Environmental Compliance Monitoring Report

2005/06

Report by -
Environment Southland
Environmental Compliance Division

Environment Southland Publication No 2006/07

Foreword

Most people who use natural resources in their businesses are well aware their future relies on protecting the environment. There will only be strong commercial and primary production sectors if we produce goods in a manner consumers are comfortable with. History shows us that, when we wreck the environment, we wreck the economy and the civilisation which depends on it.

It is pleasing to note a 13% decrease in the number of complaints made to the Compliance Division this year. Our educational programmes and regular Field Days held by Environment Southland staff, have played a great part in achieving this result.

Environment Southland is not responsible for regulating land use directly. Most soils are suitable for receiving dairy effluent, but it is our business to consider the factors of infiltration rates and possible effects on groundwater, non-point and point discharges. The Council sees it as undesirable to regulate directly to achieve particular land use outcomes. We will guide and educate and, ultimately, exercise control over environmental effects that result from the choices farmers make.

The burning of industrial, or commercial, waste appears to be an emerging problem within the city limits and abatement notices have been issued. Our Council is also enforcing compliance on urban property owners who have heavy infestations of gorse and broom. Many notices have recently been issued.

Finally, our Councillors would like to welcome our Compliance Manager, Mark Hunter, to his new position and take this opportunity to congratulate the staff for continuing to maintain a very high standard of compliance throughout the Southland region.

D S Collie
Chairman
Environment Southland

E J Tapper
Chairman
Environmental Management Committee

A word from James Holloway

I will not be actually producing the Division's Compliance Monitoring Report this year. I have, after nine years with the Council, decided to move on. I have left the report with the staff to put together.

The development of the Compliance Monitoring Report has been a significant component of the Division's reporting procedures. It arose from a perceived need to inform the Council of the Division's activities. It was rapidly recognised that the report also presented substantial opportunities to inform the public of what we do. In fact, feedback from outside the organisation exceeds internal feedback. I have, however, been disappointed at the lack of uptake by the media, considering the wide range of information and issues presented.

We have tried, and I hope succeeded, to get away from the mechanistic reporting of the "X inspections required, X inspections undertaken" format. Rather, we have tried to present material which is topical, informative and interesting. Unusual occurrences and interesting points have been presented, along with the more mundane long term data.

While much of the data is also fed into the wider monitoring programmes run by Environment Southland, we have not substantially presented the wider context of the data, as this correctly fits into the Environmental Information Division's State of the Environment monitoring and report-card format reporting. I was surprised to find that a number of organisations have used the Compliance Monitoring Report as one of their performance measures. In my new position I will be on the other side of the fence, as one of the organisations being reported, and so will keep some contact with the ongoing development of the division and their reporting.

I wish my successor well, and trust that the consent holders and the public will continue to ask those questions that have kept me engaged over the past nine years.

JDR (James) Holloway

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1.0 Piggeries

There are presently five piggeries operating in Southland.

Figure 1 – Piglets at one of Southland's piggeries

Bouquet

Because of the high standard of past effluent disposal compliance, no inspections were considered necessary this year.

2.0 Dairy Monitoring

2.1 Effluent Discharges

The 2005/06 dairy season was the sixth year that the audit system has been used, and it will be the last. The decision to change was made because it has been found that there is very little difference in the operation of those farms in the audit pool, and those that are not.

During this season, a total of 612 farm inspections were carried out. This included 57 re-inspections, which is an increase from 6.2%, in the 2004/05 year, to 10.3% this season.

Of the remaining properties that were inspected, 166 (30.1%) were given a performance rating of "1 Good", 237 (42.9%) properties were graded "2 OK, but with an issue" of a minor nature, 90 (16.3%) had a rating of "5 marginal", and two (0.4%) had cow numbers in excess of the number allowed by the consent conditions.

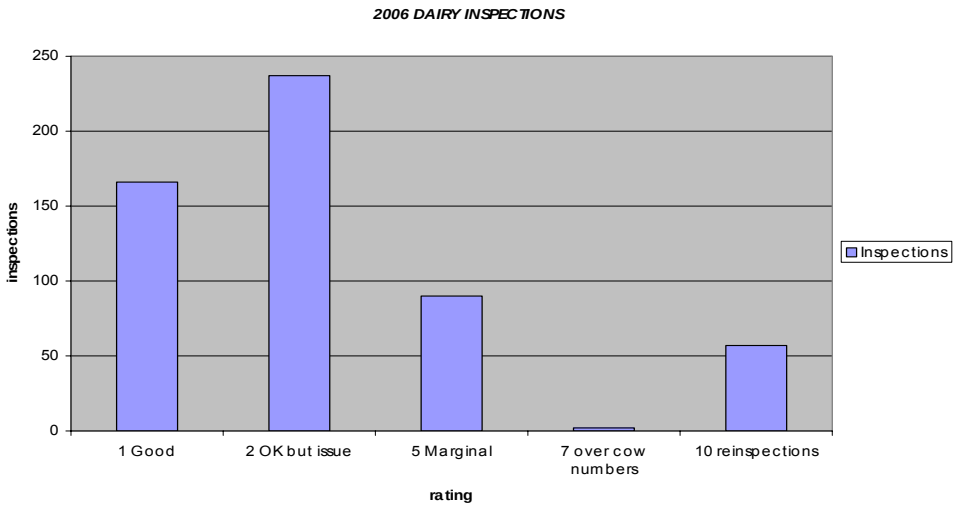

Figure 2 - The results of Dairy Inspections for the 2005/06 Season

Shared resources

Staff have worked closely with Fonterra's Environmental Officer, who has contacted farmers that have cow numbers approaching the consent limits. As a result of this, the Council has received a number of applications for a new consent, allowing an increase in herd numbers.

2.2 On-farm Assistance

Free on-farm advice and staff training continues to be offered to dairy farmers and sharemilkers. It is pleasing to see this service being utilised to train farm staff. There has been a marked increase in requests for advice on the operation of effluent systems and equipment.

Council has been discussing options for effluent disposal when soils are at field capacity, the use of a conventional irrigator in these circumstances is likely to result in an over-application of effluent, ponding or, worse, overland flow that could end up in a waterway.

Council believes strongly that landowners are responsible for determining how to manage their business. A consent allows for the operation of the business as long as it meets certain parameters; how those parameters are met is determined by the consent holder.

2.3 Surface Water Monitoring

Each year, the number of discharge consents requiring surface water sampling is increasing and Council has concerns about the cumulative effect of effluent discharges on surface water quality.

Water quality monitoring is imposed on properties with stocking rates greater than 2.5 cows/ha and on soils vulnerable to nutrient leaching or runoff. Surface water sample sites are determined by considering the location and proximity of the effluent disposal area to waterways. Samples may be collected from a tile outfall that drains from within the effluent field, or upstream and downstream of the effluent disposal field. Sample frequency can be from one to four times per season, depending on the consent conditions.

2005/06 season

- 178 dairy effluent disposal consents required surface water monitoring;
- a total of 277 samples were collected out of an expected 393;
- 39 sample occasions were missed because consent conditions could not be met (rainfall requirements, minimum cow numbers, no flowing water, etc);
- 14 consent holders electing to collect samples themselves supplied all the required sample results, although only seven fully complied by collecting all of their samples in the correct months;
- 18 consent holders who elected to collect their own samples collected nothing at all, accounting for 46 of the 76 samples not done;
- 30 fines were issued for non-supply of sample data.

Table 1 – Water quality monitoring

Water Quality Rating of Samples	*Environment Southland Collected*	*Self Collected*
Excellent (shows no impact)	36 (14%)	7 (5%)
Good (no significant differences)	89 (34%)	28 (21%)
Marginal (some water quality issues)	65 (25%)	16 (12%)
Unsatisfactory (significant water quality impact, usually visible discharge)	34 (13%)	3 (2%)
No sample (sampling conditions could not be met, or no flowing water)	35 (14%)	4 (3%)
Not done (non-compliance)	0	76 (57%)

Due to continuing poor compliance of sample collection and the considerable follow-up time involved with non-compliance, Council elected that all future sample collection is to be arranged by Environment Southland staff at the consent holder's cost.

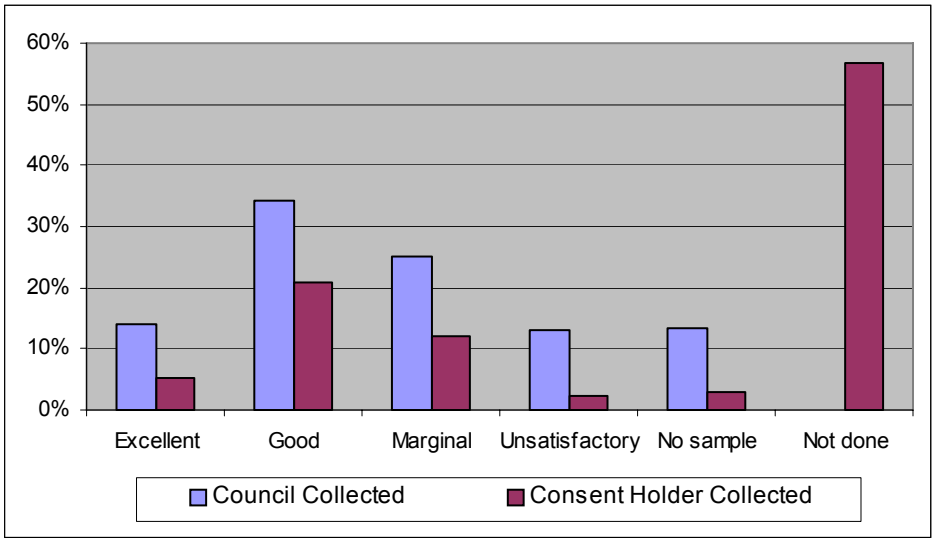

Figure 3 - Rating of required water sampling which compares Council collected against consent holder collected

Water Quality Issues for 2005/06 season

- one in four farms sampled in September 2005 had visible effluent discharges to a surface waterway;
- 44% of all unsatisfactory results were collected in the months of September and October 2005. A further 25% of unsatisfactory results were collected in November 2005 (see Figure 5);
- 35% of all excellent results were collected in April 2006, and 36% of good results were collected in May 2006 (see Figure 5);

- the highest proportion of no sample occasions was for February 2006, when 29% of consents could not meet sampling requirements;
- 15 incidents of unsatisfactory sample results lead to non-compliance follow-up, including enforcement action;
- prosecution is pending for one farm which had visible effluent discharges to a watercourse on three out of four sample occasions.

Figure 4 - Example of an unsatisfactory sample, where effluent was entering a waterway via a tile in October 2005

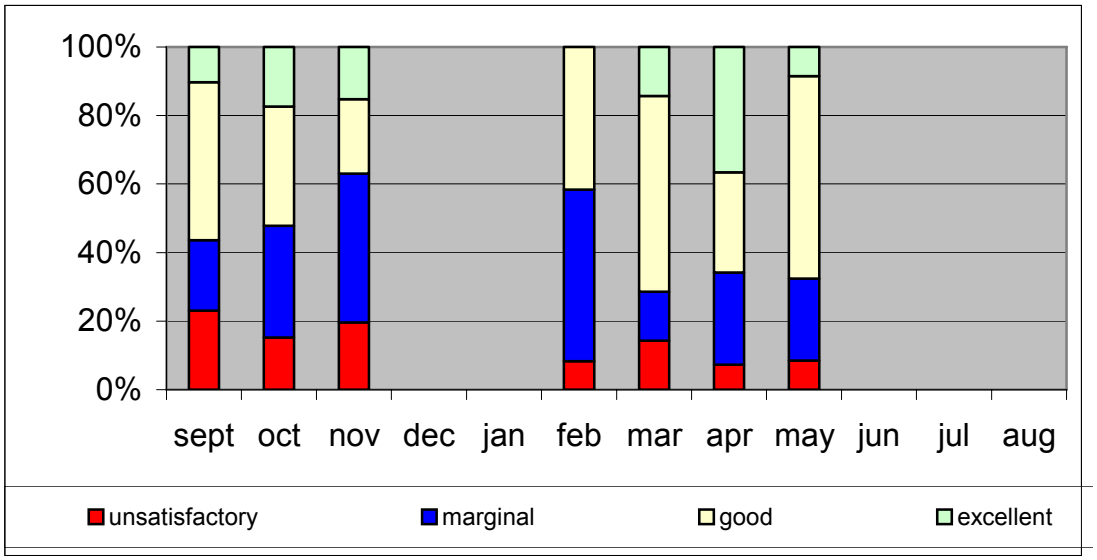

Figure 5 - Ratings of all collected samples 2005/06 season expressed as percentage and excluding months where number of samples collected was small.

Figure 6 - Example of an unsatisfactory sample result where effluent entered a tile and discharged to an open waterway September 2005

Analytical results

Sampling which requires an upstream and downstream sample aims to assess whether water quality is affected as it passes through the disposal area. The following collated results are the difference between upstream and downstream results (u/s - d/s).

Ideally, the difference would be close to zero (indicating no change). Negative values show decreasing quality (downstream analytical results were higher than upstream) and positive values show increasing water quality (dilution via cleaner inputs). The graph also shows the number of samples collected is increasing each year.

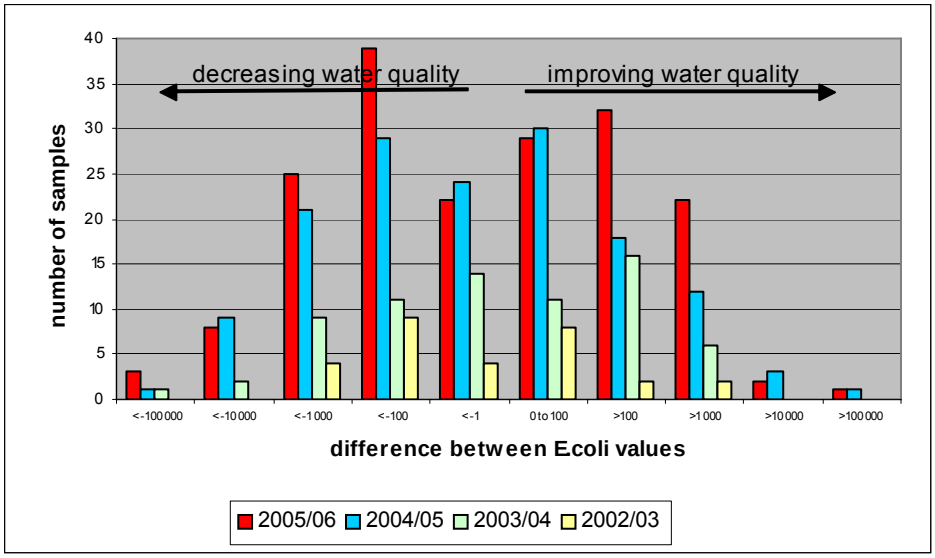

Figure 7 – Differences in E coli values

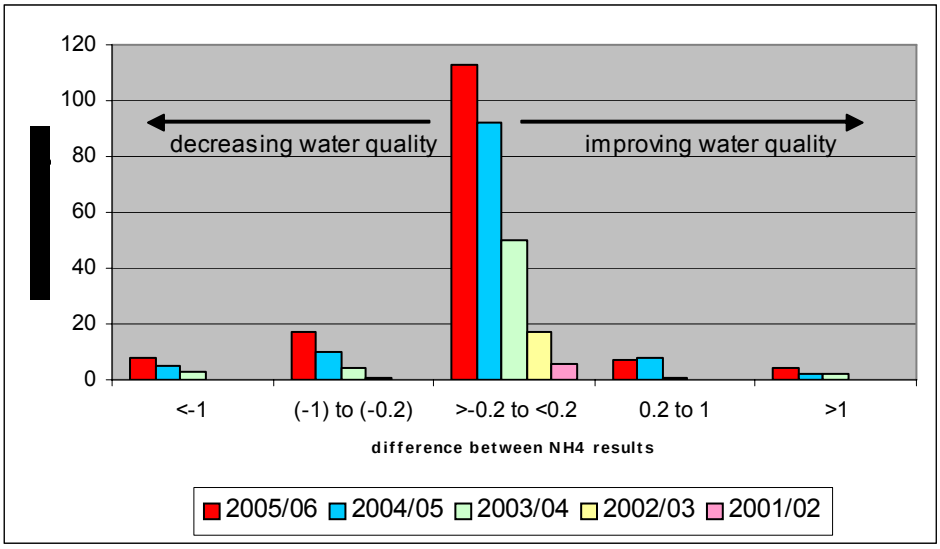

Figure 8 – Differences between NH4 results

Samples from a tile assess water quality draining from the effluent disposal area. Results are compared with dilution factors of concentrations found in raw dairy shed effluent. The spread of results is best displayed in box and whisker graphs to avoid extreme values affecting averages.

Box and whisker

- data is ranked from highest to lowest value;
- the middle ranked value (median) is a line within the box and the dotted line is the average;
- the box encases the majority (50%) of results;
- the whiskers extend to include 80% of results;
- extreme values are plotted as outlying dots (lowest 10% and highest 10% of results).

Tile results

- the number of samples has increased each season, from three to 50, and this has most likely affected the spread;
- the median has remained similar;
- most (mid %) results remain within range over sample collection years while incidents of contaminated discharges (high values) appear to be getting more extreme.

***Author's note**: statistics may vary slightly from previous Council reports due to the fluid nature of consents. During the season, consents continue to be granted, surrendered and expire. Some consent holders have begun the season collecting their own samples and later elect for Council to do it, and vice versa.*

2.4 Surface Water Sampling

Surface water monitoring results for the (2005/06) dairy season have been collated. Samples are required two, three or four times a year. Samples were collected from 151 consents, of the 178 requiring surface water sampling. Of these, 105 were sampled by compliance staff and 46 consent holders elected to collect their own water samples.

Of the 46 consent holders that elected to collect their own samples, 11 have collected all of the samples required by their consent (a considerable improvement on last year's two) and 17 consent holders collected none of the required samples.

Non-compliance penalties of $100 are being issued for missed samples and consent holders are also being advised of Council's resolution that all future water samples will be collected by Environment Southland.

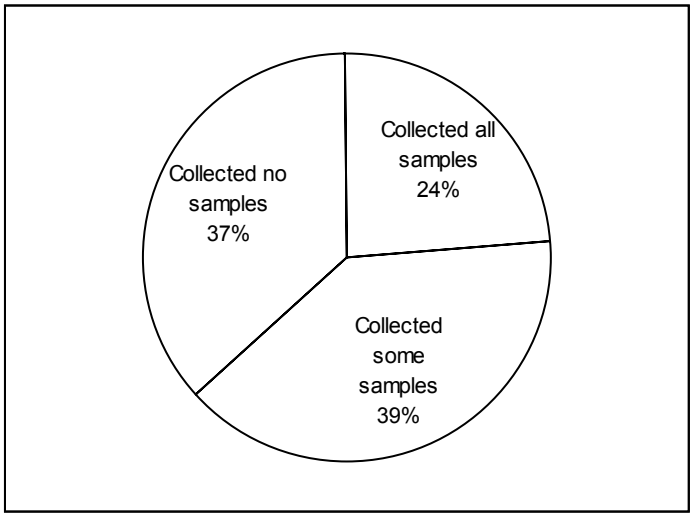

Figure 9 – Percentage of consent holders collecting own samples

2.5 Groundwater Monitoring

Council is concerned about the cumulative effect of effluent discharges to groundwater.

Monitoring may be imposed on dairy discharge consents where stocking rates are greater than 2.5 cows/ha and on soils that are vulnerable to nutrient leaching, or where environmental risk to shallow wells is deemed to be high.

Groundwater sampling is generally required at six monthly intervals and is usually collected at either end of the dairy season, approximately November and April. Samples are analysed for electrical conductivity, nitrate nitrogen and Escherichia coli (E coli). These parameters, while not exclusive to dairy shed effluent, give an indication as to whether or not the application of dairy

shed effluent is having an influence on the groundwater quality in the vicinity of the dairy effluent disposal field.

2005/06 season:

- 142 dairy consents required groundwater monitoring;
- 20 consent holders elected to collect samples themselves, but only four fully complied and avoided non-compliance penalty costs;
- 5% of samples collected (13 of 260) were found to contain nitrate nitrogen concentrations in excess of the New Zealand Drinking Water Standards (2005), where 11.3 mg/L is the maximum acceptable value;
- E coli was present in 21% (53 of 255 samples) of samples.

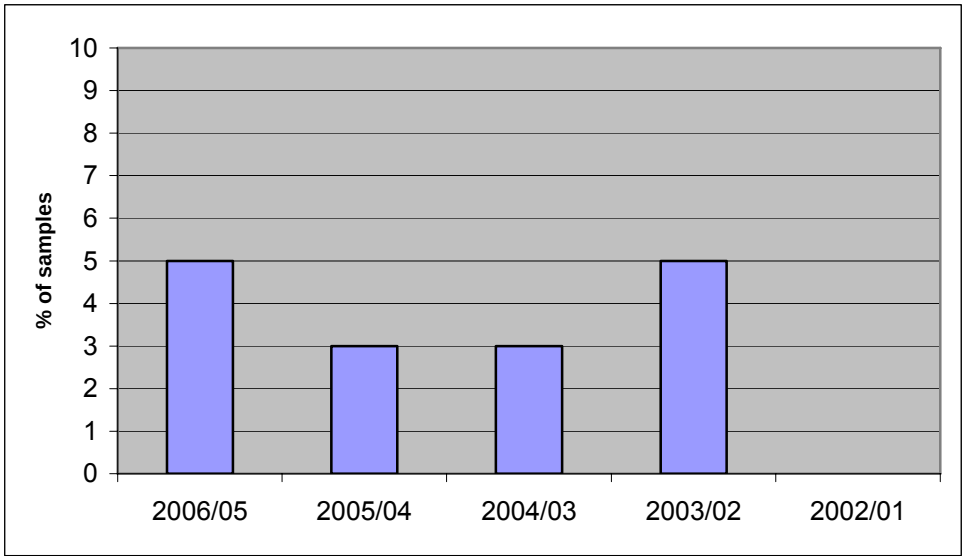

Figure 10 - Percentage of all groundwater samples which exceeded NZDWS 2005 standards of 11.3 mg/L nitrate each season

Figure 11 - Location of groundwater samples which exceeded NZDWS 2005 standards of 11.3 mg/L during the 2005/06 season

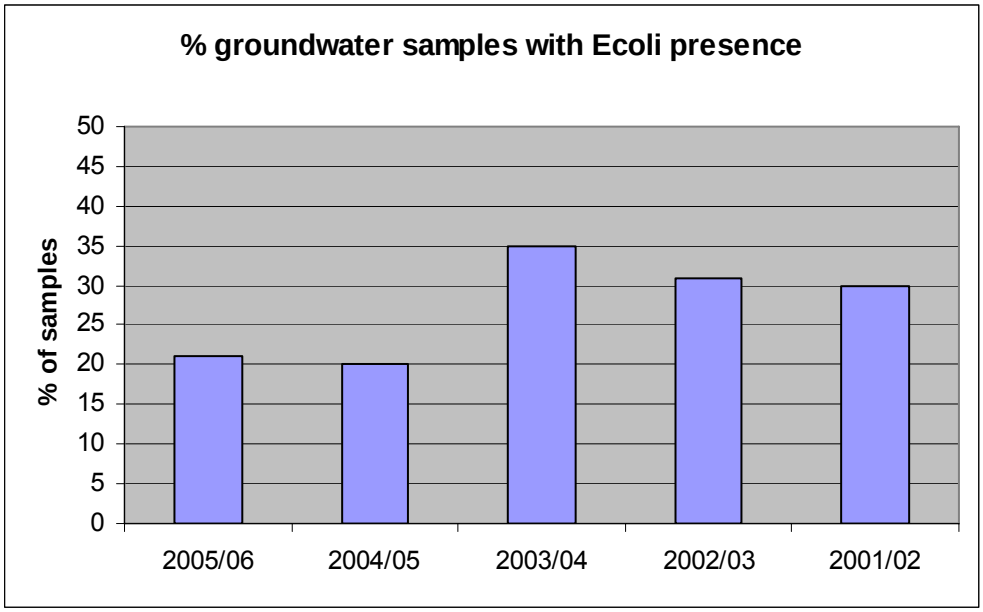

Figure 12 - Percentage of all groundwater samples with a presence of E coli bacteria

E coli bacteria are indicators of the presence of disease causing pathogenic bacteria. This season, a percentage of samples similar to last year exceeded the New Zealand Drinking Water Standards 2005 maximum acceptable value (MAV) of less than one bacterium per 100 mL. Similar tight standards are required by Fonterra for water supply to a dairy shed. Generally, the level of contamination was relatively low, indicating that the most likely source of the contamination was poor wellhead protection, i.e. infiltration of surface water into a bore.

3.0 Whitebait Structures

A total of 664 authorised whitebait structures were inspected during August and September 2005. The watersheds inspected included the Mataura River (below Gorge Road bridge), the Titiroa River (above and below the Gorge Road-Fortrose highway bridge), the Waikawa River (above and below the Waikawa bridge), the Aparima River (above and below the Gummies Bush bridge) and the Pourakino River (above and below the Centre Road bridge). Two Fiordland rivers, the Hollyford and the Awarua, were also inspected.

New whitebait stands are prohibited in any rivers in Southland or Fiordland that are not listed above.

Overall, compliance with the consent requirements has improved when comparing results to 2003/04 (Figure 12).

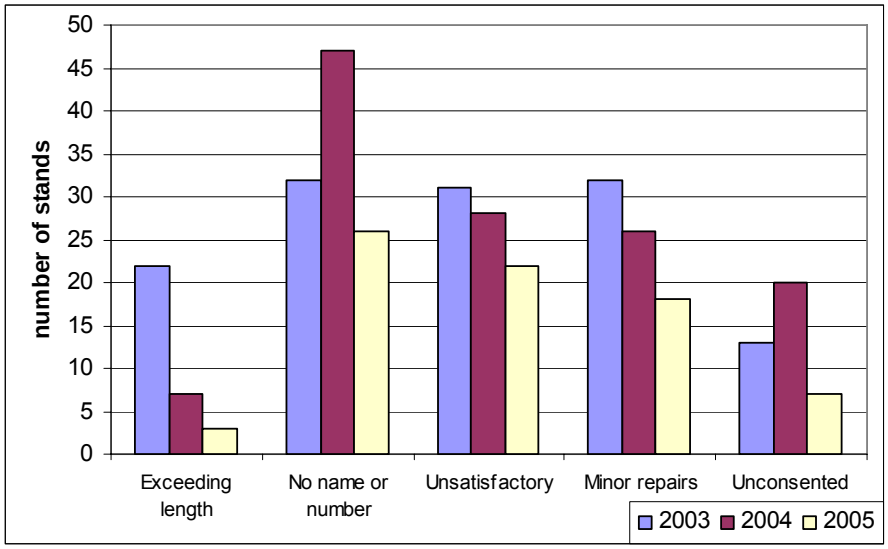

Figure 13 – Non-compliance identified during routine inspection of whitebait stands

There were only three stands (0.5% of all stands) found to be exceeding their consented length in 2005 and the owners were required to remove the excess length.

The number of stands that did not display the proper identification requirements was down considerably, from 47 in 2004, to 26 in 2005.

The number of stands found in an unsatisfactory condition and in need of minor repairs continues to improve.

Seven unconsented structures were located, four were voluntarily removed, one owner has applied for resource consent (boat jetty) and two unclaimed structures have been removed by Environment Southland staff.

Abatement Notices were issued as follows:

- two for structures in a poor state of repair;
- four for unconsented structures in the coastal marine area;
- four requiring the removal of unconsented attachments to structures;
- two requiring the removal of unconsented materials used to stopbank erosion;
- six required owners to reduce their pulley systems back to within one-third of the watercourse width.

Several other warnings have been issued where iron and other materials have been placed in an attempt to prevent bank erosion (see photo below).

Figure 14 – An example of unconsented bank work

The use of pulley system nets has created debate and discussion. Council presently views any permanent fixture placed in the bed of a waterway as a structure requiring consent. A structure placed in the bed of a waterway at the start of fishing and removed at the end of fishing on the same day, is being regarded as fishing equipment and not a structure. The key point being that it is removed at the end of fishing.

Any pulley or rope system that blocks off more than one-third of a waterway is a hazard to navigation and is not permitted. Those individuals operating over more than one-third of a waterway were sent notices and have complied with those notices.

4.0 Truck Washes

A total of 18 truckwashes were inspected, including three that have permitted activity status. No non-compliance problems were detected at the 15 consented sites or the three sites that operate under a permitted activity status.

A truckwash near Isla Bank raised concerns, as truckwash effluent mixed with stormwater was found to be disappearing through a soakhole system at an alarming rate. Staff discussed the disposal of truckwash effluent with the consent holder and it was suggested that the application of wastewater via a pot sprayer onto the adjacent paddocks would be a better option. The consent holder appeared happy with this solution and indicated they would apply for a variation to the consent.

A number of public complaints have been received about the operation of a truckwash site near Mossburn. The truckwash has a soakhole close to a major river, and in view of a major tourist route. Complainants have also indicated that they consider the site aesthetically unappealing and noted that some unpleasant odour was being emitted.

Figure 15 - The consent for this site comes up for renewal in 2007

The site was inspected by Environment Southland staff in 2006, when the following concerns were noted:

- the general state of the site;
- the odour being emitted;
- dead sheep in the soakhole;
- possible leaching to groundwater; and
- sludges lying around the north side of the hole.

A letter to the consent holder outlined the Council's concerns and also stated that the consent holder should seek professional assistance from an environmental consultant if they wanted to continue using the site.

5.0 Coastal Marine Area

5.1 Fiordland Structures

A total of 37 structures were inspected in Fiordland as part of a three yearly inspection process to ensure compliance with consent requirements.

A building inspector from the Southland District Council assisted with the inspections, and it was pleasing to note the high rate of compliance with consent requirements.

Figure 16 – A structure in Blanket Bay

The building inspector noted only two structures had a problem, one related to the building code requirements concerning the alterations undertaken, and the other general maintenance/repairs. Both problems have been rectified.

A public complaint was received concerning a locked gate on a structure in Doubtful Sound which prevents the general public from using the structure. A consent does not give the holder exclusive occupation rights and Environment Southland has contacted the consent holder to have the locking device removed.

5.2 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 Section 10(1) and 20(2) of the Aquaculture Reform (Repeals and Transitional Provisions) Act 2004 (hereafter referred to as "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 to do so, 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 its 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. Exactly how this issue will be dealt with is under consideration.

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 time, possible monitoring options will be reviewed 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.

5.6 Commercial Surface Water Operations

Cruise ships

The owners of cruise ships operating within the internal waters of Fiordland and Stewart Island are signatories to a Cruise Ship Deed of Agreement between the company and Environment Southland. The Agreement addresses potential environmental impacts of cruise ship activity within the Southland coastal marine area, with conditions setting out what the ship is permitted to do when it is in these areas.

The Deed of Agreement provides the certainty required for cruise ship operators who plan their schedules several years in advance, and meets the sustainable management objectives of the Coastal Plan. A fee, calculated from the gross tonnage and the number of ship visits, is collected each year.

The Council's Policy and Planning Manager and Maritime Manager keep in regular contact with the cruise ship industry, particularly in relation to the movement of these vessels through Fiordland and Stewart Island.

In the 2005/06 cruise season, 15 ships cruised through Fiordland, for a total of 37 individual ship visits, an increase of 16 visits from the previous season. Thirty-four cruise ship visits are expected from October 2006 to April 2007.

Each vessel monitors its compliance with the Cruise Ship Deed of Agreement. The ships must carry a pilot and document each trip, providing information to Environment Southland such as the route taken, locations visited, duration in each area, and any off-ship activities (for example going ashore, kayaking, embarking/disembarking passengers, viewing wildlife), as well as any moorings or anchorages used.

There have not been any instances of non-compliance in the 2005/06 season. Environment Southland staff were on board some of the trips for familiarisation with the ships' operations while in the fiords and Stewart Island, as well as to ensure that all of our requirements are being adhered to. We will continue to provide observers on selected trips in this coming season.

6.0 Major Industries

6.1 New Zealand Aluminium Smelters Limited

Monitoring

The New Zealand Aluminium Smelters (NZAS) Limited plant is located on the Tiwai Peninsula. A number of monitoring programmes are undertaken to assess whether the plant is having an impact on the local environment. This year's monitoring highlighted few issues, confirming again the very high level of compliance maintained by the staff that operate the smelter.

This year, a vegetation health inspection was undertaken by Dr D Doley. The summary of his findings were:

> *The survey indicated that the general condition of the vegetation in the Tiwai Peninsula, Awarua, Waituna, Bluff, and Greenhills districts was satisfactory in April 2005. This condition was attributable to favourable growing conditions during the spring and summer of 2004-2005 and to the absence of severe storms during the previous year. Several species that are commonly injured by storm, particularly Pinus radiata were almost free from injury except for locations close to the ocean or the shore of Awarua Bay.*
>
> *There was no indication of visible injury of vegetation that could be attributed to emissions of sulphur dioxide from the smelter.*
>
> *Visible injury to vegetation that could be attributed to fluoride was limited to the western end of the Tiwai Peninsula. Similar patterns of injury distribution were observed in native flax Phormium tenax), sensitive native and exotic plant species and Pinus radiata. Visible injury was not detected east of the 1 km hut on the Tiwai Peninsula, and reliable indicators of injury were not observed at Tiwai Point*
>
> *There was no evidence of visible injury to vegetation in the Bluff township, the Greenhills area close to Bluff Harbour, Awarua Bay Awarua Plain or Waituna districts that could be attributed to fluoride emissions from the smelter.*

The ammonia and total nitrogen levels in groundwater downstream of the Haysom's dross storage area have continued to increase. It was predicted that the levels of ammonia would be elevated at this point due to the nature of the dross, the groundwater chemistry and hydrology of the area. However, the levels being detected are higher than expected.

NZAS is working with consultants to reassess the impacts of the dross storage. The actual monitoring data is being used to calibrate the original model to better predict what may happen.

Complaints and Self-reported Incidents

This year there were three self reported incidents and one complaint from a member of the public.

The three self reported incidents were:

- while unloading coke from a supply vessel a small amount of coke was blown into the Coastal Marine Area (CMA), which appeared to form a "slick" on the surface of the water. The source of the problem was quickly identified and the discharge ceased. The "slick" of coke was broken up by wave action;

- NZAS staff reported one exceedance in the volume of sewage discharged for a 24 hour period. Systems were checked and it was found that the most likely cause was an unusually large input of stormwater from a heavy shower of rain;

- there was a period when the level of particulate being discharged from the main stack was elevated. This remained compliant with the consent, but was found to be the result of a series of broken filter bags in the scrubbers. When one or more of these bags break, it causes alumina to escape from the dry scrubber and discharge to air via the main stack. From its investigations, NZAS found that the broken bag detectors were faulty and now obsolete. A different type of detector was sourced, trialled, and is due to be installed.

On one occasion, a member of the public observed a "cloud of alumina" to be forming over a vessel at the Tiwai wharf during the unloading of raw material. When contacted, NZAS staff were aware that the wind had strengthened and shifted, causing turbulence in the hold of the vessel which, in turn, had mobilised some of the alumina, causing the dust problem. To resolve this, one of the hatches on the vessel was closed and the problem ended.

Issues

Electricity constraints since the end of November 2005 have resulted in the plant operating with fewer cells than normal. Since that time, approximately 76 cells have been removed from the circuit. This reduction in operational cells causes less re-circulating alumina to be available to scrub emissions and this is likely to cause an increase in gaseous fluoride emissions. Since the cell shut has occurred, monitoring levels have remained below the permitted limits in the Air Discharge Permit.

Restrictions on electricity availability were partially lifted in May 2006. This meant that cells have been progressively restarted at a rate of approximately 5-6 per week since the later part of May.

General

In 2006, six of NZAS's resource consents were due to expire. Applications were submitted and consents granted for the following:

- permits for the discharge of water and contaminants to land in circumstances where those contaminants may enter water at three locations, namely, land adjacent to the north, west and south drains;

- coastal permits to discharge stormwater, drainage water from perched water tables, cooling water and miscellaneous washing, flushing and irrigation water to coastal water via, the north, west and south drains;

- coastal permit to:

    - occupy the foreshore and seabed in Foveaux Strait for the treated effluent pipe and diffuser;
    - disturb the foreshore and seabed in order to maintain and change the effluent pipe and diffuser; and
    - discharge up to 140 m^3/day of treated effluent to Foveaux Strait;

- permit for the discharge of treated sewage onto and into land, including in circumstances where it may enter water;

- coastal permit to:

    - disturb the foreshore and seabed in Awarua Bay in order to remove a disused sewage pipe;
    - discharge contaminants (including any debris discharged in the operation of demolishing and removing) to coastal water that may be associated with the removal operation; and
    - temporarily occupy the coastal marine area so as to provide for navigational safety during the operation. The occupation of the coastal marine area by the pipe is currently authorised by consent number 96102;

- discharge permit to discharge contaminants to the air from an aluminium smelter and related activities.

Table 2 – NZAS – 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.
Responsiveness to issues e.g. drought	Excellent	Responses to incidents or other issues are well thought through, implemented and reported
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 possibly impact on the environment.

6.2 Fonterra Edendale

Monitoring

The quality of the stormwater discharge to the river and the irrigation of effluent to land have continued to be good. There has been some concern about the level of nitrate nitrogen in groundwater and further investigation is required to understand what the source of this contaminant is, and how the aquifer functions in this area.

Complaints and self-reported incidents

Fonterra has had a number of incidents that have resulted in a number of complaints relating to its operation. These are summarised in the table below:

Table 3 – Complaints

Number of complaints	Nature of complaint
16	Soot fallout from boilers
1	Soot fallout – self notified by Fonterra
1	Odour from pond system
1	Odour from irrigation system
1	Boiler bag-house failure - self notified by Fonterra
1	Milk spillage to land
1	Report of irrigation outside consented area
1	Ponding of irrigated effluent
1	Milk powder fallout from plant
25	**Total number of complaints received**

Issues

For the third year in succession, there have been substantial problems with the stack discharges from the boiler complex.

Early in the 2005/06 season Fonterra retrofitted a new baghouse onto boilers 1 and 2 to resolve the issues that had occurred during previous seasons.

Unfortunately, not long after the commissioning of the baghouse the first of the issues occurred. The most significant of these were:

28 July 2005 Bearing failure on boiler 3. Unable to operate B3 and boiler 1 was used to provide steam until 2 September 2005. Emissions only went through the existing multicyclones, resulting in soot deposits arising from soot blows in the boiler.

22 September 2005 Noticeable, but not significant, soot was deposited onto neighbouring residential properties. It was believed at the time to be due to accumulated particulate from a dead air area in the base of the stack being entrained by higher velocity gasses, resulting from increased boiler loading. It is now considered to be a result of a high pressure differential resulting in carry-over of particulate.

6 October 2005 Minor soot, probably caused by issues related to blow-out of a transition sock.

21 October 2005 A highly significant discharge, which was tracked to carry-through from the diverter box. The diverter box "insides" were considered to be ineffective and were to be replaced with a less-leaky system and a clean-up of surrounding properties was undertaken.

While the outcome (particulate on Edendale) was the same, the causes have all been different. The Resource Management Act provides that it is a defence against prosecution (statutory defences) if:

> *b) That the action or event to which the prosecution relates was due to an event beyond the control of the defendant, including natural disaster, mechanical failure, or sabotage, and in each case …—*
>
> *(i) The action or event could not reasonably have been foreseen or been provided against by the defendant; and*
>
> *(ii) The effects of the action or event were adequately mitigated or remedied by the defendant after it occurred*

The causes of the incidents were different and unforeseen. Mitigation measures had been undertaken and repairs expedited. The company was clearly working to fix the issue, even though it was constrained by the need to process milk. As a consequence, our legal advice was that the Edendale plant was likely to be able to defend any prosecution on the basis of statutory defences.

In December 2005, the valve inside the diverter box was replaced. The multi-louver design has been replaced with a single sliding valve. The valve is sealed (and currently unable to be opened automatically), which has removed the significant area of gaps through the multi-louver design that had allowed particulate discharge whenever there was a substantial pressure differential. Stack particulate monitoring following the new valve installation showed a minimal level of entrained particulate in the stack discharge.

In an attempt to quantify the level of deposition, Environment Southland deployed deposit gauges in the Edendale township. The information gained from these gauges was limited as the monitoring system can be somewhat "hit and miss" because the direction and distance of travel of any plume of material will be wind dependent.

The recognised standard for nuisance is 4 $g/m^2/30$ days above the background or control site. This has not been reached on a 30 day basis. However, given the discharges were significantly more episodic than continuous, each occurrence was obvious to the local residents.

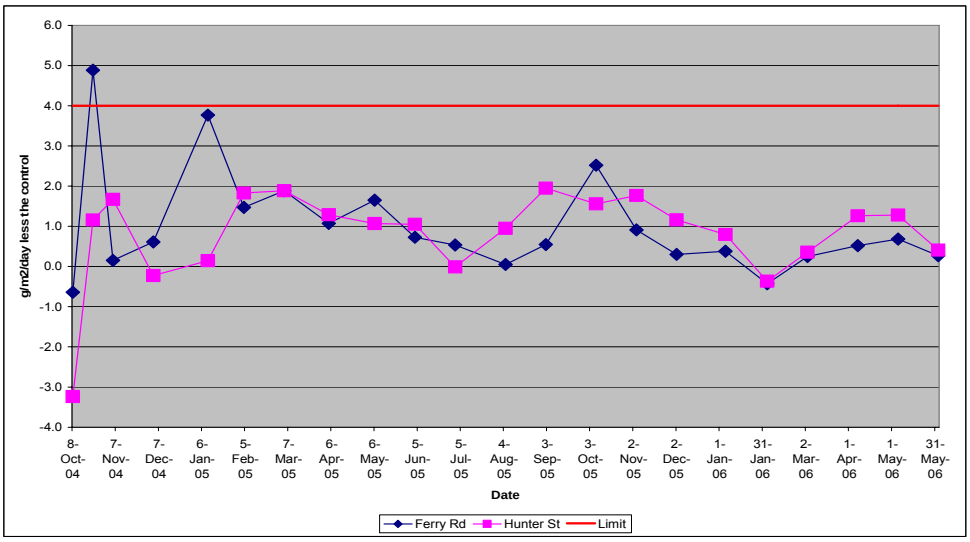

Figure 17 - Level of particulate mater deposited at two sites in the Edendale area (both results have been corrected for background deposition)

Environment Southland did not receive any more complaints regarding soot following the installation of the new diverter valve. Both Fonterra and Environment Southland believed the soot issue had been resolved until a recent community board meeting where residents indicated soot discharges were still occurring, but were not being reported. The Council's Compliance Manager has visited one property to discuss the issue and will undertake a survey of other residents to determine the extent of this issue.

General

Table 4 – Fonterra, Edendale – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Acceptable	The provision of monitoring data has improved from previous years
Compliance with consent conditions	Marginal	The continuing soot issue has been a source of frustration to residents, Fonterra and ES.
Responsiveness to issues	Average	Staff have responded to issues raised by ES, but have not always notified problems to ES in a timely manner.
Keeping Environment Southland informed of intentions, changes, etc	Acceptable	Staff have kept ES informed with progress on the boiler issue upgrades and developments.

6.3 Alliance Group – Mataura Plant

Monitoring

Discharge consent compliance has been marginal, with the main non-compliance issue being the biochemical oxygen demand (BOD_5) loading concentrations and BOD loading in the effluent discharge. This was finally traced to problems with the laboratory analysis.

The BOD_5 issue became apparent in the 2004/05 season. Investigations in late 2004/05 were unsuccessful in resolving the problem and non-compliances continued in the 2005/06 season.

Further investigation suggested that a new input of organic material was occurring, however, no additional source of material was able to be identified.

During the investigation it was noted that the company had changed suppliers of analytical services and that the new laboratory were analysing samples for total BOD_5, instead of carbonaceous BOD_5. This finding did not explain the problem and a decision was made to compare results from different laboratories.

Three laboratories were selected and samples were split and sent to the three different laboratories. The results from two laboratories were within +/- 5% of the mean of the two results, which is well within the range of +/- 20% which is considered acceptable by Environment Southland.

Alliance Mataura's current testing laboratory gave a result that was on average 42% higher than the mean of the other two laboratories with a range of variances from +4% to +79%. This highlighted a serious problem with the quality of the BOD_5 results. The BOD_5 test has some variability, but this level of inaccuracy is unacceptable.

Alliance Mataura has continued with the current laboratory in order to provide consistency of results in the current year.

All other monitoring conditions were compliant during the 2005/06 season.

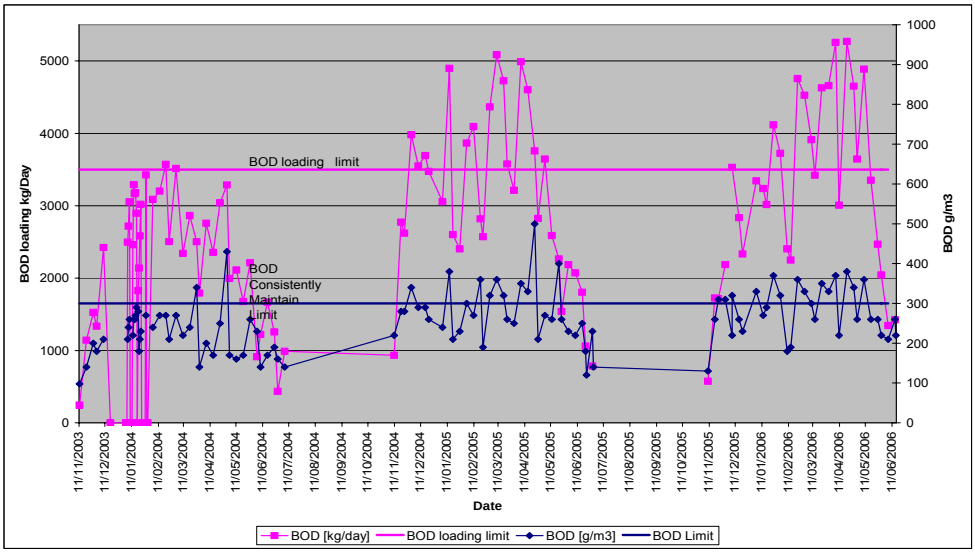

Figure 18 – BOD_5 concentrations and BOD loading of the effluent with respect to the consent conditions.

In the 2004/05 season, phosphorous was targeted as one the main priorities. Key sources of phosphorus were identified and isolated. A pilot scale treatment system was trialled and found to be 99.4% efficient in the removal of dissolved reactive phosphorus (DRP) from the effluent discharge. A full scale system was trialled during the 2005/06 season with encouraging success giving confidence that the consented limit of 14.4 kg DRP/day will be achieved by November 2007.

Complaints and self-reported incidents

Only two environmental issues were drawn to the attention of Environment Southland. Both were self notified. The first was a minor discharge of untreated wastewater (less than 10 m^3). This was quickly detected and isolated. No significant impact was expected as a result of this discharge.

The second was due to a power outage in the Mataura area. During this disruption, untreated wastewater was discharged into the Mataura River for approximately 18 minutes. It is unlikely that the volume of effluent discharged exceeded 50 m^3 and it is also unlikely to have had a significant impact on the Mataura River.

Issues

Alliance Mataura treats its effluent before discharging it to the Mataura River and has for some years applied effluent solids to pastoral land. In late 2005, new dairy company requirements and Biosecurity regulations required a change to the existing practices. Effluent solids can no longer be applied to

pastoral land used to graze sheep, cattle or deer but they can be applied to cultivated land, or other non-pastoral land.

Alliance is investigating alternative disposal options that could reduce, or replace, the effluent application to land. A new plant has been installed to dewater the solids for possible disposal to landfill or composting, or processing the material into a saleable product.

General

Table 5 – Alliance Group Limited Mataura Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Very good	Data provided as required.
Compliance with consent conditions	Marginal	Problems experienced with effluent BOD_5 concentrations and BOD loadings.
Responsiveness to issues	Acceptable	The non compliant BOD problems have been difficult to isolate and have taken some time to isolate. The two self notified environmental issues were addressed promptly by the company.
Keeping Environment Southland informed of intentions, changes, etc	Good	Changes with the new consent have reduced the level of contact but the exchange of information about important issues has been good

6.4 Alliance Group - Lorneville Plant

Monitoring

An extensive pond system, covering approximately 34 hectares, is used to treat effluent from the Alliance Lorneville plant. The quality of the effluent remains reasonably consistent and is fully compliant with the conditions specified in the company's consent.

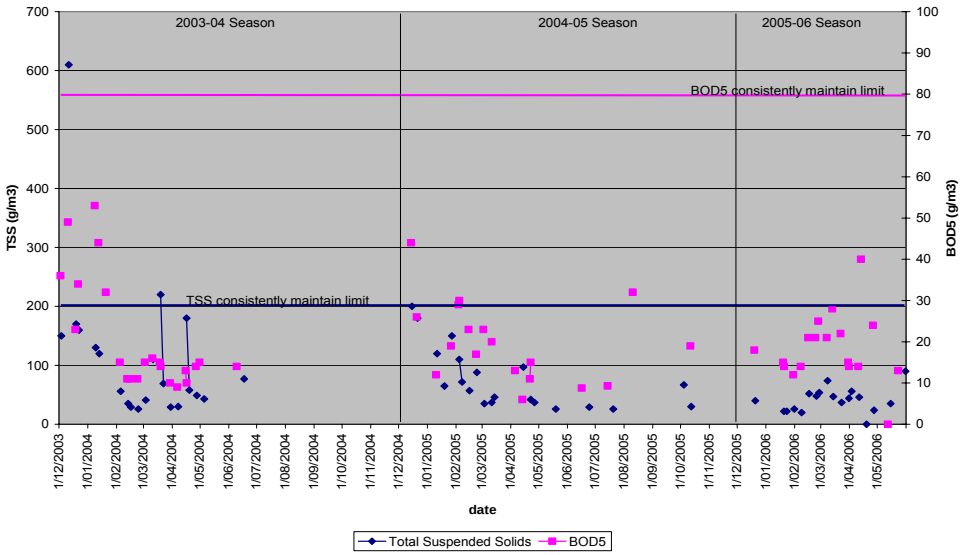

Figure 19 - Total suspended solids and biochemical oxygen demand concentrations in the effluent discharge with respect to the consistently maintain consent limits

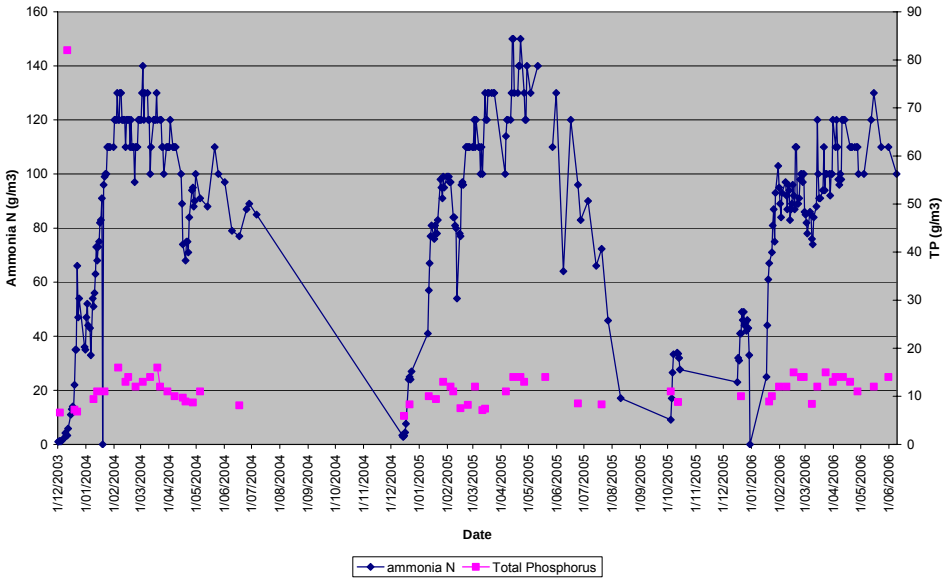

Figure 20 - Ammonia nitrogen and total phosphorus concentrations in the effluent

Management of the treatment system has been good over recent years, resulting in the level of compliance in the receiving waters being very good. This is clearly apparent in the dissolved oxygen concentration in the Makarewa River, downstream of the discharge. River flows and water temperature have a major impact on dissolved oxygen concentrations.

Only one breach of the class D water classification standards has occurred and Alliance staff responded promptly, and effectively, as soon as the issue was identified.

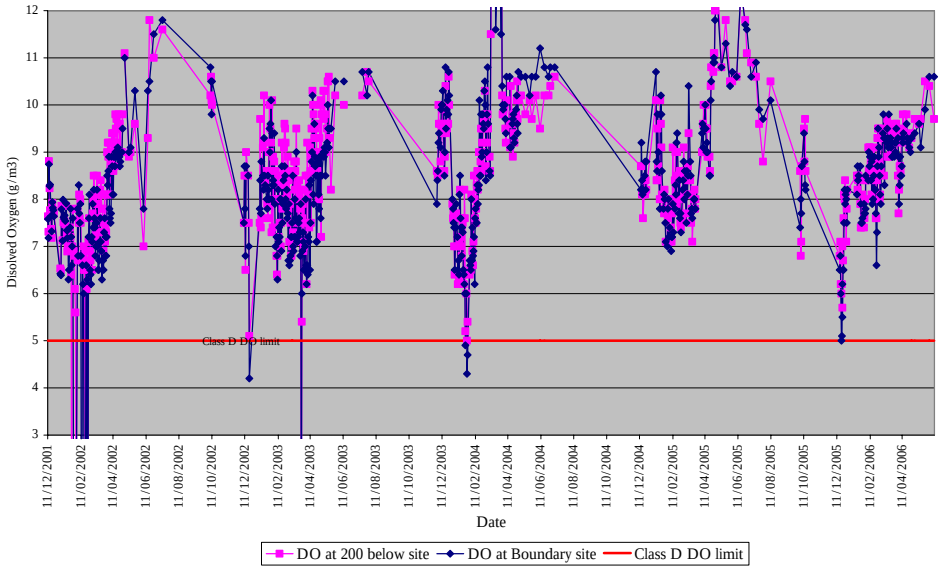

Figure 21 - Dissolved oxygen concentrations in the Makarewa River up and downstream of the effluent discharge

The nutrient concentrations in the discharge and receiving waters have been compliant with the consent, but are reaching a point that has Council staff concerned. The levels of ammonia nitrogen are elevated in the river downstream of the discharge, and any significant increase in the levels of phosphorus in Southland rivers has the potential to result in a proliferation of weed and periphyton growth on the river bed. Alliance Lorneville is aware of these concerns and has been working to reduce the levels of nutrients being discharged into the Makarewa River system

A Particulate Emissions Report has been submitted to Environment Southland by Alliance Lorneville. All tests results taken at the Alliance Lorneville plant were compliant with consent conditions.

Complaints and self-reported incidents

There were three complaints about the operation at the Alliance Lorneville plant reported to Environment Southland. All were odour related and were investigated by Environment Southland staff.

The odours were confirmed to be present, but not considered to be offensive or objectionable at the time of inspection.

Issues

An application was received by Environment Southland from Alliance Lorneville to provide for the inclusion of sewage from Wallacetown in the discharge of treated wastewater to land and water. A key concern was the potential for increased odour emissions from the treatment ponds. It was decided that there was a small likelihood of this, as the proposal would result in a relatively small additional loading to the extensive pond system.

In late 2005, the application was approved and some small changes were made to the consent conditions to allow the inclusion of the Wallacetown sewage.

General

The consent to discharge treated wastewater to land was not exercised at Lorneville during the 2005/06 season, as soil conditions were seldom suitable for irrigation.

Ground water monitoring has continued at the site to build up baseline data. It is Alliance's intention to irrigate at this site in the future, when the conditions are appropriate.

Table 6 - Alliance Group Limited Lorneville Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data provided rapidly in accordance with the consent
Compliance with consent conditions.	Very good	Good management of the treatment system has resulted in few exceedances.
Responsiveness to issues	Very good	Alliance staff responded to complaints and undertook joint inspections promptly and effectively
Keeping Environment Southland informed of intentions, changes etc.	Very good	Ongoing discussion re various options through the consent process.

6.5 Alliance Group - Makarewa Plant

Monitoring

Processing largely beef and venison, discharges from the Alliance Makarewa plant have been reasonably compliant this year. There have been a small number of consent condition exceedances but the intermittent nature of the discharge makes the management of the effluent quality difficult, especially given the two to six day delay for results to be available before compliance can be assessed.

At the time of construction the treatment system was designed to accommodate a significantly larger flow than is put through the plant at present. As a result, pond storage capacity is significant and provides the company with the opportunity to hold effluent until river flows are sufficient to allow a discharge that will have minimal impact.

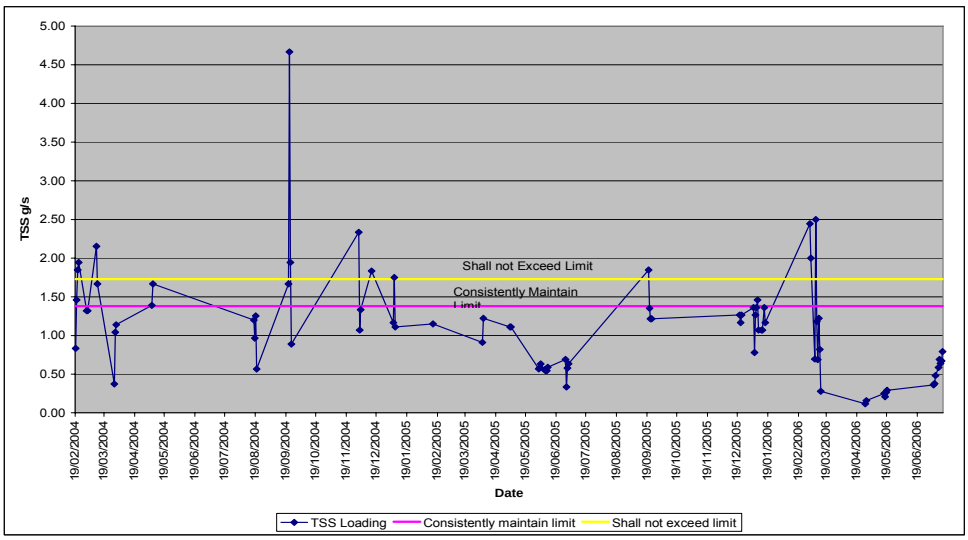

Figure 22 - Total suspended solids loading in the effluent with respect to the consent conditions

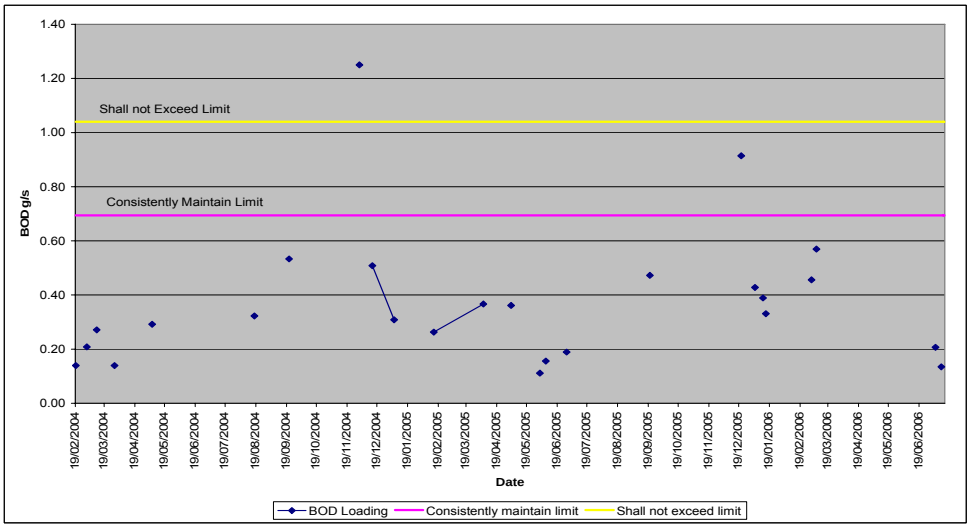

Figure 23 - Total suspended solids loading in the effluent with respect to the consent conditions

Particulate emission monitoring is conducted biennially and has identified a problem with the multi-cyclones, resulting in the emission standards being exceeded. An investigation revealed that holes in the mini-cyclones were not allowing the ash grit to settle before being released out the chimney. Repairs to remedy this have been completed on one of the boilers and the second boiler is due for repair during the 2006 off-season. Particulate testing will be conducted prior to the 2006/07 season to ensure full compliance with the consent has been achieved.

Complaints and self-reported incidents

Five complaints were received by Environment Southland, all of which were linked to odour emanating from the rendering plant. One complaint was recorded as a confirmed event.

No odour issues were reported to have originated from the effluent pond system.

Issues

There were two main issues this year, the particulate emissions from the boiler stacks and the odour problems. As discussed above, the particulate emissions will be resolved before the 2006/07 production season begins.

The odour complaints reported on neighbouring properties remain a concern. However, it is encouraging to note that the number of complaints have declined, from nine in 2004/05, to five this season.

General

Alliance Makarewa's discharge permit for the discharge of cooling water to the Makarewa River was fully compliant this year. The permit is due for renewal in May 2007.

Table 7 – Alliance Group Limited Makarewa Plant – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Very good	Monitoring results are reported as required by the consent.
Compliance with consent conditions	marginal	The particulate emissions from the boilers were non-compliant and there have been a small number of odour complaints. The number of complaints has been less than that of past years.
Responsiveness to issues	acceptable	Unable to deal to particulate emissions immediately but committed to repair multi-cyclones during off-season. Discharge volumes are adjusted as soon as laboratory results are available to ensure that effluent discharge conditions are met
Keeping Environment Southland informed of intentions, changes etc	Very good	Alliance staff from Lorneville manage the Makarewa site and keep Environment Southland up-to-date.

6.6 Ballance Agri-Nutrients

Monitoring

In 2004/05, Ballance upgraded the stormwater handling system at the Awarua site. This involved:

- the replacement and installation of new channelling and pipe work to collect as much stormwater as possible,
- reducing the amount of contamination entering the stormwater system;

- building a large containment pond; and
- recycling this water back into the production line.

The upgraded system was commissioned in March 2005. Since then, the volume of the effluent being discharged has decreased and the quality improved

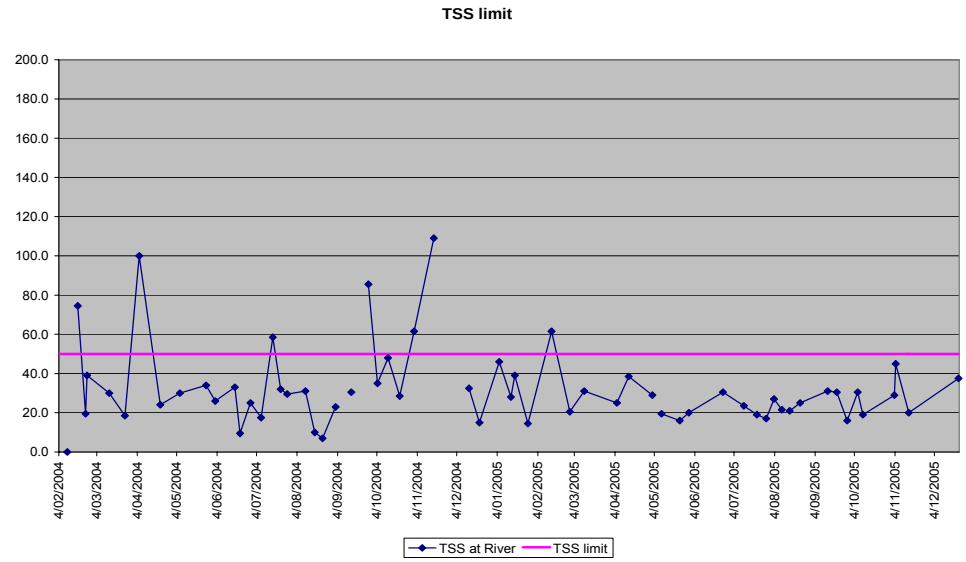

Figure 24 - Total suspended solids concentration in the discharge at the river

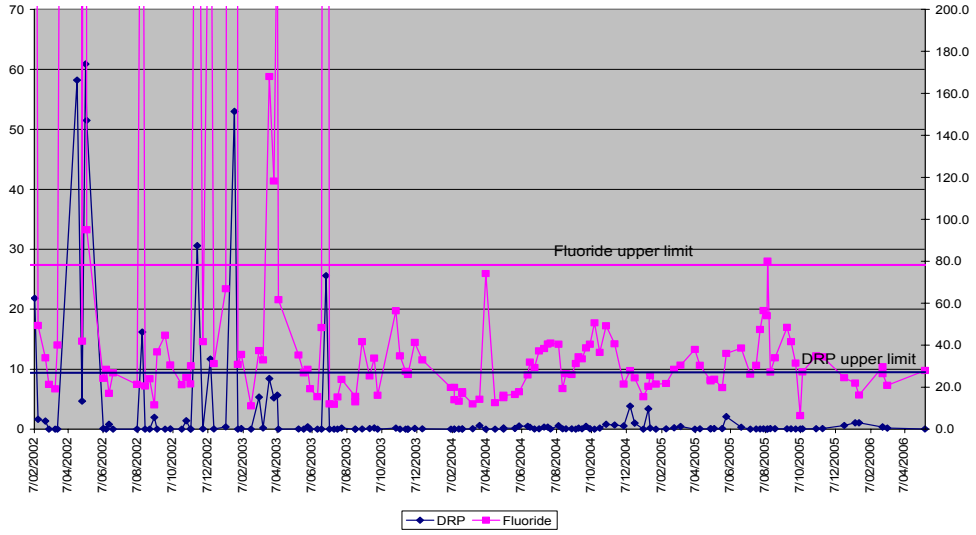

Figure 25 - Dissolved reactive phosphorus and fluoride concentration in the discharge at the river

There have been no breaches of the air discharge consent. The levels of sulphur dioxide emissions were elevated in December 2005, but this was traced back to a malfunctioning acid control valve. The valve has been replaced and emission levels have returned to normal.

During this period, the average concentration of fluoride in the herbage at the "airstrip" and "east airstrip" sites were non-compliant with the air consent. These sites are located approximately 500 m to the east and south east of the plant, indicating that fallout from the air discharge was having some impact on the immediate surrounding pastures. All other monitoring results were fully compliant with consent conditions.

The improvement and consistency of stack emissions has seen a dramatic improvement in the overall herbage monitoring programme since 1999.

Complaints and self-reported incidents

There were no complaints received regarding the Ballance fertiliser plant.

There was one self reported incident, a sulphuric acid spill, and immediate action was taken to ensure that the spill was contained. Caustic soda was added to neutralise the liquid prior to discharge to the stormwater system. Monitoring of the stormwater drains, stormwater pond and raw effluent pond continued throughout the following week and showed no adverse effects at the sites tested.

General

Ballance has lodged applications to renew its discharge permit for the Mokotua Stream and its water permit to take groundwater. Both of these permits expire in November 2006.

Table 8 – Balance Agri-Nutrients– Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Excellent	Data is always provided as required and considered commentary included as appropriate.
Compliance with consent conditions	Good	This year there have been very few breaches of the consent conditions.
Responsiveness to issues	Excellent	Staff have responded to all issues as they arise.
Keeping Environment Southland informed of intentions, changes etc	Excellent	Balance has consulted regularly with Environment Southland. during the stormwater upgrade.

6.7 Prime Range Meats

Monitoring

Prime Range Meats Limited operates a meat processing facility on the outskirts of Invercargill and has resource consent to discharge contaminants to air, land and water.

Compliance with the water discharge consent has been variable. Of concern has been the quality of effluent discharged to the Waikiwi Stream, with a number of test results having been non-compliant with consent conditions.

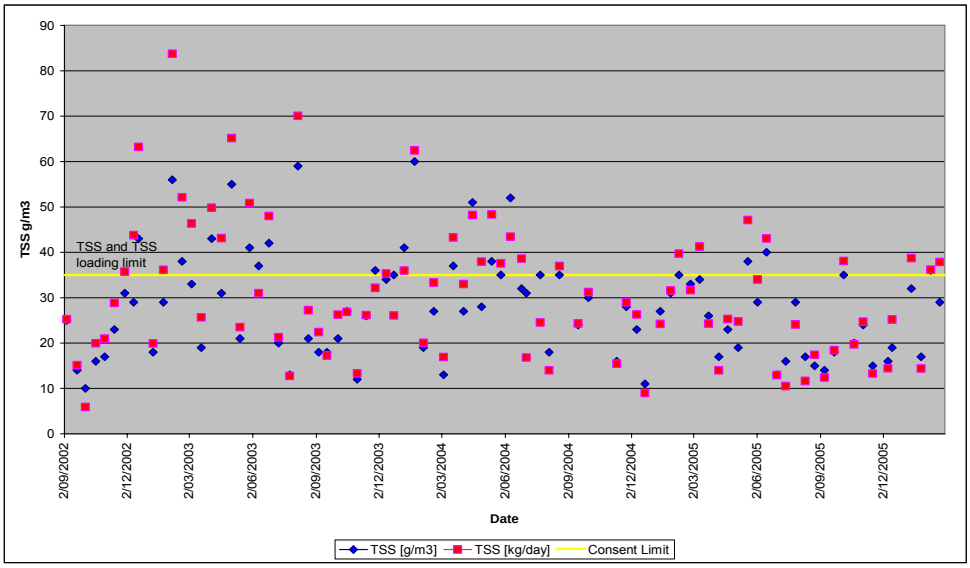

Figure 26 -Total suspended solids concentration in the Prime Range Meats effluent

Recent improvements have reduced the number of consent non-compliances, but the number of exceedances still remains a concern.

An improvement has also been observed in the nitrogen and phosphorus content of the discharge to the Waikiwi Stream.

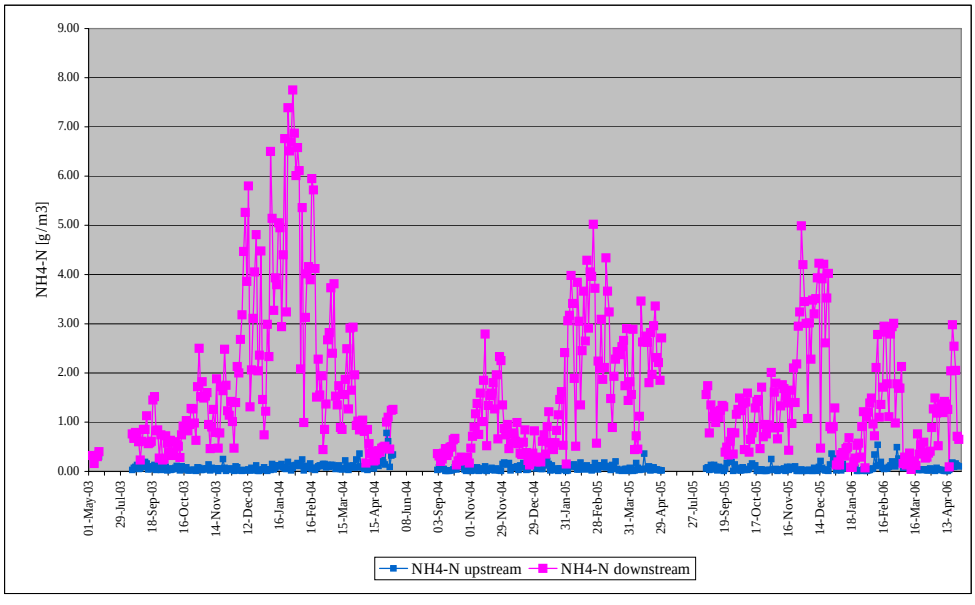

Figure 27 - Ammonia nitrogen concentration in the Waikiwi Stream upstream and downstream of the Prime Range Meats discharge

The resource consent contains a condition limiting the concentration of ammonia nitrogen concentration that is allowed in the Waikiwi Stream, downstream of Prime Range Meats. Test results have been compliant with

that condition. An issue for the future is that the most recent guidelines are more stringent than those when the consent was granted. When the consent comes up for renewal in 2008, further treatment is likely to be required to ensure that the discharge to receiving waters will meet these guidelines.

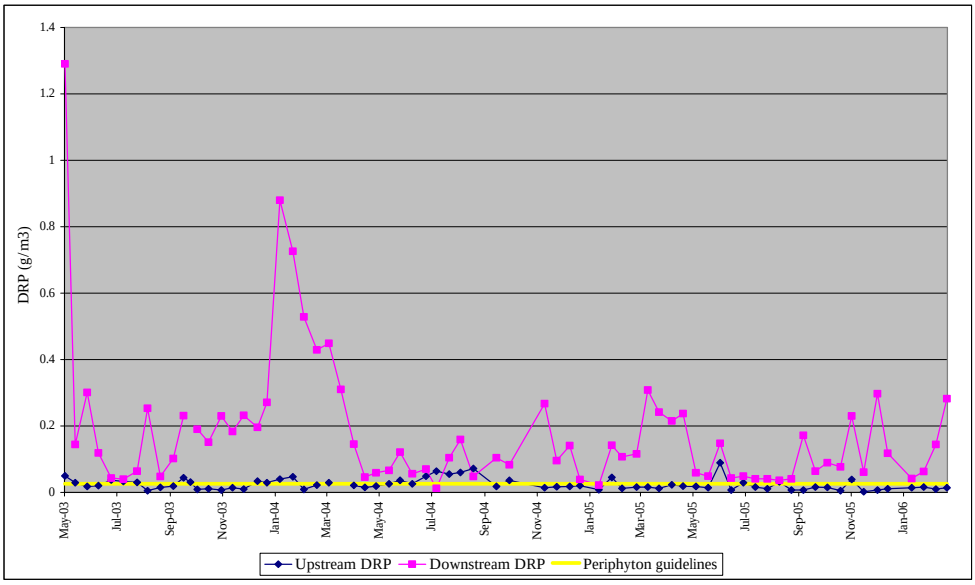

Figure 28 - Dissolved reactive phosphorus concentration in the Waikiwi Stream upstream and downstream of the Prime Range Meats discharge

A future concern is the increase in phosphorus concentrations downstream of the discharge. The concentration of phosphorus being discharged is not controlled in the existing consent, but will be limited in any new consent.

Complaints and self-reported incidents

A total of 26 odour complaints have been received this year in an area within a one kilometre radius of Prime Range Meats. Of these, 21 were confirmed to have originated from Prime Range Meats, with four being assessed as objectionable. While the weather conditions will influence elements of the odour, the frequency of these complaints is of concern and has been raised with the company.

Issues

The discharge permit to water is due to expire in 2008. Historically, the level of compliance has been poor. Prime Range Meats needs to implement a treatment and disposal system that is able to comply with the appropriate regional plans and meet future environmental standards.

The number of odour complaints associated with Prime Range Meats is up on last year. This is of concern and has been discussed with the company. The company needs to address the issue of objectionable or offensive odours being discharged beyond their property boundary.

Table 9 – Prime Range Meats – Performance Summary

Issue	*Score*	*Comments*
Provision of data/results	Acceptable	Data is provided but it is not always on time.
Compliance with consent conditions	Poor	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.	Marginal	Primarily occurring through the new consent application process.

6.8 Dongwha Patinna NZ Limited

Monitoring

Formerly owned by Rayonier (NZ), the MDF plant at Mataura is now owned and operated by Dongwha Patinna NZ Limited. The current operation of the plant is similar to that of past owners, Rayonier, however, there were some changes when the resource consents were renewed late in 2005 and early 2006.

Some key changes were:

- an increase in the mass emission rate of formaldehyde;
- the use of improved measurement equipment;
- the inclusion of a more intensive ambient air monitoring regime for the air consent;
- the inclusion of a new monitoring regime for the discharge of effluent to land.

Historically, the ambient air monitoring has been conducted using a static absorption system. Air is pumped through a series of traps containing a chemical that captures the formaldehyde and binds it into solution. The solution is then returned to a laboratory for full chemical analysis to assess the amount of formaldehyde in the air. The system is accurate, but can only measure formaldehyde for a fixed time period, and it is weather dependent.

The new measuring instrument, an Aerolaser, is far more flexible as it continuously measures formaldehyde concentrations at 20 second intervals, and stores large volumes of data that can be used to assess average and peak concentrations for any time of the day. This instrument is routinely calibrated to ensure that its operation conforms to strict national standards.

The Aerolaser can be relocated quickly to accurately assess the air quality at locations predicted to give the highest ambient formaldehyde levels from

dispersion modelling. Monitoring results during 2005/06 period show that the formaldehyde concentrations continued to be low and are well below the limit of the consent.

The first of the six monthly stack monitoring assessments for the drier and press vents for the 2005/06 period was completed in September 2005. The initial results found that the level of formaldehyde exceeded the consent conditions that existed at that time. Therefore, in accordance with the consent, the test was repeated two days later and found to be fully compliant with the consent on that occasion.

During the 2005/06 period, no wastewater was discharged to the Mataura River.

The volume of wastewater being irrigated to land has increased by approximately 10–20% this year. This increase in wastewater disposal to pasture has not resulted in a detectable higher loading of contaminants on the pasture and the loading has remained well within the limits required by the consent. There has not been any measurable impact on groundwater results.

Complaints and self-reported incidents

Over the 2005/06 period, there have been 23 complaints, either reported directly to Environment Southland, or reported to Dongwha Patinna, who has then passed copies on to Environment Southland as a requirement of its consent.

The majority of the complaints made directly to Environment Southland were odour related. One complaint was considered mildly objectionable and the rest of the complaints were assessed to be fully compliant with the consent.

Issues

There have been no non-compliance problems arising this year. The local community have expressed some concern about the intensity and frequency of odours emanating from the plant, but these odours have not been confirmed as offensive or objectionable.

General

As noted above, a number of the resource consents held by Dongwha Patinna NZ Limited were renewed in early 2006. The consultation process attracted 16 submissions following public notification of all nine consents. The consents went through the formal hearing process prior to the hearing committee approving the renewal of the consents, subject to additional conditions for the following activities:

- water permit for abstraction of up to 800 m^3/day of water from the Mataura River;
- water permit for abstraction of up to 400 m^3/day of water from the aquifer beneath the site;

- discharge permit to discharge up to 811 m^3/day of treated wastewater to land;
- discharge permit to discharge treatment pond seepage to land;
- discharge permit to discharge up to 811 m^3/day of treated wastewater to the Mataura River;
- discharge permit to discharge up to 7700 m^3/day of stormwater to the Mataura River;
- discharge permit to discharge stormwater to land;
- discharge permit to discharge tile drainage to the Hudson Stream;
- discharge permit to discharge contaminants to air from fibre processing, including the treatment of wastewater.

Table 10 – 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	Very Good	Still some issues with stack monitoring, however these were addressed in the hearing of the new resource consents.
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.

7.0 Miscellaneous Commercial Operations

7.1 Slink Skins Limited

In August 2001, Slink Skins Limited was granted a consent to discharge pre-treated tannery and fellmongery wastewater to land.

The consent:

- limits the volume of effluent to be applied;
- limits the rate which effluent is applied to the land;
- limits where the effluent cannot be applied;
- limits the frequency at which the effluent can be applied to each block of land;
- requires the consent holder to regularly monitor the effluent quality, the impact that the effluent is having on surface water, and soil health.

The quality of the effluent is characterised by high concentrations of salt (Sodium Chloride), biochemical oxygen demand and elevated levels of potassium phosphorus and nitrogen. The concentrations of these contaminants have changed little over the years, with the exception being an increase in the level of contaminants in September of each year during the peak of the processing season.

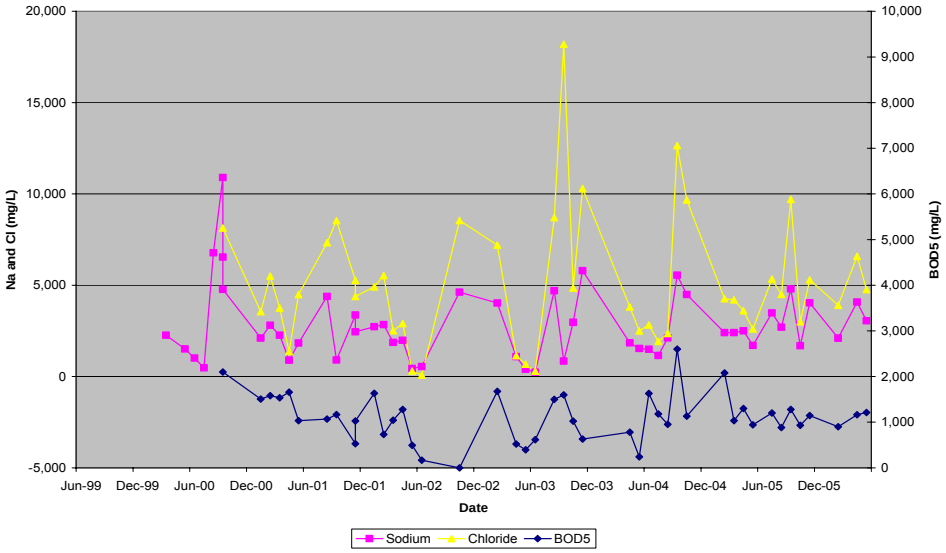

Figure 29 - Effluent sodium, chloride and BOD_5 concentrations between 1999 and 2006

The tanning process involves the addition of chromium, the bulk of which is removed during pre-treatment of the effluent.

To monitor the impact of the irrigation system on the receiving environment, the electrical conductivity (EC) of two small creeks within the irrigation blocks are measured.

While the detection of a significant difference between the two sites does not indicate that a non-compliance exists, it does provide the company with a warning that further investigation into the operation of the irrigator is warranted. It is encouraging to note that the frequency of any changes has decreased in recent years.

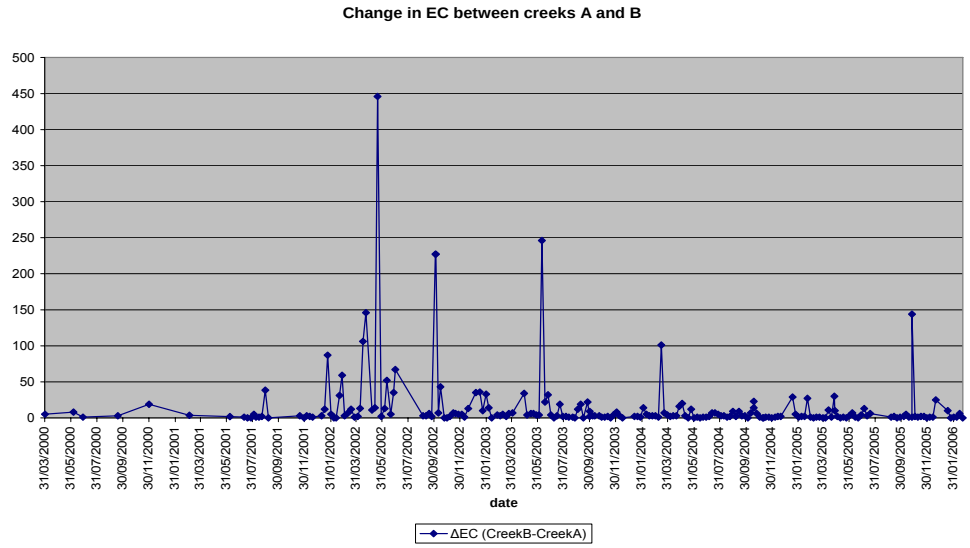

Figure 30 – Change in electrical conductivity

The soil characteristics within the effluent disposal field are assessed and reported on annually by an independent consultant, as over-application of effluent, or a breakdown in soil structure, could result in the land treatment of effluent failing.

Overall, the effluent disposal system has functioned well, with very few issues arising.

7.2 Mossburn Enterprises Limited

Mossburn Enterprises Limited, located at Kennington, was initially established to process freshwater eels. However, the nature of the operation has broadened to include the processing of deep water and inshore species of sea fish for the domestic and overseas market.

Wastewater from the factory is pumped to a storage pond, prior to discharge to a tributary of the Waihopai River. The storage pond was established to provide a level of primary treatment prior to discharge, but the volume and quality of discharge has been having some measurable impact on the water quality in the immediate receiving waters.

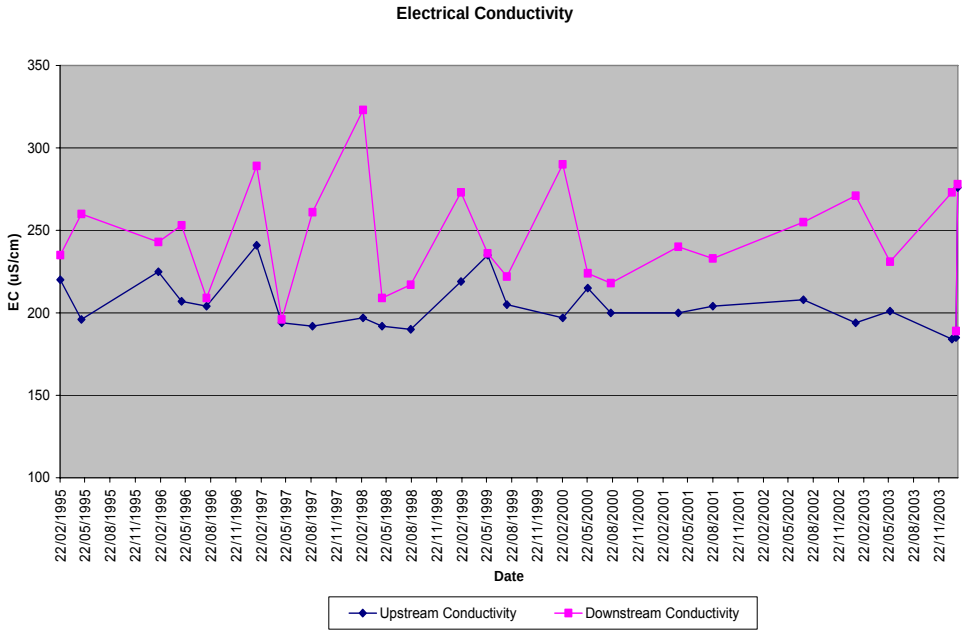

Figure 31 - Electrical conductivity in the tributary, upstream and downstream of the discharge

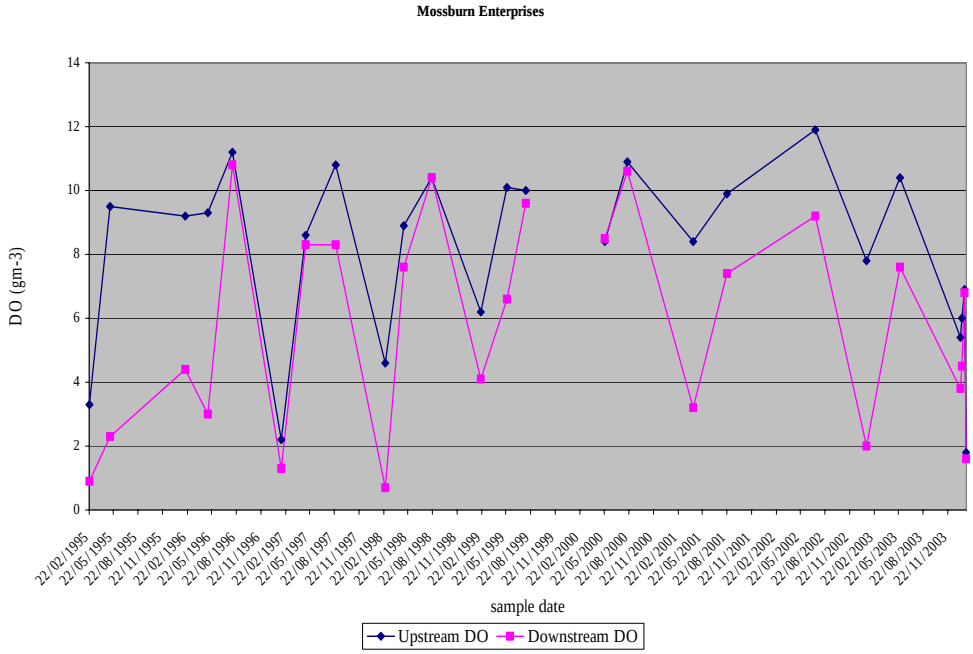

Figure 32 - Dissolved oxygen concentration in the tributary, upstream and downstream of the discharge

Mossburn Enterprises Limited has committed to upgrading the treatment of the discharge and has been granted a new consent, with specific conditions designed to closely monitor the effluent and the impacts it is having on receiving waters.

The operation of this business does not meet the current threshold to need air consent, however, Environment Southland has received a small number of odour complaints. While the exact source of these odours was unable to be traced, the new water treatment system should ensure that the effluent remains aerobic and should minimise potential odours emanating from the pond system.

7.3 Pioneer Generation

Pioneer Generation holds a number of consents to operate the Monowai Power Station. These consents control the take, use and discharge of water for the generation of power, while maintaining minimum flows in all of the existing waterways.

Quarterly monitoring reports are produced by NIWA, to assess compliance against the various consents. These reports demonstrate a good level of compliance with respect to the strict stream flow and the lake level conditions placed on the operators.

The normal operating level for Lake Monowai is 206.7 m to 208.2 m, however, the consent specifies the maximum period when flows may exceed these levels. At no time have the recent levels exceeded the consent conditions.

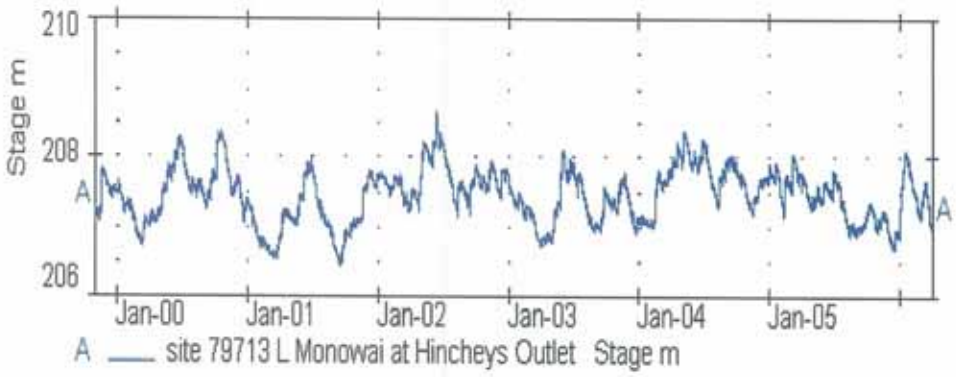

Figure 33 -Lake Monowai operating level, December 1999 to February 2006

A major issue in the past year is the discovery of Didymo in the Waiau River. Pioneer Generation's resource consents requires the fish passage to be improved within three years of the granting of the various consents. However, when Pioneer Generation attempted to make the necessary improvements, Biosecurity New Zealand declined to issue a movement permit because of the risk of introducing Didymo into the controlled area of the Monowai River.

This presented a conflict between the Biosecurity Act and the Resource Management Act, which may have resulted in Pioneer Generation being non-compliant with the requirements of its resource consents. Once this was discovered, the issue was resolved by amending the resource consent conditions so that improvements to the fish passage are required after the lifting of the Biosecurity Act movement restrictions.

8.0 Mining

A total of 14 mining sites were inspected during the 2005/06 year. The focus of the inspections was to analyse the effects of discharges to water and water abstraction. The mining consents inspected ranged from gold to coal/lignite, lime, rock and peat. There were no significant non-compliances noted during the inspections.

A complaint was received about the quality of water in a stream flowing from the Ohai area. The complainants had noted what was described as significantly discoloured waterways (grey-white) downstream of the mining activity. The description of the discolouration was characteristic of the soils in this area.

Additional inspections of the two mining companies were completed by Compliance and Land Sustainability staff, with no source of the discolouration found. Both mining companies hold discharge consents that allow discharges to a watercourse, provided standards are met.

One of the mining companies had done very little mining in the past year. Routine inspections identified that the sediment traps in place at this site may not have been capable of functioning adequately if mining of a more significant nature had taken place and this matter will be raised with the owners.

The second company is a well established company and had implemented a comprehensive wastewater management system. All water from roadside drains and coal washing operations are directed through a 'Lumella' (wastewater treatment system) before being discharged.

Figure 34 - Photograph showing the "Lumella"

There were no non-compliances at the main site.

Water levels in an old mine were getting to the point where, if they broke free, they posed a risk to the waterway via some old mine shafts. A consent was granted to pump the water from the old mine to the waterway, via a roadside ditch. Before the consent could be used the company had to install geo-textile and rock linings to the ditch, to reduce the likelihood that the running water would disturb and carry sediment into the receiving stream.

9.0 Sewage Treatment Plants

9.1 Invercargill City Council, Invercargill Sewage Treatment Plant

In 2003, construction began on a series of wetlands designed to provide tertiary treatment to polish and improve the quality of effluent discharged to the New River Estuary. Construction and the filling of the ponds were completed in March 2005, but it took some time for full operational levels to be reached in the new ponds. This was eventually achieved in June 2005.

The introduction of the new pond system resulted in a marked decrease in the level of bacteria in the effluent. While the decrease was significant, it was not sufficient to comply with conditions imposed in the coastal permit issued in 2004. The new pond system also failed to produce an effluent that was consistently able to meet the biochemical oxygen demand (BOD_5) and total suspended solids permit limits.

BOD_5

The BOD_5 concentration in the effluent was above the upper limits in May and June 2005. It appears these limits were exceeded because discharges of raw wool scour effluent took place during this period.

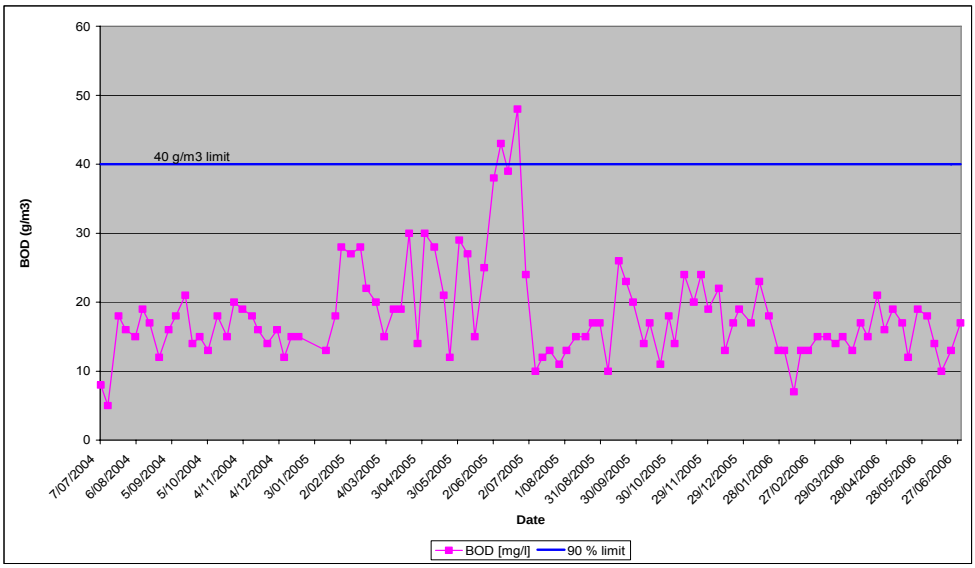

Figure 35 - BOD concentration in the effluent

The consent conditions require the quality of effluent to be maintained above a certain standard for 80 and 90% of the time:

> *"The concentration of BOD_5 in 80% of samples taken in any consecutive 10 week period to not exceed $20g/m^3$ and 90% of samples each year shall not exceed $40g/m^3$."*

There were two extended periods in 2005 when the effluent quality during a series of 10 week periods failed to meet these conditions, the first being between February and August 2005 and the other between November 2005 and January 2006.

The non-compliant six month period between February and August 2005 included the discharge of raw wool scour effluent, but was not influenced by that effluent stream.

Total Suspended Solids (TSS)

The newly commissioned tertiary treatment ponds improved the disinfection of bacteria, but increased the concentrations of algae and, subsequently, the TSS.

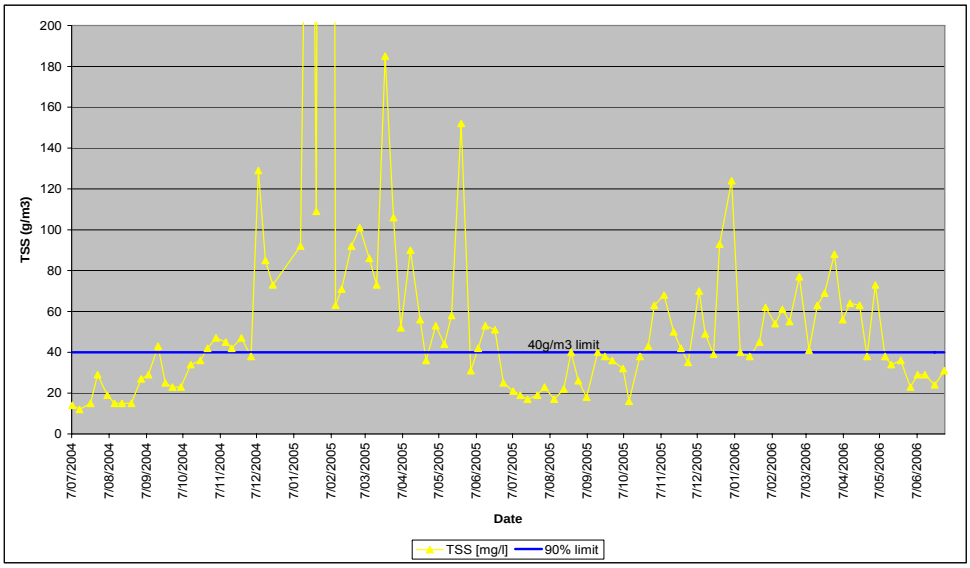

Figure 36 -TSS concentration in the effluent

As with the BOD_5 conditions, the quality of solids being discharged is required to meet a certain standard for 80 and 90% of the time:

> *"The concentration of total suspended solids in 80% of samples taken in any consecutive 10 week period to not exceed 20g/m^3 and 90% of samples each year shall not exceed 40g/m^3."*

At no time since September 2004 has the effluent quality met the 10 week period limit. The 90% limit was exceeded in 2005 and is likely to be exceeded again in 2006.

As discussed above, the improvement in the effluent stream has resulted in an increase in algal growth which, in turn, has resulted in an increase of TSS. Whether the increase in TSS has had a detrimental impact on the environment is still to be determined.

Faecal Coliforms

"The geometric mean concentration of faecal coliforms, of samples taken in any consecutive 10 week period shall not exceed 1000 CFU/100 mL and the faecal coliform concentration of 90% of samples each year shall not exceed 6000 CFU/100 mL."

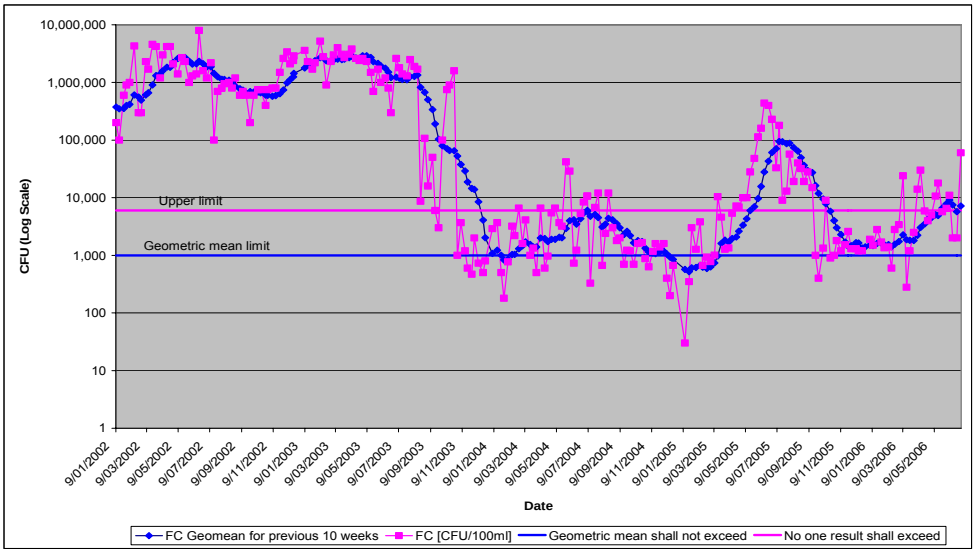

Figure 37 - Faecal coliform concentration in the effluent

At no time since the new coastal permit was granted in June 2004 has the effluent quality met the 10 week period limit. Again, the 90% limit was exceeded in 2005 and is likely to be exceeded in 2006.

Enterococci

"The geometric mean concentration of enterococci, of samples taken in any consecutive 10 week period shall not exceed 100 CFU/100 mL and the enterococci concentration of 90% of samples each year shall not exceed 600 CFU/100 mL."

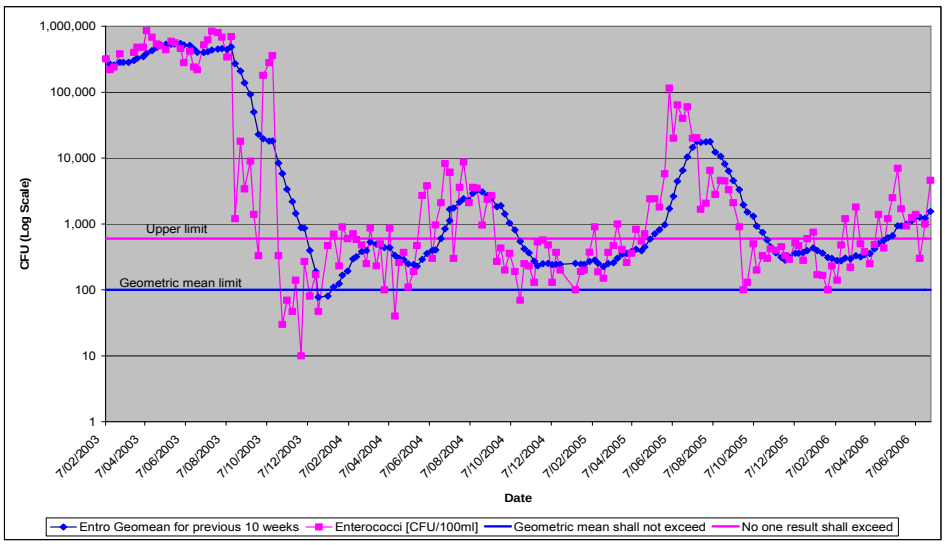

Figure 38 - Enterococci concentration in the effluent

At no time since the new coastal permit was granted in June 2004 has the effluent quality met the 10 week period limit. The 90% limit was exceeded in 2005 and is likely to be exceeded in 2006.

The compliance record of the Invercargill City Council's Sewage Treatment Plant has been poor, and it has failed to meet a number of conditions of the coastal permit granted in June 2004.

Council have raised the ongoing non-compliance problem with the Invercargill City Council and both parties are working on improving the performance of this facility.

9.2 Southland District Council – Browns Sewage Treatment

Browns is a small community that operates a package sewage treatment plant, which was set up in 1971 to service the local primary school and sewage from the local residents.

Unfortunately, the system has not been fully utilised by local residents - currently there are only 13 full connections, including the school.

The small number of connections makes maintenance and operation of the system relatively expensive and this has led to cost-cutting measures, which have impacted on the efficiency of the plant. As a result, there have been regular problems with the quality of the effluent being discharged.

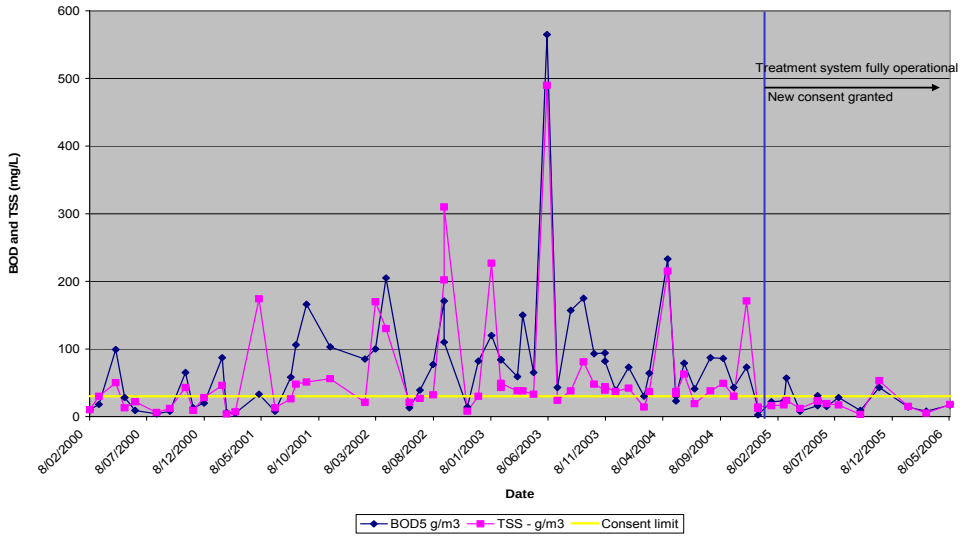

Figure 39 - Biochemical oxygen demand and total suspended solids concentrations in the Browns sewage from 2000 to 2006

A new consent was granted in December 2004, conditional on the plant being returned to the original operational design to allow the effluent quality to be reassessed and provide time for it to be upgraded, if necessary.

Figure 38 clearly shows there has been a vast improvement in the effluent quality being discharged since the new consent was granted and plant operation improved.

Treated effluent is discharged to a tributary of the Otapiri Stream. This treated effluent is not expected to have a significant impact on water quality in the Otapiri Stream, but there is some concern about the water quality in the tributary.

Water quality in the tributary will be assessed in 2009, when the consent is considered for renewal.

9.3 Southland District Council – Manapouri Sewage Treatment

In the 1970s, a single pond was formed to receive the sewage from the Manapouri township and treat it, prior to it being discharged to Home Creek. It is believed that effluent was also seeping to land through the bottom of the pond.

The quality of the effluent has been somewhat variable, based largely on seasonal variation, but has historically been compliant with consent conditions.

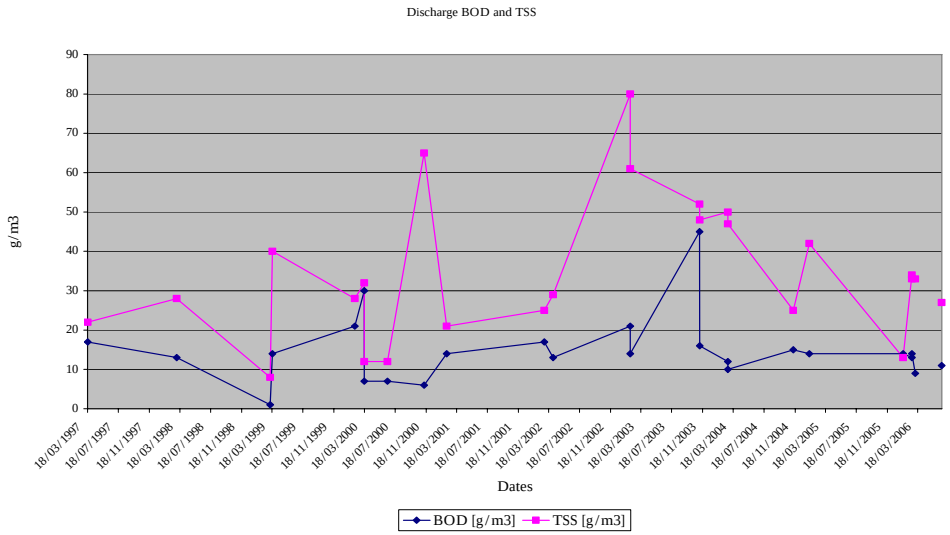

Figure 40 - BOD_5 and total suspended solids concentration in the effluent discharge

The main water quality issue has been the potential nutrient impact on Home Creek and the Waiau Arm via Home Creek. The results of testing show that the concentration of nutrients in the discharge increases noticeably during the summer period, when the numbers of residents and visitors increase.

The data available does not appear to indicate a significant impact on water quality in Home Creek. There is a cautionary note though, as it is too early to confirm this, due to information gaps in the database. A reliable indication of the impacts may be available when a full set of data is fed into the Waiau River survey, which is being co-ordinated by NIWA.

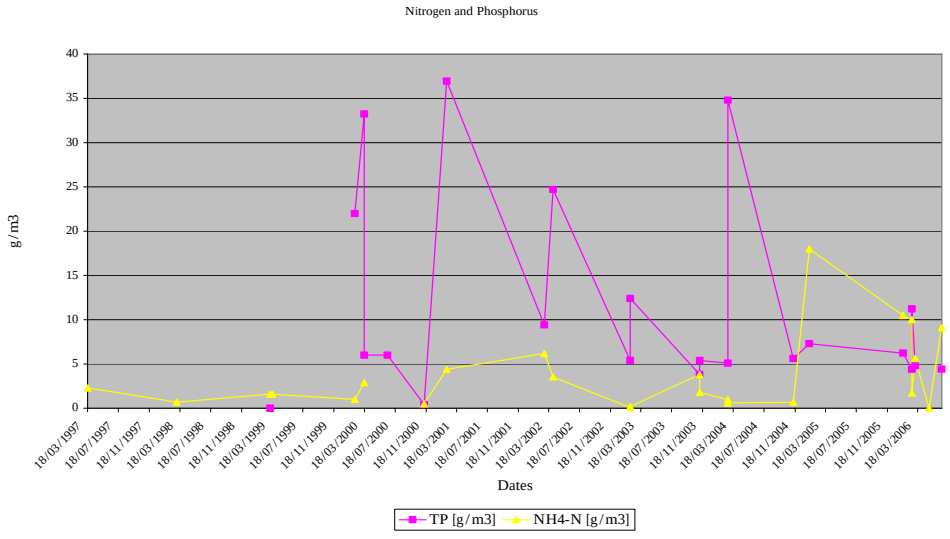

Figure 41 - Nitrogen and phosphorus concentration in the effluent discharge

10.0 Ohai-Nightcaps Water Supply

The Ohai and Nightcaps townships source raw water for their potable water supply from the Morley Stream. The solid material is flocculated using alum and removed from the system by filtration through a bed of sand.

The sediment removed by the filtration system is backwashed from the sand filter and discharged to land in a manner that may result in contaminants entering the Morley Stream.

Water samples are collected annually and the health of the stream is monitored by measuring the variety of macroinvertebrates present at upstream and downstream sites. A comparison is made between the number of pollution sensitive Taxa and the number of pollution tolerant Taxa.

The table shown below summarises this data.

Table 11 - Number of invertebrates per sample collected from Morley Stream in the vicinity of the Ohai / Nightcaps Water Supply Treatment Plant, November 2005 (table from Ryder Consulting)

Taxon	MCI score	Control					Treatment				
		1	2	3	4	5	1	2	3	4	5
COLEOPTERA											
Elmidae	6		1	3	1	1			1		
CRUSTACEA											
Paracalliope fluviatillis	5					1					
DIPTERA											
Aphrophila species	5	8	3	6	2	7	7	31	31	25	12
Austrosimulium species	3		2	1	2	4	1	1	7	2	2
Ceratopogonidae	3		1								
Chironominae	2			1						2	1
Maoridiamesa species	3	3				1		1		2	1
Muscidae	3	1									
Orthocladiinae	2	5	14	28	34	69	21	25	46	18	33
Tanypodinae	5		1	1	5			6	4	3	13
EPHEMEROPTERA											
Coloburiscus humeralis	9	1	2	7	2		5	11	14	3	6
Deleatidium species	8	386	189	310	244	170	340	244	212	246	284
Nesameletus species	9			1			1			1	
MEGALOPTERA											
Archichauliodes diversus	7	2		4	3	1	2	2	6	13	5
MOLLUSCA											
Potamopyrgus antipodarum	4	8	8	1	10	3	5	4	12	4	4
Sphaerium novaezelandiae	3				1					1	1
OLIGOCHAETA	1		1		3						
PLECOPTERA											
Austroperla cyrene	9				1						
Zelandobius species	5					3	1				1
Zelandoperla species	10		1	1	1				1		

Taxon	MCI score	Control					Treatment				
		1	2	3	4	5	1	2	3	4	5
TRICHOPTERA											
Aoteapsyche species	4	1				1	6	37	34	13	7
Beraeoptera roria	8	1	1	2	1	1	1		1		
Costachorema callistum	7	1									
Costachorema xanthopterum	7			1	1		1		1	5	1
Helicopsyche species	10	1	1		2		1		1		
Hydrobiosidae early instar	5	4	6	9	8	5	5	6	7	6	5
Hydrobiosis clavigera group	5			1			5	1	1	1	1
Hydrobiosis umbripennis group	5	2	1	2		2	2	4	4	2	2
Olinga species	9	39	13	31	16	20	93	52	81	55	66
Psilochorema species	8	1	2	2	1			2	2		1
Pycnocentria species	7	32	21	35	32	3	61	2	12	14	
Number of invertebrates		536	300	506	378	316	561	431	483	430	457
Number of taxa		18	19	21	21	17	19	17	21	20	20
MCI score		121	119	123	125	107	123	111	126	107	104
SQMCI score		7.2	7.1	6.9	6.8	6.8	6.9	6.6	6.5	7.1	6.8
Average MCI score				119					114		
Average SQMCI score				6.9					6.8		

The survey showed that the number of Taxa at both sites was similar and there was no statistical difference between the sites in terms of the number of invertebrates found in each sample. Therefore, it was concluded that the filter backwash discharge had no measurable adverse effects on the local benthic communities within the Morley Stream in the vicinity of the Ohai-Nightcaps water treatment plant.

This result was very encouraging, given that the 2004 survey found that the discharge was having minor effects on the stream.

11.0 Landfills

11.1 Landfill Sites – Annual Report 2006

Consents for the Southland District Council landfill sites at Wyndale, Tuatapere, Mossburn, Manapouri, Riverton, Ohai, Nightcaps, Gorge Road, Tokanui, Te Anau, Grove Bush, Fairfax, Colac Bay and Orepuki have expired and these sites have been closed.

The final closure work for Manapouri and Te Anau was completed during the past year. Tree planting has also been completed at the Tuatapere site.

Transfer and recycling stations are being operated at Wyndale, Riverton, Otautau, Te Anau and Lumsden, with the refuse that is collected being taken to the regional landfill site operated by AB Lime Limited at King's Bend, near Winton.

Smaller recycling centres are being operated at Tokanui, Manapouri and Mossburn. These recycling centres are modified 12 metre long containers that have been divided into sections for receiving glass, tins, plastic and paper.

Green waste sites are operated at Wallacetown, Braggs Bay (Stewart Island), Riversdale and Waikaia, with only a small volume being received at the Riversdale and Waikaia sites. The material that is received at these sites is stockpiled until sufficient quantity has been collected, and is then "chipped" for use around the gardens in the respective towns.

The Gore District Council holds consents until 2033 for the Gore, Mataura and Pukerau refuse sites:

- the Pukerau site was closed and covered some years ago, but there is still a requirement for annual sampling at this site;

- the Gore site has been closed, with an initial covering. The final covering and contouring work is to be completed over the coming summer period. Annual monitoring samples are also required at this site;

- the Mataura site has had the initial covering and shaping work done, with the final cover and contouring work to be completed this summer. Annual monitoring samples are also required at this site.

The annual sampling and monitoring is undertaken at all three sites by Golder and Associates.

The closure inspections have been completed at all of the Southland District Council landfill sites. The Gore District Council sites will continue to be inspected until the final covering and shaping works have been completed.

11.2 AB Lime Limited Landfill

AB Lime Limited has now been operating for just over two years and is a well run and tidy operation. The implementation of the landfill site has resulted in some minor issues that have been addressed very effectively by AB Lime Limited staff.

Each year, an independent peer reviewer is engaged by AB Lime Limited to review the design, construction, operation, maintenance and monitoring of the landfill and to assess whether or not the operation is undertaken by appropriately qualified personnel, in accordance with best management practices. The latest review was conducted in May 2006 and found the AB Lime Limited landfill site was very well managed.

The quantity of waste being received has increased by around 10%, to 55,000 tonnes. The landfill development is at a very early stage. Waste already accumulated has been handled effectively and landscaping of the site has been completed at the western end of the southern embankment.

The leachate from the landfill is tankered off site to the Invercargill City Council wastewater treatment plant. This practice will change when the volume of refuse is sufficient to enable the leachate to be recirculated through the landfill.

During the site visit there was little evidence of windblown litter, birds, flies or rodents. AB Lime Limited has a series of controls in place to minimise the nuisance that may be caused by each of these issues.

Monitoring

Routine monitoring is conducted on the groundwater levels, groundwater quality, surface water quality and landfill gas production. The results indicate that the ground and surface water quality changed little as a result of the landfill. The main influence on water quality appears to be historical from past agricultural activity on this, and surrounding, properties.

One of the gas monitoring bores appeared to contain elevated levels of methane immediately after refuse was dumped on site. Investigation of this issue has revealed that coal fines had been dumped in this area prior to the landfill and, as a result of this finding, the bore was replaced. Gas levels in the new bore are lower, but there still appears to be an influence from the past coal fine dumping. This site will continue to be closely monitored.

Complaints

Two complaints were received from local residents in May 2006. These were thoroughly investigated by the company and a series of actions implemented after discussions with the affected parties. These measures are expected to address the immediate issue and, as soon as the volume of refuse dumped at the landfill site is sufficient, a permanent gas flare and extraction system will be installed.

12.0 Incidents

Incidents are comprised of three components:

- issues located by Environment Southland staff during monitoring;
- self-reporting by the responsible party;
- complaints by any third party.

12.1 Monitoring

Monitoring involves serious matters found when Environment Southland staff undertake routine monitoring. In the past year, 13% of incidents were located by Environment Southland staff. This is double last year's figure and the largest percentage on record and, therefore, affects all other categories accordingly.

The main reason for the high number of monitoring complaints is the surface water monitoring programme and increased vigilance by Compliance staff.

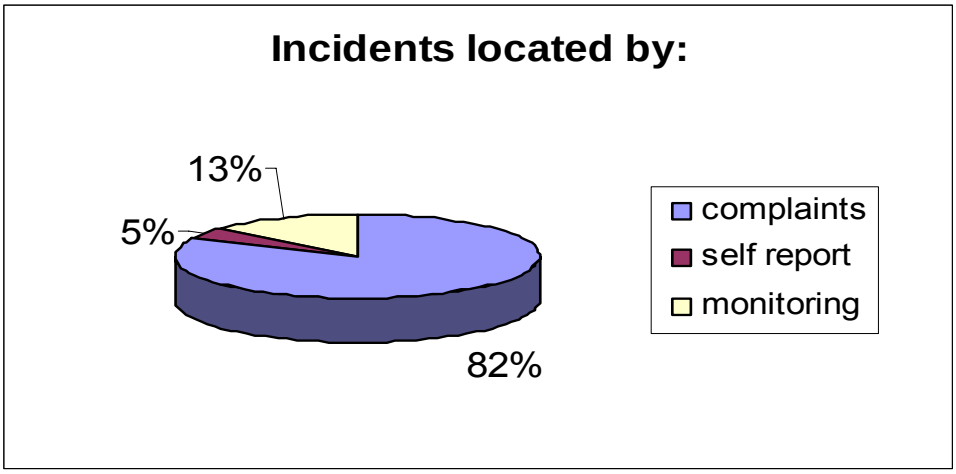

Figure 42 – Reporting source for incidents in the 2004/05 year

12.2 Self Reporting

Self reporting relates to individuals informing Environment Southland of any environmental problems they are responsible for, or Environment Southland consent holders reporting breaches of their consent conditions and what remedial action, if any, has been instituted. This constituted 5% of incidents in the past year.

12.3 Complaints

As a general rule, complaints are from members of the public. Complaints accounted for 82% of incidents in 2005/06 year, which is the lowest on record.

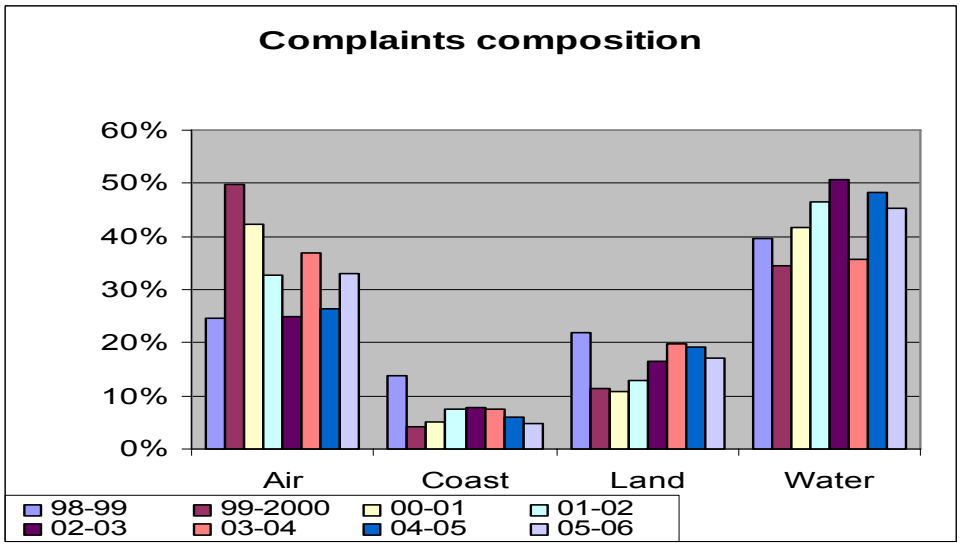

Figure 43 - Complaints composition for 2005/06

When reporting complaints people have the option of remaining anonymous or being recorded and apprised later of all outcomes resulting from the complaint. In the last year, 20% of people chose the option of anonymity.

The Environmental Compliance Division operates a 24 hour pollution service. All complaints received after normal business hours are taken by an answering service and relevant complaints forwarded to the pollution duty officer. Council policy is to respond to all after hours complaints within one hour of receipt.

Pollution complaints have dropped in numbers this year to 508, down by 13% from last year. An increase in air complaints has been offset by a slight decrease in water complaints.

12.4 Major Complaints

Major complaints are complaints that require an individual entry in our filing system, they are regarded as significant and are assigned an individual job number. This allows for all costs and correspondence to be collated in one place to assist with enforcement action that may be required at a later date, such as:

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

There were 60 major complaints last year, an increase on last year of 23%. Of these, 40 (66%) were dairy farm related (the vast majority were for dairy shed effluent discharged to a waterway via land drainage tiles), seven were related to water, six related to land, five related to air, and one to the coastal marine area.

Figure 44 - DSE flowing from clay drainage tile

Discharges of dairy shed effluent to waterways via drainage tiles are the most common major complaint. The photograph above shows dairy shed effluent flowing into a waterway on a dairy farm.

Figure 45 - Severe bank degradation caused by unrestricted stock access to a waterway

This photograph (Figure 44) relates to a prosecution taken this year due to the landowner refusing to exclude stock from the affected waterway.

Figure 46 - Unconsented material deposited in a 'Cleanfill site'

In the above photograph, the consent holders were instructed to remove the unconsented material and dispose of it in an appropriate manner.

Figure 47 - Toxic smoke from an industrial site

No burning of any material is allowed on any industrial site without a resource consent.

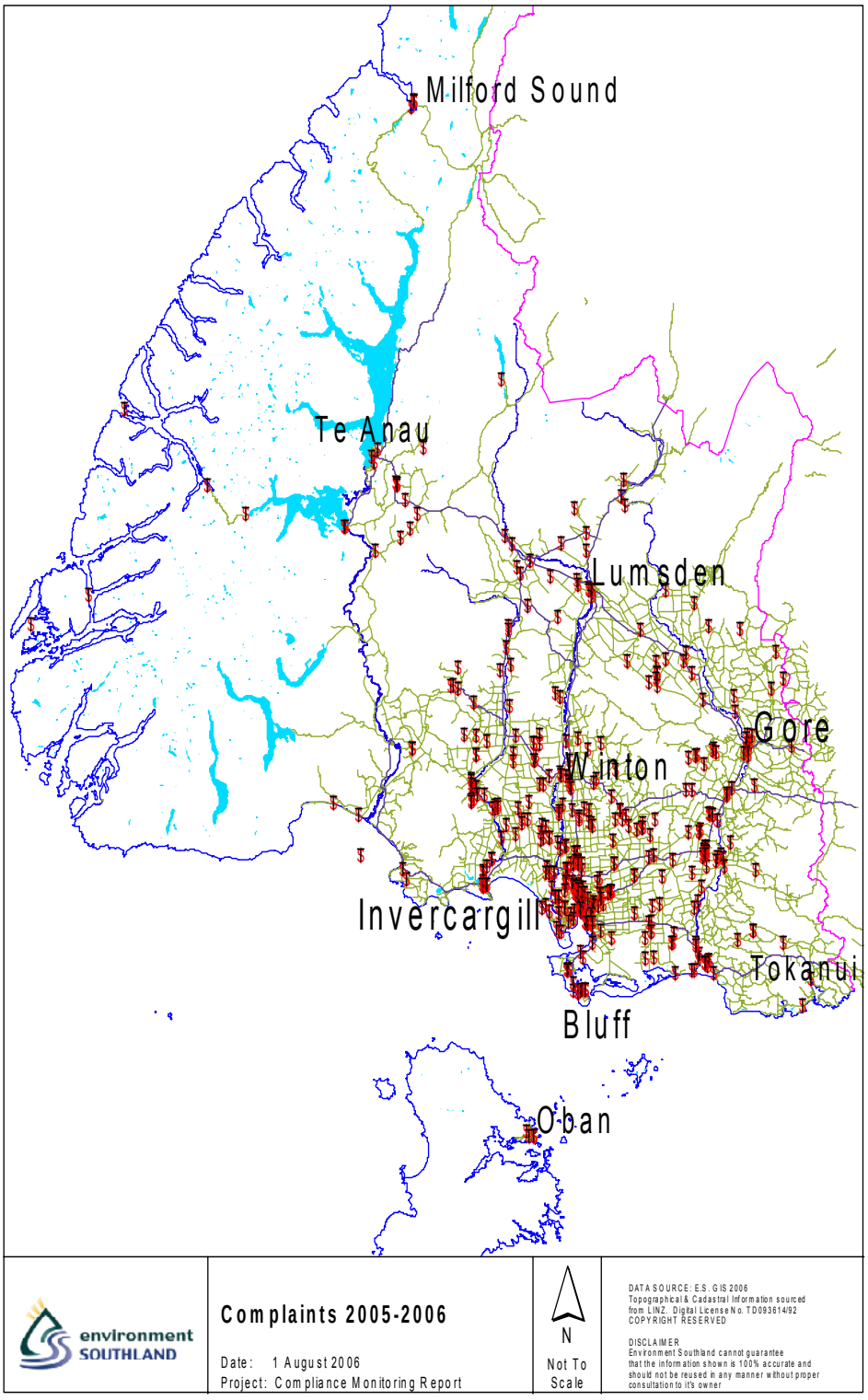

Figure 48 – Map showing complaint locations for 2005/06

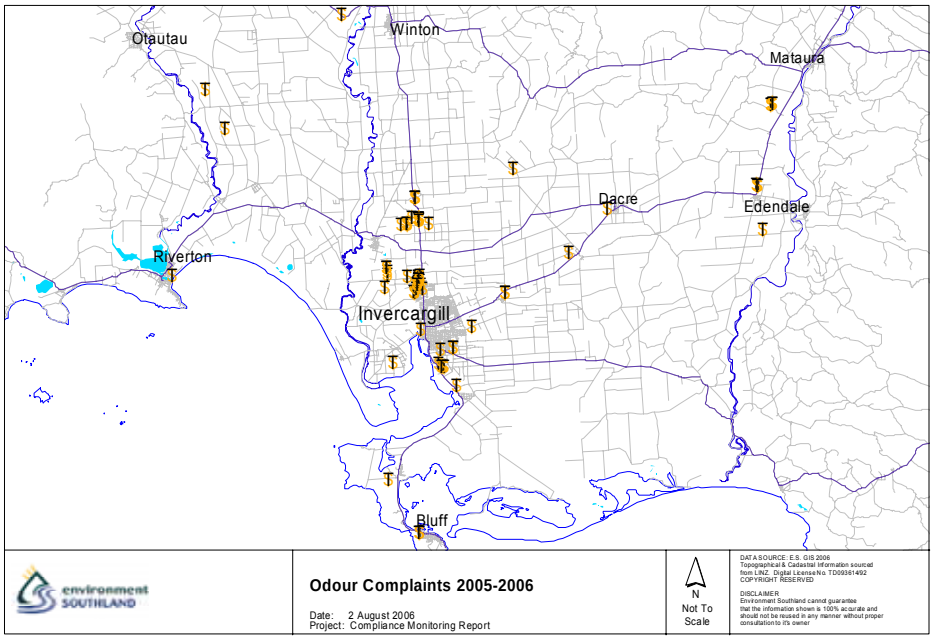

Figure 49 – Map showing location of odour complaints for 2005/06

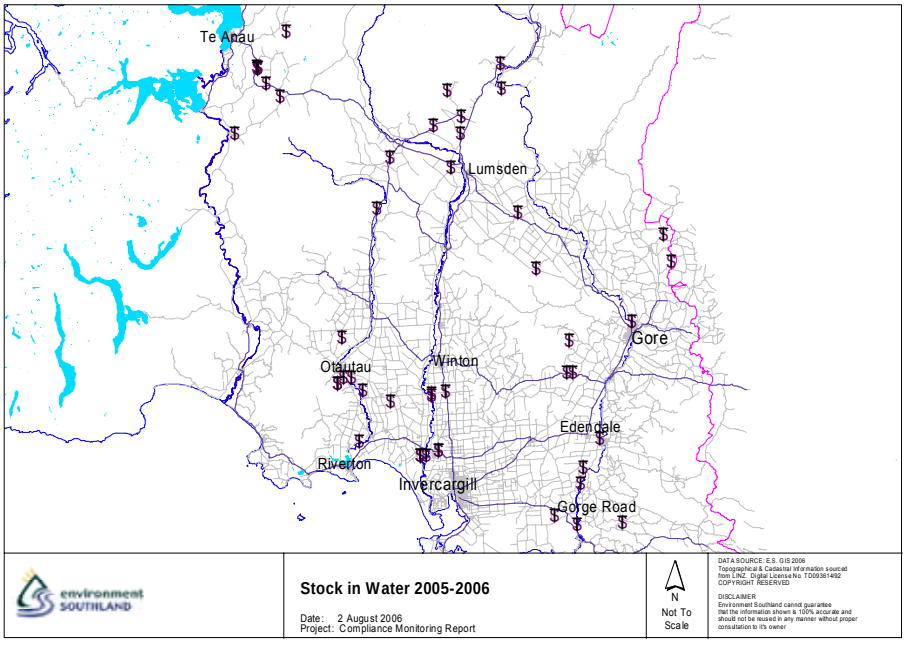

Figure 50 – Map showing location of stock in water complaints for 2005/06

12.5 Aerial Monitoring

Aerial monitoring is a proactive measure undertaken by the Environmental Compliance staff. The purpose is to identify activities that may be contravening a rule in a plan, or consent, and to then follow these up.

Two flights are usually undertaken per year, the first in June and the second in August.

During the flights, any areas of concern are photographed and given a location using Global Positioning System (GPS), which can be used back at the office to identify landowners. On the ground, follow-up inspections are undertaken immediately to ascertain environmental effects.

Past issues have been:

- stock access to waterways;
- unauthorised works;
- wintering and feed pads adjacent to waterways;
- silage pits adjacent to waterways;
- surveillance of consented high country burning is often incorporated during the flights.

Seven potential issues were identified during the June 2006 flight. One was identified as serious - the offender was warned and provided with advice and information on best practice.

Figure 51 - Unrestricted access to waterway

Bouquet

The most pleasing aspect of aerial monitoring is the improvements to waterway protection made by various landowners. Every problem area that is eliminated helps prevent cumulative effects downstream.

Mr Evan Brunton uses a deer hot-wire to prevent deer having unrestricted access to this section of the Flaxy Creek, playing his part in helping overall water quality in this catchment.

Figure 52 - Deer hot-wire

13.0 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. Penalties are prescribed in the regulations, based on which Resource Management Act section is contravened.

There were 32 offences in the 2005/06 financial year, which is an increase of 52% on last year. Of these, 65% were for discharging dairy shed effluent (DSE) to water.

Miscellaneous

Issued to	*Offence*	*Fine*
Inverlac Farms Ltd	**Incident:** The company allowed a contaminant (namely silage pit leachate) to discharge into or onto land in a manner which resulted in that contaminant entering water. **RMA Contravention:** Section 15(1)(b)	$750
Cotter	**Incident:** A contaminant (namely silage pit leachate) was allowed to discharge into or onto land in a manner which resulted in that contaminant entering water. **RMA Contravention:** Section 15(1)(b)	$750
Gutsell	**Incident:** Discharge of septic tank effluent in a manner that was not permitted, either by way of a resource consent, or via rules in the Regional Effluent Land Application Plan. **RMA Contravention:** Section 15(2)(b)	$300
Aynsley	**Incident:** Allowed unrestricted access by stock to a waterway, causing deliberate disturbance of the bed in breach of the Resource Management Act. **RMA Contravention:** Section 13(1)(b)	$500
McDowall Southland Limited	**Incident:** The company allowed a contaminant, namely burning tyres and truck oil filters, to be discharged to air, in a manner which was not expressly allowed in a rule in a regional plan, or proposed regional plan, or resource consent. **RMA Contravention:** Section 15(1)(c)	$1,000
Mossburn Enterprises Ltd	**Incident:** The company continued to discharge fish processing wastewater to water without a resource consent or rule in a plan enabling this to occur. **RMA Contravention:** Section 15(1)(a)	$750
Mossburn Enterprises Ltd	**Incident:** The company deliberately breached an Abatement Notice for commercial gain. **RMA Contravention:** Section 338(1)(c)	$750
Mountain View Ltd	**Incident:** The company allowed the disturbance of the coastal marine area (foreshore), likely to have an adverse effect on the foreshore and on plants or animals or their habitat without authorisation. **RMA Contravention:** Section 12	$500

Dairy Effluent Discharges

Issued to	*Offence*	*Fine*
Fowler	**Incident:** Allowed the unauthorised discharge of effluent onto land in breach of a resource consent **RMA Contravention:** Section 15(2)	$300
Keen	**Incident:** Allowed the unauthorised discharge of effluent onto land in breach of a resource consent. **RMA Contravention:** Section 13(2)	$300
Hughes	**Incident:** Discharged contaminants into or onto land when the discharge was not expressly allowed by a rule in a regional plan or in any relevant proposed regional plan, resource consent, or regulations. **RMA Contravention:** Section 15(2)	$300
Rimmer	**Incident:** Allowed dairy effluent to be discharged to water via a tile drain system. **RMA Contravention:** Section 15(1)(b)	$750
C Brown	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Falconer	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
O'Meara	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Waters	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Morrison	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Donnelly	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Hamlin	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Stewart	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Dennis	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Henderson	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750

Issued to	*Offence*	*Fine*
Marsh	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Ambrose Farms Limited	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Leondale Limited	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
B Brown	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Leondale Limited	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
South Hughes Farms Ltd	**Incident:** Allowed an unauthorised discharge of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Kennedy	**Incident:** Allowed an unauthorised discharge, namely an over application, of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Maxwell	**Incident:** Allowed an unauthorised discharge, namely an over application, of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Strathyre Farms	**Incident:** Allowed an unauthorised discharge, namely an over application, of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750
Whitewater	**Incident:** Allowed an unauthorised discharge, namely an over application, of dairy shed effluent onto land in circumstances where it entered water. **RMA Contravention:** Section 15(1)(b)	$750

Figure 53 - Dairy shed effluent having significant effect on a small waterway

Figure 54 - Ponded dairy shed effluent (DSE)

14.0 Abatement Notices

Abatement notices are issued where an individual or company, or both, have engaged in an activity that they do not hold consent for, and is not expressly allowed for in a plan or rule. An abatement notice will generally require the party to take immediate action to remedy, stop, or reverse the effects of their actions.

For some non-compliance, multiple abatement notices may be issued, especially where an individual and a company are involved.

Failure to comply with an abatement notice can lead to a fine and/or a prosecution.

During the 2005/06 financial year, abatement notices were issued for the following activities:

Water issues	5
Structures	13
Miscellaneous	8
Wintering/silage discharge	10
Cleanfill	4
Total	**40**

Table 12 – Discharge to Air

Issued to	***Summary of Offence and Action Required***
B A Heads	**Location:** 358 Duthie Road **Offence:** B A Heads has diverted the Kelvin Stream without the relevant authorisation. **Requirement:** Must cease the unauthorised diversion of the Kelvin Stream.
MacDonald	**Location:** 236 Waituna Road **Offence**: Stock are being wintered in a paddock where they have unrestricted access to a watercourse causing severe bank degradation and disturbance to the bed. **Requirement:** Cease the disturbance of the banks and bed of the unnamed tributary of the Mararoa River which flows through your property by allowing unrestricted access by stock.
D W McDonald	**Location:** True right bank of Mataura River **Offence:** D W McDonald and/or his agents or contractors have undertaken bank protection work resulting in the unauthorised construction of defences against water in contravention of sections (12)(1) and (12)(2) of the Resource Management Act 1991. These activities have occurred when no resource consent authorising the activities was held. **Requirement:** You must cease the following action, any building, construction or placement of materials, on the bank or bed of the Mataura River for the purpose of forming unauthorised bank protection works or a defence against water.

Issued to	*Summary of Offence and Action Required*
Clarke Farms Ltd	**Location:** The ford on the Wairio Stream. **Offfence:** Allowing dairy herds to cross at a ford on the Wairio Stream. **Requirement:** You are required to prevent cattle fording the waterway on the Wairio Stream.
Mountain View Limited	**Location:** The true right bank of the Mataura River. **Offence:** Disturbance, excavation and construction work on the bank of the Mataura River, this is a breach of sections 12(1)(a), (c), (d) and (e) and section 14(1) of the Resource Management Act 1991. **Requirement: C**ease disturbance, excavation and construction work on the bank of the Mataura River.

Figure 55 - Unauthorised excavation on Mataura River

Table 13 - Structures

Issued to	*Summary of Offence and Action Required*
West	**Location:** 488 Mill Road, North Invercargill. **Offence:** Placed a bridge over the Myross Creek which was not authorised by an appropriate resource consent. **Requirement** Must remove the bridge placed over Myross Creek on your property.
Meulenbroek	**Location:** On the Titiroa Stream. **Offence**: Placed an unlawful structure/device used for whitebaiting, covering a distance of more than one-third of the waterway, which is not authorised by a relevant rule. **Requirement:** You must not extend your structure/device more than one third of the river at that point of the Titiroa Stream.
Boniface	**Location:** On the Titiroa Stream. **Offence:** Placed an unlawful structure/device used for whitebaiting, covering a distance of more than one-third of the waterway, which is not authorised by a relevant rule. **Requirement:** You must not extend your structure/device more than one third of the river at that point of the Titiroa Stream.

Issued to	*Summary of Offence and Action Required*
Blondell	**Location:** On the Titiroa Stream. **Offence:** Mr Blondell has erected a structure and is occupying the coastal marine area in contravention of Sections 12(1)(b) and 12(2)(a) of the Resource Management Act. **Requirement:** You must permanently remove the unauthorised structure from the bed of the Titiroa Stream and coastal marine area.
Richard Drain	**Location:** True right bank of the Aparima River. **Offence:** Richard Drain and/or his agents or contractors have undertaken bank protection work resulting in the unauthorised construction of defences against water in contravention of Sections (12)(1) & (12)(2) of the Resource Management Act 1991. These activities have occurred when no resource consent authorising the activities was held. **Requirement:** Cease any building, construction or placement of materials, on the bank or bed of the Aparima River.
Hansen	**Location:** Titiroa Stream. **Offence:** Placed an unlawful structure/device used for whitebaiting, covering a distance of more than one-third of the waterway, which is not authorised by a relevant rule. **Requirement:** You must not extend your structure/device more than one-third of the river at that point of the Titiroa Stream.
Perriam	**Location:** Titiroa Stream. **Offence:** Placed an unlawful structure/device used for whitebaiting, covering a distance of more than one third of the waterway, which is not authorised by a relevant rule. **Requirement**: You must not extend your structure/device more than one-third of the river at that point of the Titiroa Stream.
Cull	**Location:** Titiroa Stream. **Offence:** Placed an unlawful structure/device used for whitebaiting, covering a distance of more than one third of the waterway, which is not authorised by a relevant rule. **Requirement**: You must not extend your structure/device more than one-third of the river at that point of the Titiroa Stream.
Taylor	**Location:** Mataura River. **Offence:** Mr Taylor and/or his agent have erected an unconsented structure and is occupying the coastal marine area in contravention of Sections (12)(1)(b) & (12)(2)(a) of the Resource Management Act 1991. **Requirement:** You must permanently remove the unauthorised structure from the bed of the Mataura River and coastal marine area.
Cameron	**Location:** Mataura River. **Offence:** That an unconsented structure is occupying the coastal marine area in contravention of Sections (12)(1)(b) & (12)(2)(a) of the Resource Management Act 1991. **Requirement:** You must permanently remove the unauthorised structure from the bed of the Mataura River and coastal marine area.
I H Glendining	**Location:** Mataura River. **Offence:** The structure consented to I H Glendining under consent number 201510 has no obvious identification and is in need of repair, therefore the consent holder is carrying out an activity by occupying the coastal marine area in contravention of Section 12(3)(a) Resource Management Act 1991.

Issued to	*Summary of Offence and Action Required*
	Requirement: Southland Regional Council gives notice that you must repair your structure and place the appropriate identification on it to a standard that meets the requirements of your resource consent.
Oke	**Location:** Mataura River. **Offence:** That Mr Oke or his agent has erected an unconsented structure (hut on whitebait stand) and is occupying the coastal marine area in contravention of Sections 12(1)(b) and 12(2)(a) of the Resource Management Act 1991. **Requirement:** You must permanently remove the unauthorised structure from the bed of the Mataura River and coastal marine area.
W L Jones	**Location:** At or about GPS E2183903 N5400367. **Offence:** The structure consented to W L Jones under consent number 200780 has no obvious identification and is in need of repair, therefore the consent holder is carrying out an activity by occupying the coastal marine area in contravention of Section 12(3)(a) Resource Management Act 1991. **Requirement:** Southland Regional Council gives notice that you must repair your structure and place the appropriate identification on it to a standard that meets the requirements of your resource consent.

Table 14 - Miscellaneous Abatement Notices

Issued to	*Summary of Offence and Action Required*
Mossburn Enterprises Limited	**Location:** 37 Kennington Road. **Offence:** Mossburn Enterprises has continued to discharge wastewater from eel and fish processing to a tributary of the Waihopai River, although consent 94413 permitting this activity expired on 24 March 2005. **Requirement:** Cease the discharge of eel and fish processing effluent to a tributary of the Waihopai River
Antara Dairy Ltd	**Location:** 1253 Wreys Bush-Mossburn Highway **Offence:** Antara Dairy Ltd and/or its agents has allowed an unauthorised discharge of dairy shed effluent to occur by disconnecting the irrigator hose and over-applying effluent to land. As a consequence of this over-application, effluent has reached a watercourse in contravention of Section 15(1)(a), (b) Resource Management Act 1991. **Requirement:** Southland Regional Council gives notice that you must cease the unauthorised discharge of dairy shed effluent to land in circumstances where it has entered water.
J DDodds	**Location:** 607 Gore-Mataura Highway. **Offence:** J D Dodds and/or his agents has discharged dairy shed effluent to land which has resulted in the effluent ponding into an artificially created depression in contravention of Rule 5.4.1 (a). iv, (b) of the Regional Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease the unauthorised discharge and ponding of dairy shed effluent into an artificially constructed depression.

Issued to	*Summary of Offence and Action Required*
G J Borst	**Location:** 223 Coalpit Road. **Offence:** G J Borst and/or his agents are discharging dairy shed effluent onto land from more than 50 cows without a current resource consent enabling them to do so. **Requirement:** Southland Regional Council gives notice that you must cease the following action, the discharge of dairy shed effluent onto land from more than 50 cows.
Batesana Holdings Limited	**Location:** Greenhills. **Offence:** Batesana Holdings Limited and/or its agents are discharging Kina waste onto land without a current resource consent enabling them to do so. The discharged waste is causing offensive and objectionable odours. **Requirement:** Cease the discharge of Kina waste onto land.
Ondrea Mary Pannet Driscoll	**Location:** Greenhills. **Offence:** OMP Driscoll and/or your agents are discharging Kina waste onto land without a current resource consent enabling them to do so. The discharged waste is causing offensive and objectionable odours. **Requirement:** Cease the discharge of Kina waste onto land.
Murdoch Refrigeration Ltd	**Location:** 92 Jed Street, Invercargill **Offence:** Murdoch Refrigeration Ltd was observed discharging contaminants to air from a trade premise without resource consent. **Requirement**: Southland Regional Council gives notice that you must cease the discharge of contaminants to the air from the burning of trade waste.
Te Wae Wae Dairies Limited	**Location:** Tuatapere – Orepuki Road. **Offence:** Discharging effluent to land from more than 600 cows in contravention of condition 7 of consent number 99011, which is held in the name of Te Wae Wae Dairies Limited. The land in question being owned by Te Wae Wae Dairies Limited. **Requirement**: Southland Regional Council gives notice that you must cease the following action: Discharging effluent to land from more than 600 cows.

Figure 56 – Polystyrene burning in a drum

Table 15 – Wintering/Silage Leachate

Issued to	*Summary of Offence and Action Required*
C G Kerr	**Location:** Rimu Road. **Offence:** C G Kerr and/or his contractors or agents, has allowed more than 100 adult cattle to be wintered on a pad that does not have a current resource consent. This is in contravention of Rule 5.4.1 of the Regional Effluent Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease the discharge of effluent to land from the wintering pad currently servicing more than one hundred adult cattle on your property.
C G Kerr	**Location:** Rimu Road. **Offence**: The silage pit areas on this property have not been sealed in accordance with Rule 5.4.4 of the Regional Effluent Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease depositing silage into silage pit areas on your property until they comply with the current rules and regulations of the Regional Effluent Land Application Plan (Rule 5.4.4).
Craig Robertson	**Location:** Rimu Road. **Offence:** Craig Robertson has allowed wintering pad effluent to pour into an unsealed hole, from which it is then being further diverted through a by-pass opening into a tile system. **Requirement:** Southland Regional Council gives notice that you must immediately cease the unauthorised discharge of wintering pad effluent to land, and unauthorised discharge of wintering pad effluent through the effluent sump by-pass system to a tile system on the property at Rimu Road.
Woldwide Farm Ltd	**Location:** 1354 Hundred Line East **Offence:** De Wolde Family Trust has allowed the unauthorised discharge of silage pit leachate onto land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water in contravention of Section 15(1)(b) of the Resource Management Act 1991. The De Wolde Family Trust has allowed the unauthorised discharge of silage pit leachate at a distance of less than 20 metres from a waterway without the area being sealed in accordance of Rule 5.4.4 of the Regional Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease the discharge from the silage pit leachate to land in circumstances where it enters or may enter water.
M J Howden	**Location:** 625 Edendale-Seaward Downs Road **Offence:** M J Howden has discharged agricultural effluent to land which has resulted in the effluent ponding into artificially created depressions in contravention of Rule 5.4.1 (a). iv, (b) of the Regional Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease the unauthorised ponding of silage leachate/runoff from silage stacks and wintering pads (agricultural effluent) into artificially constructed depressions.
N W & J M Harrison	**Location:** 1416 Gorge Road **Offence:** N W and J M Harrison Trust Partnership or its agents has allowed the unauthorised discharge of silage pit leachate onto and into water from a silage pit area, resulting in contaminants flowing onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result

Issued to	*Summary of Offence and Action Required*
	of natural processes from that contaminant) entering water in contravention of Section 15(1)(b) of the Resource Management Act 1991. Silage leachate has not been disposed of lawfully in accordance with Rule 5.4.4 of the Regional Effluent Land Application Plan. **Requirement:** Southland Regional Council gives notice that you must cease the discharge of silage pit leachate to land in circumstances where it may enter water.
Hedgehope Holdings Ltd	**Location:** 84 Hanning Road **Offence:** The silage pit areas on these properties have not been sealed in accordance with Rule 5.4.4 of the Regional Effluent Land Application Plan. **Requirement**: Southland Regional Council gives notice that you must cease depositing silage into silage pit areas on the property of Hedgehope Holdings Ltd until there is compliance with the current rules and regulations of the Regional Effluent Land Application Plan (Rule 5.4.4).
M T & L F Livingstone	**Location** 1895 Riverton-Wallacetown Highway **Offence:** M T and L F Livingstone have allowed the unauthorised discharge of silage pit leachate from a silage pit area, resulting in contaminants flowing onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water in contravention of Section 15(1)(b) of the Resource Management Act 1991. **Requirement**: Southland Regional Council gives notice that you must cease the unauthorised discharge of silage pit leachate to land in circumstances where it may enter water
Clarke Farms Ltd	**Location** 1029 Hundred Line West Road **Offence:** The silage pit, is not sealed in accordance with Rule 5.4.4 of the Regional Effluent Land Application Plan. This enables the discharge of leachate to land in circumstances which do not comply with Rule 5.4.4. **Requirement**: Southland Regional Council gives notice that you must cease discharging silage effluent to land in a manner which does not comply with Rule 5.4.4 of the Regional Effluent Land Application Plan.
M R Duncan	**Location** 119 Terrace Road **Offence:** M R Duncan and/or his agents have allowed the unauthorised discharge of silage pit leachate onto and into water from a silage pit area, resulting in contaminants flowing onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water in contravention of Section 15(1)(b) of the Resource Management Act 1991. Silage leachate has not been disposed of lawfully in accordance with Rule 5.4.4 of the Regional Effluent Land Application Plan. **Requirement**: Southland Regional Council gives notice that you must cease the discharge of silage pit leachate to land in circumstances where it may enter water.

Table 16 - Cleanfill

Issued to	*Summary of Offence and Action Required*
Southland Sand & Gravel	**Location:** 161 Pit Road **Offence:** The site is being used as a landfill when there is no consent allowing the deposition of material. **Requirement:** Southland Regional Council gives notice that you, including all agents and contractors, must cease the dumping of unconsented materials into the land site immediately on receipt of this notice.
Purdue Bros	**Location:** 500 Dunns Road **Offence**: Purdue Bros and/or their contractors have allowed unconsented materials (dag crushing materials) which are prutrescible to be dumped into ponded surface water on their cleanfill site. **Requirement:** Southland Regional Council gives notice that you, including all agents and contractors, must cease the dumping of unauthorised materials into the cleanfill site immediately on receipt of this notice.
TSK White Limited	**Location:** 226 Carmichael Road **Offence:** The site is being used as a landfill when there is no consent allowing the deposition of material on the site. **Requirement:** Southland Regional Council gives notice that you, including all agents and contractors, must cease the dumping of unconsented materials into the land described below immediately upon receipt of this notice.
TSK White Limited	**Location:** 250 Carmichael Road **Offfence:** The site is being used as a landfill when there is no consent allowing the deposition of material on this site. **Requirement:** Southland Regional Council gives notice that you, including all agents and contractors, must cease the dumping of unconsented materials into the land described below immediately upon receipt of this notice.

Figure 56 – Anything but "cleanfill"

15.0 Prosecutions

Table 17 – Miscellaneous Prosecutions

Defendant	*Case*	*Costs*
Southern Protein	**Charge:** Discharge of contaminants to air without a resource consent and contravention of an abatement notice. Company pleaded guilty to both charges.	Penalty: $1,000
Robertson	**Charge:** Discharge of agricultural effluent to land in contravention of the Regional Effluent Land Application Plan, rule 5.4.1. Pleaded guilty.	Penalty: $3,500
MacDonald	**Charges:** Allowing cattle unrestricted access to the bed of a tributary of the Mararoa River. Pleaded guilty.	Penalty: $2,000

Table 18 – Dairy Prosecutions

Defendant	*Case*	*Costs*
Taplin	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $3,500
Smith	**Charge:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $2,500
McNaught	**Charges:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $3,000
Tri Tua	**Charges:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $2,500 Council expenses: $1,025
Dings	**Charges:** Discharge of dairy shed effluent to land in circumstances where it entered a waterway. Pleaded guilty.	Penalty: $3,500 Council expenses: $223

Table 19 – Comparison with Previous Years

Year Ending	*Major Complaints*	*Prosecutions*	*Infringements*
1997	72	5	
1998	68	4	
1999	38	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

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