthorised offal disposal. Consent holders should note that the laminated copy of the dairy permits, including the discharge area map, must be displayed prominently in the dairy shed so all staff are aware of the operating limits. If this has been misplaced, a replacement copy will be provided on request. They should also ensure they are familiar with all other relevant regulations, such as permitted activity parameters. The relevant regional plans are available at our offices, public libraries and on our website.

Routine sampling identified the first case of effluent discharge to a waterway as a result of incorrect use of a deferred storage pond and low application rate system, near Otautau. The weeping wall was overflowing and the system had been set to run on a slope above a known tile drain in a gully, during heavy rain. The sample from the affected tile was visibly less turbid and more yellow in colour than a comparable discharge from a sump and travelling irrigator system failure in similar circumstances. Contaminant levels were much less.

Number Crunching

Most current permits require obtaining a representative sample of water upstream and downstream of the effluent discharge area at the time of sampling. Some consents specify the exact sampling points, or require sampling at the upstream and downstream farm boundaries in the waterway most likely to be affected by the discharge. From these types of sampling events over the previous season, the variances between the upstream and downstream results for several common analytes are presented in the following scatter diagrams.

Some consents require the sampling of a tile drain outfall, or field conditions dictated that only a downstream sample could be collected, so there are no upstream results for comparison in these cases. The information gathered from these samples is not considered below.

In these charts, a positive value indicates an increase in the level of the contaminant. If this is at, or near, the zero line it is likely to be statistically insignificant. If the value lies below the zero line (i.e. is negative), then water quality can be considered to have improved between the sampling points. There may be a number of reasons for this, including an influence from an upstream property, or dilution of the water from a clean tributary entering the system. Each sampling event is interpreted by considering all the information available, including field observations and weather conditions. Where there are indications of an effect, a follow-up field visit is usually undertaken to exclude any possible influences, apart from the application of effluent to land.

Consent conditions vary but, as can be seen from the clustering, the usual sampling periods are September to October, February, and April to May. These are considered the risk periods for effluent application, when the soils are most likely to be either saturated, or particularly dry.

Figure 22 illustrates bacteria levels, using *Escherichia coli* (*E coli*) as an indicator of likely faecal contamination. A total of 359 sample pairs were tested for *E coli* this season, with an average increase of 333 MPN per 100 mL. The change ranged between 86948 to -90800 MPN/100 mL.

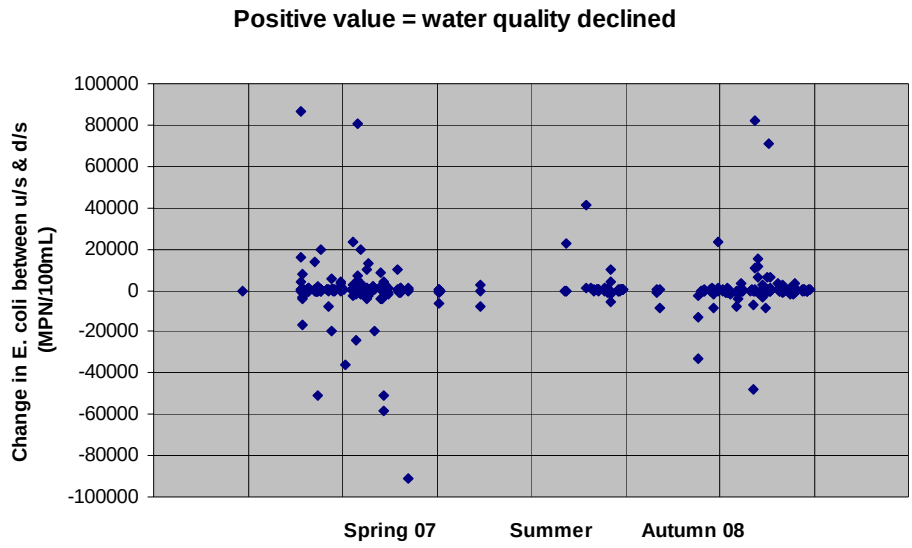

Figure 23 – *E coli* bacteria count changes between upstream and downstream sites

Figure 24 considers changes in ammoniacal nitrogen, another common contaminant of waterways, as a result of farming practices. There were 330 pairs of samples with this test, with the average change recorded overall as a decrease of 0.06 mg/L – NH4. This figure was affected by a significant outlying result of -21.1 mg/L for one pair of samples. The range was an increase of 5.8 mg/L, to a decline of -21.1 mg/L.

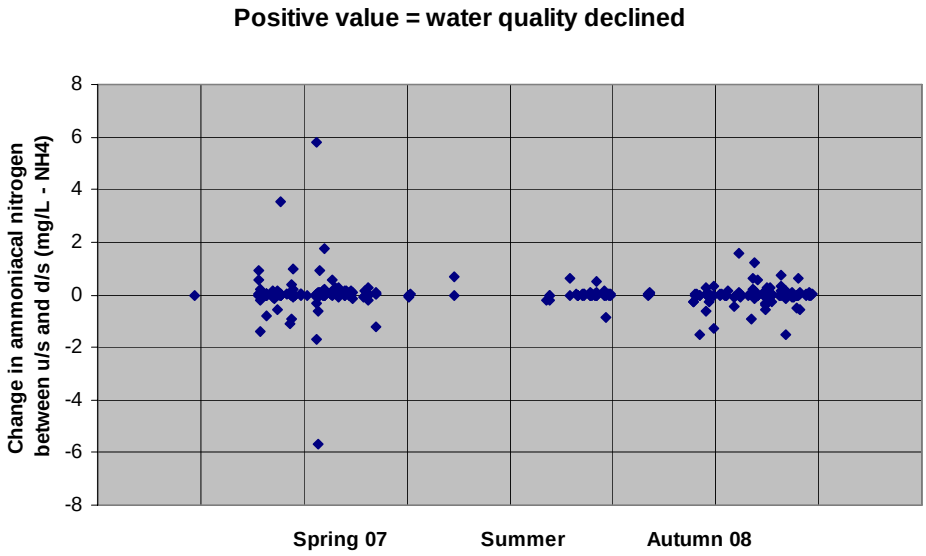

Figure 24 – Ammoniacal Nitrogen value changes – 2007/08 season

Figures 25 and 26 relate to phosphorus levels. A total of 80 pairs were tested for Total Phosphorus (TP), and 279 of the more recent permits for Dissolved Reactive Phosphorus (DRP). The average change in TP was an increase of 0.009 mg/L – P, ranging between 0.980 and -1.010 mg/L – P change. The average change in DRP was -0.072 mg/L – P, with a range of 0.976 to -19.972. This outlying result was also removed from the graph for clarity, and occurred in the same sampling event as the ammoniacal nitrogen outlier.

Again, the results from the 2007/08 dairy surface water monitoring season indicate that the highest risk periods for effluent application to land resulting in degradation of surface water quality are spring and autumn. This reinforces Council policy that land disposal of dairy shed effluent should be managed using storage facilities, so that the effluent can be applied during times of less risk. Many dairy discharge permits now require the consent holder to consider soil moisture levels before applying effluent and the data from a small network of soil moisture monitoring sites can be accessed at any time from the "Dairy Effluent" page on our website, www.es.govt.nz. Soil moisture probes can also be installed by a number of suppliers on-farm, with the data available via telemetry direct to the farm computer, mobile phone or PDA, or available on a personalised website.

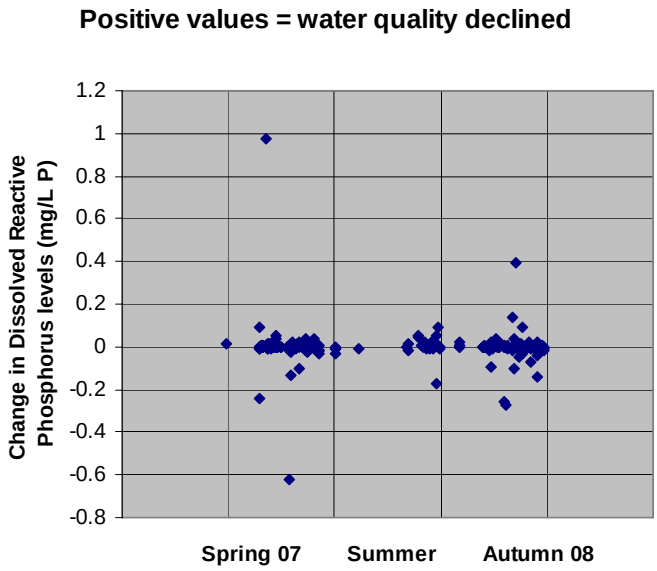

Figure 25 – Dissolved Reactive Phosphorus changes – 2007/08 season

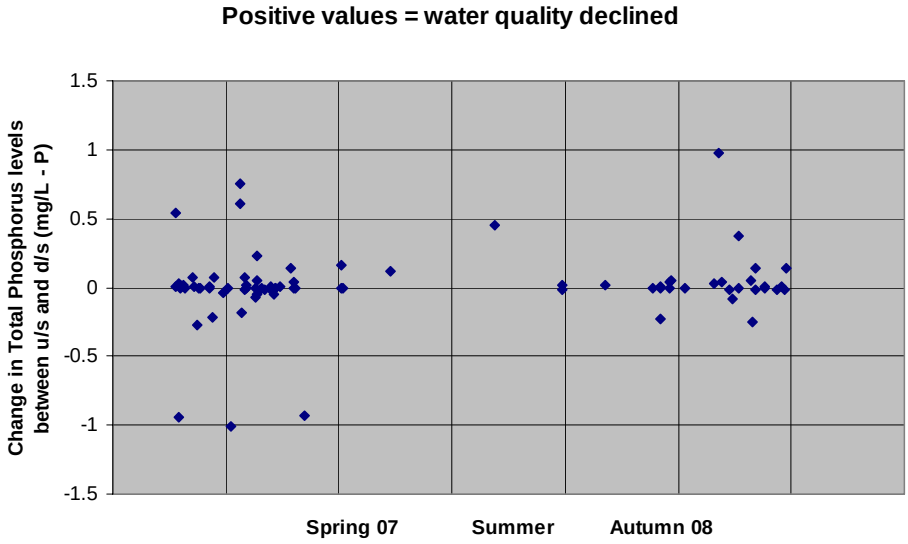

Figure 26 – Total Phosphorus changes – 2007/08 season

6.0 Structures in Waterways

6.1 Whitebait Structures

Environment Southland is responsible for the management of structures used for the purpose of whitebaiting throughout the Southland and Fiordland regions.

Resource consent is required for a whitebait structure over a waterway. A total of 657 resource consents are currently held across seven rivers in the Southland and Fiordland regions for the purpose of whitebaiting. Environment Southland has no plans to increase the amount of structures allowed for whitebaiting.

A breakdown of the number of consents for whitebait structures per river is as follows:

- Mataura - 329
- Aparima - 165
- Titiroa - 97
- Waikawa - 28
- Pourakino - 17
- Awarua - 15
- Hollyford - 6

The majority of consents are to use, occupy and erect a structure in a coastal marine area. There are, however, nine consents that are for land use as they fall outside the coastal marine area.

There is no provision in regional plans for whitebait structures on the Waiau or Oreti Rivers. Inspections on these rivers are driven by reports of illegal structures and/or navigational hazards created by whitebaiting activities.

Following on from the previous year, the main issue for the 2007/08 whitebait season was the requirement for tail rope anchors and pulleys to be consented when users wished to leave them in the river overnight.

Some consents have been granted for tail rope anchors and pulleys to remain on the river bed. These have been subject to the following criteria:

- that it remains within one-third of the river from the riverbank where it is operated from;
- that the existence of the pulleys and anchors do not create a navigational safety hazard;
- that the consent lasts for the duration of the whitebait season only;
- that the consent is subject to review at any time.

Overall compliance was deemed to be fairly good throughout the season.

7.0 Truckwashes

A total of 18 inspections were carried out on consented truckwashes during the 2007/08 year. Compliance has been very good, except for three consented sites and one non-consented site.

One site was found to be discharging contaminants to water from several different areas. A sludge heap was overflowing, overland flow from effluent irrigation was entering an underground drainage system and sediment from the gravel on the yard was found to be entering a nearby waterway. A number of samples were taken. Enforcement action has been started, with an abatement notice being issued. A decision will be made at a later date on whether further enforcement action will be taken in relation to these incidents. The company is working with Council's Land Sustainability staff to establish a wetland that will improve wastewater and sediment containment.

A further site was found to be discharging washwater onto land using a travelling irrigator in such a heavy manner that the washwater had entered a waterway via an underground drainage system. An abatement notice was issued and the company has closed the wash, stating that it was too difficult to comply with the requirements. The trucks are now washed at the company's other consented site. This other site also had some difficulty with sediment from the yard running off into a waterway. This problem was rectified by diverting the yard runoff to the wash water containment facility for application to land via a travelling irrigator.

An unconsented truckwash was located close to the coastal marine area near Bath Street, Riverton. The subsequent abatement notice required the truckwash to be disbanded and the area tidied up. The requirements have since been met and Council has recovered costs from the investigation.

Figure 27 - Unconsented truckwash

8.0 Coastal Marine Area

8.1 Commercial Surface Water Activities

The start of the 2007/08 year saw the position of Compliance Officer – Coastal becoming operational. This officer is specifically responsible for monitoring compliance with conditions of coastal permits issued pursuant to the Resource Management Act 1991 and the policies and rules in accordance with the Regional Coastal Plan for Southland.

A recent investigation into an alleged illegal commercial surface water activity operator in Fiordland has resulted in the issuing of two abatement notices and the possibility of a prosecution of the operator as a result of evidence gathered. The investigation was instigated as a result of information received from other commercial surface water operators in the Fiordland area, who were concerned at the alleged illegal activity.

The staggered reporting times for activity logs submitted by all commercial surface water activity operators has been changed. These logs are now required no later than the month following the end of each calendar quarter. This was implemented due to confusion by a number of operators about when they were required to submit activity logs. To date, 95% of all required activity logs are being furnished on time.

A change to Rule 16.2.2 of the Regional Coastal Plan for Southland was sought and implemented as a result of an incident where a recreational vessel taking a video of the internal environment of Fiordland technically fell under the definition of a research vessel.

Combined enforcement patrols in Fiordland involving the Ministry of Fisheries and Department of Conservation have also been conducted and have proved to be a valuable tool in ensuring compliance with consent conditions to date. The patrols have also facilitated interagency co-operation, enhanced the flow of information and allowed for more efficient use of compliance resources.

8.2 Marine Farms

Environment Southland has now been provided with details of all leases, licences and marine farm permits for the Southland region by the Ministry of Fisheries. Pursuant to Sections 10(1) and 20(2) of the Aquaculture Reform (Repeals and Transitional Provisions) Act 2004 (ARA 2004), all these leases, licences and marine farm permits are now deemed to be a coastal permit granted under the Resource Management Act 1991.

On 14 December 2005, pursuant to Sections 10(4) (leases & licences) and 20(3) (marine farm permits) of the ARA 2004, the Council commenced a review of the deemed coastal permits, including the conditions of the permits. The review will, if the Council considers it necessary, vary, add, or delete

conditions for the purpose of making the conditions consistent with the Resource Management Act 1991.

A significant part of the review process includes surveying all marine farm sites to determine whether or not they occupy their authorised space. If a marine farm site is found to be off-site, the Council will require an application, lodged prior to 31 December 2006, for the farm to remain in its actual space (unless the marine farmer chooses to move the farm back to their authorised space). Marine farm sites that are found to be oversized (occupying more space than allowed for in the coastal permit) will have to reduce the size of the farm.

Another issue of concern, specific to the Big Glory Bay marine farm sites, is off-site anchor and anchor lines. This is being dealt with by including all off-site anchor and anchor lines within the aquaculture management area for each respective marine farm.

At present, the survey work outlined above is being completed with consent holders contributing to the cost. It was previously decided no monitoring would be undertaken until the deemed coastal permit review process had been determined. This was to avoid duplication of work and cost to the consent holders. With the review process being determined, no monitoring will be undertaken until after the completion of the survey work. At that point possible monitoring options will be evaluated to determine if it is necessary at that stage of the review process. This is to allow off-site and oversize marine farms to be monitored for compliance, after taking into account any applications to amend permits to reflect actual space occupied.

9.0 Major Industries

9.1 New Zealand Aluminium Smelters Limited

Monitoring

New Zealand Aluminium Smelters (NZAS) currently holds the following resource discharge consents that require monitoring:

- discharge and coastal permit for discharges from the north, south and west drains;
- discharge permit for treated sewage to land;
- coastal permit for the discharge of treated effluent;
- air discharge consent from an aluminium smelter and related activities;
- discharge consent to land at the smelter's landfill site.

A wide range of monitoring is undertaken to measure the environmental impact that the smelter is having on the environment. This includes monitoring of:

- the air being discharged from the main stack;
- the air being discharged from the main smelting buildings;
- the ambient air quality at several sites in the Awarua and Bluff areas;
- the vegetation and pine needle quality, with respect to fallout from the air;
- water quality in Awarua Bay and Foveaux Strait;
- groundwater quality;
- gaseous emissions.

All of this routine monitoring is conducted routinely by NZAS as a part of its various resource consent requirements, with regular audits being conducted by Environment Southland to confirm the validity of the results. This year, all monitoring was fully compliant with the respective resource consents.

For a number of years NZAS has been able to build up a very strong and well established compliance record. As a result, Environment Southland considered rationalising some of this monitoring. However, NZAS believes that the current monitoring regime is necessary to provide it with information to assure the public that NZAS continues to perform and have a limited impact on the surrounding environs in the Awarua/Bluff area.

Complaints and Self-reported Incidents

No incidents were reported from the public, however NZAS was very active in self-reporting minor events. The reporting of these events is to be commended. The alerts received by Environment Southland resulted in no significant environmental impact. The alerts received included:

- spillage of approximately 1-2 tonnes of alumina onto the wharf, to sea and onto an adjacent work boat. All attempts were made to remedy the situation and clean up the vessel. Impact was assessed as minor;

- short period of black smoke was being discharged to the air during the commissioning of a new furnace. The burners were turned off for repair and commissioning recommenced. Impact was assessed as minor;

- a faulty thermocouple caused the carbon bake furnace fan to trip out, causing the bake furnaces to vent directly to air for four hours. Impact was assessed as minor;

- a suspected sewage leak was reported when it was discovered an underground pipe was failing to hold pressure. Further investigation found no problem with the pipe and no loss of sewage to land. No impact;

- spillage of four litres of heavy fuel oil to Bluff Harbour on an outgoing tide. This was caused by oil being retained in an elbow of the pipe after bunkering. The heavy fuel oil was lost to sea when the lines were disconnected. The oil was unable to be contained. The incident was fully investigated, the cause identified and appropriate remedial action has been put in place to eliminate a repeat of this type of incident.

Issues

No issues at the time this report was prepared.

General

In 2004 a Wharf Seabed Monitoring programme was undertaken in Bluff Harbour to assess sediment levels near the end of the NZAS wharf to determine the impacts, if any, of the activities undertaken on the wharf. The study was conducted by the Cawthron Institute and found that the concentration of contaminants in the sediments were below guideline values. During the survey a quantity of debris associated with wharf activity was noted. Some items, such as a toilet bowl, caused some thought about how they came to be there. Approval was sought, and granted by Environment Southland, to remove a lot of this debris from the seabed.

To minimise the impact on biodiversity in the area, a number of items were left on site as the local marine life had begun to colonise the area. Items with less than 50% of the surface area exposed were left in place.

Phase 1 of this programme proved very successful, with items such as bottles, crockery, electrical cable, batteries, boots, transistor radios, tyres, toilets and steel structures removed. A grand total of 10 tonnes was removed from around the wharf area. NZAS is to be commended for embarking on a project of this nature.

The plant is currently investigating the installation of a SO meter, to meet a condition within its air discharge permit. Progress towards achieving this will be reported in next year's publication.

Table 2 – New Zealand Aluminium Smelters – Performance Summary

Issue	Score	Comments
Provision of data/results	Excellent	Data is provided on time at monthly, quarterly and annual intervals
Compliance with consent conditions	Excellent	There were no significant non-compliance issues, some minor events were reported by NZAS staff.
Responsiveness to issues e.g. drought	Excellent	Responses to incidents or other issues are well thought through, implemented and results are reported back to Council
Keeping Environment Southland informed of intentions, changes etc	Excellent	NZAS staff are very pro-active in communicating with Environment Southland when there is potential for smelter operations to impact on the environment.

9.2 Blue Sky Meats Limited

Blue Sky Meats Limited processing plant has four current discharge consents to:

- discharge meat processing and rendering plant wastewater to land via a spray irrigator;
- discharge offal and wool wastes to ground via an offal pit;
- discharge contaminants to the air from a meat processing plant, rendering and blood drying plant and associated boilers;
- discharge wastewater to land via soakage.

Blue Sky Meats Limited is a single chain processing plant located in the middle of intensively farmed land in the Morton Mains area. Liquid waste from the processing plant is screened to remove large particulate matter and is then stored for a maximum of 2-3 days before being irrigated to land by means of three Briggs 25 irrigators.

Local existing farming operations in the Morton Mains area and the Blue Sky Meats effluent irrigation are the most likely influences on the water quality monitoring undertaken in accordance with the Blue Sky Meats consent.

Historically, water sampling has been conducted at two sites, one upstream and one downstream of the consented irrigation area. The results of this sampling has identified some issues at the upstream site, but has highlighted a number of occasions when the water quality at the downstream site had deteriorated noticeably. Consequently, the number of potential sampling sites has been increased to improve the understanding of this site and reflect the increased land used by Blue Sky Meats to apply effluent onto.

It is possible that a number of local activities influence the water quality in the Waihopai River tributary, but it is likely that Blue Sky Meats has been having a considerable influence and, therefore, it has been highlighted that its effluent management practices need to continue to improve.

Council staff are confident that recent management changes will result in better future performance of this company's operations.

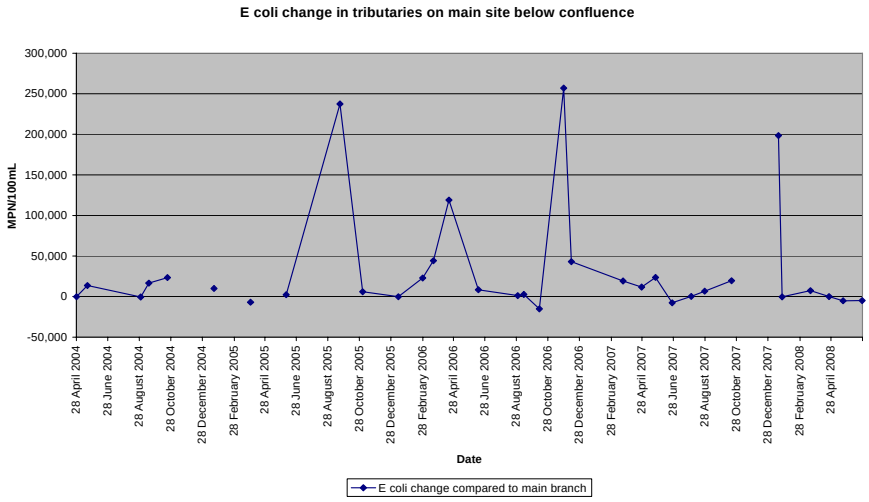

Figure 28 - Change in *E coli* levels between the up and downstream sites in the tributary to the Waihopai River

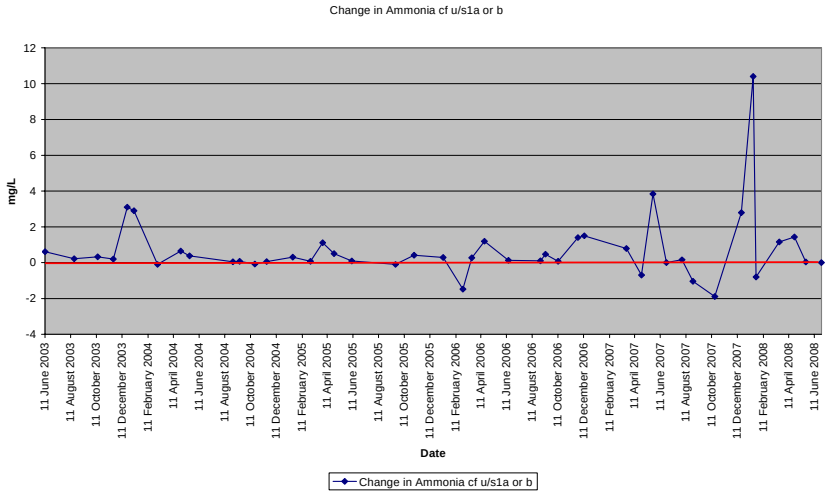

Figure 29 - Change in Ammoniacal nitrogen levels between the up and downstream sites in the tributary to the Waihopai River

The local Living Streams project has identified that the processing plant's effluent disposal system is having an impact on the quality of the Waihopai River. Sampling studies have identified that Morton Mains is a "hot spot" and consequently Environment Southland has, in consultation with Blue Sky Meats, revised the monitoring programme to better reflect operations on the Blue Sky Meats property.

Recent land acquisitions by Blue Sky Meats will enable the company to extend the land that effluent can be applied to. If successful, Blue Sky Meats will be able to take advantage of the nutrient value in the effluent by applying it at a lighter rate so that nutrients are retained within the root zone. Anything that passes by the root zone is likely to end up in groundwater at some point. Improved effluent management and nutrient retention will result in benefits for the company and the receiving environment.

Blue Sky Meats has a consent to operate a rendering plant on site, but to date has not rendered wastes at the site.

Complaints and self reported incidents

Council staff conducting a routine site inspection discovered effluent being discharged to water in a manner not permitted by a consent or plan. The effluent was being over-applied, which had resulted in that effluent finding its way into a tile drain and then being discharged to a tributary of the Waihopai River. This incident was considered by management and, in accordance with Council policy, a formal warning was issued, an invoice for costs was prepared and an infringement notice was issued.

Table 3 - Blue Sky Meats – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Good	Some miscommunication with contract laboratory resulted in the delay of some results, but overall data provision has been acceptable
Compliance with consent conditions	Marginal	Consent limits were generous and effluent management staff regarded consent limits as targets to be achieved rather than to be bettered.
Responsiveness to issues	Marginal	Management appeared disinterested in the effects of plant operations on local waterways
Keeping Environment Southland informed of intentions, changes etc.	Marginal	Communication with project group has been maintained, but communication with Compliance Division has been limited

9.3 Alliance Group – Mataura Plant

Monitoring

Alliance Group Mataura holds a number of discharge, water use and land use consents. Listed below are the main resource discharge consents that require regular monitoring to:

- discharge wastewater to the Mataura River;
- discharge cooling water the Mataura River;
- discharge contaminants to air discharge from the meat plant; and
- discharge sludge to land on selected properties.

In 2004 Alliance Group Mataura was granted a revised consent to discharge wastewater to the Mataura River. The consent required Alliance to develop a work plan and set timeframes for a number of investigations and effluent management improvements to be made. Some of the larger projects were to:

- initially characterise the wastewater identifying sources of the key contaminants;
- separate the effluent from departments containing high concentrations of nutrients; then
- install additional treatment in the high nutrient areas to significantly reduce the concentration of phosphorus in the effluent discharge.

These projects were implemented and have resulted in a number of significant improvements in the concentrations of contaminants being discharged to the Mataura River.

One of these is the more consistent control of the organic loading being discharged to the Mataura River.

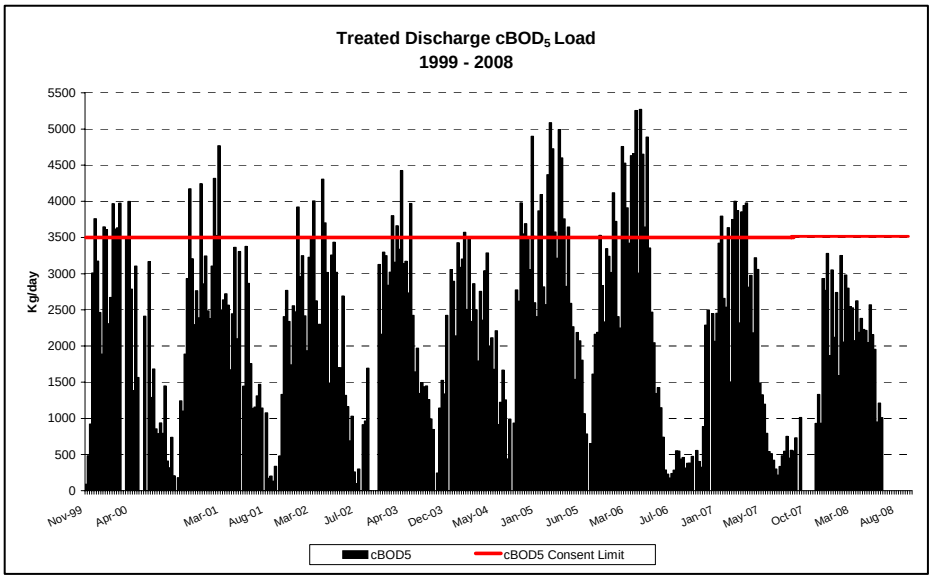

Figure 30 - Carbonaceous biochemical oxygen demand loading of the Alliance Group effluent, being discharged to the Mataura River

Figure 30 represents the quantity of carbonaceous biochemical oxygen demand ($cBOD_5$) being discharged to the river each day. Carbonaceous biochemical oxygen demand is a traditional means of measuring the level of organic material that can naturally biodegrade in an aquatic environment. The $cBOD_5$ limit controls the discharge of organic material which, if not limited and allowed to discharge unabated, has the potential to reduce the availability of oxygen to a range of aquatic organisms that make up a healthy aquatic ecosystem or the biodiversity of the river.

In addition to affecting oxygen levels in the river, $cBOD_5$ added to the natural aquatic environment can act as a feed source for nuisance fungal growths in the ecosystem or further biodegrade and "suck" or reduce the oxygen within the system causing stress on the more sensitive organisms in what would otherwise be a balanced healthy environmental system.

Research and modifications to plant systems have resulted in a reduction of the organic material (the low molecular weight BOD) that contributes to the production of nuisance fungal growths in a waterway. The result has been a marked reduction in the presence of fungal growths so that their appearance is limited to a small area in the immediate vicinity of the discharge. This is an improvement on past circumstances, but further work is required if sustained low river flows are likely to be experienced in the future.

The greatest concern relating to consent condition limits is the concentration of phosphorus being discharged to the river. The treatment system improvements have resulted in significant reductions in the concentration of phosphorous being discharged, but the improvements have not been as effective as expected and, consequently, have not been able to meet one of the key conditions of the new consent.

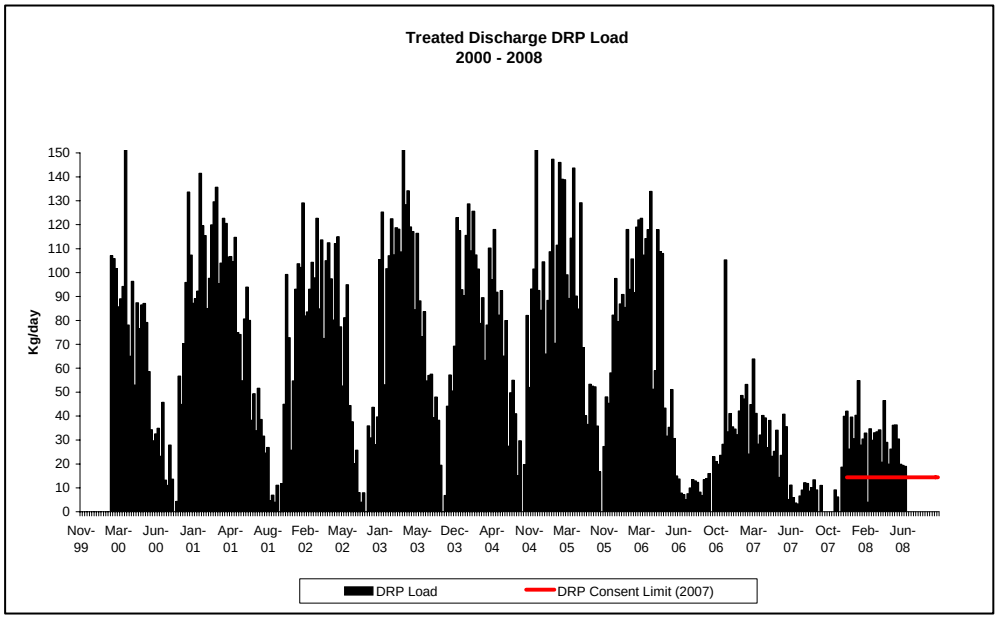

Figure 31 - The dissolved reactive phosphorus loading of the Alliance Group effluent, being discharged to the Mataura River

Routine ecological monitoring on the Mataura River has shown that the impact on the ecological communities from activities in this area were considerably lower than has been reported in the past. The only identifiable ongoing trend is increased algal growth downstream of the discharge. However, Alliance has been acutely aware of the non-compliance issues and has initiated a number of investigations to establish why the system has not been able to achieve the projected level of treatment. Alliance has already implemented a number of upgrades to address some of the issues it has identified.

The failure to achieve the target phosphorus loading has resulted in a breach of consent conditions and is of concern to Environment Southland. Alliance staff have prepared a plan setting out what they intend to do to address the situation and Council has requested Alliance staff to provide six weekly updates to the Environment Management Committee on its progress towards achieving results under this plan.

Complaints and self-reported incidents

A member of the public reported the presence of white foam in the river that smelt meaty and advised that ducks were feeding on it. Council staff responded to the call and found an odour that was confirmed as having originated from the Alliance Group Mataura plant.

The foam was being produced by illegal in-river activities being conducted by another plant in the area. The activity in the river was resulting in a very large number of invertebrates being killed and these were floating down the river and being fed on by the ducks.

Alliance reported two minor discharges of untreated effluent on 1 and 8 April 2008, experienced as a result of power outages. Neither incident was considered minor by Council staff and a Council staff member responded to assess the first of these events. It appears the plant has the ability to store effluent for a short period if power is cut off, but when this period expires it begins to overflow through a pipe and can make its way directly to the river. Staff were unable to trace the slug of effluent within the river system, however members of the public reported visiting the river and finding it had a foul smell.

Further action is being considered by Council staff to address the quantity of effluent that can be contained in the event of a power failure.

Issues

Alliance needs to continue its work to address the phosphorus issues in the discharge. Investigations into quantifying and addressing the issues of bacteria levels in the discharge and the effects that these may be having on the river have been ongoing and need to be continued to address some of the issues raised by a number of the key stakeholders interested in the health of the lower Mataura River.

Table 4 – Alliance Group Limited Mataura Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data provided as required
Compliance with consent conditions	Good	Overall compliance has been good, but the continued inability to meet the dissolved reactive phosphorus condition is of concern
Responsiveness to issues	Very Good	Alliance notified of the power outage kept Environment Southland updated with respect to the outcome of this issue
Keeping Environment Southland informed of intentions, changes, etc	Excellent	Communication between Environment Southland and Alliance has been excellent with Alliance regularly advising of any issues as they arise

9.4 Alliance Group – Lorneville

Monitoring

Alliance Group Lorneville holds the following resource discharge consents that require monitoring to:

- discharge wastewater to the Makarewa River;
- discharge wastewater to land;
- discharge contaminants to air discharge from the meat plant;
- discharge leachate from two closed landfills; and
- discharge to land via a contingency short term storage pond.

Alliance Group Lorneville has an extensive series of ponds designed to provide biological treatment for the wastewater generated from the processing of sheep and lamb meat. The size of the pond system is such that it provides considerable buffering capacity which effectively reduces the risk of excessive variation in the quality of the effluent. This can be clearly demonstrated in Figures 32 and 33, which show reasonable consistency in the quality of the effluent from one season to the next.

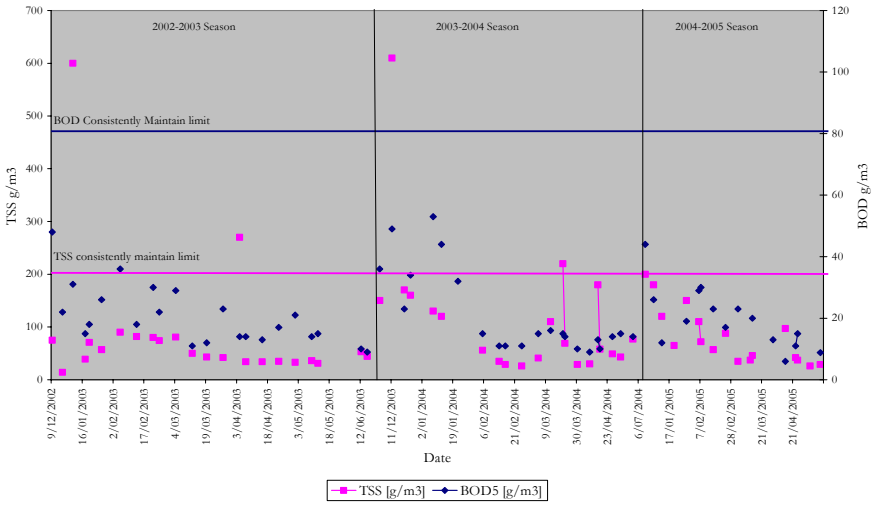

Figure 32 - Concentrations of total suspended solids and BOD_5 in the Alliance Lorneville effluent with respect to previous seasons and consent conditions

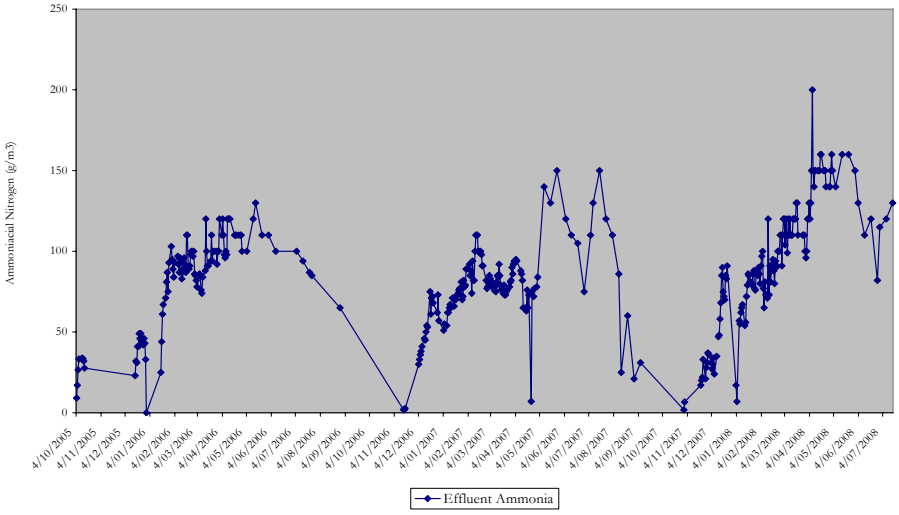

Figure 33 - Concentration of ammoniacal nitrogen concentration in the Alliance Lorneville effluent with respect to previous years

Last year it was reported that the main area of improvement over the last two years was in the level of management that the treatment system has received. Any biological system has the potential to vary considerably depending on seasonal weather conditions, therefore there is a need for systems to be closely monitored and appropriate measures taken to reflect pond and river conditions prevailing at the time. The past high standard of management continued during the 2007/08 season, with few issues arising.

This year dissolved oxygen concentrations were fully compliant with this consent. The only parameter causing any concern was ammonia nitrogen concentrations in the Makarewa River, downstream of the Alliance Group Lorneville discharge. Whilst there were some concerns with slightly elevated ammonia concentrations in the river upstream of the discharge, there were consent breaches on two occasions, in January and April 2008. The concentration of ammonia nitrogen is monitored daily by plant staff, who collect a sample that is analysed by a contracted laboratory. The results of the

analysis allow Alliance management to reduce or increase the volume of effluent being discharged, to meet the requirements of the consent.

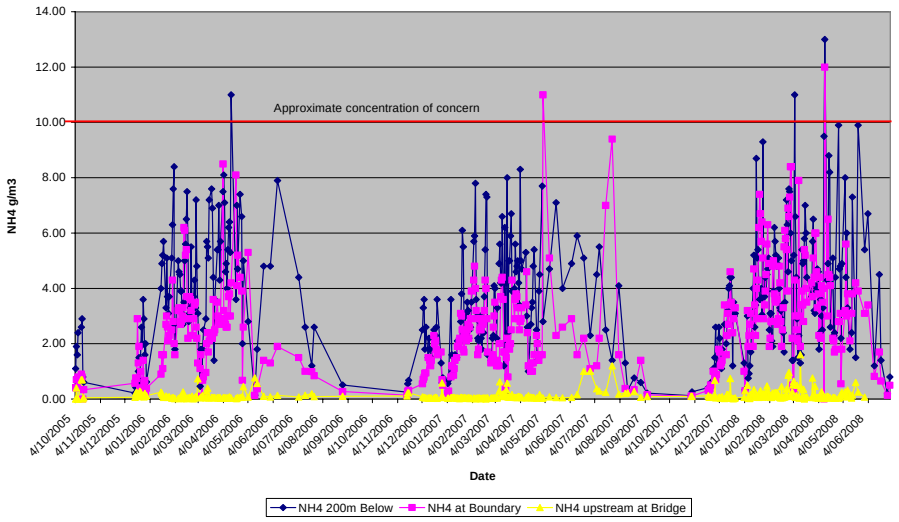

Figure 34 - Concentration of ammoniacal nitrogen concentration in the Makarewa River

The application of effluent to land was exercised this year without any significant issue.

The operation of the boiler was also fully compliant with the air consent.

Alliance Group Lorneville had historically operated a landfill for the disposal of general refuse. Active disposal of waste to this landfill has ceased, but the historical material remains in the ground naturally biodegrading and potentially producing leachate. The company is required to monitor groundwater in the area to assess whether leachate is being produced and whether the chemical makeup of the leachate has changed. This year, the monitoring results were generally in line with historical results, however, the ammonia nitrogen result was considerably lower than has been measured in previous years.

The contingency short term effluent storage pond was not required this year.

Complaints and self-reported incidents

One complaint was received about odour coming from the Lorneville site this year. This complaint was investigated and the odour confirmed to be objectionable and to have originated from the Alliance Group Lorneville site. As a result of this, an abatement notice was issued and then cancelled at a later date. No further odour incidences have occurred since this time, so the one confirmed incident is being treated as a fugitive incident that is unlikely to be repeated.

Issues

The main consent issue identified this year is the concentration of ammonia nitrogen in the Makarewa River downstream of the Alliance Group Lorneville

discharge. The relatively dry summer resulted in consistent low flows in the Makarewa River that restricted the volume of effluent the plant was able to discharge into the river.

Incidents of consent limit exceedance need to be thoroughly investigated and stopped over the coming few years.

Table 5 - Alliance Group Limited Lorneville Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data was reported on time and was complete as required by the consent.
Compliance with consent conditions.	Very good	Good management of the treatment system has resulted in only a few issues arising, Alliance staff are to be congratulated for their excellent reporting standards.
Responsiveness to issues	Excellent	Alliance management responded promptly and personally to all issues that arose during the year
Keeping Environment Southland informed of intentions, changes etc.	Very good-Excellent	Alliance management responded promptly and personally to all issues that arose during the year

9.5 Alliance Group – Makarewa

Monitoring

Alliance Group Makarewa currently holds the following resource discharge consents that require monitoring to:

- discharge wastewater to the Makarewa River;
- discharge wastewater to land;
- discharge contaminants to air discharge from the meat plant;
- discharge leachate from two closed landfills to land; and
- discharge to cooling water to the Makarewa River.

Alliance Group Makarewa historically killed a range of stock but, following restructuring, has downsized to the point where it now operates as a double shift single chain venison killing plant, with further processing and a low temperature rendering plant. The downsizing of this site has reduced the volume of air and liquid waste generated, reducing the pressure on waste treatment systems.

The wastewater treatment ponds were designed to cope with larger volumes of effluent. Consequently, the treatment systems have significantly more buffering capacity to treat the effluent to a higher standard and hold effluent longer until the Makarewa River has the capacity to assimilate the effluent without significant impact. The quality of the effluent being discharged has reflected this ability to treat to a higher standard and discharges were fully compliant for the total suspended solids and the $cBOD_5$ loading. The

ammonia nitrogen loading was compliant, with the exception of one anomalous result.

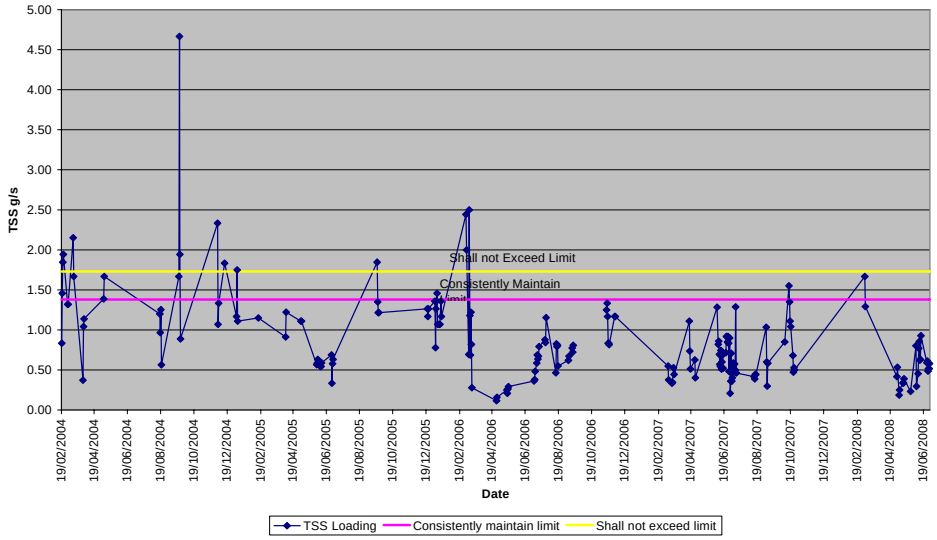

Figure 35 - TSS loading 2004-08

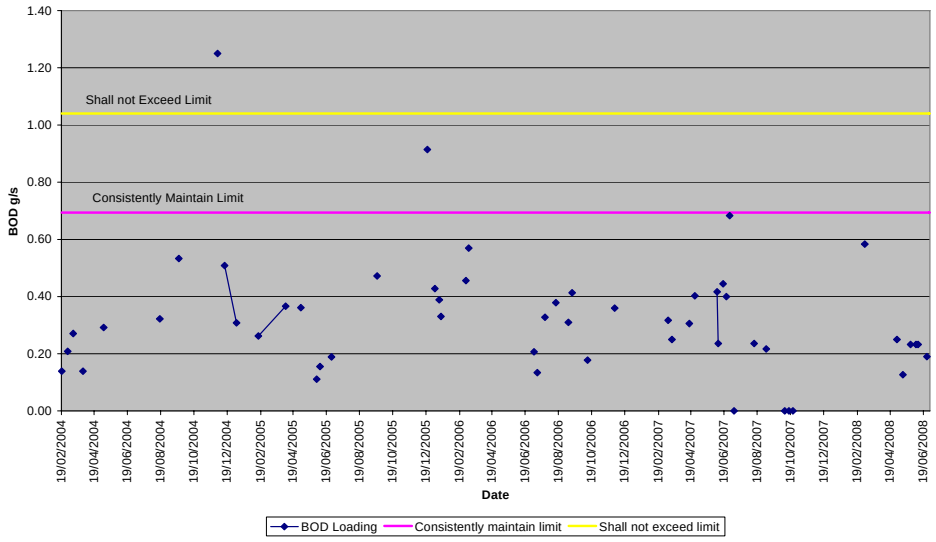

Figure 36 - BOD loading 2004-08

The consent allowing application of effluent to land was exercised for the first time this year. The irrigation management, recording procedures and monitoring procedures were all generally adequate, however, the soil scientist reviewing the process made a few recommendations that he considered should reduce the risk of the effluent irrigation having an adverse impact on the receiving environment.

After an upgrade of the boilers during the previous season the particulate emission rate from the boilers was within the consent limits and, therefore, fully compliant with the air discharge consent.

Monitoring of the historical landfills continued this year. The results for both the general refuse and the boiler landfills showed a general downward trend in contaminants. The monitoring requirements on the consent are not frequent enough to be able to conclusively state that there has been an improvement in the quality of the leachate, but the results do suggest that the "lifecycle" of the waste, especially waste at the general refuse landfill, is beginning to progress through the anaerobic stage of its biodegradation.

The cooling water discharge was fully compliant with consent conditions.

Complaints and self-reported incidents

Only one complaint was received from the Makarewa site this year. This was encouraging, but not ideal, as an objectionable odour was confirmed to have originated from the Makarewa site. Unfortunately the "on site" source of the odour was not able to be isolated, but the odour did not appear to be an ongoing issue in this instance.

Issues

While the number of odour incidents confirmed from the Makarewa site appears to be on the decline, odour still remains a critical element that needs to be strictly managed on this site.

General

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Table 6 – Alliance Group Limited Makarewa Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data was reported as required by the consent.
Compliance with consent conditions	Very good	Good management of the treatment system has resulted in few issues
Responsiveness to issues	Excellent	Alliance management responded promptly and personally to all issue that arose during the year
Keeping Environment Southland informed of intentions, changes etc	Very good-Excellent	Alliance staff are very good at communicating their intentions.

9.6 Ballance Agri-Nutrients

Monitoring

Ballance Agri-Nutrients fertiliser manufacturing plant currently holds the following resource discharge consents that require monitoring to:

- discharge stormwater from a fertiliser manufacturing facility to water;
- discharge contaminants to air from a process for manufacturing phosphatic based fertilisers.

Compliance with both consents continues to be very good, with the only exceedances being the average herbage fluoride level which exceeded the consent limit in February and May 2008. The continuing good consent compliance follows on from last year's very good results and is very pleasing to report.

In 2004, Ballance embarked on a major stormwater upgrade. Stage 1 was completed in 2005, significantly reducing contaminant loading and stormwater volume being discharged to the Mokotua Stream. Stage 2 was completed and commisioned in January 2008, focusing on the stormwater originating from the acidulation and acid storage areas and the neutralisation of this water with caustic soda, which effectively bound up the nutrients and eliminated the need for hydrated lime. The result has been the containment of the available nutrients and the eliminatation of the sludge by-product (which needs to be disposed of) produced when lime is used. This is an excellent environmental outcome and one the company and staff should be proud of.

Complaints and self-reported incidents

Environment Southland has received no reported incidents from the Ballance fertiliser site.

Issues

A neighbouring industrial area is being promoted and developed, in conjunction with the Invercargill City Council. Some concerns have been raised with Environment Southland with respect to the potential for stormwater and hardstand runoff from sites other than Ballance's to adversely impact water monitoring results. The company's concerns will have to be dealt with in any future consent application process.

Another emerging problem, which relates to the whole fertiliser industry and has been around for some time, is the issue of fertiliser spillage from the cartage of fertiliser around the region's roads. Anything spilt on to roads is then washed off during rain events and will find its way to water through roadside drainage systems.

This is becoming a greater concern as the amount of urea fertiliser being transported around the region has increased significantly in recent years. There is the potential for the contaminant to enter water directly or indirectly via the drainage systems and have a cumulative effect on nutrient concentrations in some areas. This problem is less prominent when covered trucks are used for the transportation of the material around the region.

Table 7 – Ballance Agri-Nutrients– Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data is always provided as required with considered commentary included as appropriate
Compliance with consent conditions	Excellent	This year there have been no recorded breaches of consent conditions
Responsiveness to issues	Excellent	Staff have responded to issues as they arise
Keeping Environment Southland informed of intentions, changes etc	Excellent	Ballance has regularly update Environment Southland during the stormwater upgrade

9.7 Prime Range Meats Limited

Monitoring

The Prime Range Meats Limited processing plant currently holds the following resource discharge consents to:

- discharge up to 1500 m^3/day of treated wastewater to the Waikiwi Stream, approximately 500 metres downstream of the West Plains Road Bridge;
- discharge contaminants to the air from a meat works and rendering plant, including a wastewater treatment system.

Prime Range Meats Limited is a meat processing and rendering plant that processes livestock for the local and export markets, as well as processing and rendering raw product from a number of other local companies. The meat processing plant operates a single shift five days per week and the rendering plant seven days per week, with multiple shifts to service off-site meat processing plants.

The wastewater from the plant is biologically treated in a series of anaerobic and aerobic ponds, followed by a solids removal/clarification system. This type of system is primarily designed to reduce the organic and suspended solid loading from the raw effluent produced by the meat processing plant.

The effluent produced by the plant struggled to consistently comply with the current operating consent. As systems have been improved, and the operation of the treatment system was modified, the quality of the effluent improved. However, it still struggles to comply with the conditions of this consent. This is clearly demonstrated in Figures 37 and 38.

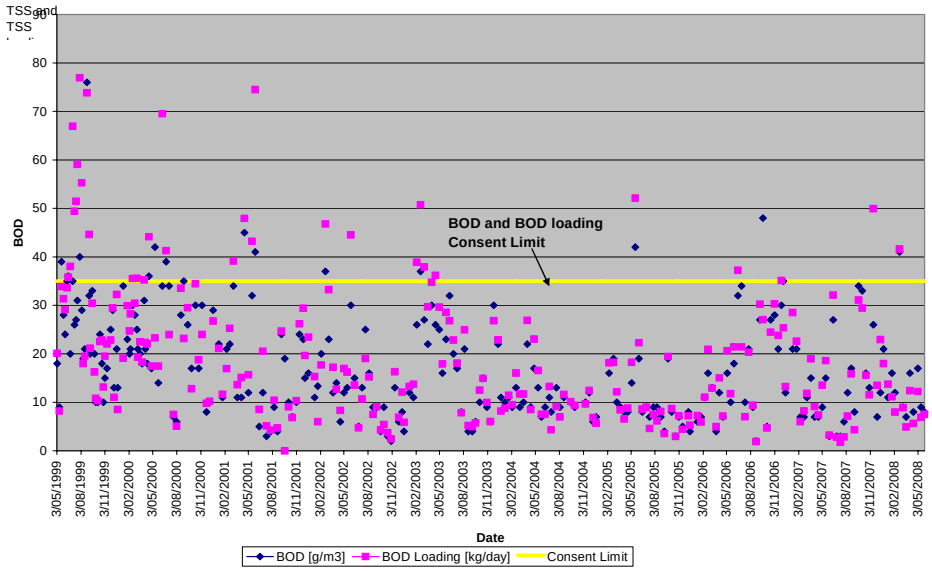

Figure 37 - Concentrations of BOD_5 and BOD loading in the Prime Range Meats effluent with respect to previous seasons and the current consent conditions

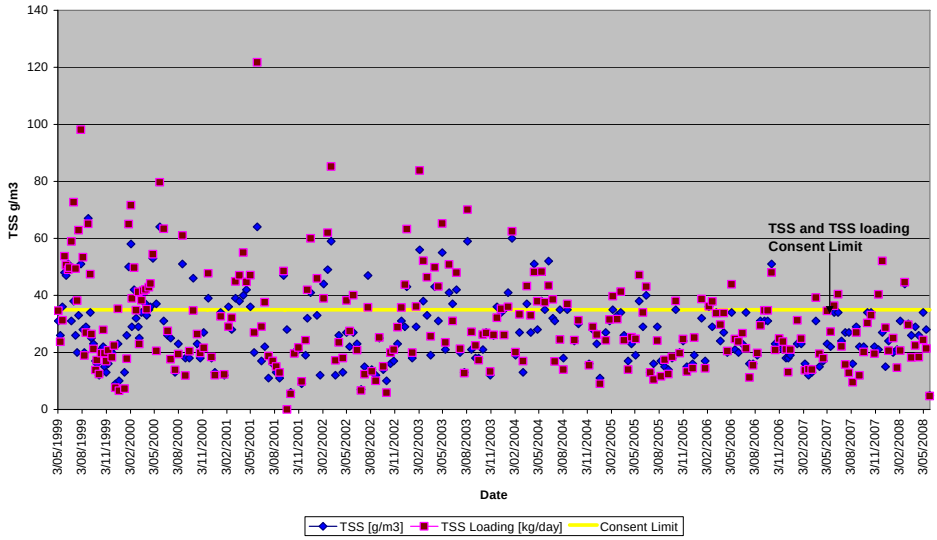

Figure 38 - Concentrations of TSS and TSS loading in the Prime Range Meats effluent with respect to previous seasons and the current consent conditions

The monitoring conditions in the Waikiwi Stream are generally descriptive and were largely met in terms of the water chemistry monitoring. When combined with the biological macroinvertebrate monitoring there was enough evidence to indicate that the discharge was likely to be having some impact on the benthic invertebrate communities. This issue will be addressed during the upcoming discharge consent renewal process.

Prime Range Meats operates a coal fired boiler to provide heat and energy to the meat processing and rendering plants. Discharges from this and the rendering plant are governed by the air discharge consent.

The boiler is required to be tested at a maximum of two yearly intervals. This check was last completed in July 2007. The consultants found that the boiler was operating satisfactorily, but made several recommendations on how to improve its future operation.

Complaints and self-reported incidents

No commentary is being put into this report, as six charges of non-compliance with the air discharge permit are presently being considered by the Court. The outcome of this action will be reported in next year's publication.

Consent Issues

The current operating consent expired in June 2008. An application to renew this consent is presently being considered, however, until that process is complete Prime Range Meats is to continue to operate under the terms of Section 124 of the Resource Management Act 1991. To continue to discharge to the Waikiwi Stream, Prime Range Meats will be required to improve the quality of the effluent or consider various other options available to it to dispose of its liquid waste. Prime Range Meats has engaged a consultant to assess a couple of alternative options. This information is due now, but was not available at the time of writing this report. The outcome of this process will be reported in next year's report.

Table 8 – Prime Range Meats – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Marginal	Data has not been supplied in a timely manner, recently this has improved.
Compliance with consent conditions	Marginal	The water quality downstream of the discharge point continues to be impacted by non-compliant discharges.
Responsiveness to issues	Poor	Staff have responded to notifications of odour complaints, but have not been so responsive when dealing with written correspondence.
Keeping Environment Southland informed of intentions, changes etc.	Poor	Some information has been shared, but progress is not regularly communicated.

9.8 Dongwha Patinna NZ Limited

Monitoring

Dongwha Patinna NZ Limited currently holds the following resource discharge consents that require monitoring to:

- discharge contaminants to the air from fibreboard processing, including the treatment of wastewater;

- discharge effluent and treatment pond seepage to land from a fibreboard factory;
- discharge untreated stormwater and treated wastewater to water;
- discharge stormwater to land;
- discharge from a tile drain to a watercourse.

Formaldehyde concentrations at the drier cyclone and press are monitored twice per year by an external IANZ accredited consultant. The November results were the highest recorded to date, but the consent limits work on a 24 month average. The average remained within consent limit requirements.

Table 9 – Formaldehyde concentrations at the drier cyclone and press

	Drier Cyclone		Press	
	West (kg/hr)	East (kg/hr)	Total (kg/hr)	Capture (%)
November 2007	9.1	8.1	0.10	81
April 2008	5.3	4.5	0.04	91
24 Month Average	6.2	5.2	0.10	81
Consent Limit*	**8.25**	**8.25**	**0.5**	**>75**

*** The consent limit is a 24 month moving average**

Ambient air quality monitoring is conducted using an independently audited portable analyser called on aerolaser. The aerolaser is mounted on a trailer and easily located at one of the six predetermined sites (the seventh site has been removed from the monitoring programme). The concentrations of formaldehyde were all well within the resource consent limits as can be seen in Table 10**.**

Table 10 – Concentrations of formaldehyde

Wind Positive (30 minute Average Period)			
		Formaldehyde Concentration	
	Number of samples	Average ($\mu g/m^3$)	Maximum ($\mu g/m^3$)
Perkin's Hill	297	1.0	8.9
Perkin's Deer Shed	287	1.1	14.7
Weatherburn Road	638	0.9	10.0
Johnstone's property	333	2.1	28.6
Duncan's property	135	1.3	7.6
Solid Energy's property	139	1.0	8.6
Resource Consent Requirements (30 minute average)		**60**	**100**

Dongwha Patinna NZ Limited has consent to discharge wastewater to land or to water. This year all effluent was discharged to land and no wastewater was discharged to water. The irrigation of wastewater to land was fully compliant with consent limits.

Complaints and self-reported incidents

Three complaints were investigated by Environment Southland, one odour and two smoke related. None were found to exceed the consent conditions, but it was confirmed that some smoke/blue haze was being discharged on one occasion. The likely cause of the smoke emission was the burning of sander dust from an alternative resin that was being trialled. Results of trial work will be reported in future.

General

On two days in June 2008 Dongwha conducted trials using an alternative resin which is applied to the board. The advantage of this resin is that it contains no formaldehyde and the quantity added to the board is considerably lower that the current urea formaldehyde resin used. The drier cyclones and press were tested during these trials for formaldehyde, isocyanates and volatile organic compounds (VOC), (VOC only tested on second day). Concentrations of all contaminants tested during the trials were low. Further testing is planned. The use of the alternative resin is not covered in the current consent, however, Environment Southland granted approval for the trials

Table 11 – Dongwha Patinna – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data is provided within the monitoring report framework and within time requirements.
Compliance with consent conditions	Excellent	There were no significant non-compliance issues
Responsiveness to issues	Excellent	Issues raised with the company have been addressed promptly
Keeping Environment Southland informed of intentions, changes etc	Very good	Environment Southland is kept well informed.

9.9 Fonterra, Edendale

Monitoring

Fonterra Edendale currently holds the following resource discharge consents that require annual reporting to:

- abstract water from the ground for dairy factory use (Homestead Road bore);
- abstract water from the ground for dairy factory use (Edendale site bore);
- discharge dairy factory wastewater on to land, that land being approximately 230 ha of the Fonterra property named Mararua Farm;

- discharge factory wastewater onto land, that land being approximately 147 ha of the Fonterra property named Leondale Farm;
- discharge treated dairy factory wastewater and activated sludge to land and associated aerosols and odours to air, that land being approximately 317 ha of the Fonterra property named Inglemere Farm;
- discharge treated dairy processing wastewater, cleaning water, condensate, stormwater and denitrification and demineralisation water to the Mataura River;
- discharge contaminants and odour to the air from a dairy factory and ancillary operations;
- discharge non-toxic dairy factory sludge to land.

Routine monitoring of the wastewater discharges to the three disposal fields, and the stormwater discharge to the river have all been fully compliant with the respective consents and raised no environmental issues.

Fonterra has consent to discharge contaminants and odour to air from a dairy factory and associated operations. The boilers were tested by an external IANZ accredited consultant and found to be operating in accordance with the consent.

Three odour complaints were investigated this year, two odours were confirmed originating from the wastewater treatment ponds and one was confirmed from one of the irrigation farms. These were assessed based on the frequency of the odours, intensity of the odour, duration of the odour, the offensiveness or character of the odour, and the location of the odour. In these instances, the intensity of the odours was not categorised as objectionable or offensive.

This year, biosolids from the company's wastewater treatment ponds and dissolved air floatation (DAF) plant were discharged to 56 separate properties, in accordance with Fonterra's consent. The nitrogen concentration can be quite variable depending on whether it is taken from the ponds, or the DAF plant. It is impractical to analyse every load of sludge leaving the plant, therefore the sludge quality is assessed monthly. The problem with this is that the sludge may be applied to land without full knowledge of its nitrogen content. Consequently, if the nitrogen content of the sludge is high and the sludge is applied to land at the usual rate, it has the potential to be in breach of the consent. This year, there were a number of breaches, 25% of all loads exceeded the consent limit. To address this issue, Fonterra bases the application rate on the highest average nitrogen concentration, unless it can confirm that the nitrogen concentration is lower and it has significantly reduced the normal rate at which all sludge is applied.

Complaints and self-reported incidents

As reported earlier, three odour complaints were received by Environment Southland in the 2007/08 year.

This year, Fonterra reported four incidents of milk being spilt from a supply tanker. Two spilt during the process of loading milk and two as a result of

road accidents. All four were investigated by Environment Southland. All had been attended by Fonterra staff, with the bulk of the milk having been cleaned up and the resulting effects on the environment being no more than minor. One road accident resulted in the tanker discharging milk to land in circumstances where it entered water. An extensive investigation of the river was conducted by Council staff, no evidence of an impact was located.

General

Information on the quality of the Edendale groundwater aquifer is obtained from routine Fonterra consent monitoring and State of the Environment monitoring conducted by Environment Southland.

Table 12 – Fonterra, Edendale – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Very Good	The provision of monitoring data has improved from previous years
Compliance with consent conditions	Very Good	The only compliance issues arising this year were the breaches associated with the application of sludge to land
Responsiveness to issues	Very Good	Fonterra staff self reported milk tanker issues and have generally responded well to issues raised by Environment Southland.
Keeping Environment Southland informed of intentions, changes, etc	Very Good	Fonterra staff have kept ES informed with issues.

10.0 Miscellaneous Commercial Operations

10.1 Slink Skins

There are four slink skin consents in Southland with discharge permits to land. All were inspected in September 2007, with no non-compliance found.

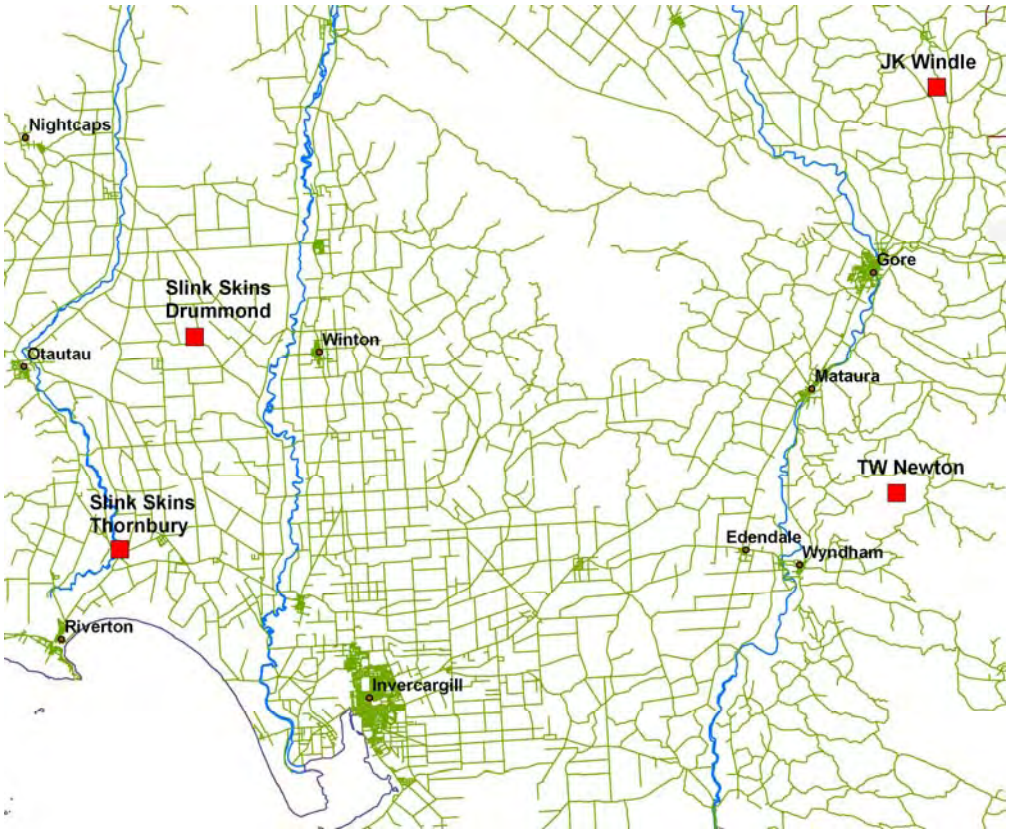

Figure 39 - Map showing slink discharge to land locations

10.2 White Hill Wind Farm

The White Hill wind farm was commissioned on 24 August 2007, ending the construction phase of the project.

The only consent condition not currently signed off relates to consent number 202779, condition 6. This relates to hydro-seeding of earthworked areas. It is expected to complete a final site inspection by the end of October 2008.

Figure 40 -A view of an area adjacent to the roadway that has been hydro-seeded

10.3 Piggeries

There are three piggeries operating in Southland, with one operator intending to surrender their consent in November 2008.

Inspections were completed on 17 and 18 June 2008. At one farm the effluent irrigator had suffered a broken fitting and was being repaired. The broken fitting had resulted in a heavy, but not significant, application of effluent to pasture.

Figure 41 - Piglets in farrowing stall

11.0 Mining/Quarrying

A total of 15 mining operations throughout Southland were inspected in the 2007/08 year. The activities monitored included gravel washing, quarrying, peat, gold and coal.

All consents required monitoring of discharges to water. Some sites have additional dam and diversion, air discharge and water abstraction monitoring requirements. No significant non-compliances were noted during the inspections.

Environment Southland staff responded to several reported incidents of dust covering neighbouring properties from two separate coal mining sites in Southland. The incidents were occurring in dry, windy conditions.

Figure 42 - Coal dust on neighbouring property

Evidence of coal dust was found on the inside and outside of neighbouring dwellings. Two abatement notices were subsequently issued, requiring the offenders to cease the unauthorised discharge of dust onto neighbouring properties.

One site closed down for the day, as the water cart had broken down and it could not deal with the dust issues. The other site has gone to some effort to try and remedy the problem, introducing measures such as levelling and re-grassing high risk areas, planting trees and installing dust meters.

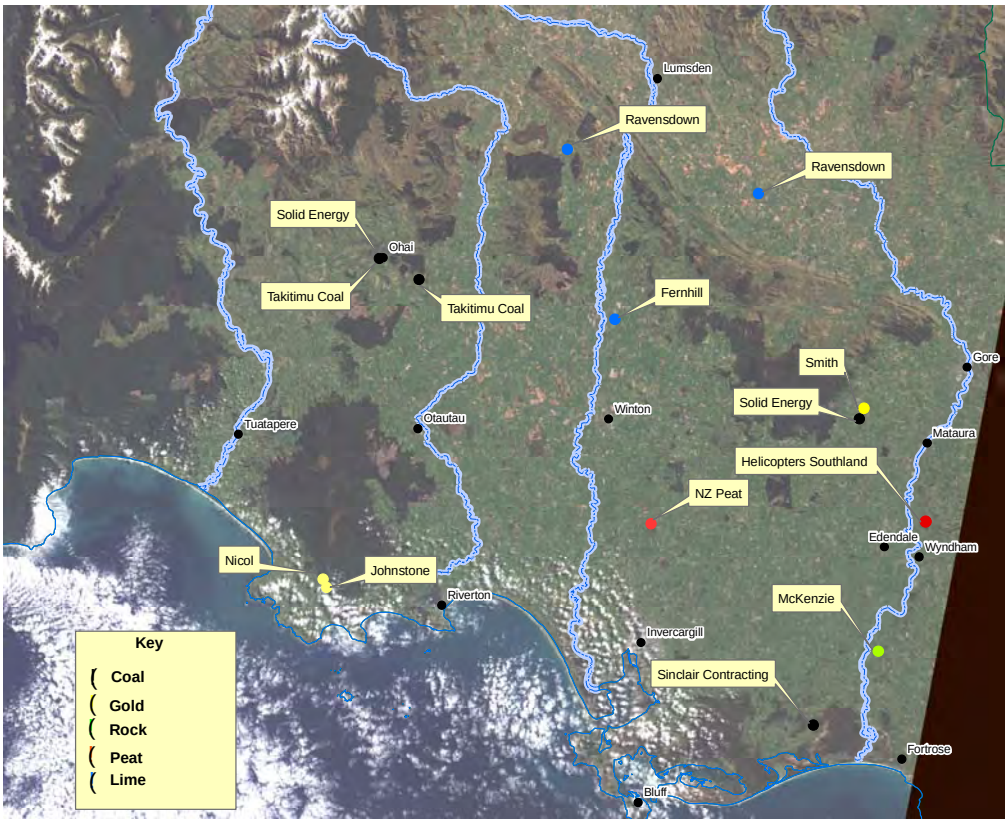

Figure 43 – Mining operations in Southland

12.0 Sewage Treatment Plants

12.1 Invercargill City Council – Invercargill Sewage Treatment Plant

The Invercargill City Council (ICC) currently holds the following resource consents/coastal permits that require monitoring to:

- discharge treated wastewater to water from a wastewater treatment plant;
- discharge contaminants to land via seepage from a wastewater treatment process;
- sporadically discharge screened wastewater to the New River Estuary when compliance with Resource Consent 200749 cannot be achieved due to plant mechanical failure or extreme weather events;
- discharge contaminants (including odour) to the air from a wastewater treatment and disposal facility;
- discharge a deodorizing agent to the air to mask odours from the sludge ponds at the sewage treatment plant.

For many years there have been a number of complaints received from residents living within a 1-2 km radius of the Invercargill City Council's wastewater treatment plant relating to odours being emitted from the treatment system. Last year, Environment Southland took enforcement action against the ICC, which has since decided to commit spending of $1,670,000 to upgrade the odour management at the plant.

The overall number of odour complaints attributable to the ICC wastewater treatment plant were fewer in the 2007/08 year than were found in the 2006/07 year. Environment Southland staff still investigated and confirmed a number of separate objectionable odour incidents found to have originated from the wastewater treatment plant. The ICC consent requires that:

> *There shall be no discharge of odour beyond the boundaries of the site that is noxious, offensive or objectionable to such an extent that it has an adverse effect on the environment beyond the boundaries of the site.*

The confirmed presence of objectionable odours originating from the plant continued to breach this consent condition and was in breach of Section 15(2) of the Resource Management Act 1991 and, consequently, Environment Southland has taken further action with the courts to initiate a possible prosecution.

Since 2003 the ICC has held a revised consent to discharge treated sewage to the New River Estuary. It took some time for the new tertiary maturation ponds to be installed. The purpose of these ponds is to polish the effluent prior to discharging to the estuary. Despite this, the final effluent quality has continually failed to meet the requirements of the consent conditions. The non-compliance has been highlighted as a serious problem requiring attention. The ICC has had its monitoring data reviewed and has lodged an application

to have its current consent reviewed. The application is being considered by Environment Southland.

The main areas of non-compliance have been the failure to comply with the faecal coliform and enterococci indicator organism limits and the total suspended solids limits.

The maturation pond primarily relies on Ultra Violet (UV) light to provide the disinfection necessary to meet the standards set by the consent conditions. Consequently the disinfection is most effective in summer and least effective in winter as can be clearly demonstrated in Figure 44.

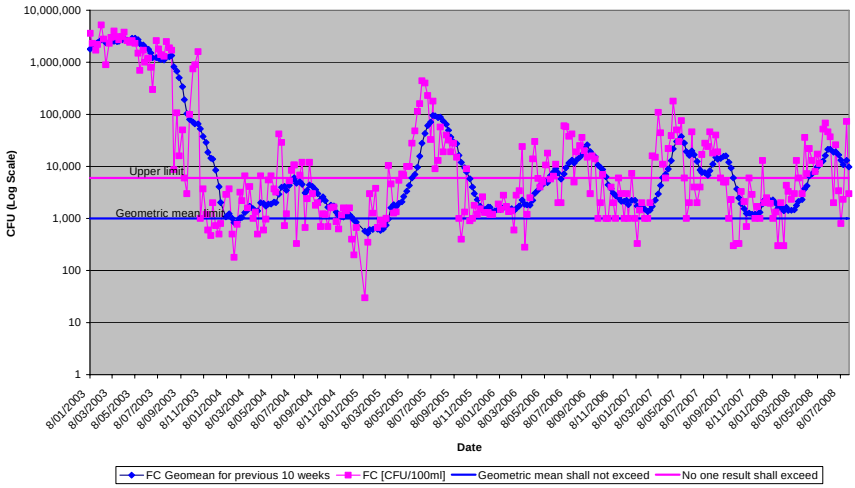

Figure 44 - Note that the bacterial numbers on the y axis have been reported using a log scale

The disinfection gains made in summer by of this type of system are likely to be off set by an increase in algal growth during the same period. This is demonstarted in Figure 45, i.e. when the disinfection improves, the faecal coliform levels decrease, but at the same time the total suspended solids concentrations tend to increase reducing the clarity of the water and UV penetration in the ponds. The end result is that the efficiency of the disinfection will be reduced to some degree by the algal growth.

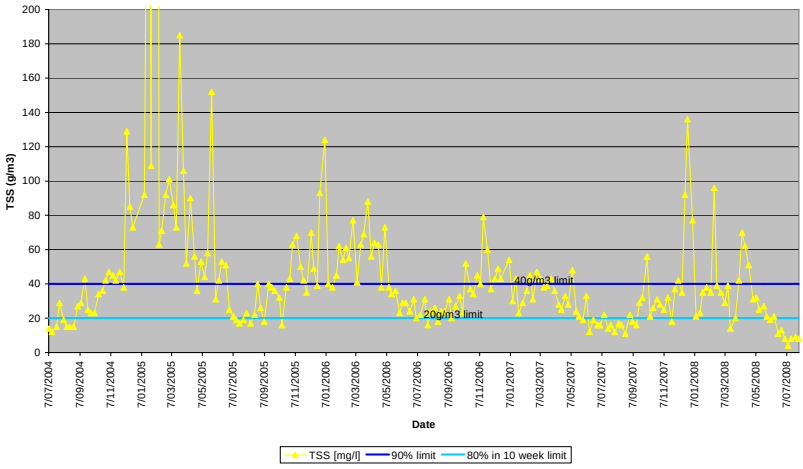

Figure 45 - TSS 2004-08

The other problem with the cyclic trend is that the concentration of total suspended solids increases in summer due to the increased algal growth in the discharge, which results in an exceedance of the resource consent conditions.

12.2 Gore District Council – Gore Wastewater Treatment

The Gore township has a population of approximately 8,000 and is currently served by a two pond oxidation system located on the southern boundary of Gore. During dry weather 4,000 to 7,000 m^3/day of treated wastewater is discharged to the Mataura River. This can rise to over 20,000 m^3/day during wet weather as a portion of the sewers in Gore are still combined, that is, they carry both stormwater and wastewater.

Monitoring the performance of the ponds and the Mataura River indicates that the main concern with the system is the increased concentration of nutrients that the discharge exerts on the river downstream of the discharge. This is clearly illustrated in Figure 46.

When the flow in the river decreases, the difference between the dissolved reactive phosphorus concentration between the up and downstream sites increases.

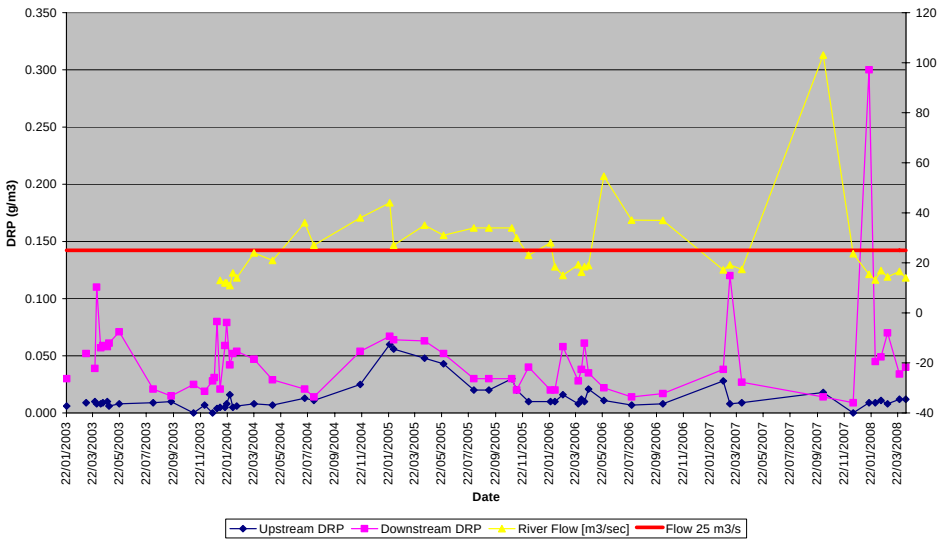

Figure 46 - Comparison of the dissolved reactive phosphorus concentration between the upstream and downstream sites

The consequence of nutrient enrichment in any water body is the potential for nuisance weed and periphyton growth on the riverbed. These growths can impact on the naturally occurring macroinvertebrate communities in the river and affect biodiversity within the river system.

This year it was very encouraging to note that the benthic macroinvertebrate survey found that the discharge from the Gore oxidation pond outfall was not adversely affecting the local benthic macroinvertebrate community of the Mataura River. However, as a part of the current consent (granted in 2006),

Gore District Council is required to reduce the concentrations of phosphorus being discharged to the Mataura River. To achieve this, Gore District Council has commenced the installation of an additional treatment system designed to reduce the phosphorus concentrations during the moderate to low flow regimes, when river ecosystems or biodiversity values are at greatest risk. Installation of the new system has progressed well and was on schedule until late August, when some of the filtration equipment missed a shipping date from Australia. This has resulted in the commissioning date being delayed approximately two weeks. Once complete and operational, the treatment system should greatly improve the effluent quality and reduce the phosphorus loading in the river.

12.3 Southland District Council – Te Anau Wastewater Treatment

In 2004 Southland District Council (SDC) was granted a short term (10 year) consent to continue to discharge treated sewage to the Upukerora River, to provide time for the SDC to develop a solution for the treatment and disposal of sewage in the long term. For this consent to be granted, additional modifications were required to improve the quality of the effluent being discharged to the Upukerora River. Mechanical aeration was introduced to increase the capacity of the system and a series of wetland ditches, to polish the effluent quality.

The improvements were made to the system in 2004/05. The effluent quality was initially still quite variable, but over recent years it has become somewhat more consistent, especially during the peak urban occupation and river low flow periods.

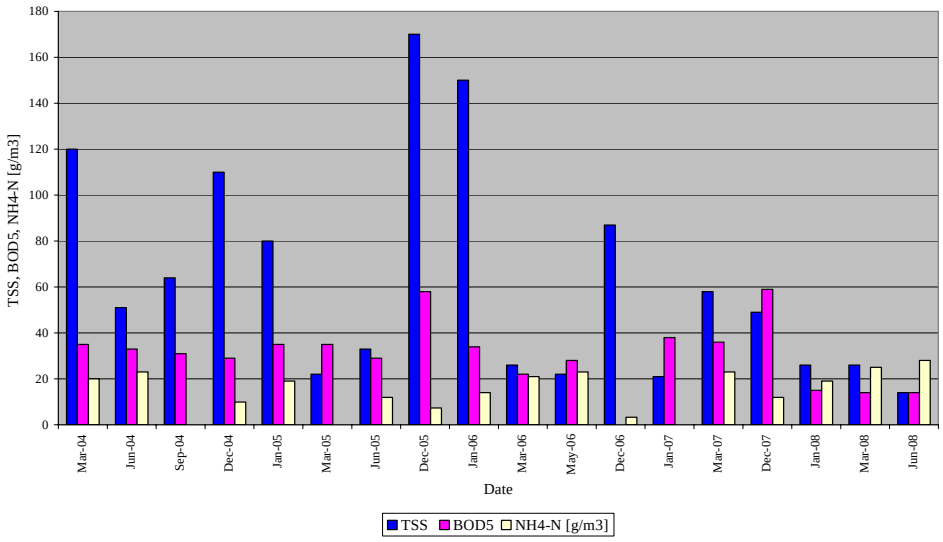

Figure 47 - Total suspended solids and biochemical oxygen demand concentrations in the wastewater discharged to the Upukerora River

During the new consent process there was concern about the impact that the discharge was having on the bacteria and nutrient levels in the river. The monitoring results indicate that the discharge was having minimal impact on

the bacteriological quality, but did have a slight impact on the concentration of phosphorus in the river.

Figure 48 - Compares the up and downstream *E coli* levels

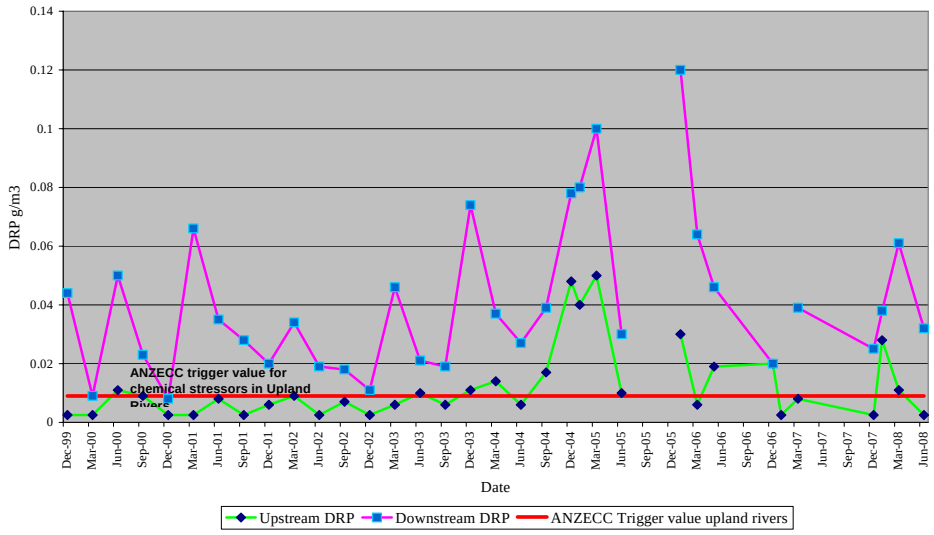

Figure 49 - Compares the up and downstream phosphorus concentrations

The main concern with increased nutrient in the river is the potential that this may have to increase nuisance periphyton and macrophyte growth in the river and/or on the lake foreshore. An in-depth macroinvertebrate and periphyton study is not required in this consent, however photographs are taken of the streambed on each sampling occasion to provide a general assessment of the instream periphyton growths at both sites. It is difficult to make an accurate quantitative assessment. However, on some monitoring occasions there has been variation in the quantity and type of growths on the streambed.

Fulton Hogan, contractor for the SDC, reported two sewage incidents - one a sewer blockage in the Te Anau township and one occasion when the wetland ditches were bypassed. The initial incident resulted in a minor overflow of treated sewage to the stormwater system and the second incident resulted in treated effluent from the treatment ponds bypassing the wetland ditches, built to accommodate high inflows, as a result of exceptionally heavy rain.

13.0 Landfills

13.1 AB Lime Limited Landfill

Monitoring

All reports have been received on time and the data they contain has been complete. URS conducted the annual audit a bit later than usual, however, all matters were found to be in order and the site appears to be operating effectively.

Council staff attended the audit with URS staff and it was very noticeable that despite the material being disposed of at the site, there was no evidence of rodent activity and, surprisingly, there was no bird activity on the day. Weather conditions were great this year, unlike the near snow conditions experienced during the previous audit.

Complaints and self-reported incidents

Two odour complaints were received by AB Lime staff. These were investigated by the staff and it appears that, as cool evening air descends down the hillside, it picks up gas or odour from the landfill site and carries it down to the flat land below, where two residents' houses are located.

AB Lime staff have been considering ways to remedy the problem and have installed a gas flare at the base of the landfill to burn off landfill gas that was escaping and may have been the cause of the odour complaints. AB Lime staff have also been advised to contact the Environment Southland after hours number if further odour complaints are received, so that a joint investigation can occur.

Table 13 - AB Lime – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	On time and complete.
Compliance with consent conditions	Excellent	Management are very aware of the consent requirements and immediately contact Council staff to discuss concerns.
Responsiveness to issues	Excellent	Management have been very helpful in assisting with unforeseen circumstances.
Keeping Environment Southland informed of intentions, changes etc	Excellent	Management have actively engaged Council staff in proposals that could affect the operation of the landfill.

13.2 Cleanfills

Environment Southland employed a contractor to inspect cleanfill sites throughout Southland. A total of 17 sites were inspected.

Of the 17 sites inspected, 10 needed additional follow-up for non-supply of data such as fill reports for the year. The on-site inspections showed that the material going into sites had generally been within consent requirements. One operator has been issued a formal warning for allowing the placement of household waste into the site.

Public complaints regarding unconsented materials being placed in cleanfill sites have decreased compared to previous years and this is seen as a significant improvement. This decrease may be due to annual inspections carried out during the past three years. There is no requirement to inspect sites annually and, if compliance on sites continues to improve, the frequency of inspections may be relaxed.

A site near Riverton was found to have no consent and non-cleanfill materials were being deposited into it. An abatement notice was issued to cease the deposition of unauthorised materials to land and the parties concerned have now applied for a resource consent.

14.0 Incidents

14.1 Search Warrants

A total of five search warrants were executed, pursuant to Section 334 of the Resource Management Act 1991, for the 2007/08 year.

The warrants were issued for the following reasons:

- search for and locate physical, documentary and electronic evidence in support of an investigation into illegal commercial surface water activities. Simultaneous search warrants were executed on a residential dwelling and a vessel;

- allow entry onto a rural property for the purpose of sampling to ascertain the effect of unrestricted animal access to a waterway;

- allow entry onto a rural property to count cow numbers and gather evidence that the consent holder was in breach of their consent.

14.2 Incidents

Incidents are made up of three components:

- issues found by Environment Southland staff during monitoring;
- self reported issues by the responsible party;
- incidents reported by any third party.

In the financial year 1 July 2007 to 30 June 2008, there were 955 incidents reported. This is a 32% increase on the previous year. Of these, 704 incidents required an inspection to measure environmental effects and there were 16 self-reports from consented industries.

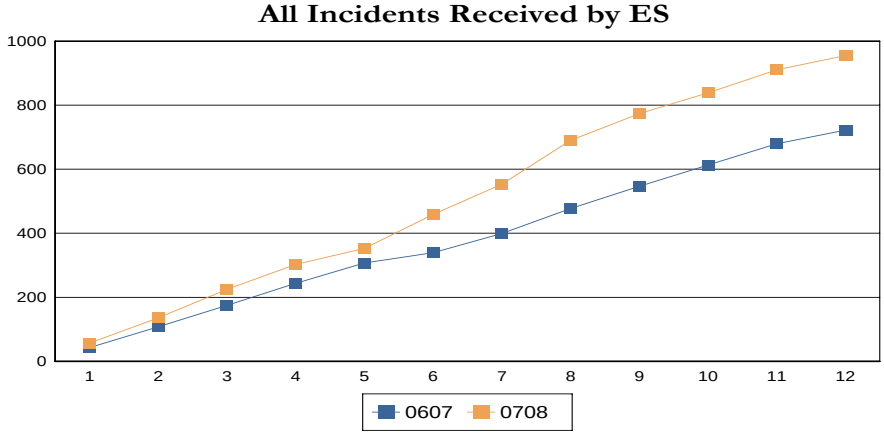

Figure 50 -All incidents received by Environment Southland in the 2007/08 year

When members of the public report an incident to Environment Southland they have the option of remaining anonymous, or their contact details being recorded. Generally, those that report an incident wish to know whether the action they have reported was considered undesirable and that the incident has been dealt with. Some outcomes are unable to be reported as legal action prevents this until the event becomes public.

All incidents are categorised as being related to air, coast, land, or water.

Seasons play a major role in the type and frequency of incidents reported by members of the public, for example, water related incidents increase in September/October. This is due to activities like whitebaiting and trout fishing, with considerably more people active on Southland rivers at this time.

Air incidents generally increase in the summer months, with odour issues more obvious to the general public due to increased outdoor activities, such as barbeques and family activities. There has been a recent increasing trend of reports of nuisance smoke within urban areas during the winter months.

Burning of "green" vegetation in the peri-urban area around Invercargill has also become a problem in the last year and education of the public has been a first response.

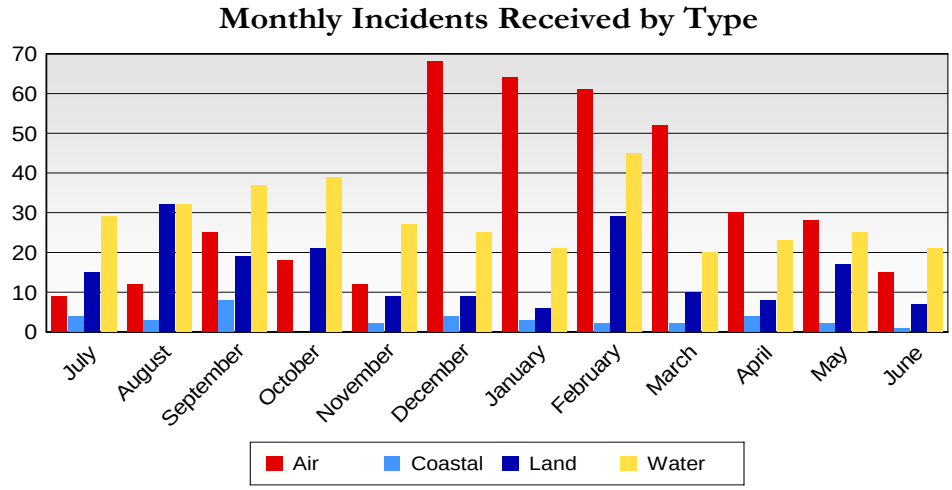

Figure 51 - Monthly incidents received by type

There were 286 odour incidents in the 2007/08 year, of which 85 (29%) were considered objectionable/offensive using Environment Southland criteria.

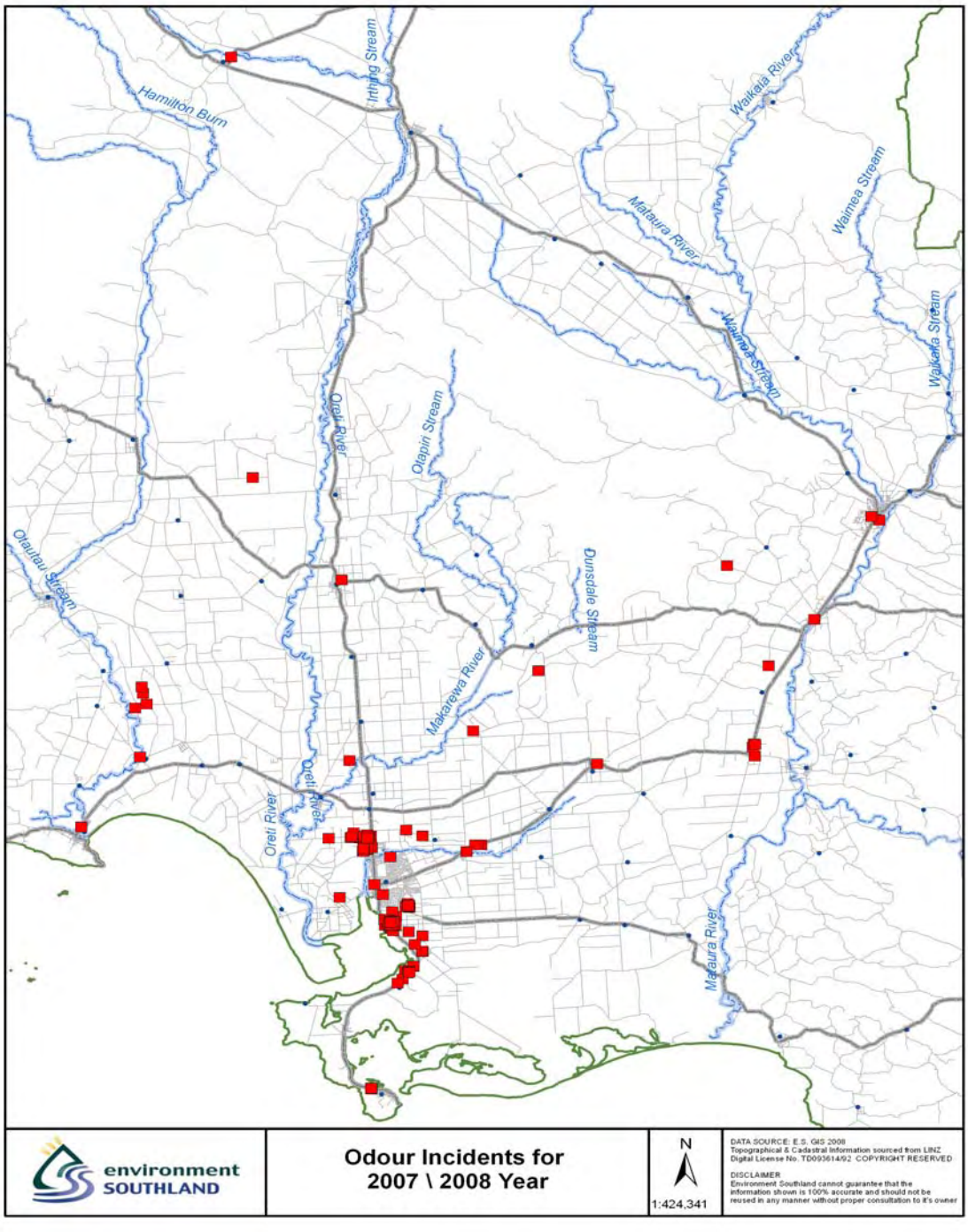

Figure 52 - Map showing the location of all odour incidents in 2007/08

Water quality in urban areas can be severely compromised for a number of reasons, the most common being the discharge of fuels, mainly diesel.

These discharges are categorised by visible "rainbow sheens" i.e. when fuels spread out to a thickness of one micron on any water body creating a rainbow effect.

Figure 53 – "Rainbow sheen" from a diesel spill into Otepuni Creek

The average number of reported incidents per month was 79. There were a high number of incidents reported in February, due to a combination of air and water incidents in one month.

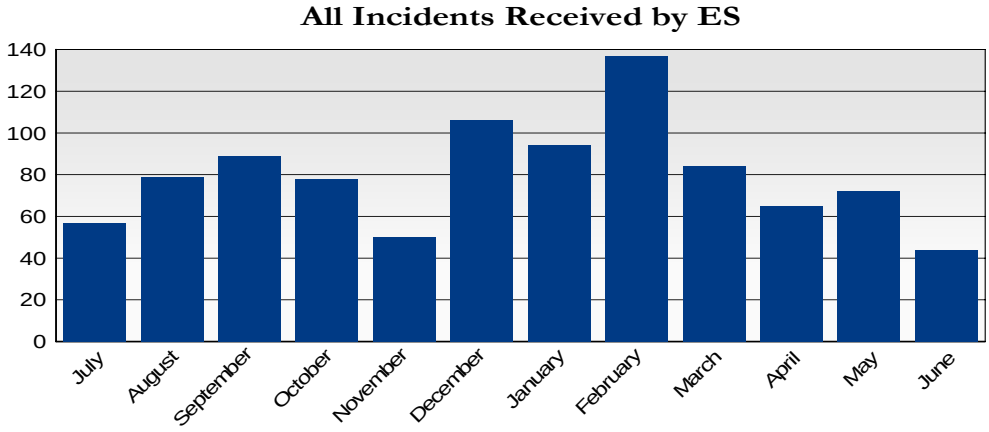

Figure 54 - Graph showing monthly incidents totals for 2007/08 year

The Environmental Compliance Division operates a 24/7 pollution response service. All incidents received after normal business hours are forwarded to the duty officer by Southland Answering Service. Council policy is to respond to all incidents within one hour of receipt where an immediate

response is warranted. Some lesser situations may not result in a response for up to 30 days.

Major Incidents

Major incidents require an individual entry in Environment Southland's filing system for any generated correspondence. Major incidents are any incident that may result in:

- cost recovery;
- abatement notice;
- infringement notice;
- prosecution.

Major incidents are allocated an individual job number to allow for all costs associated in dealing with the incident to be recovered. Costs that are recovered by Council include staff time, vehicle running, materials, disposal, photography, printing, legal, sample analysis and overheads.

Table 14 – Comparison with Previous Years

Year Ending	*Major Incidents*	*Prosecutions*	*Infringements*
1997	72	5	-
1998	68	4	-
1999	35	5	-
2000	42	4	-
2001	55	7	11
2002	66	10	12
2003	42	5	11
2004	26	3	4
2005	46	2	22
2006	58	8	32
2007	97	4	33
2008	166	9	13

The numbers of infringements have decreased markedly in last year. This has been influenced by an increased number of infringements being elevated to the Prosecution Consideration Sub-committee and, conversely, more incidents being immediately cost recovered.

There were 166 major incidents in the 2008 year, an increase of 58% on last year. This number would have been a contributory factor with regard to the increased amount of costs recovered this year (65% up from last year).

Forty-seven major incidents involved dairy effluent. This is the same number as last year but, because of the increased number of major incidents, dairy only accounts for 28% of the total incidents for the year.

Figure 55 - Picture showing a travelling irrigator stalled and siphoning onto pasture.

14.3 Cost Recovery

The Environmental Compliance Division made a significant improvement in recovering costs from incident investigations during the year 1 July 2007 to 30 June 2008.

The total during this period amounts to $190,444.53, recovered from 93 incidents, compared to the previous year where the amount recovered was $48,260.78, from 61 incidents.

The budgeted recoveries during this period was $39,000.

The result is encouraging as offenders are paying for staff time spent investigating public reports of non compliance, rather than this cost being covered by the general ratepayer.

It is expected that the upward trend will continue as staff resolve more incidents.

15.0 Infringement Notices

Infringement notices are an instant fine for situations where an offence requires a penalty, but is not considered serious enough to warrant prosecution.

The decision to issue an infringement notice is made by an Infringement Panel, made up of Environment Southland Senior Managers. Penalties are prescribed by regulations and vary depending on the section of the Resource Management Act 1991 contravened.

There were 13 offences which resulted in an infringement notice being issued in the 2007/08 financial year. This is less than the 33 in the previous year. Seven of the infringements were for dairy shed effluent (DSE) to water. The main reason for fewer infringements is that more incidents have been dealt with by direct cost recovery and put forward for prosecution.

Table 15 – Miscellaneous

Issued to	*Offence*	*RMA Section*	*Fine*
Fulton Hogan	Fulton Hogan allowed a contaminant, namely black smoke, to be discharged into the air from an industrial or trade premises in a manner that contravened a rule in a regional plan or proposed regional plan, or that was not expressly allowed by a resource consent, or regulations.	Section 15(1)(c)	$1000
Invercargill City Council (Wastewater Treatment Plant)	The Invercargill City Council allowed a contaminant, namely objectionable odour, to be discharged into the air from an industrial or trade premises in a manner that contravened a rule in a regional plan or proposed regional plan, or that was not expressly allowed by a resource consent, or regulations.	Section 15(1)(c)	$1000
W A Lawton	Breach of abatement notice.	Section 338(1)(c)	$300
Titiroa Transport Limited	Allowed a contaminant, namely stock truck effluent, to be discharged onto land which was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, by a resource consent, or by regulations.	Section 15(1)(b)	$750

Issued to	*Offence*	*RMA Section*	*Fine*
Solid Energy NZ Ltd	Allowed a contaminant, namely discoloured stormwater, to be discharged onto land in circumstances where contaminants entered water, which was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, by a resource consent, or by regulations.	Section 15(1)(b)	$750
Blue Sky Meats Ltd	Allowed a contaminant, namely effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations	Section 15(1)(b)	$750

Figure 56 -Discharge of contaminants to air from bitumen burning

Table 16 -Dairy Effluent Discharges

Issued to	*Offence*	*RMA Section*	*Fine*
Robert Zydenbos	Allowed a contaminant, namely dairy shed effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750
T J Woods	Allowed a contaminant, namely dairy shed effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750
H & L Singh	Allowed a contaminant, namely dairy shed effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750
Keith Wilson	Allowed a contaminant, namely dairy shed effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750
Jeremy Coates	Allowed a contaminant, namely dairy shed effluent, to be discharged into or onto land in circumstances which could result in that contaminant entering water, which is not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750
Regan Elder	Allowed a contaminant, namely dairy shed effluent from an irrigator, to be discharged into or onto land in circumstances which resulted in that contaminant entering water, which was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750

Issued to	*Offence*	*RMA Section*	*Fine*
M T and L F Livingstone	Allowed a contaminant, namely dairy shed effluent, to be discharged into or onto land in circumstances which could result in that contaminant entering water, which is not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, a resource consent, or regulations.	Section 15(1)(b)	$750

Figure 57 -Travelling irrigator too close to a waterway

16.0 Abatement Notices

Abatement notices are a valuable tool for compliance staff to use where an individual or parties have committed an offence against a plan, rule or other legislative requirements.

The Council recently prosecuted an individual who failed to comply with an abatement notice. The judge in sentencing indicated that abatement notices were an important tool for enforcement officers and that failure to act upon a notice would be considered very dimly by the courts. The individual was fined $6,500 for failing to comply despite there being no environmental effect.

An abatement notice is formatted in a manner that sets out the following:

- the physical address of the person or company;
- the activity or action that the offender has to cease or take;
- the location the notice applies to;
- the time allowed for the offender to meet the requirements of the notice;
- any further conditions that the officer has specified;
- the reasons for the notice;
- a warning that non-compliance with the notice could lead to a prosecution;
- advice on how to appeal the notice;
- what authorisation the officer issuing the notice has;
- the signature of the issuing officer.

Compliance officers need to be mindful that the requirements and timeframes of an abatement notice are reasonable and the offenders have the opportunity to comply.

The notice places the onus on the offender to comply within the prescribed timeframe. The offender has the right to appeal the notice to be cancelled or stayed by a District Court judge. Non-compliance with the notice can result in further enforcement action, such as prosecution for breach of notice.

Abatement notices for the 2007/08 year were issued for the following activities:

Bed disturbance	-	4
Groundwater non-provision of data issues	-	15
Unauthorised water take/diversion issues	-	3
Unauthorised discharges to land/water	-	12
Coastal	-	3
Air quality issues	-	10
Over consented cow numbers	-	6
Total issues	**-**	**53**

Table 17 - Bed disturbance

Issued to	*Summary of Offence*
William Alexander Lawton	**Location:** Taramoa **Offence:** Cattle have caused de-vegetation of the bank and altered the profile of the bank and bed of the waterway.
Southern Pastoral Holdings	**Location:** 162 Longridge Valley Road **Offence:** Excavation and bed disturbance of a waterway without resource consent.
Murray Ian Hagen	**Location**: 415 Weir Road **Offence:** Deer have caused de-vegetation of the bank of a waterway. Hagen has also been warned in writing that this activity is prohibited.
Murray Duthie	**Location:** 1300 Oporo Flat Road **Offence:** Murray Duthie has allowed animals to have unrestricted access to the Oreti River causing bed disturbance.

Table 18 - Groundwater issues

Issued to	*Summary of Offence*
J M and B A Dobson	**Location:** State Highway 6, Lumsden **Offence:** Non-provision of water abstraction records and/or environmental reports.
Edendale Nursery	**Location:** 41 Hilda Road, Edendale **Offence:** Non-provision of water abstraction records and/or environmental reports.
Geo Clark Limited	**Location:** Waipounamu Road, Riversdale **Offence:** Non-provision of water abstraction records and/or environmental reports.
R O and C D McKee	**Location:** 17 Tither Road, Riversdale **Offence:** Non-provision of water abstraction records and/or environmental reports.
D A and C K Raymond	**Location:** Jaffray Road, Riversdale **Offence:** Non-provision of water abstraction records and/or environmental reports.
D A and C K Raymond	**Location:** Jaffray Road, Riversdale **Offence:** Non-provision of water abstraction records and/or environmental reports.
Southern Flora (New Zealand Limited)	**Location**:: Pahiwi-Balfour Road, Balfour **Offence:** Non-provision of water abstraction records and/or environmental reports.
Southern Flora (New Zealand Limited) (consent 2016670)	**Location:** Pahiwi-Balfour Road, Balfour **Offence:** Non-provision of water abstraction records and/or environmental reports.
Southern Flora (New Zealand Limited) (consent 202279)	**Location:** Pahiwi-Balfour Road, Balfour **Offence:** Non-provision of water abstraction records and/or environmental reports.
P Steeghs	**Location:** 768 State Highway 94, Croydon Siding, RD6, Gore **Offence:** Non-provision of water abstraction records and/or environmental reports.
Timbertop Farm Company Limited	**Location:** Timbertop Road, Lintley/Josephville, Lumsden **Offence:** Non-provision of water abstraction records and/or environmental reports.
Van Eeden Tulips Limited (consent 203212)	**Location:** cnr of McKerchar and Trotter Roads, Longbush **Offence:** Non-provision of water abstraction records and/or environmental reports.

Issued to	*Summary of Offence*
Van Eeden Tulips Limited (consent 204101)	**Location:** McKerchar Road, Longbush **Offence:** Non-provision of water abstraction records and/or environmental reports.
MC and CM Barker	**Location:** 2142 Highway 94 The Key **Offence:** Non-provision of water abstraction records and/or environmental reports.
Kaiwera Stock Water Supply Company Limited	**Location:** water intake from the Kaiwera Stream for the Kaiwera Rural Water Supply **Offence:** Non-provision of water abstraction records and/or environmental reports.

Table 19 - Unauthorised water take/diversion issues

Issued to	*Summary of Offence*
Ten K Dairies Limited	**Location:** Sutherland Road & Mossburn-Lumsden Highway, Castlerock **Offence:** Failure to comply with groundwater abstraction rate limits**.**
Kelvin Reed for Falcon Farms	**Location:** 124 McKay Road, Riversdale **Offence:** Abstracting water for irrigation without resource consent**.**
Jurassic Farms Limited	**Location:** 309 Awarua Bay Road **Offence:** Diversion of water without resource consent.

Table 20 - Unauthorised Discharges of contaminants to land/and or in circumstances where they may reach water

Issued to	*Summary of Offence*
GlenKylie Dairy Farm Limited	**Location:** Isla Bank **Offence**: Unauthorised discharge of contaminants to land (silage leachate) in circumstances where they may reach water.
Timothy James Woods	**Location:** Wairio **Offence:** Timothy Woods and/or his agents have allowed the unauthorised discharge of dairy shed and/or feed pad effluent to be applied to land outside the consented discharge area.
Kaikaha Farms Limited	**Location:** Trig Road, Seward Downs **Offence:** Unauthorised runoff of contaminants into water and mob stocking within 3 m of a waterway.
Allied Concrete Limited	**Location:** 51 & 41 Basstian Street , Invercargill **Offence:** Unauthorised discharge of contaminants to land in circumstances where they may reach water**.**
Ocean Beach Properties Limited	**Location:** Bluff **Offence:** Unauthorised discharge of contaminants onto land and/or into water.
Euan James Shearing	**Location:** Riverton **Offence:** Unauthorised dumping of cleanfill and materials that do not constitute cleanfill to land without a resource consent.
TSK White Limited	**Location:** Riverton **Offence:** Unauthorised discharge of contaminants to land where it is likely to enter water from a truckwashing operation.
Homestead Dairies Limited	**Location:** Edendale **Offence:** Unauthorised over-application and ponding of farm dairy shed effluent to land.

Issued to	*Summary of Offence*
Fortune Farming Limited	**Location:** 63 Fortune Road, Mandeville **Offence:** Unauthorised ponding of farm dairy shed effluent to land.
Klass Waslander	**Location:** 182 Tisbury-Motu Rimu Road **Offence:** Klass Waslander and/or his agents have allowed the unauthorised discharge of dairy shed and wintering pad effluent to be applied to land outside the consented discharge area.
E G and S H Overdevest	**Location:** 73 Rose Road, Roslyn Bush **Offence:** Dairy effluent has been allowed to overflow to land from the effluent containment area in circumstances where it may enter water.
Ballance Agri-Nutrients Limited	**Location:** 48 Aparima Street Gore **Offence:** Discharge of contaminants via the stormwater system to a waterway.

Table 21 - Coastal

Issued to	*Summary of Offence and Action Required*
M Herzhoff Rakiura Adventure Limited	**Location:** Leask Bay, Stewart Island **Offence:** Using or permitting the use of a boat shed for the purposes of habitation contrary to Condition 3 of the coastal permit.
Francis Patrick Carre	**Location:** Internal waters of Fiordland between Yates and Puysegur Points **Offence:** Unauthorised commercial surface water activity.
Janice Carre	**Location:** Internal waters of Fiordland between Yates and Puysegur Points. **Offence:** Unauthorised commercial surface water activity.

Table 22 - Air quality issues

Issued to	*Summary of Offence and Action Required*
Alliance Group Limited	**Location:** Lorneville **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.
Clifton Wool Scour	**Location:** Bluff Road, Invercargill **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.
Takitimu Coal Limited	**Location:** Nightcaps **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.
Stanley Robert Mitcheson	**Location:** 54 Hokonui Drive, Gore **Offence:** Open air burning causing adverse effects outside the property boundary.
Logan Phillipson	**Location:** 54 Hokonui Drive, Gore **Offence:** Open air burning causing adverse effects outside the property boundary.
South Pacific Meats Limited	**Location:** 86 Kekeno Place, Awarua **Offence**: Unauthorised discharge of contaminants to air beyond the property boundary.
NZ & Australian Petfood Ingredients Limited	**Location:** 284 Foreshore Road, Bluff **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.

Issued to	*Summary of Offence and Action Required*
The Niagara Sawmilling Company	**Location:** The land occupied by The Niagara Sawmilling Company at Kennington **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.
McNeills Poultry Farm (2006) Limited	**Location:** 348 & 351 McQuarrie Street Invercargill **Offence:** Unauthorised discharge of contaminants to air, namely odour.
Solid Energy	**Location:** Waimumu **Offence:** Unauthorised discharge of contaminants to air beyond the property boundary.

Table 23 - Over cow numbers

Issued to	*Summary of Offence and Action Required*
Roger Whyte	**Location:** Edendale-Woodlands Highway **Offence:** Breach of consented cow numbers.
AD Gunn	**Location:** Woodlands **Offence:** Breach of consented cow numbers.
WhiteWaters Limited	**Location:** Wairio **Offence:** Breach of consented cow numbers.
A and L Foster	**Location:** Isla Bank **Offence:** Breach of consented cow numbers.
Centre Ridge Dairies	**Location:** Waipango, Riverton **Offence:** Breach of consented cow numbers.
Tony Douglas Hall	**Location:** cnr of Rakahouka-Hedgehope Road and State Highway 96 **Offence:** Having more than 100 adult cows on wintering pad without resource consent.

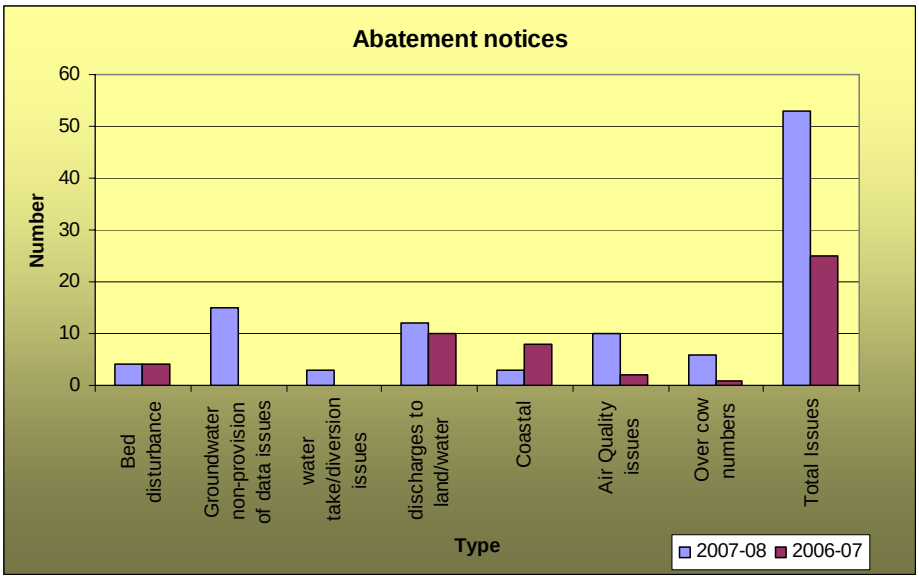

Figure 58 - Chart and data showing type and number of issues and comparisons from 2006/07 year and 2007/08 year

Table 24 – Number of issues and comparisons from 2006/07 and 2007/08 years

2006/07		*2007/08*	
Bed disturbance	4	Bed disturbance	4
Groundwater non-provision of data issues	0	Groundwater non-provision of data issues	15
Unauthorised water take/diversion issues	0	Unauthorised water take/diversion issues	3
Coastal	8	Coastal	3
Air quality issues	2	Air quality issues	10
Over consented cow numbers	1	Over consented cow numbers	6
Total issues	**25**	**Total issues**	**53**

17.0 Prosecutions

Table 25 – Miscellaneous Prosecutions

Defendant	*Case*	*Decision*
Pantas 1	**Charge:** Discharged a harmful substance, namely fuel oil, from the ship *Pantas 1* into the coastal marine area.	Penalty: $15,000 Council expenses 90% of fine

Table 26 – Dairy Prosecutions

Defendant	*Case*	*Decision*
Antara Ag Ltd	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty to three charges.	Penalty: $16,500 Council expenses 90% of fine plus investigation costs $1,005.47
Eatwell Development Limited	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $20,000
Timothy Eatwell (Farm Manager/Consent Holder)	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $10,000
Union Station	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty to three charges.	Penalty: $15,000
Jeavon Zeestraten (Manager)	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway.	Penalty: $7,500
White Waters Ltd	**Charge:** Discharge of dairy shed effluent to land in circumstances where it may enter a waterway. Pleaded guilty.	Penalty: $8,000
Marinus Frederick Antonisse	**Charge:** Discharge of dairy shed effluent to land in circumstances where it may enter a waterway. Pleaded guilty.	Penalty: 100 hours community service
Mr Heaps	**Charge:** Discharge of dairy shed effluent to land in contravention of a regional effluent plan. Pleaded guilty.	Penalty: $3,000
	Breach of an abatement notice. Pleaded guilty.	Penalty: $6,500

Glossary

AFDW	Ash free dry weight. Used for periphyton monitoring to remove any sediment included in the sample.
ANZECC	The Australia New Zealand Environmental Conservation Council. This organisation is developing guidelines similar to the USEPA but applicable to the Australian and New Zealand situations.
BOD_5	Biochemical Oxygen Demand. The is a measure of the ability the waste has to remove Dissolved Oxygen from a receiving water or waterway by decomposition
Chl *a*	Chlorophyll *a*. The pigment in plant cells which captures light energy for photosynthesis
DAF Unit	Dissolved Air Flotation unit where air is pumped into the effluent under pressure. When it discharges into the unit under atmospheric pressure the dissolved air comes out of suspension and forms bubbles on any particulate matter. This then floats and is removed as a sludge.
DRP	Dissolved Reactive Phosphorus. DRP is a subgroup of the Total Phosphorus and is an arbitrary measure of the phosphorus that is readily available to the plants to sustain growth.
dsm^3	Dry standard cubic metre. This is used for determining the contaminant levels in exhaust gases by standardising temperature and pressure, and removing the effect of variable water contents
E. coli	Escherichia coli These are a subset of the Faecal Coliform group and are regarded as a more specific indicator of faecal contamination and hence the presence of pathogenic bacteria
EC	Electrical Conductivity. The ability of a water to conduct electricity. This gives a conservative measure of the mineral content of a water. Generally, the greater the conductivity of the water the greater the mineral content of the water
Faecal Coliforms (FC)	Faecal Coiforms These are organisms that are present in the gut and faeces of warm blooded animals and are used as indicators of the presence of pathogenic organisms
g/m^3	A measure of concentration in a liquid or gas. Grams of material in 1 cubic metre of water

HFA	Hydrofluoric Acid
mg/kg	Unit to measure concentration in a solid (equivalent to ppm (parts per million) or g/m^3 the unit used to measure concentrations in liquids)
MLTR	Makarewa Low Temperature Rendering plant
N	Nitrogen. Nitrogen is an important element in the growth of plant material. It is required for protein formation and consequently animals have a significant N content
NH4-N	Ammonical Nitrogen, ionised ammonia A reduced form of nitrogen. Ammonia is rarely found at high levels in natural waters. Its presence is an excellent means of detecting pollution
NH_3	Unionised ammonia, ammonia This form of ammonia is significantly more toxic that the ionised form as above. The relationship between the ionised and unionised forms is dependant on temperature and pH of the water.
Nitrate-N	An oxidised form of Nitrogen. Nitrate Nitrogen is soluble and is therefore readily available to plant life to sustain growth
Odour Units (OU)	This is the unit for measuring odour. This unit does not refer to weight or volume as with g/m^3 etc, it is essentially based on the group of people being used, to establish the number of dilutions required before an odour cannot be detected.
PAH	Polycyclic Aromatic Hydrocarbons A class of over 100 different organic molecules composed of only carbon and hydrogen. PAHs are flat molecules with each carbon having three adjacent carbon atoms similar to the structure of graphite. The USEPA has listed 16 of these as priority chemicals due to their potential health effects.
PM_{10}	Particulate Matter with the aerodynamic particle size of 10 Micrometers or less
SO_2	Sulphur Dioxide
TP	Total Phosphorus. Phosphorus is an important element in the growth of plant material. Total Phosphorus is a measure of all phosphorus present, including all forms of phosphorous whether it is tightly bound to particulate matter or potentially available to plant life

TSS	Total suspended solids
$\mu g/m^3$	A measure of concentration in a liquid or gas. Micrograms of material in 1 cubic metre of water. 1 gram = 1,000,000 micrograms
USEPA	United States Environmental Protection Agency. The USEPA provides the environmental regulation within the United States. Its data and standards are frequently used as the internal standards by other countries such as New Zealand