

DH Lepper Trust Piggery  
Monitoring Programme  
Annual Report  
2012-2013  
Technical Report 2013–03

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Taranaki Regional Council  
Private Bag 713  
STRATFORD

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## Executive summary

DH Lepper Trust operates a piggery located on Mountain and Manganui Roads, in the Waiongana catchment. This report for the period July 2012-June 2013 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 24 conditions setting out the requirements that the Company must satisfy.

The Council's monitoring programme for the year under review included four inspections and three water samples collected for physicochemical analysis.

Consent **0715-3** expires in December 2013 with no further reviews of this consent being provided for. With the impending expiry of the consent, a thorough investigation of effluent disposal options and methods will be required by Council.

The monitoring showed that the consent holder has ensured that consented receiving water dilution ratios were generally well maintained throughout limited discharge periods. The consent holder has supplied the Council with effluent discharge records which indicate wastewater was discharged only when the flow in the Waiongana Stream was greater than 5 cubic metres per second.

Throughout the 2012-2013 monitoring period the consent holder continued to utilise extracted biogas from the covered anaerobic pond for onsite energy requirements.

During the year, the Company demonstrated a high level of environmental performance and compliance with the resource consents.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

No incidents associated with DH Lepper Trust Piggery were recorded by Council.

This report includes recommendations for the monitoring programme for the 2013-2014 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 2012-June 2013 by the Taranaki Regional Council on the monitoring programme associated with resource consents held by DH Lepper Trust. The Company operates a piggery situated on Mountain Road (SH3a) at Lepperton, 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 the 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 Company's use of water, land, and air, and is the 10th combined annual report by the Taranaki Regional Council for the Company.

#### **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 the Company.

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 2013-2014 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, (covering both activity and 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, and considered responsible resource utilisation 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 consent holder(s) 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 inconsequential (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 monitoring period were negligible or minor at most, or, the Council did not record any verified unauthorised incidents involving significant environmental impacts and was not obliged to issue any abatement notices or infringement notices, or, 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, and any inconsequential non-compliances with conditions were resolved positively, co-operatively, and quickly.
- **improvement desirable (environmental) or improvement desirable (administrative compliance)** (as appropriate) indicates that the Council may have been obliged to record a verified unauthorised incident involving measurable environmental impacts, and/or, there were measurable 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 the end of the period under review, and/or, there were on-going issues around meeting resource consent conditions even in the absence of environmental effects. Abatement notices may have been issued.

- **poor performance (environmental) or poor performance (administrative compliance)** indicates generally that the Council was obliged to record a verified unauthorised incident involving significant environmental impacts, or there were material failings to comply with resource consent conditions that required significant intervention by the Council even in the absence of environmental effects. Typically there were grounds for either a prosecution or an infringement notice.

For reference, in the 2012-2013 year, 35% of consent holders in Taranaki monitored through tailored compliance monitoring programmes achieved a high level of environmental performance and compliance with their consents, while another 59% demonstrated a good level of environmental performance and compliance with their consents.

## 1.2 Process description

The piggery operates as a 'farrow to finish' breeding and fattening unit, holding approximately 400 adult pigs and 3000 growers. The Council has calculated the total pig equivalents for the piggery equals 3420 units based on 50 kg pig equivalents.

Pigs are housed in purpose built sheds with controlled heating and ventilation systems that regulate the internal environment to optimise conditions for stock production.

A feed mill located on-site mixes the majority of the piggery's food requirements, with brought in grains and feed supplements. Recycled local waste food supplies including waste bread from local suppliers are mixed to produce a protein meal for the stock.

Stock holding pens are washed down on a daily basis and the waste is conveyed through pipes to a central collection tank. From this point, all the waste material is channelled through a solids separator contra shear screen which provides primary treatment by separating out the solid component from the piggery slurry. Solid waste is stored in three large bins prior to being mixed 50:50 with sawdust.

This mixture is then transferred to a large covered compost bunker where over a five day period it is aerated and heated to 70°C until well composted. This composting process elevates the temperature which kills harmful pathogens as well as helping to stabilize the product, and the forced aeration provides oxygen to get aerobic bacteria working. The final product, 'Grunt', is bagged and sold commercially as a soil conditioner. The screening of waste material reduces solids, biochemical oxygen demand [BOD] and some nutrients contained in the liquid effluent.

All piggery wastewater passes through a sand trap and collection sump before being pumped back up to the inlet of the covered anaerobic pond.

Partially treated effluent from the covered anaerobic pond is gravity feed via a pipeline directly to the off-site treatment ponds some 1500 metres away located on the opposing banks of the Waiongana River near Lepperton for further treatment.

The covered anaerobic pond is situated close to the north side of the piggery. Biogas is produced from the anaerobic digestion process and captured and stored beneath the plastic cover on the anaerobic pond. The biogas is compressed and forced through a hydrogen sulphide scrubber, powering a six-cylinder diesel engine that drives a 40 kilowatt generator.

This produces half of the piggery's electricity from approximately 200 m<sup>3</sup> of gas daily. Rainwater is collected from off the top of the covered anaerobic pond and is pumped back and used in the piggery.

A tank has been installed to store collected recycled water from the anaerobic pond discharge and flush out the piggery sheds. Effluent is piped back to the anaerobic pond.

Bacteria present in the two off-site treatment ponds break-down the contents of the effluent further. Periodically during high river flows, the consent holder discharges treated water from the final aerobic pond into the neighbouring Waiongana Stream in compliance with the conditions of consent 0715.

## **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 water discharge permit **0715-3** to discharge treated piggery effluent from a treatment ponds system into the Waiongana Stream during fresh (high flow) conditions. This permit was issued by the Taranaki Regional Council on December 2002 as resource consent under Section 87(e) of the Resource Management Act. It is due to expire on 1 December 2013.

Partial transfer of consent **0715-3** to separate the piggery and dairy effluent was made in accordance with sections 137(2) and (b)(i) or the RMA. These sections allow the transfer, or part transfer, of consents to another owner or occupier of the site. This part transfer of consent was completed during February 2011 with no change required to Consent **0715-3** special conditions. The transferred part of the consent (dairy discharge) is now under consent **7775-1**, held by Lepper Farms.

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 (e.g. appearance, turbidity) while biological effects may be more subtle.

Eleven special conditions are included in Resource Consent **0715-3**:

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 of 1 part effluent to 250 parts receiving water at all times.

Special condition 4 defines a minimum flow in the Waiongana Stream above 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 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 **5206-2** to discharge emissions into the air from a pig farming operation and associated practices, including solids composting, effluent treatment and other waste management activities. This permit was issued by the Taranaki Regional Council on 13 November 2008 as a resource consent under Section 87(e) of the Resource Management Act. It is due to expire on June 2026.

Ten special conditions are attached to the consent.

Special condition 1 requires the number of pigs [equivalent = 50kg per pig] on the property at any one time shall not exceed 3500 pig equivalents.

Special condition 2 requires the consent holder to adopt the best practicable option to prevent or minimise any actual or likely adverse effects.

Special condition 3 requires the new anaerobic pond to be covered and biogas utilised as an energy source.

Special condition 4 requires consultation should any alterations occur to the pig farming and effluent disposal processes, operations, equipment or layout which might change the nature or quantity of contaminants emitted from the site.

Special condition 5 requires the consent holder to minimise the emissions and impacts of air contaminants discharged into air from the site.

Special condition 6 restricts odours at or beyond the boundary of the site.  
Special condition 7 allows intermittent offensive and objectionable odour, beyond the property boundary for a limited period while anaerobic to aerobic pond conditions settle.

Special condition 8 outlines the recording and reporting of odour emissions which may be deemed offensive or objectionable.

Special condition 9 requires an Odour Management Plan outlining how odorous emissions beyond the boundary are minimised.

Special condition 10 provides for review of any or all of the conditions of the consent.

The permit is attached to this report in Appendix I.

### **1.3.3 Water abstraction permit**

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.

DH Lepper Trust holds consent **0188-3** 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.

Three special conditions are attached to this consent.

Special condition 1 requires consent holder to adopt best practicable option to prevent or minimise effects.

Special condition 2 states the abstraction should not exceed 50% of the natural stream flow and special condition 3 is a review provision.

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 obligation/s upon 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 and report upon these.

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 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 piggery was visited four times during the monitoring period. With regard to consents for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the consent holder were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects as part of the monitoring inspection.

#### **1.4.4 Chemical sampling**

The Taranaki Regional Council undertook sampling of both the discharges from the site and the water quality upstream and downstream of the discharge point and mixing zone.

The piggery discharge from the site was sampled on three separate occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD<sub>5</sub> (total carbonaceous) and temperature. Additional sampling for nutrients (NPK) was also performed to assess further trends in wastewater quality for the purpose of the forthcoming water discharge consent renewal process.

The Waiongana Stream, upstream and downstream of the discharge point was sampled on three occasions, and the samples analysed for conductivity, chloride, turbidity, suspended solids, BOD<sub>5</sub> (filtered carbonaceous), ammonia-N, DRP and temperature.

Water quality samples are generally collected starting at the upstream monitoring site (WGA000361) followed by the piggery discharge (PGP002002) then sampling at the downstream monitoring site (WGA00363).

The monitoring programme allows for the effluent discharge and receiving water to be sampled on three separate occasions, preferably during the summer, autumn and spring periods.

## **2. Results**

### **2.1 Water**

#### **2.1.1 Wastewater dilution establishment**

The peak wastewater discharge flow from the aerobic pond has been calculated at 14 litres per second - (ref: Colebrock-White equation and chart).

Flow rates in the Waiongana Stream are recorded at the SH3a hydrological site. The consent holder has access to the Taranaki Regional Council web site ([www.trc.govt.nz](http://www.trc.govt.nz)) which provides current river flow and water levels for the Waiongana Stream recorded at SH3a upstream of the pond discharge point. The information allows the consent holder to monitor and discharge during optimum river flow conditions in compliance with Special Consent condition 4.

The river level and flow data is automatically entered via the Council database. The data is tabulated every two hours and a graph is provided within ten minutes of downloading.

The consent holder also has available HydroTel text messaging and is signalled when the Waiongana Stream flow has reached 5m<sup>3</sup>/sec (minimum flow to allow discharge) and again when the stream flow has receded below this point.

The Waiongana Stream rise and fall is usually rapid, typical of all Taranaki mountain ring plain streams, and the actual opportunity when treated effluent can be discharged to the stream is limited.

#### **2.1.2 Inspections**

##### **14 August 2012**

This initial inspection for the 2012-2013 monitoring period was carried out during fine weather. A slight NW breeze was blowing at the time of inspection. The first pond (covered anaerobic pond) had accumulated a large pocket of methane gas beneath the cover demonstrating that active microbial digestion was occurring even during the lower winter temperatures. No odour was detected at various sites around the piggery. The levelling tank had a slight build up around the outlet pipe which was easily cleared. The grunt area and bottom sumps looked to be working satisfactory with all waste streams directed to the lower sumps. The bottom 2 ponds appeared to be working well with no noticeable odours emanating from around them. The piggery looked to be well managed and maintained.

##### **20 August 2012**

This initial receiving water monitoring survey was performed after the consent holder had informed the Council that the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected during showery weather conditions after heavy overnight rain was recorded throughout the catchment. The stream was running swift and was turbid brown in colour. The wastewater discharge from the final anaerobic pond showed no downstream environmental impact on the Waiongana Stream.

**9 November 2012**

A slight westerly wind was blowing at the time of inspection. The covered anaerobic pond appeared to be producing a high volume of methane gas as displayed by the large accumulated gas reserve stored beneath the cover. Piggery effluent was discharging directly to the receiving collection area then downward towards the lower two oxidation ponds. Normal piggery odours were detected at various sites around the piggery. The grunt area was only producing a small discharge which was flowing directly back to the effluent collection area. Ken G Moratti Ltd (agricultural contractors) spray irrigated effluent from the second pond onto a near-by cropping paddock (as per Consent 0715 Special condition 9). The final pond had discharged to the Waiongana Stream on 3 November 2013 after a heavy rainfall period. Insignificant odour was emanating from around the ponds. Overall, the wastewater treatment system was working effectively and the piggery was well managed.

**04 March 2013**

A strong southwesterly wind was blowing at the time of inspection. Piggery odour was slightly noticeable towards the downwind side of the piggery. All wastewater from the piggery and solids separator areas was flowing directly towards the discharge sump and showed no sign of any recent overflow. The ponds system was working satisfactorily with minimal microbial activity taking place in the second pond.

**9 May 2013**

This inspection was carried out during wet weather conditions. The solids separation area was working satisfactory with all wastewater collected and directed to the effluent system. Methane gas was being produced from the covered anaerobic pond and was powering the generator set. The levelling tank (anaerobic pond discharge) was slightly higher than previously noticed indicating a possible restriction in the discharge flow. No noticeable odour was detected from around the piggery (possibly due to the rain). The oxidation ponds adjacent to the Lepperton Township were operating satisfactory with no odour emanating from the ponds. Overall the piggery and wastewater treatment system was found to be well managed.

**20 May 2013**

The consent holder had requested the Council take water quality samples as the Waiongana Stream was still flowing above 5m<sup>3</sup> /sec (discharge consent limit). The consent holder had commenced discharging on 19 May at 0730 hrs. Samples were collected towards the end of the discharge some 26 hours after the discharge had commenced. The discharge was stopped shortly after the samples were collected. Nutrients analyses were included in the treated effluent to establish NPK values for the impending consent renewal process. No downstream environmental impact on the Waiongana Stream was observed from the wastewater discharge.

**18 June 2013**

Samples were collected during fine weather after a heavy rainfall event throughout the catchment prior to sampling. The consent holder had commenced discharging treated effluent into the Waiongana Stream on 17 June at 0730 hrs. Water quality samples were collected on a receding flow some 22 hours after the discharge had started. Nutrient analysis on the wastewater discharge was included as per the previous sampling run to establish NPK values. There was no visual downstream environmental impact on

the Waiongana Stream from the wastewater discharge. The final pond staff gauge reading was 430mm.

### 2.1.3 Results of discharge and monitoring receiving waters physicochemical monitoring

During the monitoring period, four inspections of the piggery site were conducted by Taranaki Regional Council staff. Samples were collected on three separate occasions from three sites as listed in Table 1 and illustrated in Figure 1, for physicochemical analysis in the Taranaki Regional Council IANZ registered laboratory.

**Table 1** Location of sampling sites in the Waiongana Stream

Site	Location	Site code	GPS reference
Waiongana Stream	Approx 100 m u/s of discharge	WGA000361	N1704439 E5676128
Piggery pond treated effluent	final pond treated effluent	PGP002002	N1704469 E5676209
Waiongana Stream	50 m d/s of discharge – true left bank	WGA000363	N1704466 E5676274

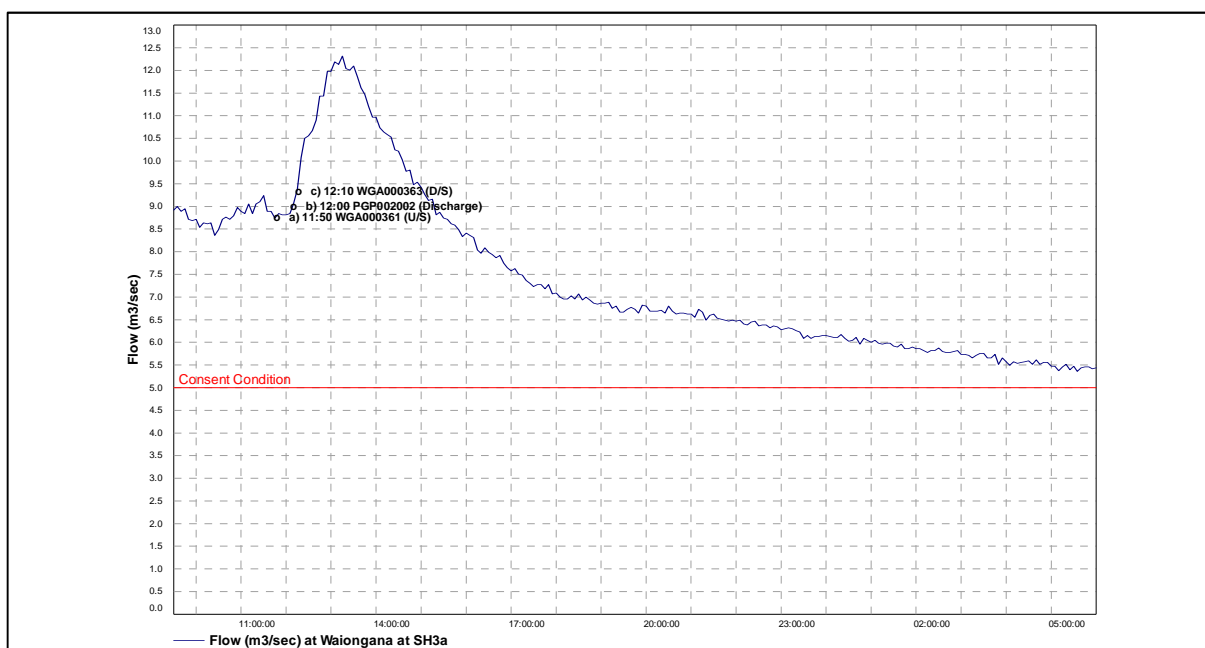


**Figure 1** Location of sampling sites



### Survey of 20 August 2012

This initial receiving water monitoring survey was performed on 20 August 2012 after the consent holder had informed the Council that the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected near the beginning of the discharge during showery weather conditions after heavy overnight rain was recorded throughout the catchment. At the time of sampling the stream was running at a swift, moderate flow with a stream flow of approximately 9m<sup>3</sup>/sec (Figure 2) following the previous fresh, (which peaked at 70m<sup>3</sup>/sec some nine hours earlier (not shown in Figure 2)). The river was turbid brown in colour. The wastewater discharge from the final anaerobic pond had no visual downstream environmental impact on the Waiongana Stream at the time of the survey. The consent holder continued to discharge for a further 18 hours before stopping the discharge when the river flow had fallen to 5.5m<sup>3</sup>/sec.



**Figure 2** Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 20 August 2012 at 0930 hrs and finishing 21 August 2012 at 0600 hrs

**Table 2** Results of the receiving water compliance survey of 20 August 2012

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	1150	1200	1210
Temperature	°C	10.9	13.4	11.6
Conductivity @ 20°C	mSm	6.4	272	7.0
Chloride	g/m <sup>3</sup>	7.5	190	7.8
pH		7.4	6.1	7.4
BOD <sub>5</sub> (total)	g/m <sup>3</sup>	-	93	-
BOD <sub>5</sub> (carbonaceous filtered)	g/m <sup>3</sup>	0.8	-	0.9
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.088	-	0.217
Un-ionised ammonia	g/m <sup>3</sup> N	0.0005	-	0.0014
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.037	-	0.094
Suspended solids	g/m <sup>3</sup>	13	198	13
Turbidity	NTU	11	97	9.1
Appearance		turbid brown	Turbid dark brown	turbid brown

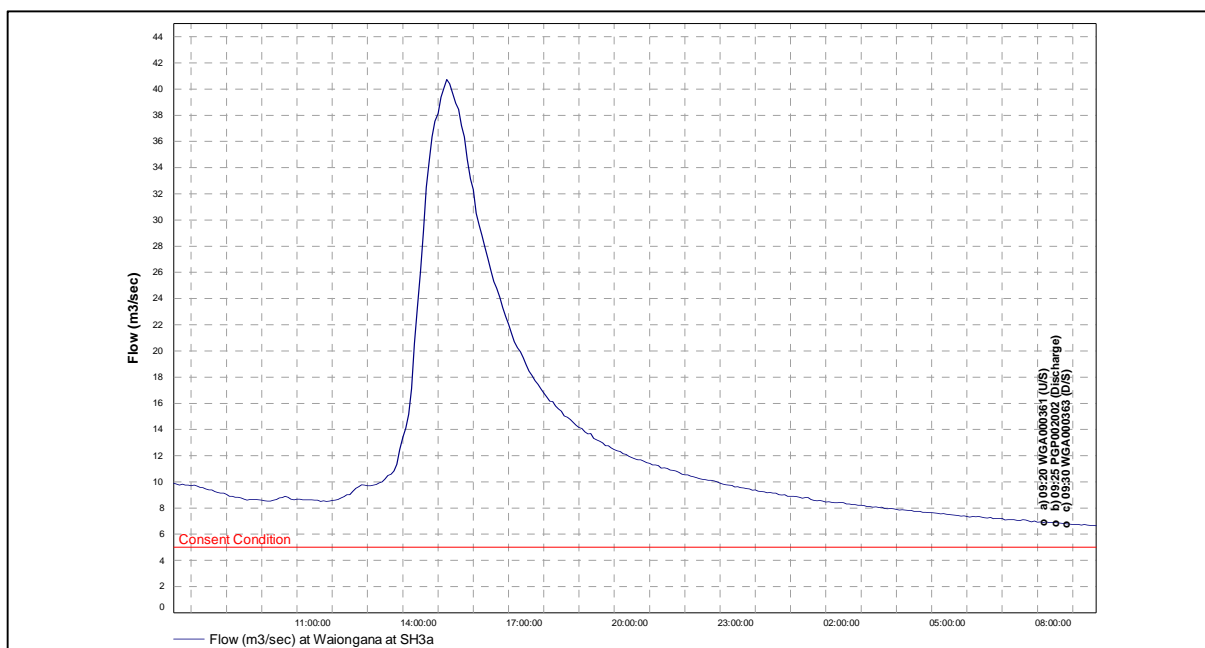
These results indicate that the dilution rate was approximately 1 part effluent to 600 parts receiving water and therefore was in compliance with Special Condition 3 at the time of the survey and likely to have complied until the discharge ceased. The increase of 0.129 g/m<sup>3</sup>N in ammoniacal nitrogen did not result in noncompliance with the un-ionised ammonia limit imposed by special Condition 5 as a result of the relatively low water temperature (11.6°C) and slightly alkaline pH (7.4) at the time of survey. There was a minimal increase in filtered carbonaceous BOD<sub>5</sub> which remained within the limit imposed by Special Condition 6, and otherwise the discharge had minimal impact in terms of pH, conductivity, and suspended solids. Compliance with Special Condition 6(b) was indicated by the field observation that there was no change in the colour or visual clarity within the receiving waters at the boundary of the mixing zone.

The piggery pond wastewater quality sampled was typical of the quality recorded since the dairy wastes were removed from the treatment system and slightly better than past median levels for all parameters.

### Survey of 20 May 2013

This second receiving water monitoring survey was performed on 20 May 2013 after the consent holder had informed the Council the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected during overcast weather conditions after heavy overnight rain on the steady recession flow of the stream which was recorded at approximately 6.8m<sup>3</sup>/sec (Figure 3) and was running at a moderate swift flow which had peaked at 40m<sup>3</sup>/sec some seventeen hours previously. The river was slightly turbid brown in colour. The consent holder stopped discharging not long after the samples had been collected, when the river had dropped to below 6.5m<sup>3</sup>/sec.

The wastewater discharge from the final anaerobic pond showed no downstream environmental impact on the Waiongana Stream.



**Figure 3** Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 19 May 2013 at 0730 hrs and finishing 20 May 2013 at 0940 hrs

**Table 3** Results of the receiving water compliance survey of 20 May 2013

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	0920	0925	0930
Temperature	°C	12.5	12.9	12.4
Conductivity @ 20°C	mSm	10.4	280	11.9
Chloride	g/m <sup>3</sup>	12.7	297	14.3
pH		7.6	8.0	7.7
Potassium	g/m <sup>3</sup>	-	247	-
BOD <sub>5</sub> (total)	g/m <sup>3</sup>	-	140	-
BOD <sub>5</sub> (carbonaceous filtered)	g/m <sup>3</sup>	<0.5	-	0.5
Chemical oxygen demand	g/m <sup>3</sup>	-	310	-
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.067	204	1.12
Un-ionised ammonia	g/m <sup>3</sup> N	0.0007	5.632	0.0151
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.028	-	0.290
Total nitrogen	g/m <sup>3</sup> N	-	246	-
Suspended solids	g/m <sup>3</sup>	7	250	8
Total phosphorus	g/m <sup>3</sup> P	-	59.7	-
Turbidity	NTU	4.6	170	5.2
Appearance		slightly turbid, brown	light turbid brown	slightly turbid, brown

These results indicate that the dilution rate was approximately 1 part effluent to 175 parts receiving water and therefore not in compliance with Special Condition 3 at the time of the survey and reflected the incomplete mixing of the discharge with the flood recession flow (referenced from time to time in earlier reports). However, the increase of 1.05 g/m<sup>3</sup>N in ammoniacal nitrogen did not result in noncompliance with the un-ionised ammonia limit imposed by special Condition 5 as a result of the low water temperature (12.5°C) and slightly alkaline pH (7.7) at the time of survey. There was no significant increase in filtered carbonaceous BOD<sub>5</sub> which remained within the limit imposed by Special Condition 6. Otherwise the discharge had minimal impact in terms of pH, conductivity, turbidity, and suspended solids. A visual assessment of Special Condition 6(b) indicated there was no change in the colour or visual clarity within the receiving waters at the boundary of the mixing zone.

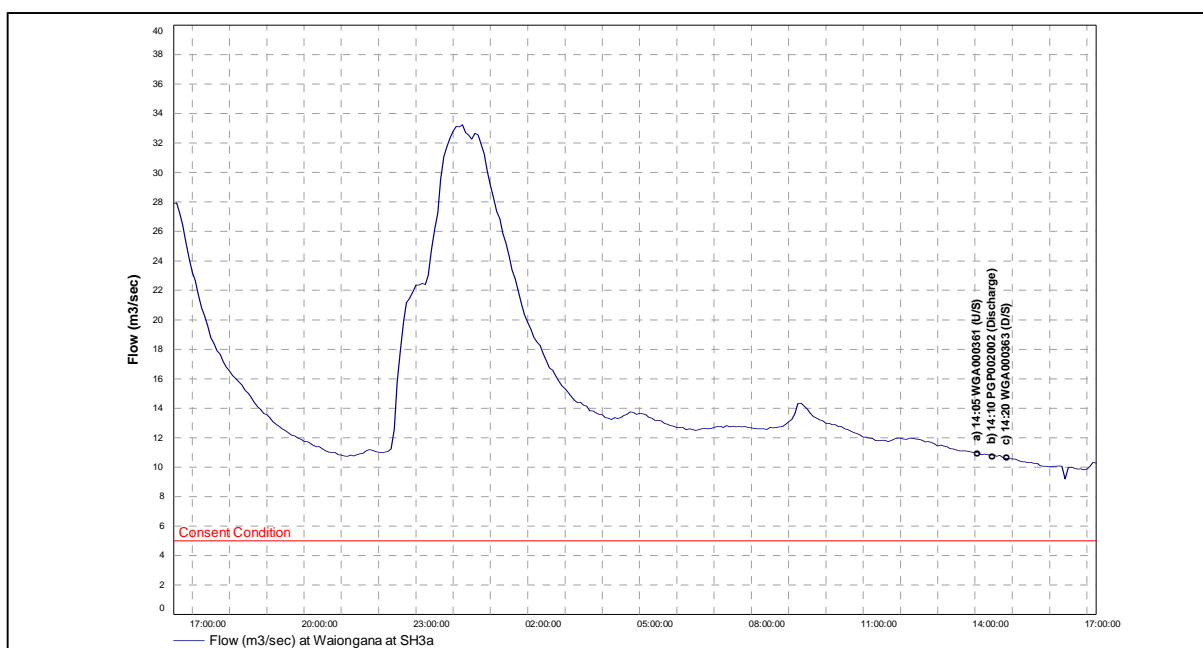
The piggery pond treated wastewater quality at the time of the survey was typical of that recorded since dairy wastes were removed from the treatment system, although toward maximum concentrations for total BOD<sub>5</sub> and turbidity.

Nitrogen (N), phosphorus (P) and potassium (K) values of the piggery wastewater have been included (Table 3) to assess the nutrient potential when spray irrigating to land compared to discharging to the receiving waters.

### Survey of 18 June 2013

This third and final receiving water monitoring survey was performed on 18 June 2013 after the consent holder had informed the Council that the piggery was discharging treated effluent to the Waiongana Stream. Samples were collected towards the end of the discharge (31 hours after the discharge commenced) during fine weather conditions after previous overnight rain. At the time of sampling the stream was running at a swift moderate recession flow of approximately 12m<sup>3</sup>/sec (Figure 4) after a fresh which peaked at 33m<sup>3</sup>/sec some fourteen hours earlier.

The river was turbid brown in colour. The consent holder continued to discharge for a further two hours after samples had been collected before stopping the discharge when the stream flow had fallen to 10m<sup>3</sup>/sec.



**Figure 4** Flow data recorded for the Waiongana Stream for the duration of the piggery wastewater discharge commencing 17 June 2013 at 1630 hrs and finishing 18 June 2013 at 1715 hrs

**Table 4** Results of the receiving water compliance survey of 18 June 2013

Site		WGA000361	PGP002002	WGA000363
Parameter	Unit	upstream	discharge	50 metres downstream
Time	NZST	1405	1410	1420
Temperature	°C	13.8	12.5	13.8
Conductivity @ 20°c	mSm	8.5	276	9.0
Chloride	g/m <sup>3</sup>	11.0	246	11.6
pH		7.5	8.1	7.6
Potassium	g/m <sup>3</sup>	-	205	-
BOD <sub>5</sub> (total)	g/m <sup>3</sup>	-	110	-
BOD <sub>5</sub> (carbonaceous filtered)	g/m <sup>3</sup>	0.6	-	0.6
Chemical oxygen demand	g/m <sup>3</sup>	-	670	-
Ammoniacal nitrogen	g/m <sup>3</sup> N	0.099	246	0.442
Un-ionised ammonia	g/m <sup>3</sup> N	0.0009	8.257	0.0053
Dissolved reactive phosphorus	g/m <sup>3</sup> P	0.035	-	0.096
Total nitrogen	g/m <sup>3</sup> N	-	260	-
Suspended solids	g/m <sup>3</sup>	16	250	17
Total phosphorus	g/m <sup>3</sup> P	-	51.4	-
Turbidity	NTU	10.2	180	9.2
Appearance		turbid brown	brown	turbid brown

These results indicate that the dilution rate was approximately 1 part effluent to 390 parts receiving water and therefore was in compliance with Special Condition 3 at the time of the survey and likely to have complied until the discharge ceased some three

hours later. The increase of 0.343 g/m<sup>3</sup>N in ammoniacal nitrogen did not result in noncompliance with the un-ionised ammonia limit imposed by special Condition 5 due to the relatively low water temperature (°C) and slightly alkaline pH (7.6) at the time of survey. There was no increase in filtered carbonaceous BOD<sub>5</sub> which remained within the limit imposed by special Condition 6. Otherwise the discharge had minimal impact in terms of pH, conductivity, turbidity, and suspended solids. A visual assessment of Special Condition 6(b) indicated there was no change in the colour or visual clarity of the receiving waters at the boundary of the mixing zone.

The treated piggery pond wastewater quality at the time of the survey was within ranges recorded since the dairy wastes were removed from the treatment system and very similar to median values for the principal parameters.

Nitrogen (N), phosphorus (P) and potassium (K) values of the piggery wastewater have again been included (Table 4) to further evaluate the nutrient potential when effluent is spray irrigating to land.

## 2.2 Historical wastewater trends

### 2.2.1 Evaluation of treatment pond system wastewater quality

**Table 5** Summary of treated wastewater analysis results from the DH Lepper Trust piggery/dairy for the period 1991 to January 2011

Parameter	Unit	Number of samples	Min	Max	Median
Conductivity @ 20°C	mS/m	16	222	415	289
pH		4	8.1	8.3	8.1
Total carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	16	110	310	170
Filtered carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	7	7.2	46	28
Ammoniacal nitrogen	g/m <sup>3</sup> N	9	189	336	257
Turbidity	NTU	14	110	450	205
Suspended solids	g/m <sup>3</sup>	17	230	840	420

The results from the final aerobic pond 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 the configuration of the recent additional covered anaerobic pond preceding the final aerobic ponds provided by the treatment system over the twenty-two-year period surveyed.

Wastewater quality data recorded for the combined piggery and dairy treatment system between 1991 and January 2011 have been summarised in Table 6.

**Table 6** Summary of the treated wastewater analysis results from the DH Lepper Trust piggery for the period May 2011 to June 2013 (ex removal of dairy wastes)

Parameter	Unit	Number of samples	Min	Max	Median
Conductivity @ 20°C	mS/m	10	216	311	278
pH	pH	10	7.9	8.3	8.1
Total carbonaceous BOD <sub>5</sub>	g/m <sup>3</sup>	10	80	140	110
Potassium (K)	g/m <sup>3</sup>	2	205	247	226
Ammoniacal nitrogen	g/m <sup>3</sup> N	2	204	246	225
Total nitrogen (N)	g/m <sup>3</sup> N	2	246	260	253
Total phosphorus (P)	g/m <sup>3</sup> P	2	51	60	56
Turbidity	NTU	10	87	180	108
Suspended solids	g/m <sup>3</sup>	10	198	300	250

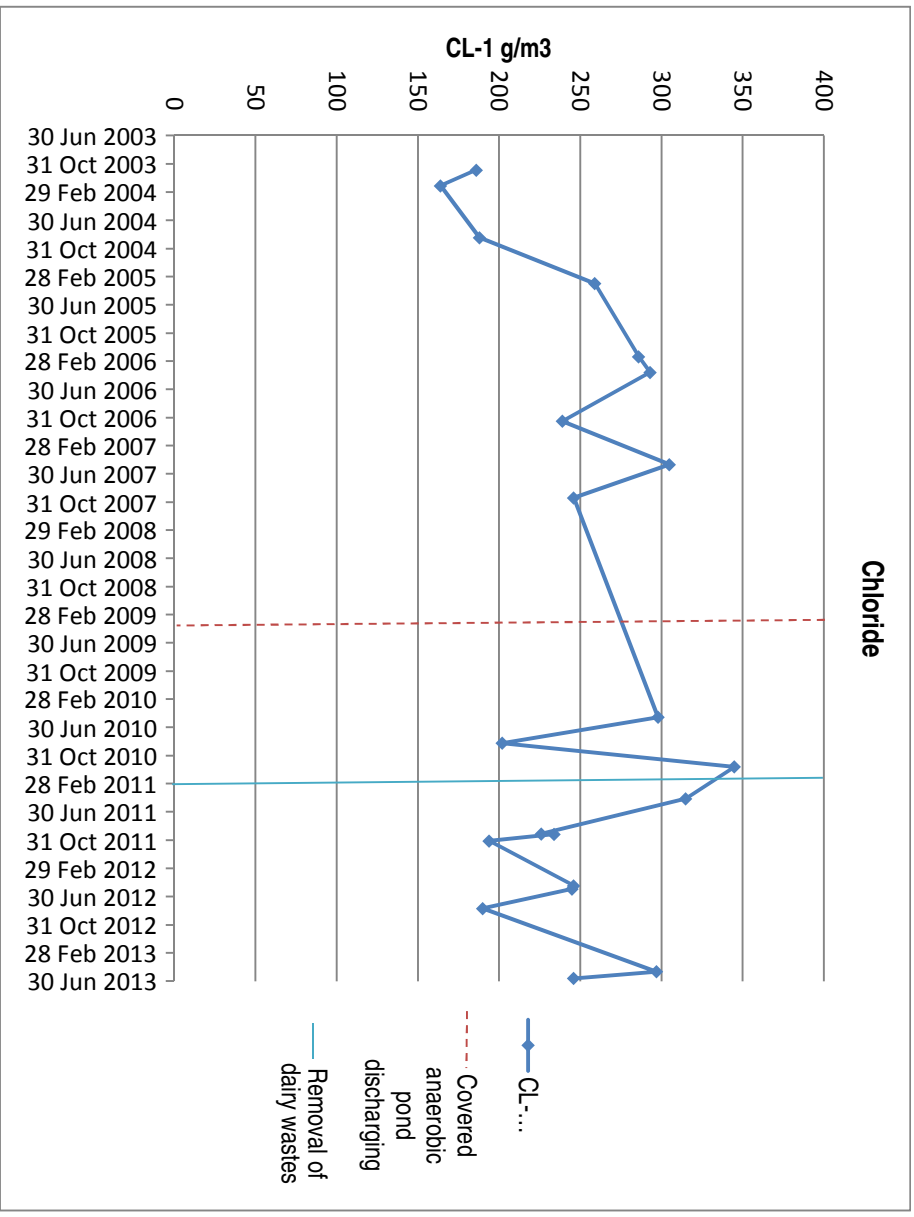
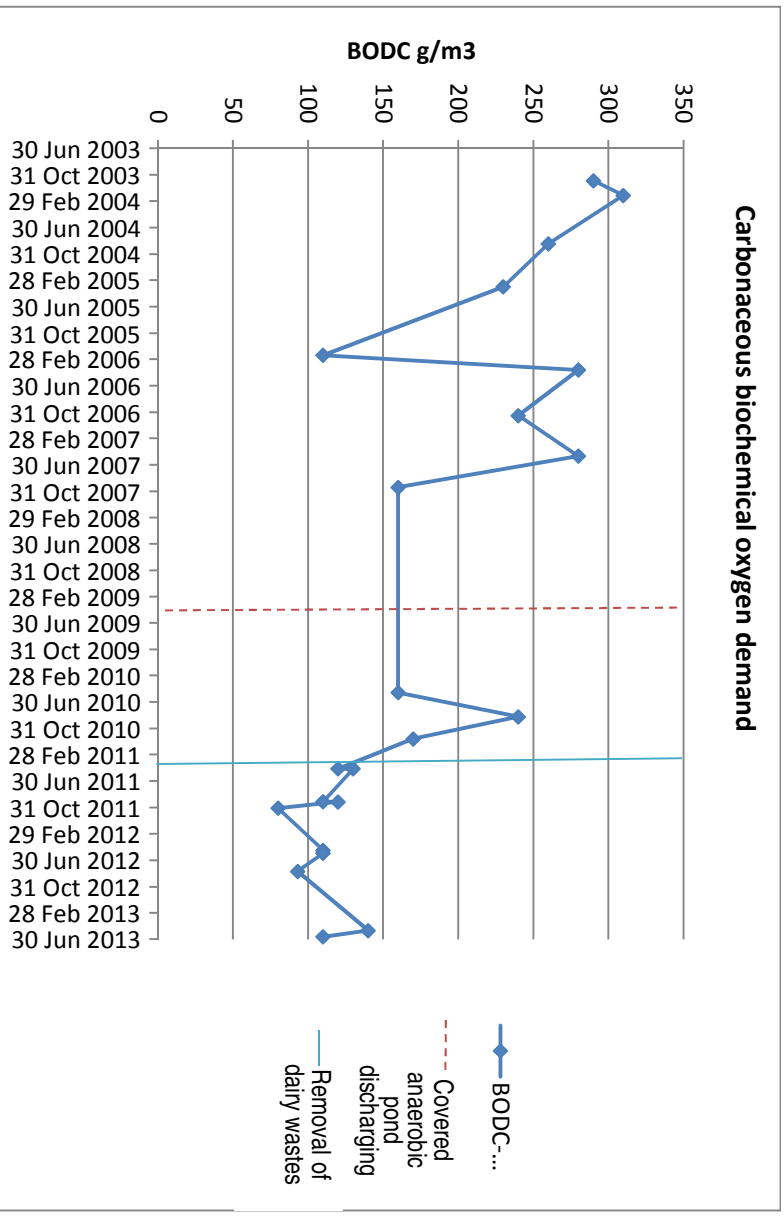
Marked improvements in terms of median wastewater concentrations are apparent for total BOD<sub>5</sub> (37% reduction) and suspended solids (40% reduction) following the removal of dairy wastes from the treatment system, although concentrations for the parameters remain typical of piggery ponds treated wastewaters (particularly very high nutrient levels).

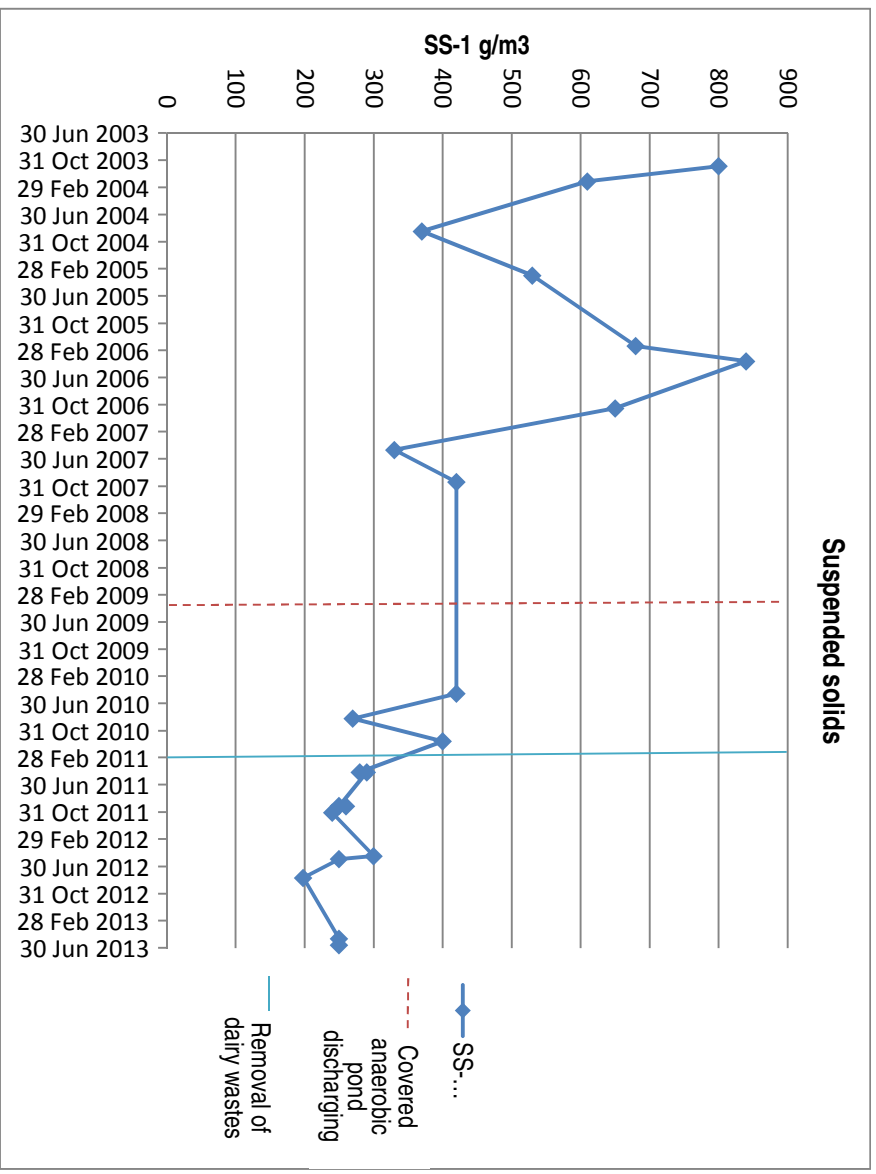
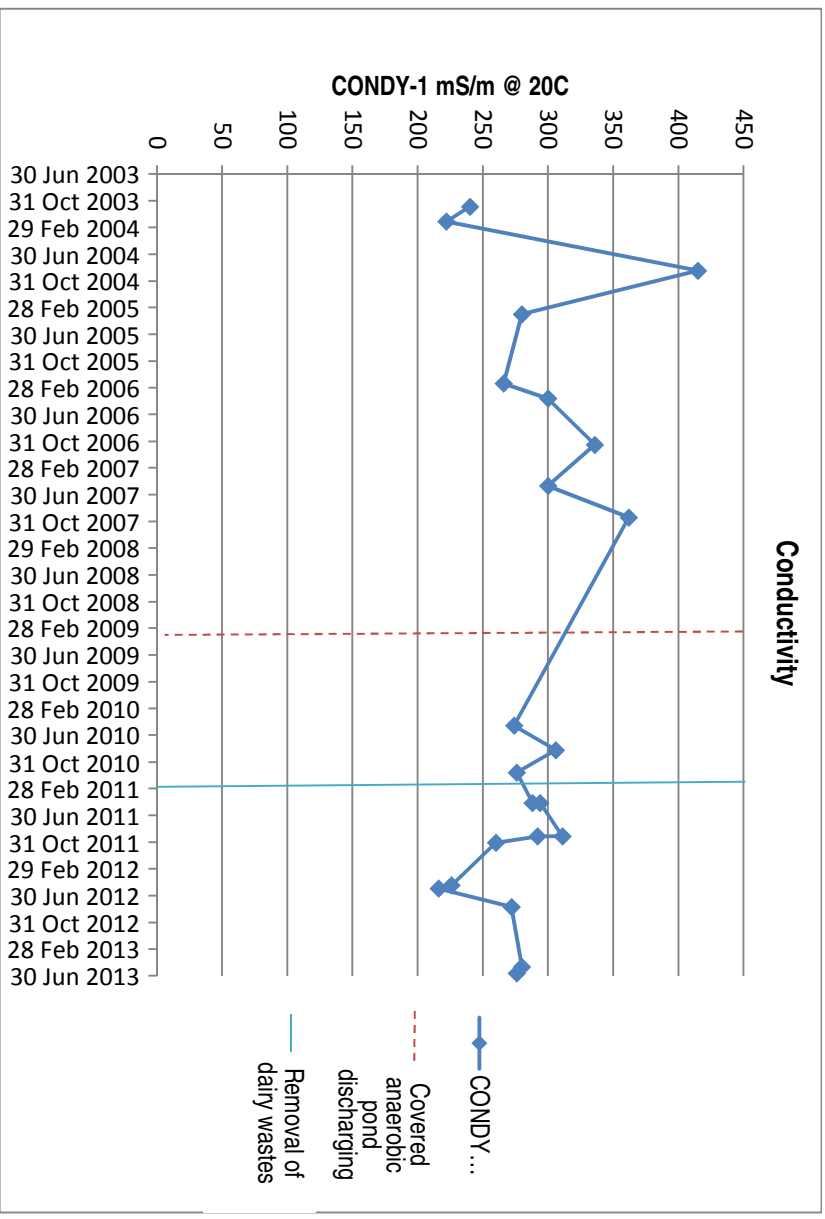
Sampling the final anaerobic pond wastewater discharge for nutrients was carried out on two separate occasions during 2012-2013. Nutrients: nitrogen (N), phosphorus (P) and potassium (K) were analysed to evaluate nutrient benefits when spray irrigating effluent to land commences compared to discharging treated effluent to the receiving waters.

The average discharge volume for the past five years = 14,868 m<sup>3</sup> per annum (295 actual discharge hours x 14 L/sec discharge effluent flow rate).

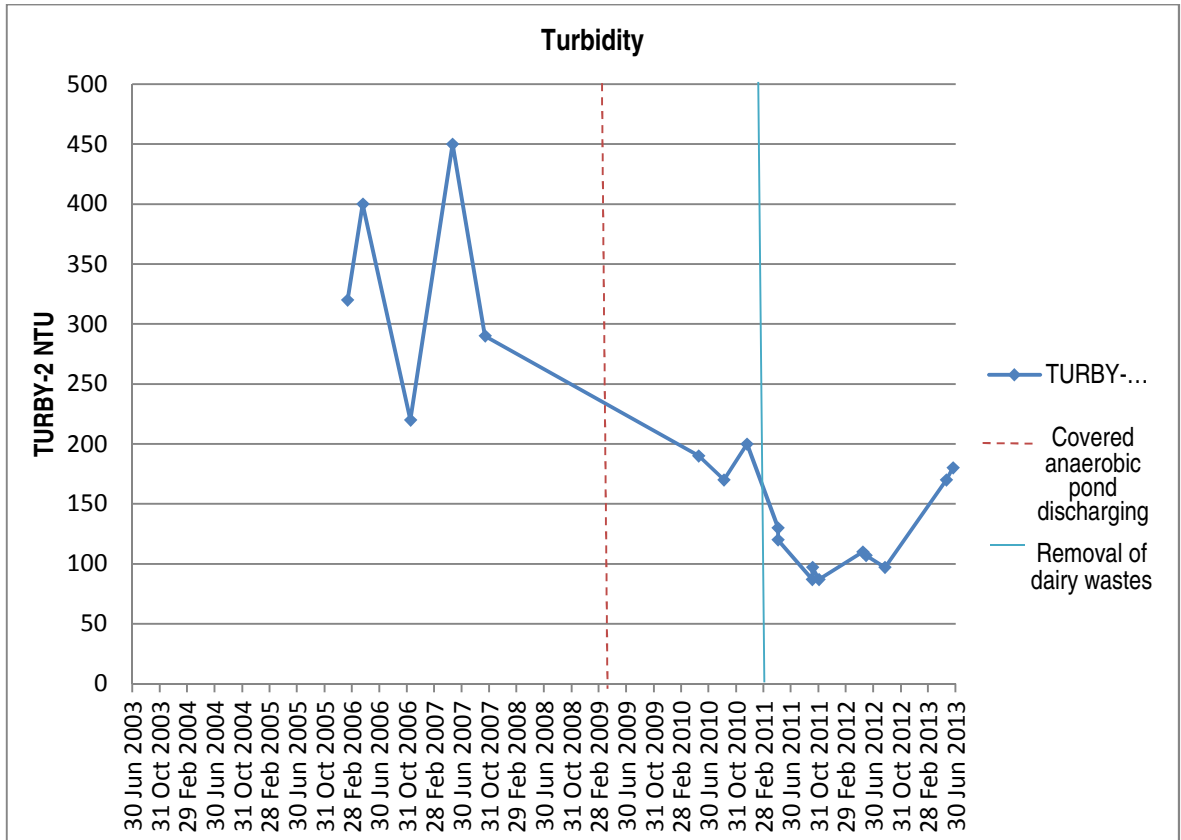
The nutrient results from the discharged wastewater show that the annual loading of total nitrogen (N) = 3,615 kg phosphorus (P) = 800 kg and potassium (K) = 3,229 kg.

Trends in various parameters are graphed in Figures 5-9.









**Figure 9** Turbidity levels for the 2003-2013 period

Since the pond upgrade in 2008 and removing the dairy shed effluent in February 2011, in terms of wastewater quality it appears that the BOD<sub>5</sub>, suspended solids, chloride and conductivity levels have now stabilised, with turbidity showing a slight upward trend. There appears to be no significant change in the chloride level at this stage.

## 2.2.2 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 **0715-3**, are provided in Table 8.

**Table 7** Discharge records of piggery treated wastes to the Waiongana Stream

Discharge period	Duration (hrs approx.)	Stream flow above 5m <sup>3</sup> /sec while discharging
14 Jul 2012 1610 hrs to 14 Jul 2012 1900 hrs	3	Yes
15 Jul 2012 0900 hrs to 17 Jul 2012 1730 hrs	56.5	Yes
07 Aug 2012 1100 hrs to 7 Aug 2012 1430 hrs	3.5	Yes
15 Aug 2012 1430 hrs to 16 Aug 2012 1810 hrs	28.5	Yes
20 Aug 2012 0930 hrs to 21 Aug 2012 0600 hrs	20.5	Yes
07 Sep 2012 1600 hrs to 08 Sep 2012 1700 hrs	25	Yes
17 Sep 2012 1345 hrs to 17 Sep 2012 1645 hrs	3	Yes
03 Nov 2012 1450 hrs to 03 Nov 2012 1930 hrs	5	Yes
17 Nov 2012 1330 hrs to 17 Nov 2012 2030 hrs	7	Yes

Discharge period	Duration (hrs approx.)	Stream flow above 5m <sup>3</sup> /sec while discharging
05 Dec 2012 1800 hrs to 05 Dec 2012 2130 hrs	3.5	Yes
30 Dec 2012 1700 hrs to 30 Dec 2012 2230 hrs	5.5	Yes
14 Jan 2013 1100 hrs to 14 Jan 2013 1430 hrs	3.5	Yes
04 Feb 2013 1735 hrs to 05 Feb 2013 0530 hrs	12	Yes
17 Mar 2013 1515 hrs to 17 Mar 2013 2015 hrs	5	Yes
17 May 2013 2030 hrs to 18 May 2013 1000 hrs	14.5	Yes
19 May 2013 0730 hrs to 20 May 2013 0940 hrs	26	Yes
22 May 2013 1530 hrs to 23 May 2013 1730 hrs	26	Yes
16 Jun 2013 2130 hrs to 17 Jun 2013 0800 hrs	11.5	Yes
17 Jun 2013 1630 hrs to 18 Jun 2013 1715 hrs	25	Yes

(Note: all times in NZST)

These records indicate that the treated effluent discharge into the Waiongana Stream was well managed and that good wastewater dilution ratios have been maintained most of the time and were compliant with Special Condition 4 of consent 0715-3. The discharge records indicated that all discharges had occurred when the river flow was above the allowable 5 m<sup>3</sup>/sec which was compliant with Special Condition 4.

The Waiongana Stream hydrology displays a natural rapid rise and fall (typical of Taranaki ring plain streams) which allows for a limited window of opportunity when treated wastewater can be discharged above the minimum consent limit. The consent holder has access to the Taranaki Regional Council web site ([www.trc.govt.nz](http://www.trc.govt.nz)) which provides current river flow and water levels for the Waiongana Stream recorded at SH3a at the time of discharging.

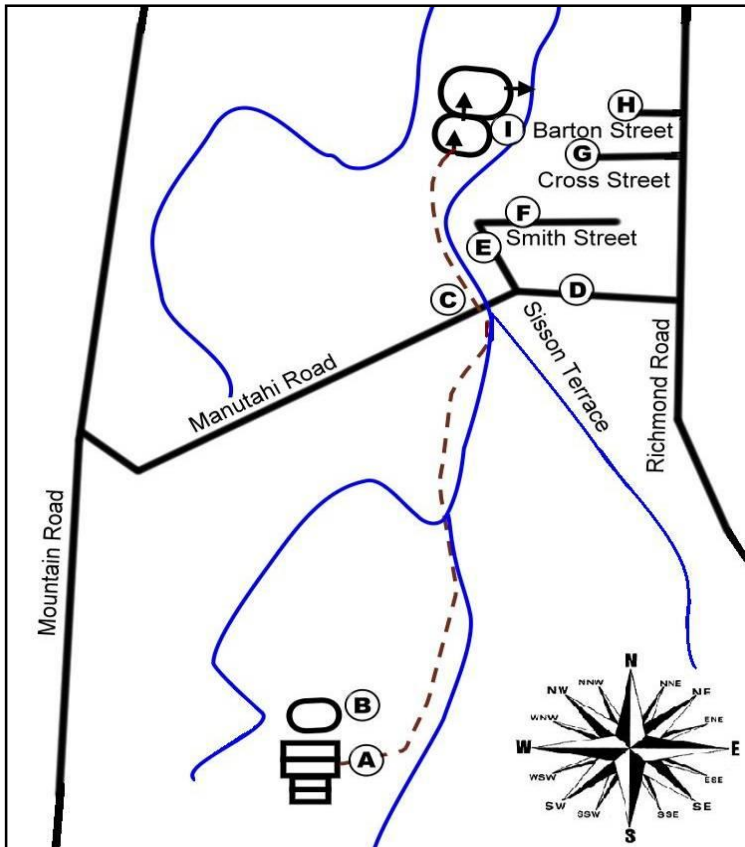
The consent holder also has access to the HydroTel text messaging service and is notified when the Waiongana Stream flow exceeds 5m<sup>3</sup>/sec (i.e. when discharge to stream is allowed) and again when the stream flow recedes back to minimum consent conditions.

For the 2012-2013 period a total of 283.5 discharge hours were recorded compared to 274.75 hours for the 2011-2012 period, 311.65 hours for the 2010-2011 period and 312 hours for the 2009-2010 period.

## 2.3 Air

### 2.3.1 Inspections

Air quality is checked during compliance monitoring inspections, or if odour complaints are received. There were no odour complaints concerning the piggery emissions from the ponds system, and routine follow-up inspections found no objectionable odour offsite. The covered anaerobic pond, including the removal of cowshed effluent from the piggery effluent treatment system has been hugely instrumental in reducing odour resulting in no odour complaints for the 2012-2013 monitoring period.



**Figure 10** Odour survey monitoring locations

**Table 8** An example of odour survey monitoring sheet

Odour survey sites		Time	Wind direction	Odour strength
A	Piggery operation			
B	Covered anaerobic pond			
C	Manutahi Bridge			
D	Manutahi Road			
E	Sisson Terrace			
F	Smith Street			
G	Cross Street			
H	Barton Street			
I	Oxidation ponds			

Operations at the piggery had resulted in some odour emanating offsite from the ponds system from time to time prior to installing the covered anaerobic pond situated back at the piggery site in year of installation. Odour issues were the result of general piggery operations and adverse weather conditions. As the piggery wastewater treatment ponds are located near a residential area in the Lepperton Township, there is no real buffer zone.

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 0-6 scale (ambient).

0. *Not detectable - no odour*
1. *Very weak - odour detected but may not be recognisable*
2. *Weak - odour recognisable (i.e. discernible)*
3. *Distinct - odour very distinct and clearly distinguishable*
4. *Strong - odour causes a person to try to avoid it*
5. *Very strong - odour overpowering and intolerable*
6. *Extremely strong - pungent, highly offensive, 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 necessarily have the same meaning as offensiveness in the Act or consent condition.
- A subjective assessment which can vary between individuals, but which must also be based for compliance purposes on a 'typical' response.

**Location:**

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

The RMA (1991) requires that there should be no offensive or objectionable odour beyond the boundary of the farm.

The pork industry's guide to managing environmental effects, deals with management practices ensuring the effect of odour is taken into account when undertaking activities relating to farm operations.

No complaints concerning piggery odour emissions were received by the Council during the 2012-2013 monitoring period.

## 2.4 Investigations, interventions, and incidents

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holder. During the year matters may arise which require additional activity by the Council eg provision of advice and information, or investigation of potential or actual causes

of non-compliance or failure to maintain good practices. A pro-active approach that in the first instance avoids issues occurring is favoured.

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 Unauthorised Incident Register (UIR) includes events where the company concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

Complaints may be alleged to be associated with a particular site. If there is potentially 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 2012-2013 period, it was not necessary for the Council to undertake significant additional investigations and interventions, or record incidents, in association with the DH Lepper Trust Piggery.

### 3. Discussion

#### 3.1 Discussion of site performance

Consent 0715-3 expires in December 2013 with no further reviews of this consent being provided for, prior to expiry. With the impending expiry of Consent 0715 a thorough investigation of effluent disposal options and methods will be required by Council. Investigative work in preparing the application for the discharge permit was initially carried out by consultant John McBride but due to ill health, Colin Kay Agricultural Engineer has now been engaged to prepare the discharge application for the consent holder.

The consent holder has continued to make significant improvements to the wastewater treatment system, by installing a covered anaerobic pond to remove 60-70% of wastewater solids through sedimentation and anaerobic digestion. More recently the removal of farm dairy shed effluent appears to have improved the wastewater loading on the existing pond treatment system.

The Council's policy is to promote spray irrigation to land in preference to discharge to water. However there may be an opportunity to further assess the option of partial discharge to land. Effluent from either the aerobic or anaerobic ponds is discharged onto and into land via irrigation at least once annually during the summer/autumn period to help minimize the adverse effects on water quality in the Waiongana Stream. Throughout November 2012 wastewater from the aerobic pond had been spray irrigated to cropping land.

Throughout the 2012-2013 monitoring period the consent holder continued to utilise extracted biogas from the covered anaerobic pond for onsite energy requirements.

The Council has commenced a review of its Regional Freshwater Plan. The Council emphasised that the draft report 'Future Directions for the Management of Farm Dairy Effluent' has been prepared by the Council to canvas issues and initiate discussion in relation to future farm dairy effluent management in Taranaki. The NZ pork industry has been invited to take part in further discussions. The review of the RFWP may impact the way effluent is disposed of now, in preference to discharging partially treated effluent to land.

#### 3.2 Evaluation of performance

**Table 9** Summary of performance for Consent 0715-3 to discharge piggery and farm dairy effluent from an oxidation pond treatment system

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 points	Monitoring inspections	Yes
3. Minimum dilution rate in receiving waters	Consent holder's discharge records and monitoring	Yes (most of the time)

Condition requirement	Means of monitoring during period under review	Compliance achieved?
4. Discharge only when river conditions allow	Consent holder's discharge records and monitoring	Yes
5. Maximum concentrations in receiving water after mixing	Sampling	Yes
6. Effects on 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	Records received	Yes
9. Effluent of aerobic pond discharged to land	Consent holder to notify Council	N/R
10. Notification of discharging to land	Consent holder to notify Council	N/R
11. Optional review provision	No further review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

N/A = not applicable N/R = not required

**Table 10** Summary of performance for Consent **5206-2** 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	Yes
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	Monitoring inspections	Yes
6. Objectionable dust levels at the 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 and associated activities	Monitoring inspections	Yes

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Advise neighbours prior to irrigating effluent to land	Consent holder to advise 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	Optional permit review June 2013	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 11** 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?
Minimise environmental effects	Monitoring Inspections	Yes
Water abstraction not to exceed 50% of the stream flow	Monitoring Inspections	Yes
Optional review of consent	No review sought by Council	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>

N/A = not applicable

During the year, the Company demonstrated a **high** level of environmental performance and compliance with the resource consents as defined in Section 1.1.4.

### 3.3 Recommendations from the 2011-2012 Annual Report

In the 2011-2012 Annual Report, it was recommended:

1. THAT monitoring of air emissions and discharges to natural water from the DH Lepper Trust Piggery and dairy farm in the 2012-2013 year continues at the same level as in the 2011-2012 period except where noted below.
2. THAT the consent holder continues to advise the Council of all treated wastewater discharges to the Waiongana Stream and onto land and to maintain a discharge only when the Waiongana Stream flow rate is above the allowable 5m<sup>3</sup>/sec.
3. THAT the consent holder monitors and maintains discharge records and forwards these records to the Council as required.
4. THAT the consent holder monitors and maintains anaerobic biogas abstraction rates (flaring and usage) and supplies details to Council if required.



5. THAT the provisions in the monitoring programme to sample the discharge and receiving waters be reviewed as a precursor of the discharge consent renewal process.
6. THAT the effluent be analysed for ammonia concentration to determine the dilution required to meet the unionised ammonia conditions.
7. THAT the consent holder provides all necessary information as requested by Council in support of the discharge renewal process.
8. THAT a review of consent **5206** is not deemed necessary (as per section 3.5).

These recommendations were implemented in the year under review.

### **3.4 Alterations to monitoring programmes for 2013-2014**

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 monitoring programme, it is proposed that for 2013-2014 period monitoring continues as set out in the 2012-2013 compliance monitoring programme to assess any environmental effects in relation to the treated effluent discharge, and as required for the pending consent review process .

A recommendation to this effect is attached to this report.

### **3.5 Exercise of optional review of consent**

Resource consent 0715-3 (wastewater discharge) does not provide for an optional review and the consent expires on 1 December 2013.

Resource consent **0188-3** provides for an optional review of the consent in June 2014.

Resource consent 5206-2 (air discharge) provides for a review of consent in June 2016

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.

A recommendation to this effect is presented in Section 4 of this report.

## 4. Recommendations

1. THAT monitoring of air emissions and discharges to natural water from the DH Lepper Trust Piggery and dairy farm in the 2013-2014 year continues at the same level as in the 2012-2013 period except where noted below.
2. THAT the consent holder continues to advise the Council of all treated wastewater discharges to the Waiongana Stream and onto land and to maintain a discharge only when the Waiongana Stream flow rate is above the allowable  $5\text{m}^3/\text{sec}$ .
3. THAT the consent holder monitors and maintains discharge records and forwards these records to the Council as required.
4. THAT the consent holder monitors and maintains anaerobic biogas abstraction rates (flaring and usage) and supplies details to Council if required.
5. THAT the provisions in the monitoring programme to sample the discharge and receiving waters be reviewed as a precursor of the discharge consent renewal process.
6. THAT the effluent be analysed for ammonia concentration to determine the dilution required to meet the unionised ammonia conditions.
7. THAT the consent holder provides all necessary information as requested by Council in support of the discharge renewal process.
8. THAT a review of consent **0188** is not deemed necessary (as per section 3.5).

## Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

Al*	aluminium
As*	arsenic
Biomonitoring	assessing the health of the environment using aquatic organisms
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
cfu	colony forming units. A measure of the concentration of bacteria usually expressed as per 100 millilitre sample
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
Cu*	copper
Cumec	A volumetric measure of flow- 1 cubic metre per second (1 m <sup>3</sup> s <sup>-1</sup> )
DO	dissolved oxygen
DRP	dissolved reactive phosphorus
<i>E.coli</i>	<i>escherichia coli</i> , an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
Ent	enterococci, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre of sample
F	fluoride
FC	faecal coliforms, an indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 millilitre sample
fresh	elevated flow in a stream, such as after heavy rainfall
g/m <sup>3</sup>	grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures
Incident	an event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred
Intervention	action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring
Investigation	action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident
l/s	litres per second

MCI	macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats
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 <sub>4</sub>	ammonium, normally expressed in terms of the mass of nitrogen (N)
NH <sub>3</sub>	unionised ammonia, normally expressed in terms of the mass of nitrogen (N)
NO <sub>3</sub>	nitrate, normally expressed in terms of the mass of nitrogen (N)
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water
O&G	oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons)
Pb*	lead
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
PM <sub>10</sub>	relatively fine airborne particles (less than 10 micrometre diameter)
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 including all subsequent amendments
SS	suspended solids
SQMCI	semi quantitative macroinvertebrate community index;
Temp	temperature, measured in °C (degrees Celsius)
Turb	turbidity, expressed in NTU
UI	Unauthorised Incident
UIR	Unauthorised Incident Register – contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan
Zn*	zinc

\*an abbreviation for a metal or other analyte may be followed by the letters '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
- Taranaki Regional Council 2007 DH Lepper Trust Piggery Monitoring Programme Annual Report 2006-2007 Technical Report 2007-50
- Taranaki Regional Council 2008 DH Lepper Trust Piggery Monitoring Programme Annual Report 2007-2008 Technical Report 2008-16
- Taranaki Regional Council 2009 DH Lepper Trust Piggery Monitoring Programme Annual Report 2008-2009 Technical Report 2009-34
- Taranaki Regional Council 2010 DH Lepper Trust Piggery Monitoring Programme Annual Report 2009-2010 Technical Report 2010-12
- Taranaki Regional Council 2011 DH Lepper Trust Piggery Monitoring Programme Annual Report 2010-2011 Technical Report 2011-34
- Taranaki Regional Council 2012 DH Lepper Trust Piggery Monitoring Programme Annual Report 2011-2012 Technical Report 2012-33

## **Miscellaneous references**

- Ministry for the Environment Good Practice Guide for Assessing & Managing Odour in New Zealand – June 2003
- New Zealand Pork Industry Board – Pork Industry guide to Managing Environmental Effects EnviroPork – 2005
- NIWA Year in Review 2011 Energy Section
- Fish & Game (Taranaki Region) Re Consent 0715-3 - discharge to the Waiongana Stream (TRC ref. # 1030484)



## **Appendix I**

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





Consent 0188-3



PRIVATE BAG 713  
47 CLOTEN ROAD  
STRATFORD  
NEW ZEALAND  
PHONE 0-6-765 7127  
FAX 0-6-765 5097

**Water Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Lepper D H Trust  
S Lepper  
326 Wortley Road  
R D 9  
INGLEWOOD

Consent Granted  
Date: 9 January 2002

**Conditions of Consent**

Consent Granted: To take up to 75 cubic metres/day [0.9 litres/second] of water from an unnamed tributary of the Waiongana Stream for piggery operation purposes at or about GR: Q19:145-366

Expiry Date: 1 June 2020

Review Date(s): June 2008, June 2014

Site Location: Manutahi Road, RD 3, New Plymouth

Legal Description: Pt Sec 185 & 186 Huirangi Dist Blk VII Paritutu SD

Catchment: Waiongana

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## Consent 0188-3

### General conditions

- a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water from the unnamed tributary in the Waiongana Stream catchment, including, but not limited to, the efficient and conservative use of water.
2. That abstraction shall not exceed 50% of the natural stream flow at any time.
3. The Taranaki Regional Council may review, according to section 128 of the Resource Management Act 1991, any or all of the conditions of this consent by giving notice of review during June 2008 and/or June 2014, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 January 2002

For and on behalf of  
Taranaki Regional Council



---

Director-Resource Management



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

CHIEF EXECUTIVE  
PRIVATE BAG 713  
47 CLOTEN ROAD  
STRATFORD  
NEW ZEALAND  
PHONE: 06-765 7127  
FAX: 06-765 5097  
www.trc.govt.nz

Please quote our file number  
on all correspondence

Name of  
Consent Holder: DH Lepper Trust  
[Trustee: Steven Maxwell Lepper]  
326 Wortley Road  
R D 9  
INGLEWOOD 4389



Decision Date  
[Change]: 23 February 2011

Commencement  
Date [Change]: 23 February 2011 [Granted: 18 December 2002]

**Conditions of Consent**



Consent Granted: To discharge treated piggery effluent from an oxidation  
pond treatment system into the Waiongana Stream during  
fresh [high flow] conditions at or about (NZTM)  
1704451E-5676184N

Expiry Date: 1 December 2013

Site Location: Manutahi Road, Lepperton

Legal Description: Pt Lot 2 DP 2634

Catchment: Waiongana

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.



### Special conditions

1. The consent holder shall, at all times, operate the piggery and associated activities and discharges in accordance with the information provided in support of application 1649, including the management and contingency plans, except as otherwise required or directed by the conditions set out in this resource consent.
2. The discharge point into the Waiongana Stream shall be located at 1704451E-5676184N. The point of discharge shall be beneath the surface of the receiving water.
3. A minimum dilution rate of 1 part effluent to 250 parts receiving water shall be maintained at all times in the receiving water at the point of discharge, during discharge events
4. Discharge from the ponds to the Waiongana Stream shall occur only when the flow in the Waiongana Stream measured at the Taranaki Regional Council SH3A monitoring site is greater than 5 cumecs (5 cubic metres per second).
5. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not cause the receiving waters of the Waiongana Stream to exceed the following concentrations:

Constituent	Concentration
Unionised ammonia	0.025 gm <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>


6. After allowing for reasonable mixing, within a mixing zone extending 50 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the receiving waters of the Waiongana Stream:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life, habitats or ecology.

Consent 0715-3

7. The consent holder shall operate and maintain the treatment and discharge system to ensure that the conditions of this consent are met.
8. The consent holder shall monitor and maintain records of the discharge including date, rate, and volume discharged to the Waiongana Stream; and date, volume and area of land discharge occurs to onto and into land; and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.
9. Effluent from the aerobic pond shall be discharged onto and into land via irrigation at least once annually during the summer/autumn period, to minimise the adverse effects on water quality in the Waiongana Stream, to the satisfaction of the Chief Executive, Taranaki Regional Council.
10. The Chief Executive, Taranaki Regional Council shall be advised in writing at least 24 hours prior to any irrigation onto and into land from the aerobic pond.
11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2004 and/or June 2008, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time, including but not limited to:
  - a) dilution rate
  - b) maximum discharge rate
  - c) concentrations of constituents of the discharge
  - d) concentrations of constituents of the receiving water.

Signed at Stratford on 23 February 2011

For and on behalf of  
Taranaki Regional Council



Director-Resource Management





**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

CHIEF EXECUTIVE  
PRIVATE BAG 713  
47 CLOTEN ROAD  
STRATFORD  
NEW ZEALAND  
PHONE: 06-765 7127  
FAX: 06-765 5097  
[www.trc.govt.nz](http://www.trc.govt.nz)

Please quote our file number  
on all correspondence

Name of  
Consent Holder: DH Lepper Trust  
[Trustees: Steven Maxwell Lepper & Paul Robert Franklin]  
326 Wortley Road  
R D 9  
INGLEWOOD

Consent Granted  
Date: 13 November 2008

**Conditions of Consent**

Consent Granted: To discharge emissions into the air from a pig farming  
operation and associated practices including solids  
composting, effluent treatment and other waste  
management activities at or about (NZTM)  
1704054E-5674882N [Piggery] and  
1704345E-5676156N [Ponds]

Expiry Date: 1 June 2026

Review Date(s): June 2009, June 2011, June 2013, June 2016, June 2020

Site Location: Mountain Road, Lepperton

Legal Description: Lot 3 DP 21006 [Piggery] &  
Pt Lot 1491, Pt Lot 2 DP 2634 [Ponds]

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## Consent 5206-2

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. The number of pigs [equivalent 50 kg per pig] on the property at any one time shall not exceed 3500 pig equivalents.
2. Notwithstanding any other condition of this consent, the consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
3. Before 30 September 2009, the development of the covered anaerobic pond shall be completed. From that date gases emanating from the covered anaerobic pond shall be captured and appropriately utilised as an energy source.
4. Prior to undertaking any alterations to the piggery unit's processes, operations, equipment or layout, which may significantly change the nature or quantity of contaminants emitted from the site, the consent holder shall consult with the Chief Executive, Taranaki Regional Council, and shall obtain any necessary approvals under the Resource Management Act 1991 and its amendments.
5. The consent holder shall minimise the emissions and impacts of contaminants discharged into air from the site by:
  - a) the selection of the most appropriate process equipment;
  - b) process control equipment and emission control equipment;
  - c) the methods of control;
  - d) the proper and effective operation, supervision, maintenance and control of all equipment and processes; and
  - e) the proper care of all pigs on the site.
6. Subject to condition 7, the discharges authorised by this consent shall not give rise to an odour at or beyond the property boundary that is offensive or objectionable.



Consent 5206-2

7. To allow for the conversion of the existing anaerobic pond to an aerobic state, discharges from this pond may give rise to intermittent offensive and objectionable odour beyond the property boundary until 30 September 2009.
8. For the purposes of condition 6 and 7, an odour shall be deemed to be offensive or objectionable if:
  - a) it is held to be so in the opinion of an enforcement officer of the Taranaki Regional Council, having regard to the duration, frequency, intensity and nature of the odour; and/or
  - b) an officer of the Taranaki Regional Council observes that an odour is noticeable, and either it lasts longer than three (3) hours continuously, or it occurs frequently during a single period of more than six (6) hours; and/or
  - c) no less than three individuals from at least two different properties, each declare in writing that an objectionable or offensive odour was detected beyond the boundary of the site, provided the Council is satisfied that the declarations are not vexatious and that the objectionable or offensive odour was emitted from the site at the frequency and duration specified in (b). Each declaration shall be signed and dated and include:
    - the individuals' names and addresses;
    - the date and time the objectionable or offensive odour was detected;
    - details of the duration, frequency, intensity and nature of the odour that cause it to be considered offensive or objectionable;
    - the location of the individual when it was detected; and
    - the prevailing weather conditions during the event.
9. The consent holder shall provide an Odour Management Plan that details to the satisfaction of the Chief Executive of Taranaki Regional Council how odorous emissions beyond the property boundary will be minimised by 30 September 2009. The plan shall include:
  - i) Define the environmental effect/s being managed by the plan and the objective sought in relation to this effect;
  - ii) Identify key personnel responsible to managing the effect;
  - iii) Describe the activities on the site and describe the main potential sources of odour emissions;
  - iv) Identify and describe methods of mitigation and operating procedures including the dewatering of the anaerobic pond or during control contingency discharge events;
  - v) Monitoring methods including record keeping of maintenance and control parameters, any odour complaints received and weather conditions present at time of complaints.

Thereafter, the piggery and associated waste management practices shall be operated in accordance with the plan.

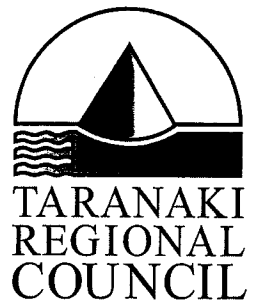
Consent 5206-2

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2011 and/or June 2013 and/or June 2016 and/or June 2020, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 13 November 2008

For and on behalf of  
Taranaki Regional Council

  
\_\_\_\_\_  
Director-Resource Management



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

CHIEF EXECUTIVE  
PRIVATE BAG 713  
47 CLOTEN ROAD  
STRATFORD  
NEW ZEALAND  
PHONE: 06-765 7127  
FAX: 06-765 5097  
www.trc.govt.nz

Please quote our file number  
on all correspondence

Name of  
Consent Holder: Lepper Farms  
[Graeme Charles Lepper]  
138 Te Arei Road East  
R D 3  
NEW PLYMOUTH 4373

Decision Date: 23 February 2011

Commencement  
Date: 23 February 2011

**Conditions of Consent**

Consent Granted: To discharge treated farm dairy effluent from an oxidation pond treatment system and a constructed drain into an unnamed tributary of the Waiongana Stream at or about (NZTM) 1704351E-5675198N

Expiry Date: 1 December 2013

Site Location: Manutahi Road, Lepperton

Legal Description: Lot 2 DP 21006

Catchment: Waiongana

Treatment/Discharge System[s]:	three oxidation ponds:	length	width	depth	[metres]
	anaerobic:	53	50	4.5	
	first aerobic:	60	20	1.5	
	second aerobic:	55	20	1.5	
	constructed drain:	200	1		

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### General condition

- a. The consent holder shall pay to the Taranaki Regional Council [the Council] all the administration, monitoring and supervision costs of this consent, fixed in accordance to section 36 of the Resource Management Act.

### Special conditions

1. The effluent discharged shall be from the milking of no more than 470 cows.
2. The discharge point shall be located at or about 1704351E-5675198N.
3. After treatment in an oxidation pond treatment system, the concentrations of the constituents shown in the table below shall not be exceeded in the effluent discharged:

Constituent	Concentration
Total carbonaceous BOD <sub>5</sub>	110 gm <sup>-3</sup>
Suspended solids	100 gm <sup>-3</sup>
4. After allowing for mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not cause the concentrations shown in the following table to be exceeded:

Constituent	Concentration
Unionised ammonia	0.025 gm <sup>-3</sup>
Filtered carbonaceous BOD <sub>5</sub>	2.0 gm <sup>-3</sup>
5. After allowing for mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the receiving water:
  - (a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - (b) any conspicuous change in the colour or visual clarity;
  - (c) any emission of objectionable odour;
  - (d) the rendering of fresh water unsuitable for consumption by farm animals;
  - (e) any significant adverse effects on aquatic life, habitats or ecology;
  - (f) the generation of undesirable heterotrophic growths [sewage fungus].
6. The treatment and discharge system shall be designed, managed, operated and regularly maintained to ensure that the conditions of this consent are met.
7. The consent holder shall ensure that no stock gain access to the constructed drain.
8. In order that the constructed drain continually provides effective treatment it shall not be cleaned out or sprayed.

Consent 7775-1

9. Where, for any cause [accidental or otherwise], untreated or partially treated effluent associated with the consent holder's operations escapes to surface water, the consent holder shall:
- (a) immediately notify the Taranaki Regional Council on Ph 0800 736 222 [notification must include either the consent number or farm dairy number]; and
  - (b) stop the discharge and immediately take steps to control and stop the escape of untreated or partially treated effluent to surface water; and
  - (c) immediately take steps to ensure that a recurrence of the escape of untreated or partially treated effluent to surface water is prevented; and
  - (d) report in writing to the Chief Executive, Taranaki Regional Council, describing the manner and cause of the escape and the steps taken to control it and to prevent it reoccurring. The report shall be provided to the Chief Executive within seven [7] days of the occurrence.

Signed at Stratford on 23 February 2011

For and on behalf of  
Taranaki Regional Council



Director-Resource Management

