

DH Lepper Trust Piggery
Monitoring Programme
Annual Report
2006-2007

Technical Report 2007–50

ISSN: 0114-8184 (Print)
ISSN: 1178-1467 (Online)
Document: 328140

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November 2007

Executive summary

The DH Lepper Trust operates a piggery located on Mountain and Manutahi Roads, and a farm dairy located on Manutahi Road, in the Waiongana catchment. The Company holds resource consents for the discharge of treated piggery and dairy effluent to water, and for the discharge of emissions into the air. This report for the period July 2006-June 2007 describes the monitoring programme implemented by the Taranaki Regional Council to assess the Company's environmental performance during the period under review, and the results and environmental effects of the Company's activities.

The Company holds a total of three resource consents, which include a total of 26 conditions setting out the requirements that the Company must satisfy.

The Council's monitoring programme included five inspections, comprising two wastewater and receiving water surveys for physicochemical analysis, two inspections of the wastewater treatment system during low flow conditions, and one inspection when wastewater from the treatment ponds was being spray irrigated to land. In addition, seven investigations of odour complaints were carried out.

Because the treatment ponds are near the south eastern neighbouring residents and industry, odour issues are becoming a concern within the Lepperton community. Residential encroachment and reverse sensitivity issues in the rural countryside are also a major concern for the pork industry. The agricultural air discharge consent expires in June 2008 and the Council has received an application for a new consent.

Monitoring indicated a good level of environmental performance and generally good consent compliance. Impacts on the water quality of the Waiongana Stream were minor and in compliance with consent conditions.

During the monitoring programme, the consent holder has ensured that consented receiving water dilution ratios were maintained throughout discharge periods.

The consent holder has supplied the Council with accurate effluent discharge records, including notification of discharges to water and land.

This report includes recommendations for an unaltered monitoring programme for the 2007-2008 year.

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1. Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2006-June 2007 by the Taranaki Regional Council on the monitoring programme associated with resource consents held by DH Lepper Trust. The DH Lepper Trust operates a piggery situated on Mountain Road (SH3a), and the waste water treatment ponds are situated on Manutahi Road in the Waiongana catchment.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by DH Lepper Trust that relate to a discharge of water within the Waiongana catchment, and the air discharge permit held by DH Lepper Trust to cover emissions to air from the site.

One of the intents of the Resource Management Act (1991) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Taranaki Regional Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the consent holders use of both water and air and is the second combined annual report by the Taranaki Regional Council for the DH Lepper Trust piggery and dairy farm.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about compliance monitoring under the Resource Management Act and the Council's obligations and general approach to monitoring sites through annual programmes, the resource consents held by DH Lepper Trust in the Waiongana catchment, the nature of the monitoring programme in place for the period under review, and a description of the activities and operations conducted by DH Lepper Trust.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretation, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2006-2007 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act (1991) and monitoring

The Resource Management Act primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

- (a) the neighbourhood or the wider community around a discharger, and may include cultural and socio-economic effects;
- (b) physical effects on the locality, including landscape, amenity and visual effects;
- (c) ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- (d) natural and physical resources having special significance (eg, recreational, cultural, or aesthetic);
- (e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Taranaki Regional Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each discharge source. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the Resource Management Act to assess the effects of the exercise of consents. In accordance with section 35 of the Resource Management Act 1991, the Council undertakes compliance monitoring for consents and rules in regional plans; and maintains an overview of performance of resource users against regional plans and consents. Compliance monitoring, including impact monitoring, also enables the Council to continuously assess its own performance in resource management as well as that of resource users particularly consent holders. It further enables the Council to continually re-evaluate its approach and that of consent holders to resource management, and, ultimately, through the refinement of methods, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental performance

Besides discussing the various details of the performance and extent of compliance by the DH Lepper Trust in the Waiongana catchment during the period under review, this report also assigns an overall rating. The categories used by the Council, and their interpretation, are as follows:

- a **high** level of environmental performance and compliance indicates that essentially there were no adverse environmental effects to be concerned about, and no, or trivial (such as data supplied after a deadline) non-compliance with conditions.
- a **good** level of environmental performance and compliance indicates that adverse environmental effects of activities during the year were negligible or minor at most, items of concern were resolved positively, co-operatively, and quickly, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices, there were perhaps some items noted on inspection notices for attention but these items were not urgent nor critical, and follow-up inspections showed they have been dealt with.
- **improvement desirable** indicates that the Council may have been obliged to record a verified unauthorised incident involving significant environmental

impacts against the company, and/or abatement notices may have been issued; there were adverse environmental effects arising from activities and intervention by Council staff was required, and there were matters that required urgent intervention, took some time to resolve, or remained unresolved at end of the period under review.

- **poor** performance is used when there were grounds for prosecution or infringement notice

1.2 Process description

All raw wastewater is collected in a large holding tank from which it is pumped through a rotating screen machine (Photo 1) which provides primary treatment by separating the solid component of the effluent. The solids are stored in three large



Photo 1 Solids separation and collection system

bins prior to being mixed 50:50 with sawdust. The mixture is transferred to a large shed where it is aerated until well composted. The end product is then bagged and sold as a soil conditioner. The screening reduces solids, biochemical oxygen demand (BOD₅) and some nutrients contained in the liquid wastes (Photo 2) which are then pumped to the treatment ponds.



Photo 2 Raw effluent wastewater collection and pumping system

Treated effluent is discharged from the ponds system to the Waiongana Stream when flows permit (consent requirement of a minimum flow of 5m³/s in the stream). The discharge occurs through a diffuser anchored to the bed of the stream and, as this lies beneath the stream under fresh flow conditions, all sampling of the treated wastewater is from within the final (aerobic) pond, adjacent to the outlet. The pond system is cleaned out annually by contractors and irrigated to the consent holder's surrounding dairy pasture. The ponds are stirred and pumped for 1 to 2 days, which allows for some solids to be removed and for a reduction in volume. Due to the size of the treatment ponds they are not completely emptied, as to do so would be impractical and would take too long.

Because of the treatment ponds' close proximity to the eastern neighbouring houses, odour issues remain a concern. Residential encroachment and reverse sensitivity issues in the rural countryside are also a major concern for the pork industry.

The ponds system was designed to MAF specifications and constructed around 1981. They are located 1.2 km from the piggery, on the banks of the Waiongana River and surrounded by land owned by the consent holder. Effluent from both the piggery [3,500 animals] and a dairyshed [400 cows] is treated in the ponds system, with treated effluent being discharged to the Waiongana River during consented, high river flow conditions.

1.3 Resource consents

1.3.1 Water discharge permit

Section 15(1) (a) of the Resource Management Act stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations.

DH Lepper Trust holds consent **0715** to discharge treated piggery and farm dairy effluent from a treatment ponds system into the Waiongana Stream during fresh (high flow) conditions. This renewed consent was issued by the Taranaki Regional Council on 19 December 2002 as a resource consent under Section 87(e) of the Resource Management Act. It is due to expire on 1 December 2013.

The discharge of treated wastewater of this nature may affect the water quality of a stream, particularly if there is insufficient dilution. Some effects may be obvious (eg appearance, turbidity) while biological effects may be more subtle.

Eleven special conditions are included in Resource Consent **0715**:

Special Condition 1 relates to the operation of the piggery and associated activities and discharges.

Special Condition 2 defines the point of discharge.

Special Condition 3 requires the maintenance of a minimum dilution rate at all times in the receiving water.

Special Condition 4 defines a minimum flow in the Waiongana Stream at which the discharge may occur.

Special Conditions 5 and 6 define the mixing zone and prohibit a number of effects.

Special Condition 7 requires the consent holder to operate and maintain the treatment and discharge system to ensure compliance.

Special Condition 8 requires the consent holder to monitor and maintain records of the discharge.

Special Conditions 9 and 10 require effluent from the aerobic pond to be discharged onto and into land via irrigation at least once annually during the summer/autumn period and notification to be provided prior to any irrigation.

Special Condition 11 provides for review of the consent

The permit is attached to this report in Appendix I.

1.3.2 Water abstraction permit

DH Lepper Trust holds consent (0188) to cover the take of water from an unnamed tributary of the Waiongana Stream for piggery operation purposes.

This permit was re-issued by the Council on 09 January 2002 under Section 87(d) of the RMA. It is due to expire on 1 June 2020.

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14.

Three special conditions provide for prevention of adverse effects, limit of abstraction and provision for consent review.

The permit is attached to this report in Appendix I.

1.3.3 Air discharge permit

Section 15(1)(c) of the Resource Management Act stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

DH Lepper Trust holds air discharge permit 5206 to discharge emissions into the air from a pig farming activity and associated practices, including solids composting, effluent treatment and other waste management activities. This permit was issued by the Taranaki Regional Council on 4 February 1998 as a resource consent under Section 87(e) of the Resource Management Act. It is due to expire on 1 June 2008.

Twelve special conditions are attached to the consent.

Special Condition 1 requires the consent holder to adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment.

Special Condition 2 requires consultation should any alterations occur to the pig farming and effluent disposal processes, operations, equipment or layout which might significantly change the nature or quantity of contaminants emitted from the site.

Special Condition 3 requires the consent holder to minimise the emissions and impacts of air contaminants discharged from the site.

Special Condition 4 requires the consent holder to operate the piggery and associated activities in accordance with information provided.

Special Condition 5 restricts odours at or beyond the boundary of the site.

Special Condition 6 limits the discharge of suspended or deposited dust at or beyond the boundary of the site.

Special Condition 7 prohibits any significant adverse ecological effect on any ecosystems in the Taranaki region.

Special Condition 8 requires the consent holder to submit an effluent ponds maintenance and landscaping plan.

Special Condition 9 requires the consent holder to maintain and operate the effluent ponds system and associated activities in compliance with the plan required by Special Condition 8.

Special Condition 10 requires the consent holder to advise neighbours of any scheduled land application of effluent or sludge onto a property.

Special Condition 11 requires the consent holder to minimise effects upon neighbours and the land uses of neighbouring properties.

Special Condition 12 provides for review of any or all of the conditions of the consent.

The permit is attached to this report in Appendix I.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the Resource Management Act sets out an obligation for the Taranaki Regional Council to gather information, monitor, and conduct research on the exercise of resource consents, and the effects arising, within the Taranaki region.

The Taranaki Regional Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations, and seek information from consent holders.

The monitoring programme for the DH Lepper Trust site consisted of three primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Taranaki Regional Council in ongoing liaison with resource consent holders over consent conditions and their interpretation and application, in discussion over monitoring requirements, preparation for any reviews, renewals, or new consents, advice on the Council's environmental management strategies and the content of regional plans, and consultation on associated matters.

1.4.3 Site inspections

The DH Lepper Trust site was visited five times during the monitoring period. The main points of interest were the collection area, the separator and composting system and treatment ponds system with associated actual and potential emission sources and characteristics, including discussion on any recent odour complaints.

1.4.4 Physicochemical sampling

The Taranaki Regional Council undertook sampling of the discharges from the treatment ponds system and of the stream water quality upstream of the discharge point and downstream of the designated mixing zone.

The effluent discharge was sampled on two occasions, and the sample analysed for carbonaceous biochemical oxygen demand (CBOD₅), chloride, conductivity, suspended solids and turbidity.

The Waiongana Stream was sampled on two occasions, upstream and downstream of the discharge, and analysed for filtered carbonaceous biochemical oxygen demand (FCBOD₅), chloride, conductivity, dissolved reactive phosphorus, unionised ammonia, ammoniacal nitrogen, pH, suspended solids, turbidity and temperature.

The monitoring programme allows for the effluent discharge and receiving water to be sampled on three occasions. When discharging to the Waiongana Stream the consent holder advises the Council staff, who undertake sampling if required. Discharge and receiving water sampling were undertaken on two occasions.

2. Results

2.1 Water

2.1.1 Wastewater dilution establishment

To determine flow rates in the Waiongana Stream, a rating curve of flow against water depth is maintained by the Council. This enables the consent holder to assess treated wastewater discharge compliance with the minimum dilution ratio of 1:250 (one part effluent to two hundred and fifty parts of receiving water flow).

The wastewater discharge flow from the aerobic pond was established at 15 litres per second by calculating the conductivity ratios of the receiving water. To ensure that the dilution ratio is being met during a moderate fresh, the discharge flow can be controlled by reducing the flow via a control valve.

A staff gauge installed at Manutahi Road Bridge provides the consent holder with the stream level (or height) and a rating chart produced by the Council shows water flow rates at any given stream depth. This rating was last updated during March 2006 from the hydrological gauging programme.

The Taranaki Regional Council web site (www.trc.govt.nz) provides current river flow and water levels for the Waiongana Stream recorded at SH3a. The river level and flow data are automatically forwarded to the Council computer database. The data are analysed every two hours and a graph is provided within ten minutes of downloading. Because of the time lag between the pond discharge point and downstream flow at Waiongana SH3a, the staff gauge provides the consent holder with accurate 'real time' river conditions.

2.1.2 Inspections

Inspection of 23 August 2006

This first inspection for the monitoring period of the piggery and ponds system was carried out during fine weather conditions. The piggery operational area was found to be satisfactory. The sump was at normal level with no sign of overflow and the pumping area was tidy. Liquid wastes from the separator were well contained with discharges being directed back to the separator sump.

The Waiongana Stream was running low; there was no discharge from the ponds. Normal piggery odours were emanating from around the piggery and ponds system.

Inspection of 15 November 2006

Notification was received from the consent holder that a discharge of treated wastes from the ponds system into the Waiongana Stream had commenced. This inspection of the piggery and ponds system was carried out during fine weather conditions after heavy overnight rain within the Waitara catchment. The river staff gauge was recorded at 0.65m, equating to a river flow well in excess of 10.0 cubic metres per second. Wastewater and receiving water samples were collected. The results of analysis are provided in Table 2.

This inspection around the piggery, including the waste collection, composting system and sump area was found to be well managed and tidy.

Noticeable piggery odours were emanating from the direction of the oxidation ponds when walking towards the ponds from the south. A steady northerly breeze was occurring at the time of inspection.

Inspection of 7 May 2007

This inspection of the piggery and ponds system was carried out during overcast weather conditions with a gustily westerly wind. The consent holder had informed the Council that contractors were desludging the anaerobic pond and were spray irrigating onto paddocks, west of the oxidation ponds. Two mechanical stirrers were being used to mix up the sludge; the anaerobic pond, then contents were pumped to land.

Because of the nature of work being carried out, the Council conducted a downwind odour survey across Manutahi Road and down the Lepperton Township. No offensive odours were detected off-site during this survey.

Inspection of 21 May 2007

Notification was received from the consent holder that a discharge of treated wastes into the Waiongana Stream had commenced. This inspection of the ponds system was carried out during heavy rain. The river staff gauge at Manutahi Road Bridge was recorded at 0.56m, equating to a river flow well in excess of 8.0 cubic metres per second. The Waiongana Stream was a dirty turbid brown colour and a distinctive pink plume was observed from the effluent discharge which continued a few metres downstream before dispersing.

Wastewater and receiving water samples were collected. The results of analysis are provided in Table 3. Slight odours were 'noticeable' alongside the river while taking samples. An odour complaint regarding piggery odours was received by the Council the previous day (20 May 2007), and an inspection was carried out with a follow-up discussion regarding odour with the consent holder.

Inspection of 25 June 2007

This final inspection of the piggery for the year was carried out during wet, weather conditions after a five day period of rain. The focus was on the solids separator unit, composting operation and collection; and disposal of the piggery wastes. Everything was found to be operating satisfactory. Some solids had spilled out onto the concrete pad area due to the wet weather conditions, but were contained. Normal piggery odours were evident from around the site. A site meeting with the consent holder was held about the piggery operation in general and in particular, about piggery odours that brought recent complaints from neighbouring residents. The consent holder had been working with Waratah Piggeries Ltd on ways of minimising odour effects and undertook to present a plan and recommendations to Council.

2.1.3 Analytical results of wastewater and receiving water physicochemical monitoring

During the monitoring period, five inspections of the piggery site were conducted by Taranaki Regional Council staff. Samples were collected on two of these occasions for physico-chemical analysis in the Taranaki Regional Council IANZ-registered laboratory using standard methods. Sites sampled were located as listed in Table 1 and illustrated in Figure 1.

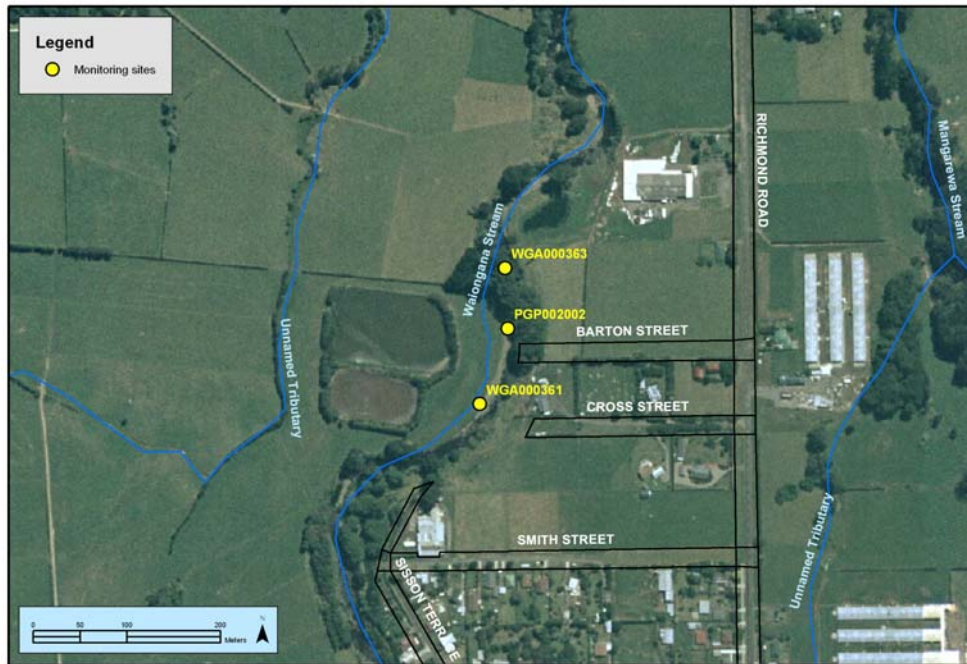


Figure 1 Aerial location map of sampling sites in the Waiongana Stream

Table 1 Location of sampling sites

Site	Site code	Map reference	Location
Waiongana Stream	WGA000361	Q19: 145-379	100 m u/s of discharge
Piggery effluent	PGP002002	Q19: 146-380	In aerobic pond adjacent to outlet
Waiongana Stream	WGA000363	Q19: 146-380	50 m d/s of discharge

Comments in relation to these inspections and the results of the sampling programme are provided as follows:

Table 2 Results from DH Lepper Trust piggery and Waiongana Stream, sampled on 15 November 2006

Site location		WGA000361 Waiongana Stream upstream	WGA000363 Waiongana Stream downstream	PGP002002 Piggery final effluent
Parameter	Unit			
Time	NZST	0930	0935	0940
Temperature	°C	16.0	16.0	18.0
Conductivity @ 20°C	mS/m	6.6	8.0	336
Chloride	g/m ³	9.4	10.2	239
pH		7.4	7.4	-
Total carbonaceous BOD5	g/m ³	-	-	240
Filtered carbonaceous BOD5	g/m ³	2.5	2.0	36
Ammoniacal nitrogen	g/m ³ N	0.104	1.45	-
Unionised ammonia	g/m ³ NH ₃	0.001	0.013	-
Dissolved reactive phosphorus	g/m ³ P	0.044	0.1.81	-
Turbidity	NTU	16	19	220
Suspended solids	g/m ³	22	30	650
Appearance		high, turbid (SG = 0.65m)	Faint red plume	Reddish coloured (algal bloom)

SG = staff gauge (depth of flow)

Under moderately high river flow conditions (>10 cumecs) these results indicated that the wastewater dilution was probably in excess of 300:1. Minimal impacts were measured in the Waiongana Stream below the mixing zone and the discharge was in compliance with all relevant Special Conditions of consent **0715**. Elevated nutrients, turbidity and suspended solids were typical of flood conditions in the Waiongana Stream. The wastewater total cBOD₅ result was comparable to previous year's results and the suspended solids concentration was slightly elevated compared to previous results, indicating the anaerobic pond would possibly benefit from desludging.

Table 3 Results from DH Lepper Trust piggery and Waiongana Stream, sampled on 21 May 2007

Site location		WGA000361 Waiongana Stream upstream	WGA000363 Waiongana Stream downstream	PGP002002 Piggery final effluent
Parameter	Unit			
Time	NZST	1210	1205	1200
Temperature	°C	14.5	14.5	15.5
Conductivity @ 20°C	mS/m	12.1	12.6	300
Chloride	g/m ³	13.2	13.5	305
pH		7.6	7.6	-
Total carbonaceous BOD ₅	g/m ³	-	-	280
Filtered carbonaceous BOD ₅	g/m ³	1.8	1.9	28
Ammoniacal nitrogen	g/m ³ N	0.225	1.45	-
Unionised ammonia	g/m ³ NH ₃	0.003	0.011	-
Dissolved reactive phosphorus	g/m ³ P	0.054	0.134	-
Turbidity	NTU	72	61	450
Suspended solids	g/m ³	90	93	330
Appearance		High & turbid (SG = 0.56m)	High & turbid slight pink discoloration	Pink colour, slightly noticeable discharge plume

Under moderately high turbid river flow conditions (8.0 cumecs) these results indicated wastewater dilution was probably in excess of 600:1.

Minimal impacts were measured in the Waiongana Stream below the mixing zone and the discharge was in compliance with all relevant Special Conditions of consent **0715**. Elevated nutrients, turbidity and suspended solids were typical of flood conditions in the Waiongana Stream. The wastewater total cBOD₅ result was comparable to previous years' results and the suspended solids concentration was lower, which may have been a result of desludging the anaerobic pond a fortnight previously on 7 May 2007. The wastewater turbidity result was slightly elevated which was typical of mechanical mixers stirring the ponds during the desludging program.

2.1.4 Treated piggery/dairy wastewater

Prior to the 2006-2007 monitoring period, the treatment ponds system was sampled for various reasons. These results are summarised in Table 4. The sampling point was within the final (aerobic) pond, adjacent to the outlet.

Table 4 Summary of treated wastewater analysis results from the DH Lepper Trust piggery/dairy for the period 1991 to June 2006

Parameter	Unit	Number of samples	Range	Median
Conductivity @ 20°C	mS/m	14	222 - 415	288
pH		4	8.1 - 8.3	8.1
Total carbonaceous BOD ₅	g/m ³	8	120 - 1100	170
Filtered carbonaceous BOD ₅	g/m ³	7	7.2 - 46	28
Ammoniacal nitrogen	g/m ³ N	9	189 - 336	257
Turbidity (cyberscan)	NTU	4	220 - 450	360
Suspended solids	g/m ³	11	230 - 800	410

These results illustrate the variability in effluent quality measured from this dairy/piggery treatment system over the period prior to the establishment of the current tailored consent monitoring programme. Some of this variability relates to stormwater infiltration through the system and may have coincided with changes in the configuration preceding storage provided by the treatment system over the fifteen-year period surveyed.

The current treatment system's effluent was monitored on two occasions during the 2006-2007 period (see Section 2.1.2) and these results are summarised in Table 5 for comparative purposes.

Table 5 Summary of treated wastewater analysis results from the DH Lepper Trust piggery/dairy for the period July 2006 to June 2007

Parameter	Unit	Number of samples	Range	Median
Conductivity @ 20°C	mS/m	2	300 - 336	318
Total carbonaceous BOD ₅	g/m ³	2	240 - 280	260
Turbidity	NTU	2	220 - 450	335
Suspended solids	g/m ³	2	330 - 650	490

2.1.5 Treated effluent discharge records

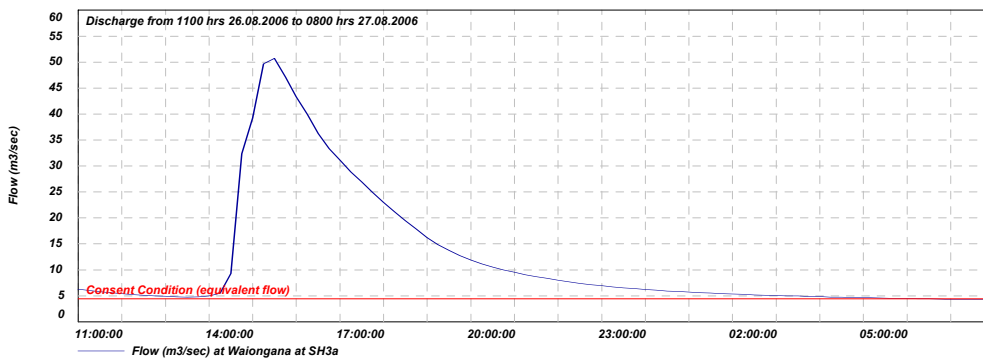
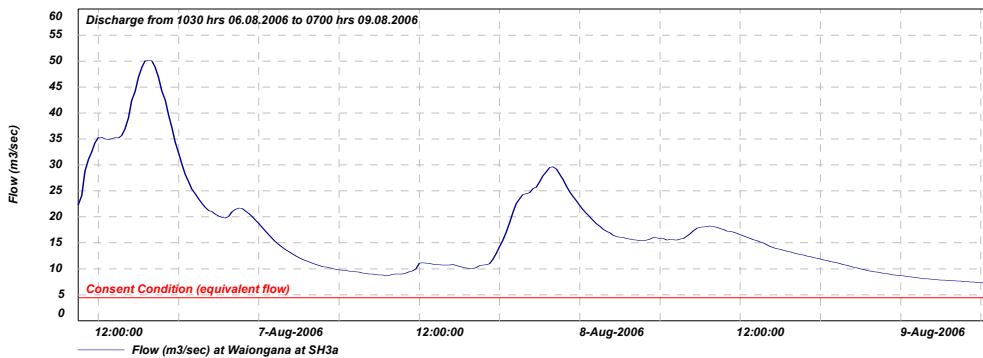
Records of treated wastewater discharges to the Waiongana Stream supplied by the consent holder, as required by Special Condition 8 of consent **0715**, are provided in Table 6.

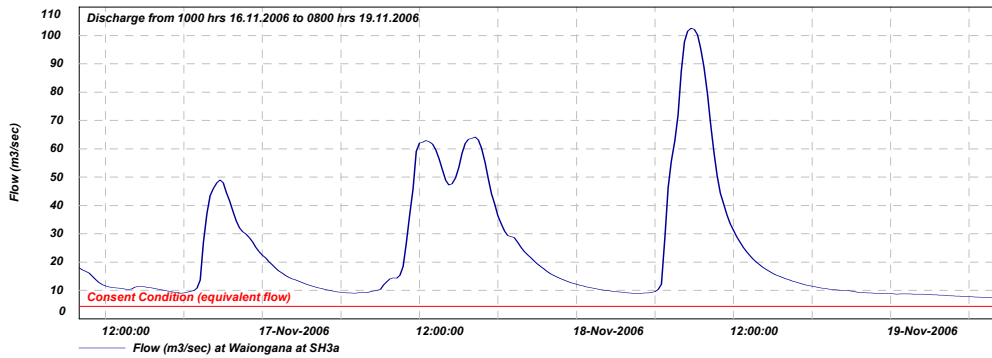
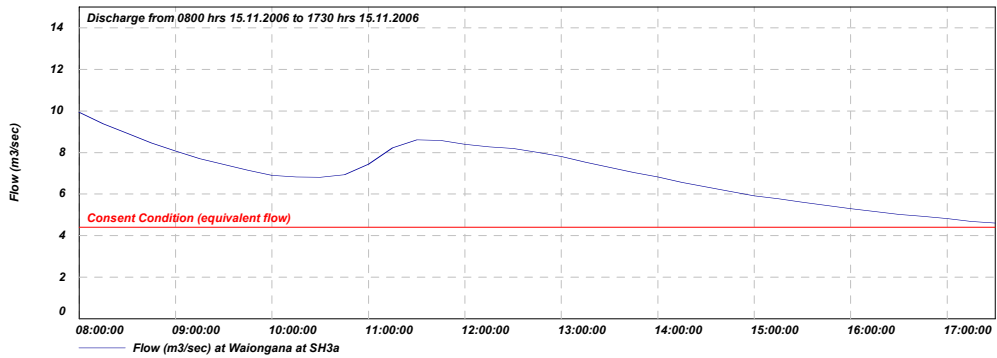
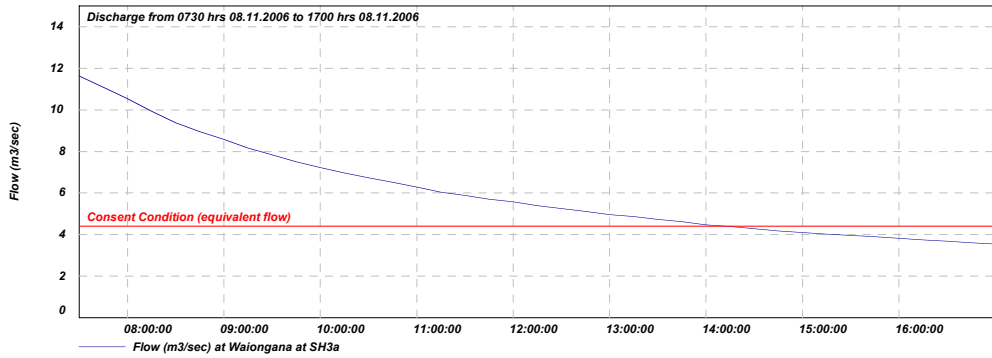
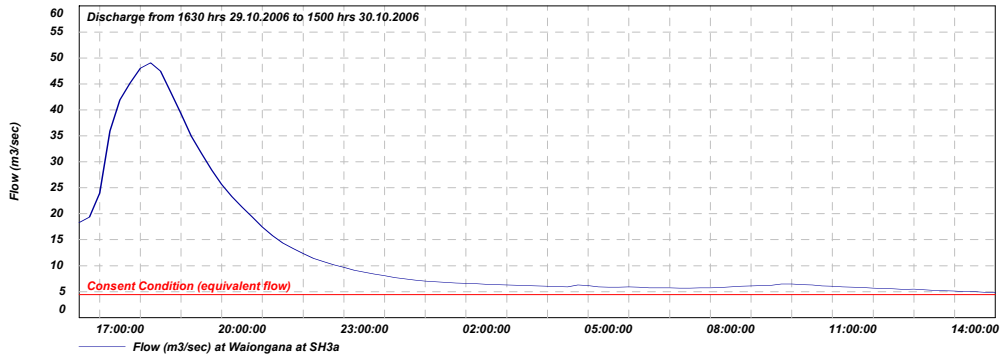
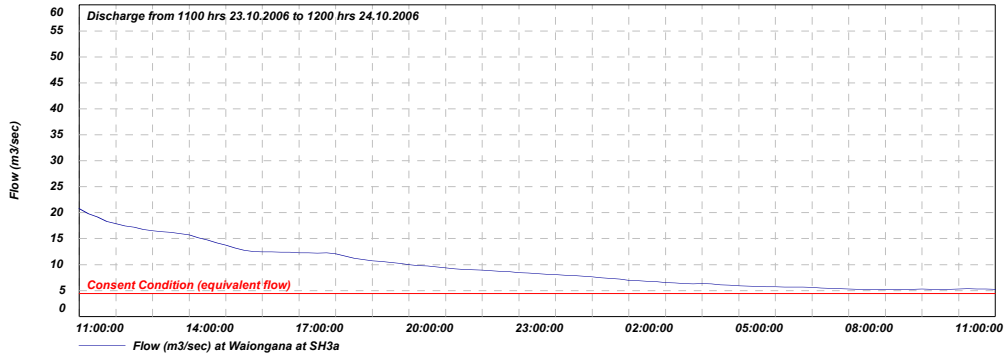
Table 6 Discharge records of piggery treated wastes to the Waiongana Stream

Discharge period	Duration (hrs)	TRC notified	Stream flow during period (m ³ /sec)
06 Aug 06, 1030 hrs to 09 Aug 06, 0700 hrs	68.5		50 - 7.5
26 Aug 06, 1100 hrs to 27 Aug 06, 0800hrs	21		52 - 5
23 Oct 06, 1100 hrs to 24 Oct 06, 1200 hrs	25		21 - 6
29 Oct 06, 1630 hrs to 30 Oct 06, 1500 hrs	22.5		47 - 5.2
08 Nov 06, 0730 hrs to 08 Nov 06, 1700 hrs	9.5	✓	11.8 - 4.8
15 Nov 06, 0800 hrs to 15 Nov 06, 1730 hrs	9.5	✓	10 - 5.2
16 Nov 06, 1000 hrs to 19 Nov 06, 0800 hrs	70		102 - 6
18 Mar 07, 0830 hrs to 19 Mar 07, 1730 hrs	9		40 - 4.8
21 May 07, 0930 hrs to 21 May 07, 1700 hrs	7.5	✓	9 - 4
23 May 07, 0915 hrs to 24 May 07, 1300 hrs	3.5		125 - 5
30 June 07, 0815 hrs to 06 July 07, 1430 hrs	151		87 - 7

These records indicate that, on most occasions, the treated effluent discharge into the Waiongana Stream was well managed and compliant with Special Condition 4 of consent **0715**. Council was notified of discharges on three out of eleven occasions. On 07 May 2007 the consent holder informed Council that spray irrigation to land had commenced.

The following graphs (Figure 2) illustrate the piggery discharges in relation to the Waiongana Stream flow conditions at the time of discharge. The 5 m³/sec minimum river flow consent condition is highlighted in red. The blue line represents the river flow (m³/sec) at the time of discharge.





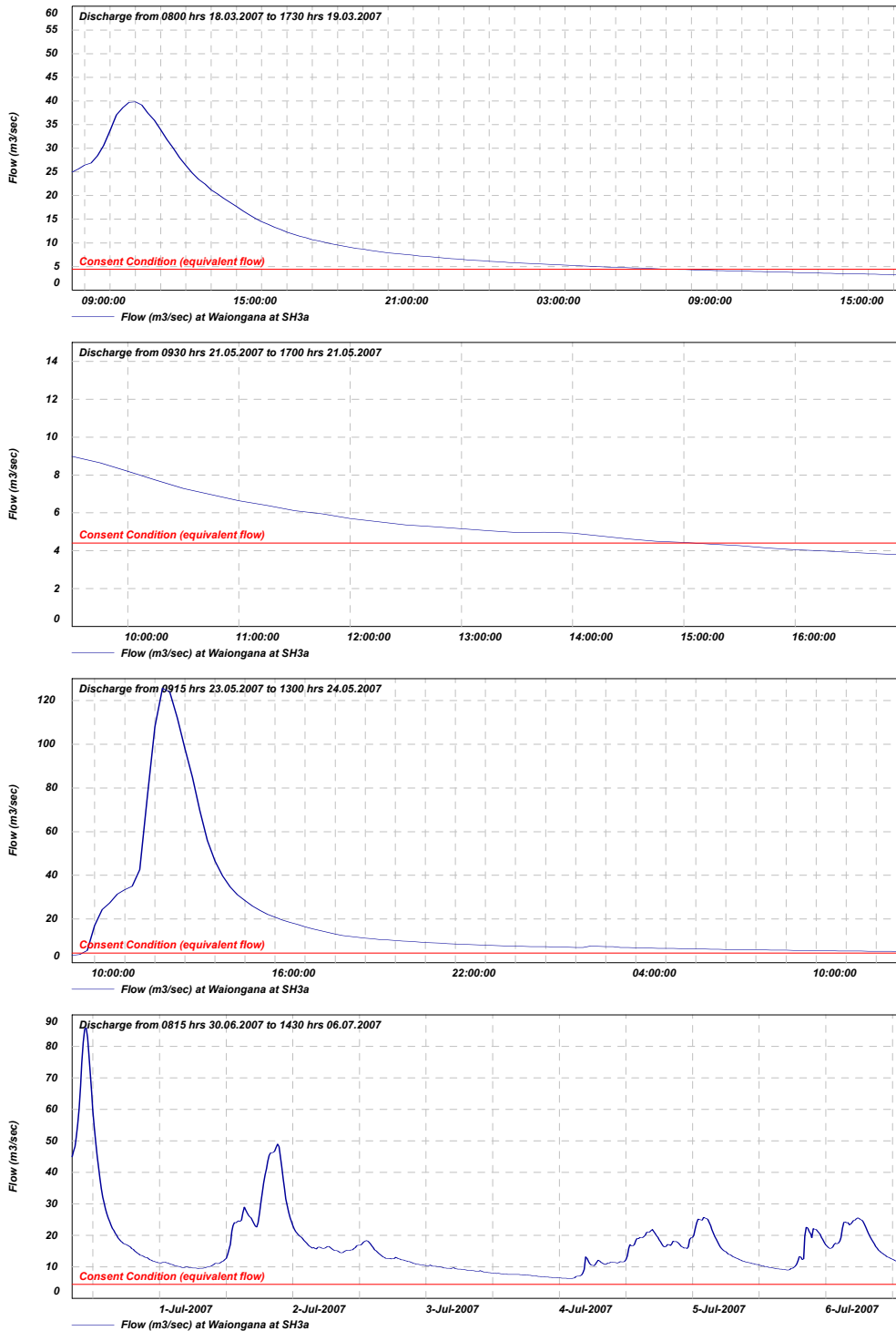


Figure 2 Graphs displaying discharge records received from the consent holder

The above graphs (Figure 2) demonstrate that good wastewater dilution ratios have been maintained on most occasions. The Waiongana Stream hydrology displays a natural rapid rise and fall (typical of Taranaki mountain ring plain streams) which allows for a limited window of opportunity when treated wastewater can be discharged all flows above the minimum consent limit.

The treated wastewater discharge on 08 November 2006 (Figure 2 graph 5) shows a receding stream flow condition that was slightly below the consent requirement

which continued for a further period of up to two hours. No adverse effect was likely to have resulted.

2.2 Air

2.2.1 Inspections

Air quality is checked during compliance monitoring inspections, or if odour complaints are received. There were several odour complaints concerning piggery emissions from the ponds system, and routine follow-up inspections found objectionable odours off site on four occasions.

2.3 Register of incidents

The Taranaki Regional Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The register ('unauthorised incident register') includes events where the company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

Incidents may be alleged to be associated with a particular site. If there is an issue of legal liability, the Council must be able to prove by investigation that the identified company is indeed the source of the incident (or that the allegation cannot be proven).

In the 2006-2007 year, there were seven incidents recorded by the Council that were associated with the DH Lepper Trust piggery.

2.3.1 Incidents

Odour complaint received on 11 July 2006

A Council Investigating Officer carried out an ambient air odour survey of the piggery and oxidation pond system, after receiving an odour complaint. It was found that odours were consistently objectionable beyond the farm boundary. The wind conditions were moderate to strong west-north-westerly, changing direction to the north during the inspection. The survey was conducted along Sisson Terrace and Manutahi Roads, Lepperton. Consistent and objectionable odours were detected at Sisson Street, which as a result in the wind changing direction during the investigation, reduced in intensity in the area where neighbours were affected.

Odour complaint received on 3 August 2006

A complaint was received by the Council that odours were emanating from the oxidation pond system. The wind at the time of investigation was a strong north-westerly. Intermittent and noticeable odours from the oxidation pond system were detected at Smith Street. The Investigating Officers reported that odours had abated in the previous hours and that the odour complaint could not be substantiated.

On 4 September 2006, a further odour investigation was carried out by Council around the oxidation ponds and at Lepperton Township. A moderate northerly wind brought light strength odours from the ponds. Stronger odours were detected along a track off Smith Street.

Odour complaint received on 26 September 2006

A complaint was received regarding odour from the oxidation ponds. An investigation by Council officer on 27 September 2006 found that the odour was objectionable beyond the consent holder's boundary. A discussion with surrounding neighbours revealed that the odours had become much worse since the Christmas period. The Council requested a meeting with the consent holder, which took place on 20 October 2006 at the Council offices. A recommendation from this meeting was that DH Lepper trust engages an environmental consultant with experience in odour management and carry out an appraisal and make recommendations in eliminating odour. The consent holder was advised to keep the Council informed of any developments regarding these odour issues.

Odour complaint received on 14 November 2006

An odour complaint was received by the Council from a local resident regarding ongoing piggery odour from the effluent ponds. A compliance monitoring inspection was carried out the following day and it was noted, that odours were noticeable while walking to the ponds from a southerly direction. A steady, northerly breeze was blowing at the time of inspection.

Odour complaint received on 16 December 2006

A complaint regarding odour was received by the Council which was promptly investigated by an officer that afternoon. A light northerly wind was blowing and odours were noticeable, but not objectionable, along Smith Street. In this case the odour complaint was not substantiated.

On 27 December 2006 a local Lepperton resident contacted the Council to advise that the ponds had been smelly the previous night and earlier on that morning but when contacted later on during the day the resident informed the Council the ponds did not smell. The wind direction was predominately from the north-west throughout the day.

Odour complaint received on 8 January 2007

A Council officer investigated an odour complaint, received by the Council, concerning piggery pond odours coming from Lepper's oxidation ponds. The ponds were inspected and it appeared that the ponds were working as per design. A warm humid northerly was carrying the odour beyond the property boundary and causing a noticeable, but not offensive, odour about 180 metres downwind, along Sisson Terrace and Smith Street corner. The consent holder was instructed that no particular immediate action was required as a result of the investigation but to comply with the consent conditions and try to avoid offsite odours.

Odour complaint received 20 May 2007

An odour complaint regarding piggery odours was received by Council and an investigation was carried out. Moderate to intermittent odours were noted at Manutahi Road and intermittent odours were also noted at Sisson Street. A light, steady wind from a northerly direction had occurred throughout the day.

The Council requested that the consent holder submit a letter to Council detailing any progress made towards finding a solution towards minimising odour effects and also to provide a suitable timeframe required in resolving these odour issues.

3. Discussion

3.1 Discussion of plant performance

The DH Lepper Trust's piggery/dairy performance generally has been very good. The implementation of a tailored consent monitoring programme has shown the consent holder to have met consent conditions, including receiving water conditions (for unionised ammonia and filtered carbonaceous BOD₅ and dilution), receiving water dilution ratios with minor exception, monitoring of the wastewater disposal system, maintenance of records and discharge to land requirements. The consent holder has also advised Council on some occasions of the exercise of the consent to discharge to the Waiongana Stream, thereby assisting with components of the monitoring programme.

The site has been well maintained and the use of the piggery wastes separator system assists with lowering waste loadings to the anaerobic-aerobic treatment ponds system. It also enables the use of valuable nutrients and organic material as a soil conditioner.

Annual disposal of treated wastewater to land was also performed during the monitoring period in compliance with Special Condition 9 of consent 0715.

Several odour complaints were received and investigated by the Council throughout the monitoring period. All the complaints related to odours (of varying sensitivity) emanating from the oxidation ponds system. No complaints were received from the piggery operation itself.

The consent holder is working with NIWA, Waratah Farms Ltd and other institutions within the pork industry to improve the pond odour situation and the consent holder will keep the Council informed of any developments. The air discharge permit expires in June 2008 and an odour management plan will need to be developed and submitted to Council for consideration of a replacement consent.

3.2 Environmental effects of the exercise of water and land discharge consent

Receiving water physicochemical monitoring indicated that the discharge of treated piggery/dairy effluent to the Waiongana Stream, which generally only occurred under high stream flows, had minimal impacts on the stream and complied with the minimum dilution standard. All parameters measured complied with relevant consent conditions.

Discharge of treated effluent to land from the first pond reduced the frequency of discharge of effluent to water, and was likely to have improved effluent quality (through the reduction of wastes loadings on the system). Discharge to land also improves soil structure and fertility.

3.3 Environmental effects of exercise of air discharge permit

Seven odour complaints concerning piggery odour emissions from the pond system was received by the Council during the 2006-2007 period. Four complaints investigated by the Council were recorded as '*light*' odours, two of the odour

complaints were reported as '*strong*' odour and one complaint investigated was '*moderate*' odour, all recorded beyond the boundary of the site.

The Council uses FIDOL factors and scales to rate odour observations. The five FIDOL factors used are frequency, intensity, duration, offensiveness and location.

Frequency:

- How many times the odour is detected during the investigation.

Intensity:

- Perceived strength or concentration of the odour.
- Does not relate to degree of pleasantness or unpleasantness.
- Assessed subjectively using 0-5 scale (ambient)
 0. *Not detectable – no odour*
 1. *very light – odour detected but may not be recognisable*
 2. *light – odour recognisable (ie, discernible)*
 3. *Moderate – odour very distinct and clearly distinguishable.*
 4. *Strong – odour causes a person to try to avoid it*
 5. *very strong – odour overpowering and intolerable*

Duration:

- The lengths of time people are exposed to odour.
- During an investigation how long does the odour persist

Offensiveness:

- A rating of an odour's pleasantness or unpleasantness ("hedonic tone").
- This does not necessary have the same meaning as offensiveness in the Act or consent conditions
- A subjective assessment which can vary between individuals, but which must also be based on a 'typical' response.

Location:

- Where the odour is detected from.
- Note type of area (for example, agricultural, residential, or industrial).

Odours emanating from the aerobic pond are generally acceptable, but odours from the anaerobic pond, as to be expected, are more odorous and it's these odours which give rise to complaints from neighbours. Weather conditions, especially wind direction (Figure 3), have been the main trigger for residents to register an odour complaint with the Council. In all odour cases investigated, the wind has been from a northerly quarter in relation to the oxidation ponds.

The complainants are all local residents living within close proximity (200 metres), directly south-west of the ponds system. The locations from where the complaints have been received, and the Council subsequently investigated, are Sisson Terrace, Smith Street and an industrial area on the eastern side of Manutahi Road Bridge. The consent holder has not received any odour complaints directly, but is aware of recent developments and disquiet with within the Lepperton Township and is working with other pork producers and consultants to minimise and rectify this situation.

For the majority of the monitoring period the consent holder has maintained and operated the ponds system effectively, demonstrating good odour control apart from the localised neighbouring issue which needs to be resolved.



Figure 3 Aerial map showing wind direction in relation to ponds and township

3.4 Evaluation of performance

A tabular summary of DH Lepper Trust's compliance record for the year under review is provided in Tables 7, 8 & 9.

Table 7 Summary of performance for Consent 0715-3 To discharge piggery and farm dairy effluent from an oxidation pond treatment system into the Waiongana Stream during fresh (high flow) conditions

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Operation and discharge in accordance with application	Inspections of data and discharge point inspections	Yes
2. Location and position of the discharge point	Monitoring inspections	Yes
3. Minimum dilution rate in receiving waters	Consent holders discharge records and monitoring	Yes
4. Discharge only when the river conditions allow.	Consent holders discharge records and monitoring	Yes
5. Maximum concentrations in receiving water after mixing	Physiochemical sampling	Yes
6. Constituents not permitted in receiving water after mixing	Monitoring inspections of receiving waters	Yes
7. Operation and maintenance of treatment and discharge system	Monitoring inspections	Yes
8. Records of discharge	Consent holders discharge records received by Council	Yes
9. Effluent from aerobic pond discharged to land	Consent holder to notify Council	Yes
10. Notification of discharging to land	Consent holder to notify Council	Yes
11. Optional review provision	Next permit review – June 2008	N/A

N/A = not applicable

DH Lepper Trust has subsequently demonstrated an overall high level of environmental performance and compliance with the resource consent.

Table 8 Summary of performance for Consent 5206-1 to discharge emissions into the air from a pig farming operation and associated practices including solids composting, effluent treatment and other waste management activities

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Adoption of action to minimise adverse environmental effects	Monitoring inspections	Yes
2. Consultation and approval prior to alterations to plant or process	Monitoring inspections	N/A
3. Minimisation of impact and emissions through use of equipment and suitable methods	Monitoring inspections	Yes
4. Operation in accordance with application	Monitoring inspections	Yes
5. Objectionable odour at site boundary not permitted (excluding ponds)	Monitoring inspections	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
6. Objectionable dust levels at site boundary not permitted	Monitoring inspections	Yes
7. Significant adverse ecological effect on ecosystems	Monitoring inspections	Yes
8. Maintenance and landscaping plan	Monitoring inspections	N/A
9. Maintain and operate the effluent ponds system and associated activities	Monitoring inspections	Yes
10. Advise neighbours prior to irrigating effluent to land	Consent holder to inform neighbours and Council prior to irrigating to land.	Yes
11 Particular regard to wind direction to minimise effects upon neighbours when discharging effluent	Monitoring inspections	Yes
12. Review of consent conditions	Consent expires 1 June 2008	N/A

N/A = not applicable

Although seven odour complaints regarding the effluent ponds system were received and subsequently investigated by the Council, Special condition 5 authorised by the consent reads,

'other than emissions from the effluent ponds shall not give rise to an odour at or beyond the boundary of the site.'

which implies that DH Lepper Trust has subsequently demonstrated an overall good level of environmental performance and compliance with the resource consent.

Table 9 Summary of performance for Consent 0188-3 to take water from an unnamed tributary of the Waiongana Stream for piggery purposes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
1 Minimise environmental effects	Monitoring inspections	Yes
2 Water abstraction not to exceed 50% of the stream flow	Monitoring inspections	Yes
3. Review of consent conditions	Optional permit review – June 2008	N/A

N/A = not applicable

DH Lepper Trust has subsequently demonstrated an overall high level of environmental performance and compliance with the resource consent.

The overall rating across all three resource consents indicated that a good level of environmental performance and good compliance was achieved.

3.5 Recommendations from the 2005-2006 Annual Report

In the 2005-2006 Annual Report, it was recommended:

That monitoring of air emissions and discharges to natural water from the DH Lepper Trust Piggery and farm dairy in the 2006-2007 year, continues at the same level as in the 2005-2006 period.

The monitoring programme was undertaken as scheduled.

3.6 Alterations to monitoring programme for 2007-2008

In designing and implementing the monitoring programmes for air/water discharges in the region, the Taranaki Regional Council has taken into account the extent of information made available by previous authorities, its relevance under the Resource Management Act, the obligations of the Act in terms of monitoring emissions/discharges and effects, and subsequently reporting to the regional community, the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki emitting to the atmosphere/discharging to the environment.

In the case of DH Lepper Trust piggery/dairy monitoring programme, it is recommended that there be no alteration to the programme for the 2007-2008 period. A recommendation to this effect is attached to this report.

3.7 Exercise of optional review of consent

Resource consents **0715-3** (wastewater discharge) and **0188-3** (water take) both provide for an optional review of consent in June 2008.

Condition 11 on consent **0715-3** allows the Council to review the consent, to ensure that conditions are adequate to deal with any significant adverse effects on the environment in relation to dilution rate, maximum discharge rate, and concentrations of constituents of both the discharge and receiving water. Similarly, condition 3 on consent **0188-3** allows the Council to review the consent to deal with effects on the environment which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued in respect of either consent.

The air discharge Consent **5206-1** expires on 1 June 2008 and an application for renewal has been received by Council.

4. Recommendations

1. THAT monitoring of air emissions and discharges to natural water from the DH Lepper Trust piggery and dairy farm in the 2007-2008 year continue at the same level as in the 2006-2007 period.
2. THAT the consent holder continues to advise the Council of all treated effluent wastewater discharges to the Waiongana Stream and onto land.
3. THAT the consent holder monitors and maintain discharge records and forward these records to the Council at six month intervals.
4. THAT the consent holder operates and maintain pond levels with a minimum of 300mm freeboard.
5. THAT the provisions in the monitoring programme to sample the discharge and receiving waters on three separate occasions remain unchanged.
6. THAT the Consent holder be required to provide to Council an odour management plan for the avoidance of any offensive or objectionable odour from the effluent ponds on neighbouring properties, as part of the process for replacement of resource consent **5206**.
7. THAT the option for a review of resource consents **0715-3** (wastewater discharge) and **0188-3** (water abstraction) in June 2008, as set out in condition 11 of consent **0715-3**, and condition 3 of consent **0188-3**, not be exercised.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

BOD	biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate
BODF	biochemical oxygen demand of a filtered sample
bund	a wall around a tank to contain its contents in the case of a leak
CBOD	carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate
COD	chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Condy	conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m
DO	dissolved oxygen
DRP	dissolved reactive phosphorus
FIDOL	factors (frequency, intensity, duration, offensiveness and location) and scales to rate odour observations
fresh	elevated flow in a stream, such as after heavy rainfall
g/m ³	grammes per cubic metre, and equivalent to milligrammes per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures
l/s	litres per second
mS/m	millisiemens per metre
mixing zone	the zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH ₄	ammoniacal nitrogen, normally expressed in terms of the mass of nitrogen (N)
NH ₃	unionised ammonia nitrogen, normally expressed in terms of the mass of nitrogen (N)
NO ₃	nitrate, normally expressed in terms of the mass of nitrogen (N)
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water
pH	a numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.

physicochemical	measurement of both physical properties(e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment
resource consent	refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15)
RMA	Resource Management Act 1991 and subsequent amendments
SS	suspended solids,
Temp	temperature, measured in °C
Turb	turbidity, expressed in NTU
UIR	Unauthorised Incident Register entry- an event recorded by the Council on the basis that it had potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan

*an abbreviation for a metal or other analyte may be followed by the letter 'As', to denote the amount of metal recoverable in acidic conditions. This is taken as indicating the total amount of metal that might be solubilised under extreme environmental conditions. The abbreviation may alternatively be followed by the letter 'D', denoting the amount of the metal present in dissolved form rather than in particulate or solid form. For further information on analytical methods, contact the Council's laboratory

Bibliography and references

Taranaki Regional Council 1990 Review of monitoring and inspectoral procedures for dairy shed oxidation pond waste treatment systems. Taranaki Regional Council Technical report 90-42

Taranaki Regional Council 2004 DH Lepper Trust Piggery Monitoring Programme Annual Report 2003-2004 Technical Report 2004-79

Taranaki Regional Council 2005 DH Lepper Trust Piggery Monitoring Programme Annual Report 2004-2005 Technical Report 2005-24

Taranaki Regional Council 2006 DH Lepper Trust Piggery Monitoring Programme Annual Report 2005-2006 Technical Report 2006-61

Appendix I

**Resource consents held by
DH Lepper Trust Piggery**

Appendix II

Flow Rating for the Waiongana Stream (at Manutahi Road)

Waiongana Stream at Manutahi Road Bridge Height vs Flow Values

Prepared for DH Lepper Trust

(updated March 2006)

A staff gauge has been installed on the Waiongana Stream at Manutahi Road Bridge for monitoring of the stream level (or height).

The table shows stream levels at this bridge and the corresponding flow for each level.

River Level	Flow (m ³ /sec)
0.20	0.572
0.21	0.604
0.22	0.640
0.23	0.683
0.24	0.733
0.25	0.790
0.26	0.857
0.27	0.932
0.28	1.020
0.29	1.110
0.30	1.220
0.31	1.340
0.32	1.470
0.33	1.620
0.34	1.770
0.35	1.940
0.36	2.109
0.37	2.292
0.38	2.486
0.39	2.691
0.40	2.906
0.41	3.133
0.42	3.372
0.43	3.622
0.44	3.885
0.45	4.160
0.46	4.448
0.47	4.749
0.48	5.063
0.49	5.391
0.50	5.733
0.51	6.089
0.52	6.460
0.53	6.846
0.54	7.247
0.55	7.663
0.56	8.096
0.57	8.544
0.58	9.008
0.59	9.490
0.60	9.988

