ANZCO Eltham Limited Monitoring Programme Annual Report 2015-2016

Technical Report 2016-53

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Taranaki Regional Council
Private Bag 713
STRATFORD

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Executive summary

ANZCO Foods Eltham Limited (ANZCO) operates a meat processing plant located at Eltham, in the Waingongoro catchment. Until May 2014, the site was known as Riverlands Eltham. The plant has an associated wastewater treatment ponds system from which effluent is disposed of either to land or to the river. This report for the killing season from October 2015-September 2016 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of the Company's activities.

The Company holds 11 resource consents, which include a total of 114 conditions setting out the requirements that the Company must satisfy. The Company holds one consent to allow it to take and use water, two consents to discharge effluent and stormwater into the Waingongoro River, three consents to discharge effluent and solids to land, four consents for structures in watercourses, and one consent to discharge emissions into the air at the plant site. The consent to emit to air was replaced in May 2016.

During the monitoring period, ANZCO demonstrated a generally good level of environmental performance.

Monitoring is carried out by both ANZCO and the Council. ANZCO monitors water abstraction rate, effluent flow rate and composition, receiving water quality, odour at the plant boundaries, and effluent loadings, soil, and herbage for irrigation areas. The Council undertakes inspections of the plant site and irrigation areas; effluent quality checks and inter-laboratory comparisons; flow, water quality, and biological monitoring in the Waingongoro River; and groundwater monitoring.

The Council's monitoring programmes for the period under review together included four inspections, 59 water samples collected for physicochemical analysis, and two biomonitoring surveys of receiving waters.

The abstraction of water from the Waingongoro River was not found to have any adverse effect on the river. The large reduction in the amount of water abstracted that occurred in 2010-2011, as the result of improved efficiency in water use, was maintained.

The physicochemical monitoring of the river showed full compliance with consent conditions.

It is noted that the implementation of the "dual" land/river wastewater disposal system, which is managed so as to maximise discharge to land, has resulted in significant improvement in the quality of the Waingongoro River since the system was adopted in 2001. The biomonitoring surveys in 2015-2016 did not find any detrimental impact on the river caused by discharges from the meat plant to either land or water.

During the 2015-2016 monitoring period most of the total plant effluent was sprayed onto grazed pasture. The irrigation period lasted 32 weeks, between 28 October 2015 and 6 July 2016, that included the low flow periods for the river. The limit on nitrogen loading was complied with overall, though there were minor exceedances on some paddocks. The irrigation of effluent from ANZCO has effected the underlying groundwater quality.

With regard to emissions to air over the 2015-2016 period, two incidents were recorded, both about odour, neither of which was substantiated.

During the period under review, ANZCO demonstrated a good level of environmental performance. Improvement was required in administrative compliance, in respect of the provision of reviewed/updated management plans and monitoring reports on exercise of consents, and the supply of instantaneous abstraction data.

For reference, in the 2015-2016 year, 71% 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 24% demonstrated a good level of environmental performance and compliance with their consents.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a generally good level.

This report includes recommendations for the 2016-2017 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 for the period October 2015-September 2016 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by ANZCO Eltham Limited. The Company operates a meat processing plant situated on London Street at Eltham, in the Waingongoro catchment. Since May 2014, the site has been known as ANZCO Foods Eltham, after the parent company, ANZCO Foods Limited. The period covered coincides with the killing season and the Company's financial year.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by ANZCO that relate to abstractions and discharges of water within the Waingongoro catchment, and the air discharge permit held by ANZCO to cover emissions to air from the site.

One of the intents of the *Resource Management Act 1991* (RMA) 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 Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of ANZCO's use of water, land, and air, and represents the twenty-fifth combined annual report and the twenty-seventh water-related report by the Council and its predecessors 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:

- Consent compliance monitoring under the RMA and the Council's obligations;
- The Council's approach to monitoring sites through annual programmes;
- the resource consents held by the Company in the Waingongoro catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Company's site.

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 2016-2017 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 RMA 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 (e.g., recreational, cultural, or aesthetic); and
(e) risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of `effects' inasmuch as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, 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 and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Company, the report also assigns it a rating for its environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. **Administrative performance** is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (i.e. a defence under the provisions of the *RMA* can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

- **High:** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment .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 in relation to such impacts.

- **Good** Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or in response to unauthorised incident reports, but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

  For example:

  - High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
  - Strong odour beyond boundary but no residential properties or other recipient nearby.

- **Improvement required:** Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

- **Poor** Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative compliance

- **High** The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

- **Good** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was

provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

- **Improvement required** Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

- **Poor** Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

1.2 Process description

The meat processing plant is situated in mid-catchment, about 42 km by river from the sea (Figure 1). There has been a meat plant on the site since about 1894. Prior to the current monitoring period, the effluent was one of two major point source discharges to the river. The other discharge, comprising domestic and industrial effluent from Eltham municipal oxidation ponds, entered the Waingongoro River via the Mangawhero Stream about 3.2 km downstream of the ANZCO plant. The municipal effluent was diverted to Hawera via pipeline in June 2010. There is one major water abstraction (13 km) downstream, for the ammonia urea plant at Kapuni. Intensive pastoral farming occurs above and below the meat processing plant.

The Waingongoro River is ranked second highest among Taranaki streams as a recreational resource and highest as a recreational fishery. The median flow at Eltham Road is about 1,751 litres/second. The one-day duration mean annual low flow (MALF) is 443 litres/second.

The meat processing plant of ANZCO Foods Eltham Limited on lower London Street, Eltham has the capacity to process about 200,000 beef units and 120,000 calves per year. Maximum kill rate is approximately 1,000 beef units per day. The beef season runs from early October to mid-July, peaking between January and May depending on livestock availability. Generally, peak kill occurs earlier and is higher in dry seasons owing to the reduced availability of stock feed. Calves are slaughtered between July and September.

Annual kills since the 1993-94 season are shown in Figure 2. Since the mid-1990s, annual kill has increased from about 60,000 to 180,000 beef units, a factor of about 200%, and calf processing has been introduced. (The low kill in 1995-1996 occurred as a result of an industrial labour dispute).

The majority of the processed output is exported. There are no fellmongery or rendering facilities. Blood and renderable material are taken off site for processing.

Water for plant operation is drawn from the Waingongoro River, both from Eltham town supply and from the river directly. The river abstraction point at the plant site is situated at the upstream boundary, immediately above the confluence with a small tributary that runs past the stockyards. A water treatment plant, commissioned at the abstraction site in August 2000, augments the supply of potable water from the municipal system.

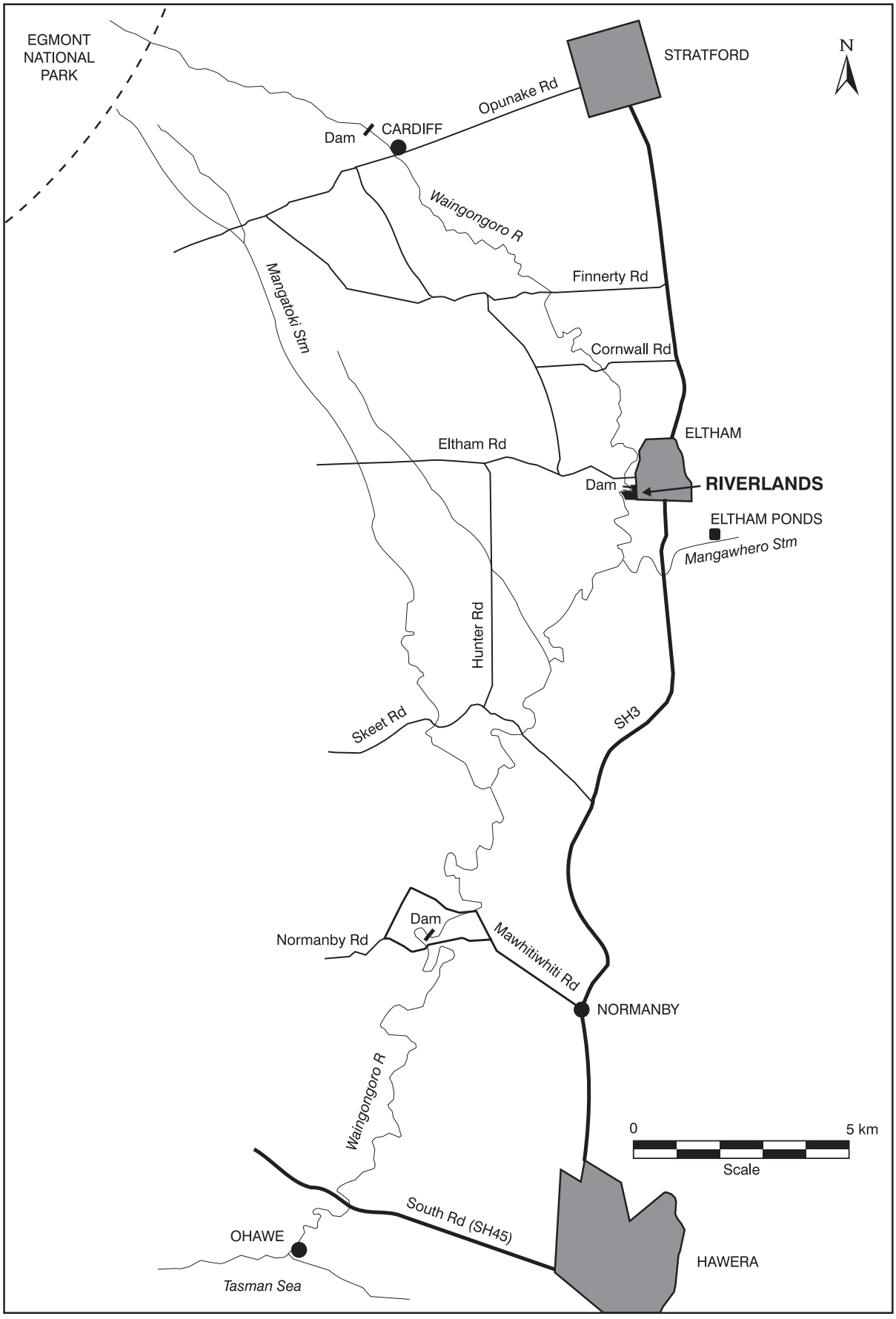

Figure 1 ANZCO site location in the Waingongoro catchment

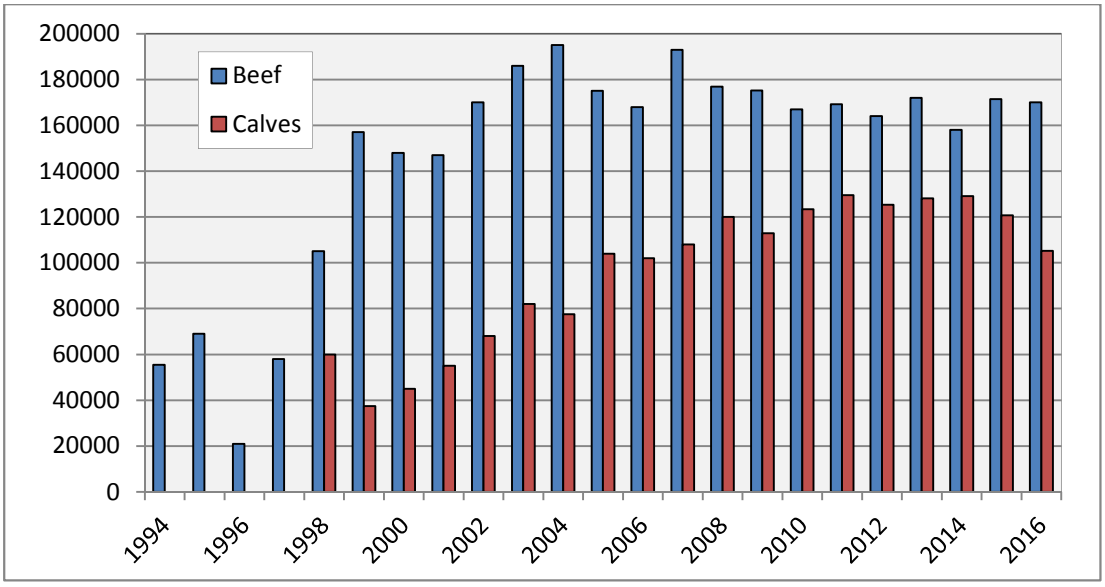

Figure 2 Annual beef and calf kills since 1993-94 season

Wastewater derives from four sources: killing, gutting (paunch material), processing, and the stockyards. Wastewater treatment comprises solids separation, followed by biological degradation in lagoons.

Paunch contents are segregated by 'dry dumping' into hoppers, dewatered, and trucked off-site for use in vermiculture. Liquid effluent from paunch opening areas and the stockyards is passed through a 0.5 mm rotary screen. The screened solids are disposed of with the paunch material. All red meat streams are discharged to a sump through a coarse bar screen and pumped through a rotary screen. The separated solids are de-watered in a press and removed daily to an off-site rendering plant. The liquid effluent stream combines with the screened paunch/stockyard effluent and is discharged to the lagoon system.

There are eight lagoons in series with a total volume of about 40,000 m^3. The first five (ponds 1, 2, 3, 3A and 4), about 20,000 m^3 in volume, are anaerobic. The sixth (pond 5) is an aerated facultative lagoon, about 3 metres in depth, with aeration capacity of 44 kW. The seventh (pond 6), about 4.8 metres in depth, is for settling and allows some denitrification. The final lagoon (pond 7) is shallow, with a maximum depth of 1.5 m and an area of 0.76 ha.

Effluent from the final lagoon is discharged either to land or to the Waingongoro River. The disposal system is managed so as to maximise discharge to land, thereby to minimise any adverse effects of the effluent on the river.

The irrigation area is a dairy farm immediately across the river from the plant that is accessed from Lower Stuart Road. The area irrigated increased progressively, from 60 ha when the reticulation system was commissioned in January 2001, to 265 ha in 2012-2013.

When effluent is discharged to the river, it is through a variable-rate pump via a pipe that projects over the river by about one third of its width. Flow is measured at a v-notch weir above the pipe inlet and is recorded electronically.

1.3 Resource consents

A summary of the consents held by ANZCO in relation to activities at its Eltham plant is given in Table 1 below and the consents are discussed in Sections 1.3.1 to 1.3.5. A copy of each of the consents can be found in Appendix I.

Table 1 Summary of resource consents held by Riverlands Eltham Limited

Consent number	Purpose	Volume	Next review date	Expiry date
1968-4	Discharge stormwater to Waingongoro River		2017	2029
2039-4	Discharge treated wastewater to Waingongoro River	3,500 m³/day (81 L/s)	2017	2029
4644-3	Discharge emissions to air		2023	2035
5437-3	Take from Waingongoro River	1,972 m³/day (22.8 L/s)	2017	2029
5569-1	Discharge treated wastewater to land (Stuart Road)	3,500 m³/day	2018	2026
5604-1	Structure for erosion control at water intake		-	2017
5736-2	Discharge treated wastewater to land (Eltham Road)			2026
5739-1	Structure for pipeline crossing of Waingongoro River		-	2017
6455-1	Structure for piping of unnamed tributary		2017	2023
7487-1	Discharge solids to land and emissions to air		2017	2029

1.3.1 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.

Water permit **5437-3** covers the take and use of water from the Waingongoro River for stock drinking, yard wash-down and miscellaneous purposes. This permit was issued by the Taranaki Regional Council on 7 July 2012 under Section 87(d) of the RMA. It is due to expire on 1 June 2029.

There are 12 special conditions attached to this permit.

Condition 1 limits maximum abstraction rate.

Conditions 2 to 6 relate to metering and the keeping of records.

Conditions 7 and 8 relate to use of the best practicable option to conserve water and to reporting.

Conditions 9 and 10 address intake screen design for protection of fish.

Condition 11 sets out a requirement for a donation to Council for riparian planting and management in the Waingongoro catchment.

Condition 12 is a review provision.

1.3.2 Water discharge permits

Section 15(1)(a) of the RMA 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.

ANZCO holds two water discharge permits.

1.3.2.1 Wastewater discharge

Water permit **2039-4** covers the discharge of treated meat processing wastewater from the meat processing plant into the Waingongoro River. This permit was issued by the Council on 7 July 2012 under Section 87(d) of the RMA. It is due to expire on 1 June 2029.

There are 14 special conditions attached to this permit.

Condition 1 limits maximum discharge rate.

Condition 2 addresses receiving water effects after mixing.

Condition 3 requires consultation with Council prior to significant changes on the site.

Condition 4 addresses flow metering and provision of records.

Conditions 5 to 8 relate to a Wastewater Management Plan.

Condition 9 requires the appointment of a suitable wastewater operator on the site.

Condition 10 requires adoption of the best practicable option to avoid adverse environmental effects.

Condition 11 sets out a requirement for a donation to Council for riparian planting and management in the Waingongoro catchment.

Conditions 12 and 13 deal with reduction of dissolved reactive phosphorus in the discharge, requiring a report and providing for subsequent review of consent.

Condition 14 is a review provision.

1.3.2.2 Stormwater discharge

Water permit **1968-4** covers the discharge of stormwater from various locations at the plant site into the Waingongoro River. This permit was issued by the Council on 7 July 2012 under Section 87(d) of the RMA. It is due to expire on 1 June 2029.

There are eight special conditions attached to this permit.

Condition 1 requires adoption of the best practicable option to avoid adverse environmental effects.

Condition 2 limits the catchment area.

Condition 3 imposes limits on significant potential contaminants.

Condition 4 addresses receiving water effects after mixing.

Condition 5 requires a contingency plan in case of accidental spillage of contaminants.

Condition 6 requires the maintenance of a stormwater management plan.

Condition 7 requires consultation with Council prior to significant changes on the site.

Condition 8 is a review provision.

1.3.3 Air discharge permit

Section 15(1)(c) of the RMA 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.

ANZCO held two permits to discharge to air during the 2015-2016 review period. Air discharge permit **4644-2** expired and was replaced with discharge permit **4644-3**.

ANZCO held air discharge permit **4644-2** to cover the discharge of emissions into the air arising from meat processing and associated activities at the factory premises. This permit was issued by the Council on 8 June 2005 under Section 87(e) of the RMA and it expired on 1 June 2016.

Condition 1 requires that the procedures and requirements set out in the consent application be followed, except when there is a conflict between such matters and the resource consent. (In the case of conflict, the consent prevails).

Condition 2 requires consultation with Council before any significant changes on the site.

Conditions 3 and 4 require the adoption of the best practicable option for controlling effects of discharges on the environment, and that processes be operated to minimise discharges.

Condition 5 prohibits significant adverse effect on the environment.

Conditions 6 to 9 address odour, including the provision of an air quality management plan.

Conditions 10 and 11 relate to an incinerator and to natural gas-fired equipment.

Condition 12 is a review provision.

ANZCO holds discharge permit **4644-3** to cover the discharge of emissions into the air arising from meat processing and associated activities at the factory premises. This permit was issued by the Council on 5 May 2016 under Section 87(e) of the RMA. It is due to expire on 1 June 2035.

Condition1 defines the area of licensed activity.

Condition 2 requires that the procedures and requirements set out in the consent application be followed, except when there is a conflict between such matters and the resource consent. (In the case of conflict, the consent prevails).

Condition 3 and require the adoption of the best practicable option for controlling effects of discharges on the environment, and that processes be operated to minimise discharges.

Condition 5 prohibits significant adverse effect on the environment.

Conditions 6 and 7 address odour, including the provision of an air quality management plan.

Condition 8 is a review provision.

1.3.4 Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations.

ANZCO holds three discharge permits that provide for disposal of wastewater and solids onto land in the Waingongoro catchment.

1.3.4.1 Wastewater - Lower Stuart Road

Discharge permit **5569-1** covers the discharge of treated wastewater from meat processing and associated activities by irrigation onto and into land on Lower Stuart Road, Eltham and to discharge of emissions into the air, in the vicinity of various unnamed tributaries of the Waingongoro River and the Waingongoro River. This permit was issued by the Council on 23 December 1999 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

Condition 1 sets a date for installation of the irrigation system.

Conditions 2 to 5 relate to the implementation of a spray irrigation management plan.

Conditions 6 to 8 address odour and spray effects.

Conditions 9 to 13 place controls on the source, composition and application of wastewater.

Condition 14 deals with any contamination of local groundwater or water supply.

Conditions 15 and 16 address monitoring the exercise of consent.

Conditions 17 to 19 are review provisions.

1.3.4.2 Wastewater - Eltham Road

Discharge permit **5736-2** covers the discharge of treated wastewater from meat processing and associated activities by irrigation onto and into land known as Paulwell Farm, Eltham Road, Eltham and the discharge of emissions into the air. This permit was issued by the Council on 7 July 2012 under Section 87(e) of the RMA. It is due to expire on 1 June 2026.

There are 18 conditions attached to this permit.

Condition 1 defines the sources of wastewater.

Conditions 2 and 3 address odour and spray effects.

Conditions 4 to 7 place controls on the composition and application of wastewater.

Condition 8 deals with any contamination of local groundwater or water supply.

Conditions 9 to 11 relate to the implementation of a wastewater irrigation management plan.

Condition 12 requires the appointment of a suitable irrigation manager.

Condition 13 requires adoption of the best practicable option to avoid adverse environmental effects.

Conditions 14, 15 and 16 address monitoring of the discharge and receiving environment.

Condition 17 requires a written annual report on exercise of the consent.

Condition 18 is a review provision.

1.3.4.3 Waste solids

Discharge permit **7487-1** covers the discharge of anaerobic pond solids and paunch solids onto and into land and contaminants to air in the Waingongoro catchment at locations on Lower Stuart, Eltham and Anderson Roads, Eltham. This permit was issued by the Council on 17 September 2010 under Section 87(e) of the RMA. It is due to expire on 1 June 2029.

Condition 1 relates to location of the disposal sites

Condition 2 addresses the keeping of records.

Condition 3 requires adoption of the best practicable option for controlling effects of discharges on the environment, and that processes be operated to minimise discharges.

Conditions 4 and 5 prohibit entry to surface water and define buffer zones.

Condition 6 limits nitrogen application rate.

Condition 7 addresses odour.

Conditions 8 relates to implementation of a management plan for solids disposal.

Condition 9 deals with complaints.

Conditions 10 and 11 relate to lapse and review of consent.

1.3.5 Land use permits

Section 13(1)(a) of the RMA stipulates that no person may use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, or under, or over the bed of any lake or river, unless the activity is expressly allowed for by a resource consent, or a rule in a regional plan and in any relevant proposed regional plan.

ANZCO holds three land use permits in relation to structures in the Waingongoro River and a tributary.

1.3.5.1 Water intake

Land use permit **5604-1** covers the construction, placement, use and maintenance of an intake structure and associated bank protection works on the true left bank of the Waingongoro River. This permit was issued by the Council on 9 March 2000 as a resource consent under Section 87(a) of the RMA. It is due to expire on 1 June 2017.

Condition 1 relates to notification of construction and maintenance works.

Conditions 2 to 7 relate to structure design and construction method.

Condition 8 relates to removal of the structure.

Condition 9 is a review condition.

1.3.5.2 Pipeline crossings

Land use permit **5739-1** covers the erection, placement and maintenance of a pipeline under the Waingongoro River. The pipeline carries treated effluent from the meat plant site to where it is irrigated onto land. This permit was issued by the Council on 14 December 2000 as a resource consent under Section 87(a) of the RMA. It is due to expire on 1 June 2017.

Condition 1 relates to notification of construction and maintenance works.

Conditions 2 to 4 relate to structure design and construction method.

Condition 5 relates to removal of the structure.

Condition 6 is a review condition.

1.3.5.3 Culvert and stream alignment

Land use permit **6455-1** covers the placement and maintenance of a culvert in, and the realignment of, an unnamed of tributary of the Waingongoro River immediately upstream of the water intake. This permit was issued by the Council on 20 September 2004 as a resource consent under Section 87(a) of the RMA. It is due to expire on 1 June 2023.

Condition 1 requires that the best practicable option be used to prevent adverse effects on the environment.

Condition 2 requires the consent to be exercised in accordance with documentation submitted.

Conditions 3 and 4 relate to notification and timing of maintenance works.

Condition 5 requires that the area of river bed disturbance be minimised.

Conditions 6 and 7 relate to lapse and review of consent.

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor, and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The 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.

Monitoring in relation to the meat processing plant is carried out by both ANZCO and the Council, as outlined below.

1.4.2 Monitoring by ANZCO Foods Eltham Limited

Monitoring undertaken by ANZCO covers four main areas as described below. The results are reported to the Council monthly.

Water abstraction

The volume of water abstracted from the Waingongoro River is monitored continuously. A record is also kept of the volume of water taken from Eltham town supply.

Discharge to Waingongoro River

Wastewater discharge rate to the river is monitored continuously. The chemical composition of the discharge and the receiving water upstream and downstream is monitored as prescribed by the Council. The frequency of chemical monitoring depends on the ability of the river to assimilate the discharge, particularly its ammonia component. The minimum frequency is weekly.

The chemical composition of wastewater is also monitored at several points within the wastewater treatment system, as part of management of that system.

Discharge to land

Wastewater discharge rate to land is monitored continuously. The chemical composition of the discharge and the soil, herbage and adjacent surface waters of the irrigation areas are monitored as prescribed by the Council.

Odour surveys

Odour surveys are carried out at four points around the plant boundary at approximately weekly intervals. The frequency may be increased if significant odour is detected.

1.4.3 Monitoring by Taranaki Regional Council

The consent monitoring programme for the ANZCO site undertaken by the Council consists of six primary components as described below.

Programme liaison and management

There is generally a significant investment of time and resources by the 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.

Review of ANZCO's monitoring data

Monitoring data gathered by ANZCO are reviewed to determine compliance with resource consent conditions, and to assess trends in water usage, in wastewater discharge volume and composition and effects on the Waingongoro River and land irrigation areas, and in odour generation.

Site inspections

An officer of the Council visits the ANZCO plant at quarterly intervals. The main points of interest are the water abstraction system, plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters, and sources of emission to air. The land irrigation system is inspected. Sources of data being collected by the consent holder are identified and accessed, so that performance in respect of operation, internal monitoring, and supervision can be reviewed by the Council. The neighbourhood is surveyed for environmental effects, particularly from odour.

Chemical sampling

Routine monitoring by the Council includes two chemical checks relating to the discharge permit conditions and an annual survey relating to river water quality and the discharge during low flow conditions in the river. Additional monitoring may be carried out if any breach of consent occurs.

Groundwater in the vicinity of the wastewater irrigation area on Lower Stuart Road is monitored quarterly for effects on water quality. A small surface stream is also monitored.

Inter-laboratory comparison exercises are carried out concurrently on the sampling dates of the two chemical compliance checks and the annual water quality survey. Additional exercises may be carried out if there is a disagreement on monitoring results.

Biological surveys

Surveys of streambed macroinvertebrates and algae collected from several sampling sites in the Waingongoro River are carried out on a biannual basis, during spring and summer/autumn under low flow conditions. An additional survey may be carried out if a particularly low receiving water flow coincides with high kill rate at the meat plant.

Biological surveys are used to determine the impacts that discharges may cause over a period of time, as distinct from chemical surveys which give detailed information upon the constituents of a discharge at the time of sampling, but cannot give information upon previous discharge characteristics and effects. Biological surveys also directly indicate any significant adverse effects of discharges upon in-stream flora and fauna, so that cause-effect relationships do not have to be established as for critical levels of individual chemical parameters.

Water level and quality monitoring station

The Council maintains a water level and water quality monitoring station on the Waingongoro River at Eltham Road, about 900 metres above ANZCO's discharge point. Data from the station are telemetered to the Council offices at Stratford. Flow records date from December 1974.

The information from flow is useful in the management of ANZCO's discharge to the river in terms of estimating dilution available.

2. Results

2.1 Inspections

Four inspections were conducted during the 2015-2016 review period, on 17 December 2015, and 18 February, 6 July and 16 September 2016. Inspections were also carried out at the times of effluent and receiving water chemistry monitoring. Each inspection by an officer of the Council is usually conducted in conjunction with a Company employee, though not always for odour surveys.

Particular attention is given to the following items:

- stormwater drains
- stockyard drains
- by-product load-out areas
- septic tanks
- chemical and oil/fuel storage areas
- wastewater treatment system
- land irrigation system
- offsite odour

In general, housekeeping was good. No objectionable odour was noted beyond the boundaries of the plant.

2.2 Water abstractions

Records of abstraction volume were supplied by ANZCO, providing data on volume of water drawn from the river directly and the town supply, and on average use per body. The annual report produced by ANZCO under consent 5437-3, condition 8 on minimising water usage is given in Appendix IV.

2.2.1 Monitoring records

Under the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, ANZCO was required by 10 November 2012 to take continuous measurements and keep daily records of volume taken, and thereafter supply by 31 July each year the record for the preceding 1 July to 30 June period. Suitable flow metering was already in place, and appropriate records kept, at the time the regulations came into force. Independent verification of the accuracy of the system was produced on 18 November 2014.

Special condition 2 of consent 5437-3 requires the company to provide abstraction records of the date, the time and the rate and volume of water taken at intervals not exceeding 15 mins.

In September 2016, the Company reported that computer problems had resulted in some of the record of daily water abstraction volumes being lost, the instantaneous consent limit is 22.8L/s. Weekly records were available. A similar problem occurred in 2014-2015, resulting in the computer being replaced, and changes to data storage back-up procedure.

The abstraction record for 1 October 2015 to 30 September 2016 is presented in Figure 3, comprising a combination of daily and weekly average volumes. The periods 5 November to 14 December 2015 and 23 March to 19 July 2016 relate to weekly records.

The record shows that the limit of 1,972 m³/day on maximum daily abstraction volume was exceeded on 34 days, between 30 October 2015 and 19 March 2016, with a highest value of 2,116 m³/day, or 7% above the limit. The measured daily volume exceeded the limit by more than 5%, the allowable accuracy error, on 4 days. When an abstraction exceedance is greater than 5% an incident is usually lodged. However due to the sporadic and late supply of data this practice is difficult to follow.

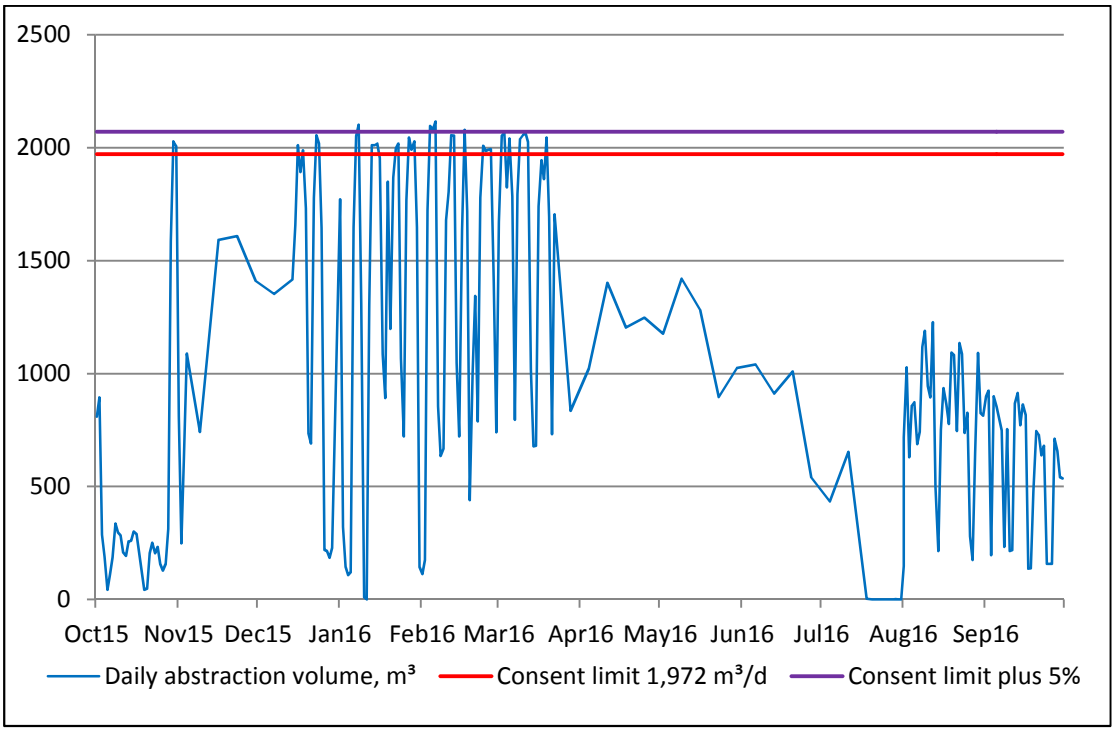

Figure 3 Daily water abstraction by ANZCO Eltham, October 2015– September 2016, m³

2.2.2 Report on water use minimisation

The annual report required by 31 May 2017 was received on 5 November 2016.

The period covered by the 2015-2016 annual water use report ended on 6 July 2016, in order to cover the entire beef season and thus allow direct comparison with data from previous seasons.

The total river abstraction volume recorded was 307,453 m³. This amounted to 65% of the total volume of 474,073 m³ used at the plant, and was the same as the proportion recorded in 2014-2015.

Water usage per cattle beast processed decreased from the previous season, from about 2.84 to 2.79 m³ per cattle beast processed. Non-potable use was 0.63 m³ per body, and potable use was 2.16 m³ per body. The decrease comprised about 0.04 m³ per body of non-potable water and 0.01 m³ per body of potable water.

Total annual water use during the 2015-2016 beef season decreased by a factor of 2.6% compared to 2014-2015, as a result of the combined effect of a 0.9% decrease in beef kill with a 1.8% decrease per animal processed. The water use per body was about average, in the fifth year of the water conservation programme that began in 2010-2011.

2.3 Discharges to Waingongoro River

Monitoring for compliance with conditions on the discharge permits is carried out by both ANZCO and the Council. ANZCO measures effluent discharge rate continuously, and undertakes chemical analysis of the discharge and the river upstream and downstream of the discharge point weekly. The consent requires data to be provided to the Council monthly. The Council monitors at the same points during two of the quarterly site inspections.

A survey of effects of the discharge on the river under low-flow conditions was carried out annually by the Council in summer/autumn between 1987 and 2000. This annual survey continued to be undertaken after the cessation of discharge to the river during low flows, in order to assess whether there was any unknown discharge or seepage from the plant site. Several points along the river, which encompass the main wastewater discharge and the tributary beside the stockyards, are monitored for chemical composition and bacteriological quality (Figure 4). The effects of the discharge from Eltham municipal ponds were surveyed concurrently. Given the small difference in river water quality found across the plant site in recent years, a low flow survey was not carried out during the 2015-2016 monitoring period.

Interlaboratory comparisons are carried out during the two compliance monitoring checks and (any) low-flow survey.

2.3.1 Monitoring by ANZCO

Effluent discharge rate to the river is measured continuously and is recorded with an electronic data logger. Effluent flow measurement is necessary to determine mass discharges of effluent components. Such information enables assessment of the effects of changes in waste management practices, and estimation of the effects of the discharge on the river under various killing schedules and river flows.

The discharge and two river sites are sampled weekly and analysed for temperature, dissolved oxygen, pH, and ammonia. The discharge is also monitored weekly for chemical oxygen demand (COD) and nitrate. A record is provided of the daily kill.

Although five day biochemical oxygen demand (BOD) is controlled on the discharge permit, it is not monitored, as dissolved oxygen is monitored for the river, and COD, a quicker and technically easier test, is monitored for the discharge.

The time of sampling is usually early to mid-morning. The data set for the effluent discharge for the 2014-2015 monitoring period is attached in Appendix II of this report.

ANZCO also monitors the discharges from Pond 5 and Pond 6 monthly in order to assess the effects of aeration in Pond 5. Parameters monitored are temperature,

dissolved oxygen, pH, ammonia and nitrate. Pond 4 is also monitored for temperature, pH and ammonia.

The results of monitoring by ANZCO show compliance with conditions on discharge permit 2039 throughout the 2015-2016 review period, in terms of discharge volume, and concentration of dissolved oxygen and total ammonia in the receiving water.

2.3.2 Monitoring by Council

The Council monitors for the same parameters as does ANZCO, and some additional parameters. BOD (five day test at 20^{o}C) is measured, both with and without nitrifier inhibition. This enables determination both of compliance with the consent limit on BOD increase in the receiving water, and of the degree of nitrogenous oxygen demand exerted by the treated wastewater. Enterococci and *E coli* (mTEC) tests are performed to produce information on micro-organisms that are used as indicators of water quality for contact recreation. Cations are measured to assess potential effects on soil of irrigation areas, and sulphate for generation of odour. Dissolved and total phosphorus are monitored as nutrients, and chloride is measured to assist in calculation of effluent dilution. Conductivity, turbidity and total alkalinity are measured as general water quality parameters.

For the summer low flow run, black disk measurements have been made in relation to water clarity.

The flow record for the Waingongoro River at Eltham Road hydrologic station over the monitoring period is attached as Appendix III.

Compliance monitoring checks

Routine discharge permit compliance checks were made on 6 July and 16 September 2016. The results are presented in Table 2 and Table 3. Discharge to the river was occurring on 1 July 2015, at the end of the beef processing season, and on 2 September, during the calf processing season. Discharge rates to the river are taken from the ANZCO flow meter, which was newly installed in May 2016 and is due for calibration.

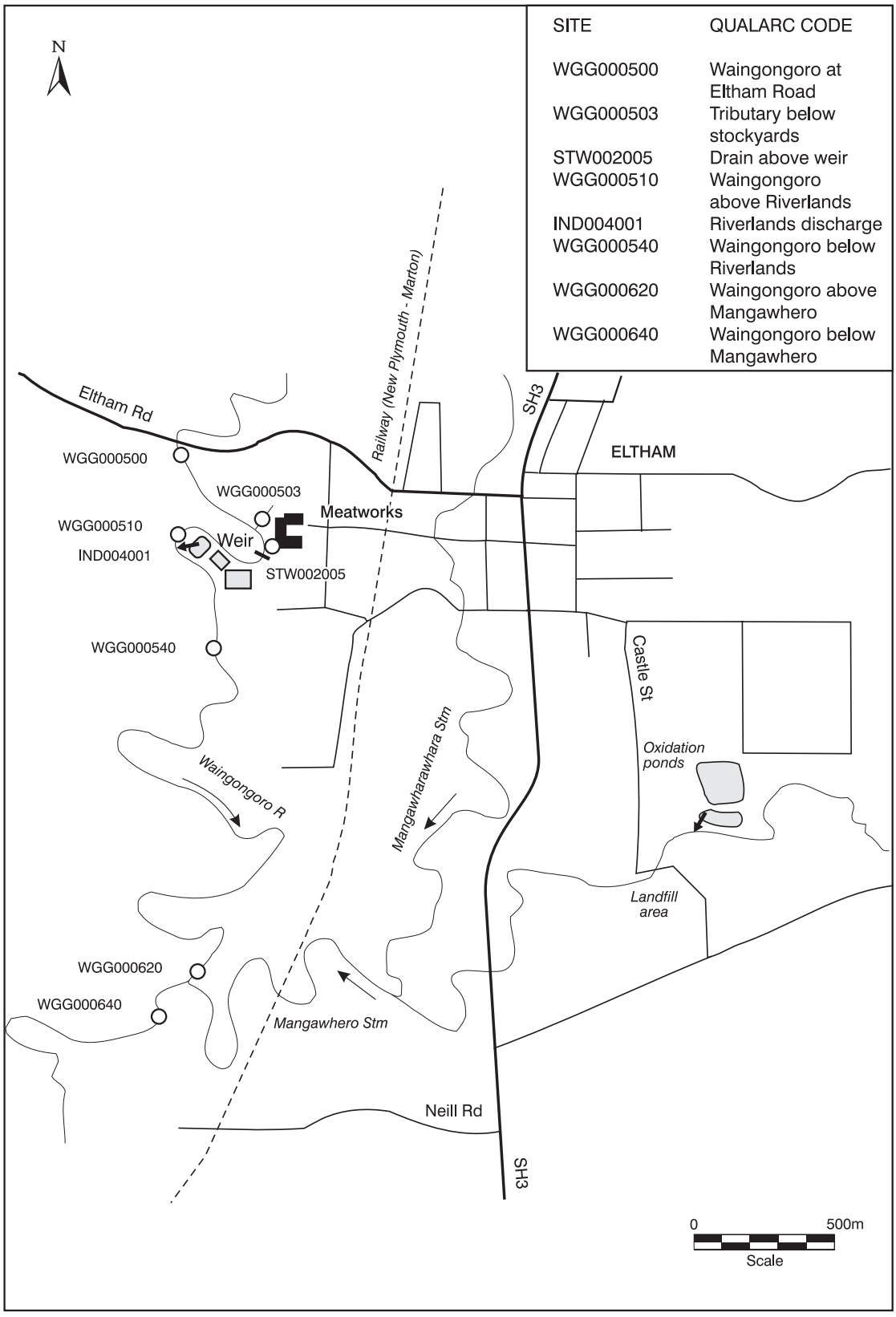

Figure 4 Chemical sampling sites

Table 2 Results of chemical analysis of ANZCO's discharge and Waingongoro River, 6 July 2016. Waingongoro River flow: 2,759 L/s. Discharge rate: 50 m³/h (14 L/s)

Parameter	Unit	Discharge	Upstream	Downstream	Downstream	Consent Limit
		IND004001	WGG000510	WGG000540	WGG000620	
Time	NZST	1125	1115	1145	1240	
Temperature	ºC	11.2	9.4	9.5	9.7	
Dissolved oxygen	g/m^3	5.8	11.5	11.4	11.2	>6
Conductivity @ 20ºC	mS/m	128	11.6	12.7	12.7	
pH	pH	7.7	7.7	7.7	7.6	
Alkalinity, total	g/m^3CaCO_3	370				
Turbidity	NTU	20	3.0	3.1	2.8	
Suspended solids	g/m^3	29	12	4	3	
Total grease	g/m^3	7				
COD	g/m^3	160				
BOD_5, total	g/m^3	45	1.3	1.7	2.9	
BOD_5, filtered carbonaceous	g/m^3	9.2	<0.5	0.5	0.6	<+2.0
Ammonia, total	g/m^3N	79	0.026	0.52	0.43	1.87
Un-ionised ammonia	g/m^3NH_3	0.97	0.000	0.006	0.004	
Kjeldahl nitrogen	g/m^3N	86				
Nitrite	g/m^3N	38	0.004	0.28	0.25	
Nitrate	g/m^3N	0	1.93	1.92	1.89	
Total nitrogen	g/m^3N	120				
Dissolved reactive phosphorus	g/m^3P	22	0.014	0.163	0.149	
Total phosphorus	g/m^3P	23				
Chloride	g/m^3	77	12.6	13.0	13.2	
Sulphate	g/m^3	16				
Sodium	g/m^3	134				
Potassium	g/m^3	50				
Calcium	g/m^3	17				
Magnesium	g/m^3	6.0				
Sodium adsorption ratio		7.1				
Potassium adsorption ratio		1.6				
Faecal coliforms	cfu/100ml	4200	180	140	150	
Enterococci	cfu/100ml	220	37	20	40	

Table 3 Results of chemical analysis of ANZCO's discharge and Waingongoro River, 16 September 2016. Waingongoro River flow: 2,317 L/s. Discharge rate: 50 m³/h (14 L/s)

Parameter	Unit	Discharge	Upstream	Downstream	Downstream	Consent Limit
		IND004001	WGG000510	WGG000540	WGG000620	
Time	NZST	0932	0925	0942	1020	
Temperature	ºC	14.7	12.7	12.8	12.8	
Dissolved oxygen	g/m^3	8.3	10.6	10.6	10.6	>6
Conductivity @ 20ºC	mS/m	88.6	11.6	12.2	12.2	
pH	pH	7.8	7.7	7.8	7.7	
Alkalinity, total	g/m^3CaCO_3	172				
Turbidity	NTU	11	1.7	1.5	2.0	
Suspended solids	g/m^3	20	3	3	3	
Total grease	g/m^3	<5				
COD	g/m^3	130				
BOD_5, total	g/m^3	13	0.5	<0.5	0.7	
BOD_5, filtered carbonaceous	g/m^3	2.0	<0.5	<0.5	<0.5	<+2.0
Ammonia, total	g/m^3N	58	0.023	0.43	0.33	1.66
Un-ionised ammonia	g/m^3NH_3	1.17	0.000	0.007	0.005	
Kjeldahl nitrogen	g/m^3N	75				
Nitrite	g/m^3N	46	0.007	0.29	0.26	
Nitrate	g/m^3N	<0.01	1.65	1.67	1.75	
Total nitrogen	g/m^3N	114				
Dissolved reactive phosphorus	g/m^3P	7.9	0.021	0.067	0.060	
Total phosphorus	g/m^3P	8.1				
Chloride	g/m^3	57	12.5	12.8	13.0	
Sulphate	g/m^3	<1				
Sodium	g/m^3	61				
Potassium	g/m^3	20				
Calcium	g/m^3	19				
Magnesium	g/m^3	4.7				
Sodium adsorption ratio		3.3				
Potassium adsorption ratio		0.63				
Faecal coliforms	cfu/100ml	800	230	200	240	
Enterococci	cfu/100ml	150	88	110	100	

Compliance with consent conditions on minimum dissolved oxygen and on maximum increase in filtered carbonaceous BOD, was achieved on each monitoring occasion.

A summary of the results of compliance monitoring checks on total ammonia nitrogen is given in Table 4. Compliance with the pH-dependent limit was achieved on each monitoring occasion.

Table 4 Summary of total ammonia nitrogen results from compliance monitoring by TRC

Date	Time NZST	Flow, L/s		pH	Total ammonia, g/m³N			
		Waingo-ngoro. River*	Effluent		Upstream	Down-stream	Limit	Percent of limit
06.07.16	1145	2,759	14	7.7	0.032	0.44	1.87	34
16.09.16	0942	2,317	14	7.8	0.028	0.52	1.66	31

* at Eltham Road

Annual low-flow survey

A low-flow survey was not carried out during the review period, as ANZCO did not discharge to the Waingongoro River during low flows. Low-flow surveys were carried out over the previous several years, also when there was no discharge, which showed that there was little change in water quality in the river between sites immediately above and below the meat plant site, a slight increase in ammonia concentration being apparent.

2.3.3 Interlaboratory comparisons

Routine inter-laboratory comparison exercises for 2015-2016 were carried out on 6 July and 16 September 2016. The results are given in Table 5.

Significant differences are highlighted in bold, taking into account the heterogeneity of the effluent, the accuracy and detection limits of the test methods employed, and the importance of the results in determining the potential for adverse effect in receiving water.

Table 5 Results of inter-laboratory comparisons 2015-2016 monitoring period

Parameter	Unit	Discharge		Upstream		Downstream	
		ANZCO	TRC	ANZCO	TRC	ANZCO	TRC
6 July 2016							
Temperature	ºC	11.6	11.2	9.9	9.4	10.0	9.5
Dissolved oxygen	g/m³	6.1	5.8	11.2	11.5	11.2	11.2
pH	pH	7.6	7.7	7.6	7.7	7.5	7.7
Ammonia	g/m³N	108	77	0.46	0.026	**1.15**	**0.52**
Nitrate + nitrite	g/m³N	50	34				
Chemical oxygen demand	g/m³	185	160				
Suspended solids	g/m³	20	29				
16 September 2016							
Temperature	ºC	15.2	14.7	12.9	12.7	13.0	12.8
Dissolved oxygen	g/m³	8.5	8.3	10.3	10.6	10.2	10.6
pH	pH	7.9	7.8	7.7	7.7	7.7	7.8
Ammonia	g/m³N	80	58	0.37	0.023	0.67	0.43
Nitrate + nitrite	g/m³N	30	39				
Chemical oxygen demand	g/m³	112	120				
Suspended solids	g/m³	60	20				

* samples taken by **ANZCO**

Overall, the results are satisfactory in terms of ability to determine compliance with relevant conditions on consent 2039.

Agreement on dissolved oxygen in the river has always been good. For the discharge, nitrification (microbial oxidation of ammonia) during transport to the Council laboratory sometimes resulted in Council values being the lower when using the Winkler (iodometric) method. The use of a field dissolved oxygen meter by Council appears to have remedied this.

The pH value is important in the determination of compliance with the consent limit on total ammonia. Low pH value leads to a false high value for the ammonia concentration that is allowed in the river. There was good agreement for the river on the two exercises.

Agreement on total ammonia was reasonable for the effluent, ANZCO's results being the higher. For the receiving water, ANZCO results were the higher at low concentrations. This probably owed to the relatively low sensitivity of the test employed by ANZCO. On the first comparison, the ANZCO downstream result was significantly higher.

Chemical oxygen demand and nitrate are used to assess the performance of the wastewater treatment system. For chemical oxygen demand, ANZCO results have usually been higher than those of the Council because a more rigorous digestion is used in the test. There was reasonable agreement on nitrate, given the relatively low sensitivity of the method employed by ANZCO. It is trends derived from weekly monitoring, rather than great accuracy for individual determinations, that matter for these parameters.

2.3.4 Biological surveys

The two routine streambed community surveys of the Waingongoro River for the 2015-2016 review period included a spring survey on 7 October 2015 and a late summer survey on 1March 2016.

The 2015 spring survey was performed under a period of moderate, recession flow conditions of about 1,650 L/s, after a period of about six days since the discharge of the treated wastewater ceased following the annual plant shutdown at the end of calf processing. The survey followed a relatively wet early spring period with seven freshes during the previous four weeks.

The 2016 late summer survey was performed during low flow conditions of about 510 L/s after a period of about four months of no river discharge, while 100% of wastewater had been irrigated to land.

Both surveys involved the assessment of macroinvertebrate communities (aquatic insects, crustacea, etc) and riverbed algae (microscopic plants). For the spring survey, samples were collected from three sites in the Waingongoro River: one upstream and two downstream of the ANZCO discharge (Figure 5). For the late summer survey, four sites were sampled downstream, encompassing the sites formerly monitored to assess the influence of discharges from Eltham town wastewater treatment system.

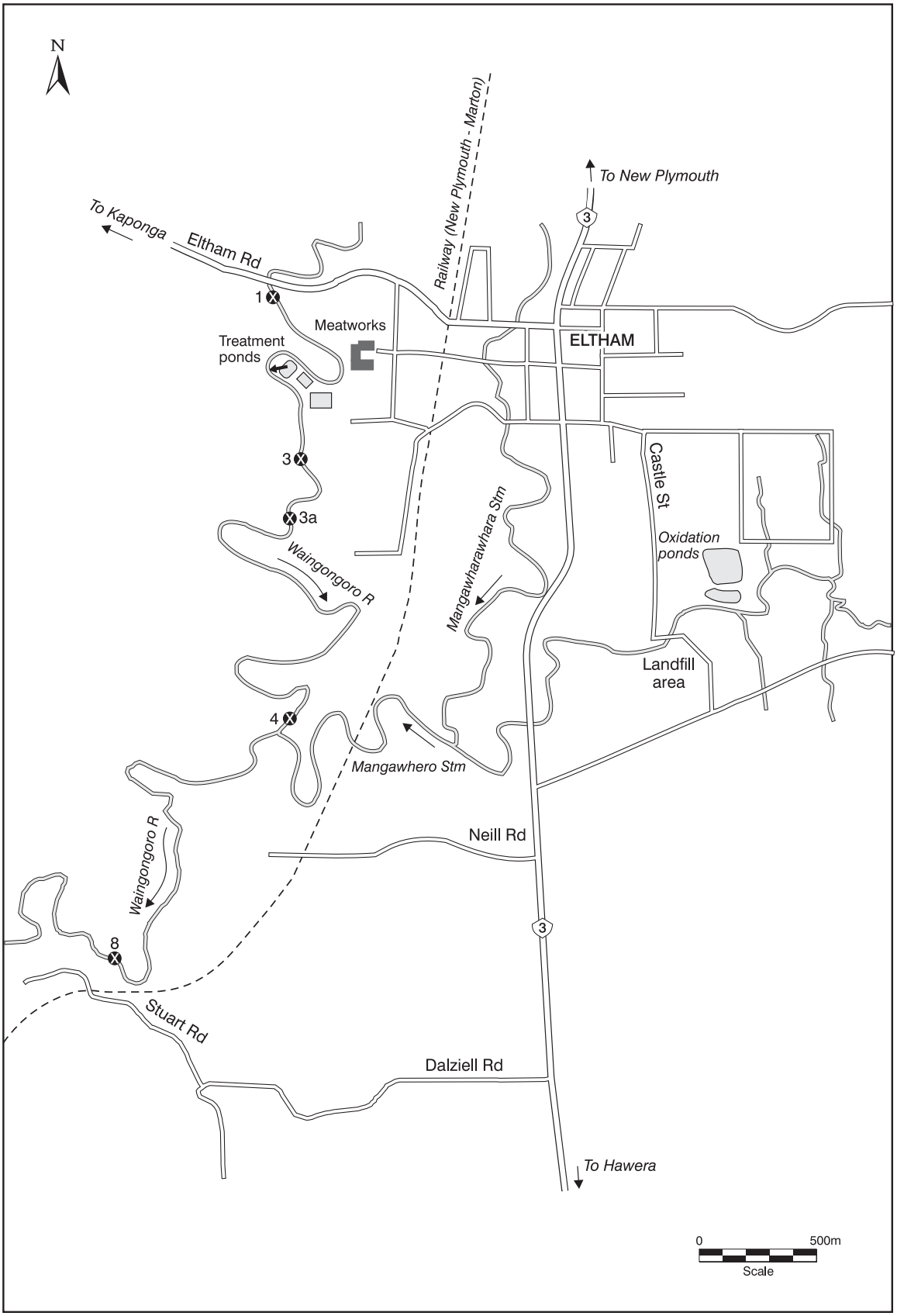

Figure 5 Biological sampling sites

7 October 2015

Macroinvertebrate richnesses were slightly lower than historical medians but differences among sites were not particularly large. MCI scores indicated that the river communities were of 'fair' to 'good' generic health and generally of 'expected' predicted conditions recorded for reaches of similar Taranaki rivers and streams though the 'control' site had a higher than normal MCI score. The results of this spring survey indicated that the discharge of waste from the ANZCO meatworks into the Waingongoro River had not had any recent significant detrimental effects on the macroinvertebrate communities downstream of the discharge. Differences among sites for MCI scores were likely due to habitat differences.

1 March 2016

Macroinvertebrate richnesses were similar to historical medians except for the 'control' site which had low taxa richness, possibly due to the large fresh which occurred 12 days prior to sampling. MCI scores indicated that the river communities were of 'fair' to 'good' generic health with sites further downstream having lower recorded MCI scores which is typical of Taranaki ring plain streams. The results of this summer survey indicated that the discharge of waste from the ANZCO meatworks into the Waingongoro River had not had any recent significant detrimental effects on the macroinvertebrate communities downstream of the discharge. Differences among sites for MCI and $SQMCI_s$ scores were likely due to habitat differences and incremental increases in nutrients from agricultural activities.

2.4 Discharges to land

Treated wastewater from ANZCO is irrigated on a 272 ha dairy farm on Lower Stuart Road (Figure 7). The contour of irrigation areas is flat to moderately rolling, with slope up to 17 degrees.

Figure 6 Travelling irrigator showing low discharge trajectory to minimise spray drift

Irrigation commenced in late January 2001, on an area of about 60 ha on the eastern side of Lower Stuart Road. A total of 100,050 m^3 was irrigated over a period until the middle of May.

In spring 2002, the mainline was extended through land on the western side of Lower Stuart Road, increasing the reticulated area to 133 ha. In December 2002, the mainline was further extended, increasing the reticulated area to 171 ha. In the 2004-2005 season, the area reticulated was 215 ha. The area available for irrigation is 264.71 ha, with approximately 251.5 ha used in 2015-2016.

The irrigation system is operated by the farmer in accordance with the procedures of a management plan written by ANZCO and approved by the Council. The governing factors are nitrogen application rate, prevention of ponding and run-off, and avoidance of odour or spray drift beyond the property boundary.

Applications are typically 45 mm (range 20-70 mm) in depth, with a minimum stand-down period before grazing of 10 days. Buffer zones are marked around residential dwellings (150 m), property boundaries, public roads and waterways (20 m), and wells or bores used for water supply (50 m).

Discharges to land and their effects are monitored by both ANZCO and the Council. ANZCO monitors effluent composition and application rate, and employs an independent consultant to monitor soil, foliage and surface waters of the irrigation areas. The Council monitors groundwater in the vicinity of the irrigation areas.

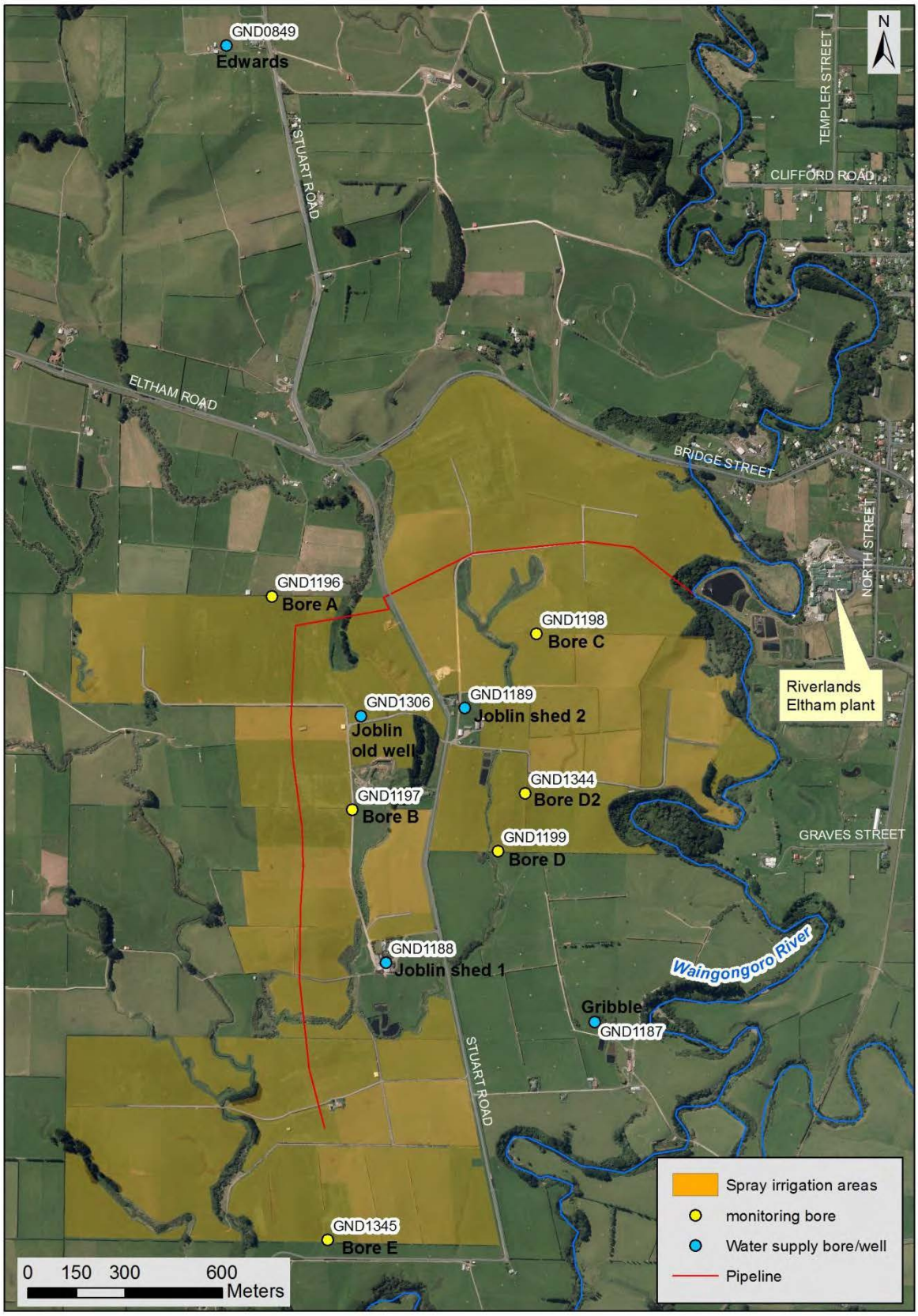

Figure 7 Wastewater irrigation areas in 2014-2015, showing groundwater monitoring sites

2.4.1 Monitoring by ANZCO

Hydraulic and nitrogen application rates

Effluent application rate is monitored by two methods. First, the volume of effluent pumped is metered at the meat plant. Secondly, a record is kept of every application on each paddock, and the standard depth of effluent applied (45 mm) is multiplied by the area irrigated to give a volume. Agreement between the methods has been reasonable, though actual application depths need to be checked.

Effluent composition is tested weekly by ANZCO for temperature, dissolved oxygen, pH, total ammonia, nitrate, suspended solids and COD (section 2.3.1). In addition, an independent laboratory (Industrial Chemical Services Limited) analyses the effluent monthly for pH, total dissolved solids, total Kjeldahl nitrogen and sodium, and bi-monthly for those parameters plus nitrate, nitrite, total ammonia, potassium, calcium and magnesium, total and dissolved reactive phosphorus, oil and grease, chemical oxygen demand, biochemical oxygen demand and faecal coliforms.

In the 2015-2016 period, irrigation occurred over a total period of 32 weeks, between 30 October 2015 and 8 June 2016. Total metered volume of effluent applied was 333,339 m^3, being 81% of the estimated total effluent generated over the year (413,056 m^3), and 91% of effluent generated during the beef processing season, 367,685 m^3. (The estimated total effluent volume may be low, as the accuracy of the new river discharge meter installed in May 2016 is in question. The meter is being recalibrated).

A total mass of 66,065 kg of nitrogen (based on weekly tests for ammonia-nitrogen and nitrate/nitrite-nitrogen, and assuming 15 g/m^3 organic nitrogen) was applied at concentrations ranging from 148 to 274 g/m^3 (average 198 g/m^3). Average nitrogen application rate was 262 kg/ha over 32 weeks, on the basis of pumped volumes. In comparison, nitrogen application rate on the basis of assumed application depth of 45 mm, on 88 paddocks totalling 251.5 ha in area (mostly three applications, up to four), was 252.3 kg/ha. Overall, in 2015-2016, the total mass of nitrogen applied decreased by 3.8%, while the area irrigated decreased by 3.7%, resulting in no change in average nitrogen application rate.

Loadings on individual paddocks ranged from 139 to 344 kg/ha/y. The maximum nitrogen application limit of 300 kg/ha/y was exceeded in eight paddocks over an area of 25.3 ha (10% of total), most of it by less than 10%. The nitrogen loading limit was exceeded by more than 10% in three paddocks, over an area of 8.5 ha or 3.4% of the total irrigated.

Soil and herbage

Shallow soil, up to 150 mm depth, is monitored monthly for parameters which give early indication of potential for nitrogen leaching, and for damage to soil structure. The parameters monitored are pH, water extractable nitrate, exchangeable ammonia, total nitrogen and exchangeable sodium.

Major soil components are monitored bi-annually for evaluation of fertiliser and soil conditioner requirements.

Foliage of the irrigation areas is monitored quarterly to assess major and trace nutrient uptake, for the purpose of checking pasture health and the suitability of the pasture as stock feed.

For the 2015-2016 review period, the results of shallow soil monitoring indicated that the nitrogen and sodium loadings applied are sustainable.

Soil analysis for major ions showed that calcium (as gypsum) application was needed in all areas. Herbage analysis indicated nutrient uptake to be in good condition. These factors were addressed through topdressing with appropriate (non-nitrogen) fertilisers.

Surface waters

Surface waters that exit the irrigation areas are monitored monthly at up to eight sites to detect any leaching or surface run-off. Parameters determined are pH, total dissolved solids, nitrate, nitrite, ammonia, Kjeldahl nitrogen, total and dissolved reactive phosphorus, and sodium.

In the 2015-2016 review period, the results of surface steam monitoring showed nitrate concentration in the tributary west of Lower Stuart Road at the downstream site to be fairly stable, in the range 2.4 to 3.6 g/m^{3}N.

2.4.2 Monitoring by Council

Groundwater in the vicinity of the irrigation areas is monitored quarterly by the Council at wells and bores used for water supply, and at dedicated monitoring bores. The monitoring sites are depicted in Figure 7 and described in Table 6.

Table 6 Groundwater monitoring sites

Site name	Site code	Depth m	Grid reference	
			Easting	Northing
Water supply				
Edwards	GND0849	14.9	2619191	6197881
Gribble	GND1187	6.7	2620329	6194862
Joblin cowshed1	GND1188		2619683	6195045
Joblin old well	GND1306	7.2	2619607	6195807
Joblin cowshed 2	GND1189	6.3	2619928	6195832
Monitoring				
Bore A	GND1196	9.0	2619332	6196178
Bore B	GND1197	9.1	2619580	6195518
Bore C	GND1198	8.6	2620148	6196062
Bore D	GND1199	8.6	2620030	6195390
Bore D2	GND1344	8.8	2620114	6195569
Bore E	GND1345	8.8	2619503	6194188

Monitoring at water supply wells and bores commenced in February 2001. Up to five supplies are sampled, four within or downgradient of the irrigation areas, and one control bore 1.3 km north on Stuart Road that previously was monitored for nitrate.

Four dedicated groundwater monitoring bores were drilled on 10/11 January 2002 under the supervision of the Council, to depths of between 2.5 - 8.5 m. Bore A (GND1196) is a control bore; Bore B (GND1197) was originally drilled as a downgradient bore, before the irrigation area was expanded, it now represents the irrigation area west of Lower Stuart Road; Bore C (GND1197) is in the centre of the irrigation area east of Lower Stuart Road; and Bore D (GND1199) is at the downgradient irrigation boundary east of Lower Stuart Road.

Two more monitoring bores were drilled on 6 November 2004. Bore D2 (GND1344) was installed upgradient of and to replace Bore D, which spans an organic layer and had produced variable results. Bore E (GND1345) is at the downgradient boundary of the southern extension of the irrigation area, west of Lower Stuart Road.

During the 2015-2016 review period, groundwater sampling was conducted at all wells on 10 November 2015, and 2 February, 3 May and 31 August 2016. The results from groundwater monitoring are summarised in Table 7 and Table 8.

Table 7 Water quality results for supply bores and wells, October 2015– September 2016

Parameter	Unit	Edwards	Gribble	Joblin shed 1*	Joblin old well	Joblin shed 2
		GND0849	GND1187	GND1188	GND1306	GND1189
Groundwater level	m	4.30 – 7.48	-	-	2.76 – 5.03	4.02 – 5.20
Temperature	ºC	12.7 – 16.3	13.7 – 14.8	14.2 – 14.3	11.7 – 16.1	13.7 – 15.0
Conductivity, 20ºC	mS/m	15.8 – 17.8	22.9 – 25.5	24.9 – 25.5	29.3 – 33.7	3.0 – 38.9
pH	pH	6.2 – 6.3	6.6	6.9	6.1 – 6.9	6.0 – 6.2
Nitrate + Nitrite	g/m^{3}N	4.6 – 5.8	4.5 – 6.5	3.0 – 3.5	12.6 – 19.7	13.3 – 18.2
Ammoniacal N	g/m^{3}N	<0.003 – 0.022	<0.003	0.22 – 0.28	<0.003 – 0.013	<0.003 – 0.021

* only 2 samples at Joblin shed 1 (GND1188) , on10 November 2015 and 3 May 2016, as pump not going at other times

Table 8 Water quality results for monitoring bores, October 2015 – September 2016

Parameter	Unit	Bore A	Bore B	Bore C	Bore D2	Bore E
		GND1196	GND1197	GND1198	GND1344	GND1345
Groundwater level	m	3.37 – 6.03	2.89 – 3.94	2.11 – 3.09	1.98 – 2.35	3.17 – 3.65
Temperature	ºC	13.6 – 14.4	13.4 – 14.4	13.2 – 14.6	13.2 – 14.7	14.0 – 16.2
Conductivity, 20ºC	mS/m	17.3 – 19.6	30.5 – 35.6	18.8 – 20.6	22.3 – 25.1	27.7 – 30.7
pH	pH	6.5 – 6.7	6.0 – 6.3	6.2 – 6.6	6.8 – 6.9	6.0 – 6.6
Nitrate + Nitrite	g/m^{3}N	2.5 – 3.8	13.0 – 19.5	5.0 – 7.4	0.02 – 1.26	12.0 – 17.5
Ammoniacal N	g/m^{3}N	<0.003 – 0.026	<0.003 – 0.030	<0.003 – 0.005	0.78 – 1.24	<0.003 – 0.009
Calcium	g/m^3	9.3 – 11	21 - 23	11 – 12	12 – 16	15 - 19
Magnesium	g/m^3	4.3 – 4.6	8.7 – 11	4.6 – 6.4	6.4 – 7.6	10 – 11
Potassium	g/m^3	5.7 – 6.1	6.6 – 10.4	3.4 – 4.4	6..8 – 8.0	4.9 – 5.4
Sodium	g/m^3	18.6 – 20.3	21.5 – 27.4	18.1 – 22.5	21.9 – 24.5	21.4 – 23.1
Chloride	g/m^3	18 - 25	19 - 32	22 – 25	22 - 25	28 – 31
COD	g/m^3	<5 - 19	5 - 36	<5 - 6	12 - 47	<5 - 6

These monitoring results indicate that the irrigation of effluent from ANZCO has effected groundwater quality at two monitoring bores and two wells through increase in nitrate/nitrite concentration (Figure 8).

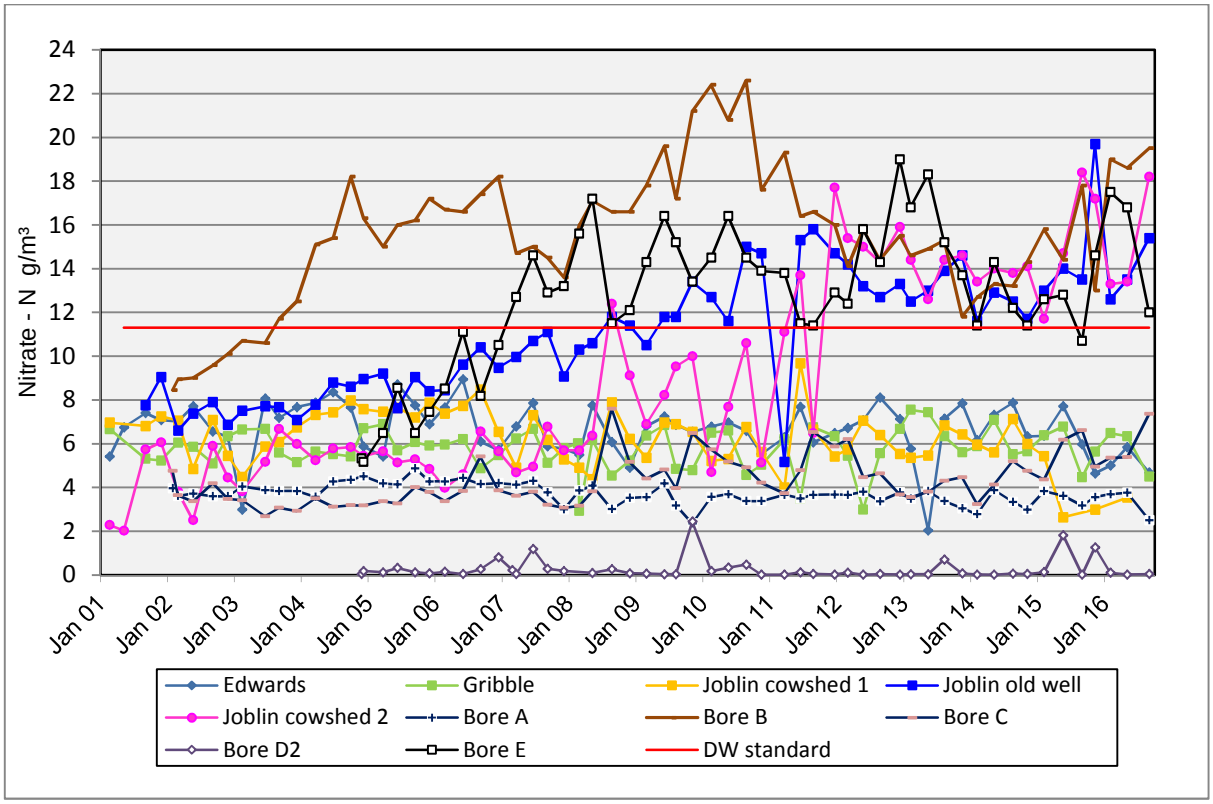

Figure 8 Nitrate concentration at groundwater monitoring bores and wells, 2001 - 2016

Six of ten sites monitored show relatively stable nitrate concentration, being sites Edwards (GND0849), Gribble (GND1187), Joblin cowshed 1 (GND1188), Bore A (GND1196), Bore C (GND1198) and Bore D2 (GND1344). Nitrate concentration at these sites ranges from about 3 to 7 g/m³N, except Bore D2 (GND1344) where values are typically <1 g/m³N. Bore C (GND1198) may show a slight increase.

The four affected sites, all within or immediately downgradient of the irrigated areas, are addressed below.

At Bore B (GND1197), on the eastern edge of the irrigation area west of Lower Stuart Road, the concentration of nitrate increased from 8.4 to 22.6 g/m³N from when monitoring began in January 2002 until August 2010. A decrease in levels was then observed, followed by an increase to 19.5 g/m³N since Jan 2015.

At Bore E (GND1345), at the downgradient irrigation area boundary, nitrate concentration increased from 5.2 g/m³N in November 2004 to 17.2 g/m³N in June 2008, then has undergone seasonal variation, peaking near the end of each irrigation period, with a highest value of 19.0 g/m³ in December 2012.

At Joblin old well (GND1306), 300 m upgradient of Bore B, nitrate concentration underwent a rising seasonal cycle, until a peak of 15.8 g/m³N in August 2011, after which the concentration has stabilised, with the exception of a spike to 19.7 g/m³ in November 2015.

At Joblin cowshed 2 (GND1189), nitrate level rose sharply in August 2008, from 6.4 to 12.4 g/m³N, then underwent seasonal variation with peaks of up to 18.4 g/m³N, in August 2015.

Overall, monitored groundwater nitrate levels were stable or increased during the 2015-2016 review period, reflecting less even application of effluent and higher nitrogen loading recorded in the preceding review period.

The New Zealand drinking water standard for nitrate is 11.3 g/m^3N (Ministry of Health, 1995). None of the wells affected is used for domestic water supply.

2.5 Discharges to air

The Council undertook four routine inspections during the review period in relation to aerial emissions from the Company's site. On several inspections, depending on wind direction, faint or noticeable odours as a result of operations at the site were detected beyond the site boundary. Stockyard odour was noticeable at the site entrance and on Eltham Road (Bridge Street). At the end of Conway Road, SE of the site, a musty smell from the adjacent Pond 1 was noted.

No offensive odour from the plant was found by the inspecting officer beyond the plant boundary.

During the 2015-2016 monitoring period, ANZCO undertook weekly odour surveys at four points situated around the site boundary, with particular attention given to potential effects on the neighbouring residential areas. The Company is consented to send the data through. Odour is assessed on a scale of 0 to 5, ranging from no noticeable odours, to slight occasional wafts, to slight but constant odour, to very noticeable odour, to unpleasant odours (frequently strong or continuously noticeable), to putrid. The monitoring sites are located to the south and to the east of the wastewater treatment system (Conway Road and North Street), the main gate, and north of the plant on Bridge Street.

Odour was detected at some point beyond the site boundary on 27% of occasions in 2015-2016, the reported strength being slight occasional wafts on 20% of occasions, and slight but constant odour on 7% of occasions. Sources of reported odour were mainly the stock yards at the entrance gate and on North Street to the east, with ponds odour detected on Conway Road to the south and Eltham Road to the north. No very noticeable, unpleasant or putrid odours were recorded from the boundary surveys.

Two complaints were received by Council about odour during the monitoring period, neither of which was substantiated. These are addressed in section 2.9.

In view of the potential for generation of objectionable odour at the meat plant, continuation of weekly monitoring by ANZCO is recommended.

2.6 Development of non-dairy land for irrigation

In October 2001, ANZCO (Riverlands then) was granted consent to discharge treated wastewater onto a 54 ha property owned by the Company on Eltham Road, about 2.5 km from the meat plant and adjacent to the existing irrigation area on Lower Stuart Road. Consent **5736** was obtained to provide for disposal of wastewater on land that is not used for dairy farming, in case disposal of meat plant wastewater on dairy farms is prohibited. The block is capable of assimilating up to about half of the meat plant effluent at times of low flow in the Waingongoro River, depending on effluent nitrogen concentration.

The consent has not been exercised for disposal of wastewater, though biosolids from de-sludging of Ponds 6 and 7 were applied on the block in September/October 2005 by irrigation with wastewater in accordance with a Biosolids Discharge Management Plan that had been approved by Council.

Certain works were required to be undertaken if the consent were to be exercised.

Special conditions 10 and 11 on consent **5736** require the consent to be exercised in accordance with the procedures of an irrigation management plan which shall incorporate, among other things, mitigation measures detailed in a riparian management plan that was prepared by the Council. The riparian management plan includes the removal of willows from watercourses, the fencing off and planting of riparian margins, and the planting of a shelterbelt along Eltham Road for the purpose of protecting a neighbour from irrigation spray drift.

The required works of clearing water courses, fencing and planting of riparian margins, and planting of shelter along Eltham Road were carried out to a high standard in Winter/Spring 2002, and were maintained well during the 2015-2016 reporting period.

2.6.1 Fonterra policy on meat processing waste application to dairy land

In March 2005, the dairy company Fonterra Co-operative Group Limited (Fonterra) notified ANZCO that there was to be no application of wastewater from meat processing on any pasture grazed by or harvested for dairy animals that would supply Fonterra after 1 June 2006. The possibility that this might happen had been raised by the dairy company in 1999 when application was made for consent 5569 to discharge to the dairy farm on lower Stuart Road.

The Council advised ANZCO that the conditions on consents to discharge to river (**2039**) and land (**5569** and **5736**) requiring that discharge to land be maximised would hold, irrespective of the Fonterra decision.

ANZCO commissioned a consultant to investigate alternative methods of wastewater treatment and disposal, and, together with the meat industry and government agencies, negotiated with the dairy company various options for acceptance of meat processing wastes.

In October 2006, Fonterra advised that, as a result of a number of factors including the recent recognition of New Zealand being BSE free, changes within some of its

major markets, and ongoing discussion with the Meat Industry Association, Fonterra would continue to accept milk from suppliers that irrigate pasture with meat processing waste provided certain wastewater treatment standards were met and suppliers meet enhanced animal health recording requirements. ANZCO has advised that its wastewater treatment system already meets the required standard.

2.7 Riparian management

To mitigate, in part, any effect of its abstraction of water from, and discharge of wastewater to, the Waingongoro River, ANZCO has since 1999 donated to the Taranaki Tree Trust $10,000 or more per year for the purpose of riparian planting and management in the Waingongoro catchment (GST exclusive and adjusted according to the consumer price index).

This agreement, with the Council as successor to the Trust, was rewritten into water permit 5437 (special condition 11, for $5,000) and discharge permit 2039 (special condition 11, for $9,000), when the consents were replaced in July 2012.

At the end of the 2015-2016 reporting period, a total of $188,117 of ANZCO funding had been spent on or was committed to riparian management covering planting, fencing, and some willow control. The works were carried out throughout the catchment, mainly along reaches above the Eltham plant. Funding was granted to landholders at a rate of 50% on plants, and 50% on all works in certain situations.

These donations, together with donations received from Ballance Agri-Nutrients Limited (abstractor) and South Taranaki District Council (abstractor and discharger), have been used to subsidise riparian planting and fencing along the main river and its tributaries. The effect of these measures will be to increase shading, with consequent decrease in water temperature and in nuisance algal growth; to reduce stock access and bank erosion; to reduce nutrient and sediment input to watercourses; and to enhance the appearance of the riparian margins.

During 2015-2016, a total of 14 holders of Riparian Management Plans (RMPs) received funding from ANZCO. The recommended riparian planting for the 14 RMPs that had received ANZCO funding covered a stream bank distance of 33km, of which 21 km, or 64%, had been completed at the end of June 2016. In comparison, of the recommended 265 km for other RMPs, (not including those properties receiving funding from Ballance and STDC), only 98km, or 37% of stream bank planting had been completed.

The locations in Waingongoro catchment of the RMP properties which have received funding from ANZCO are given in **Error! Reference source not found.**. The proportion of recommended planting that has been implemented is indicated for each property.

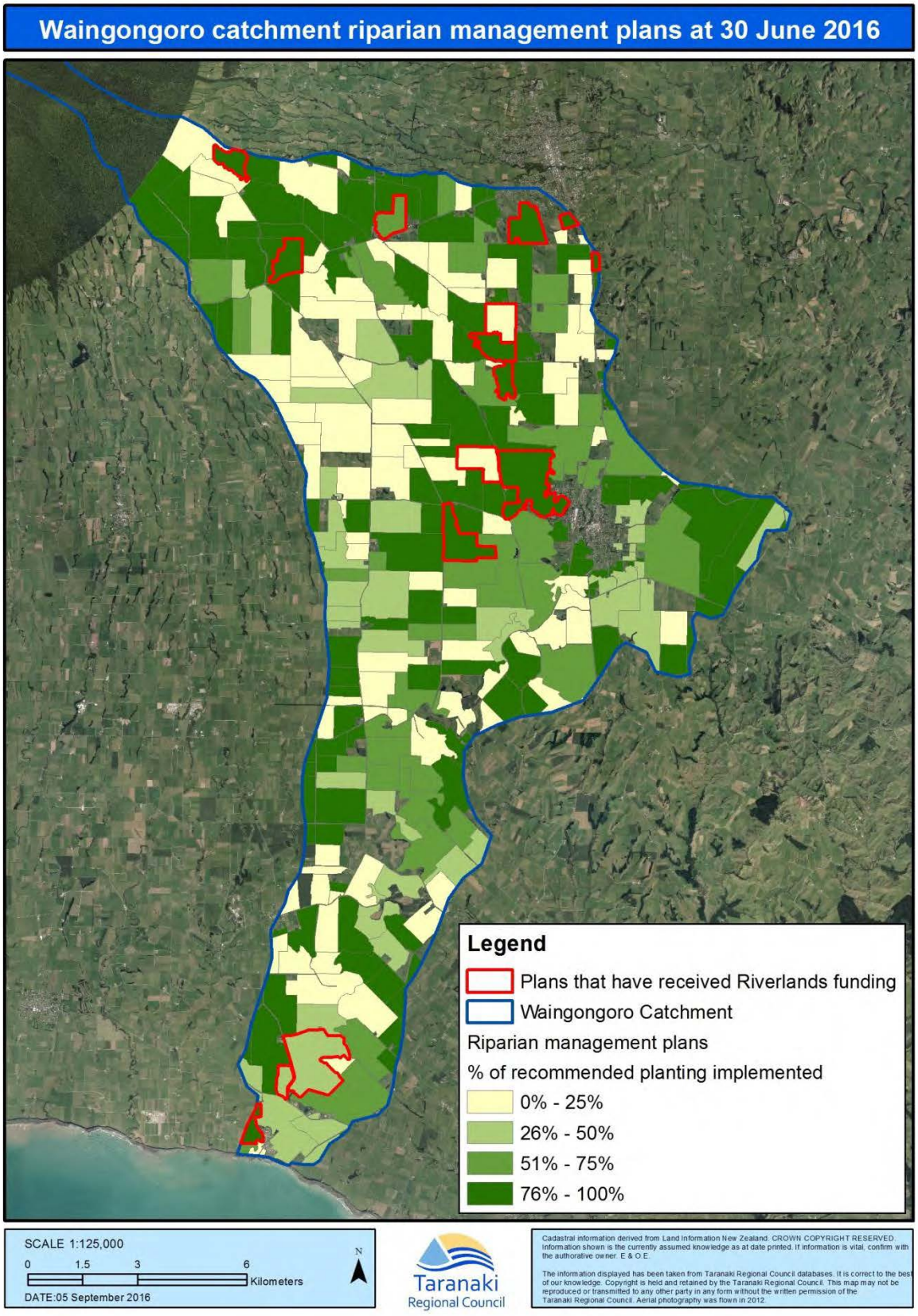

Figure 9 Riparian management plans in Waingongoro catchment with ANZCO funding

2.8 Annual report by ANZCO

ANZCO is required under the Effluent Management Plan to produce a annual report on the operation of its wastewater treatment and disposal systems.

The annual report for 2015-2016 was received on 5 January 2017. The report is attached at Appendix VI.

Subjects covered in the report include processing activity, ponds/treatment system changes, site management, effluent quality, irrigation, paunch material disposal, odour, water use, stormwater and inter-laboratory comparisons. Data on weekly kill, water usage, and effluent volume and quality are appended.

In summary, the report states:

> *The irrigation season for 2015/16 saw approximately the same volume of the wastewater going to land. The irrigation season ran for 32 weeks compared to 30 weeks the previous season.*
>
> *As has been for previous seasons, accurate monitoring of air quality, effluent, site inspections at Anzco Foods Eltham Limited) and monitoring on the Joblin farm will continue to be carried out to a high standard in order to achieve an excellent standard of compliance with consent conditions.*
>
> *Overall, we consider that we have achieved an excellent level of environmental performance for the 2015/16 year.*
>
> *In the 2016/17 season, Anzco Foods Eltham Limited is planning to have another successful year where we achieve compliance with all our consents and will continue to make innovative changes within the plant to improve our environmental outcomes.*

2.9 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, for example, 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 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 Incident Register (IR) 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 2015-2016 period, the Council was required to undertake significant additional investigations and interventions, or record incidents, in association with conditions in resource consents or provisions in Regional Plans on two occasions, both in relation to complaint about odour.

21 October 2015

On Wednesday 21 October 2015 at 1125 NZDT, Council received a complaint about odour emanating from the meat plant site. The complaint was investigated by a Council Officer about five minutes later. A gentle westerly wind was blowing. No odour was detected beyond the plant boundary, including the complainant's property to the east on London Street. The Company advised that no killing had taken place for several days. The complainant was informed. No further action was taken by Council.

1 June 2016

On Wednesday 1 June 2016 at 0835 NZST, Council received a complaint about odours arising from the meat plant site. The complaint was investigated by a Council Officer in the presence of the ANZCO Environmental Officer about one hour later. Noticeable, but not objectionable, odours were found at the complainant's property to the south of the plant, and adjacent to the wastewater treatment system off Conway Road**.** No further action was taken by Council.

2.10 Effluent, stormwater and air emissions management plans

Under consents held at the beginning of the review period, ANZCO was required to produce management and contingency plans under five consents. Plans were required for management of wastewater disposal to the Waingongoro River (consent **2039-3**) and to land by spray irrigation (consent **5569-1,** condition 2), for management of solids waste disposal (consent **7487-1**, special condition 8), for management of emissions to air (consent **4644-2**, special condition 8), and for spill contingency (consent **1968-3**).

ANZCO has combined all four of the required plans (spill contingency, and river, land and air discharge management), in a single document, which was updated in December 2014.

The combined plan was received and is under review.

Review/provision of Wastewater Disposal and Stormwater Management Plans

Consents **2039** and **1968**, to provide for discharges of treated wastewater and of stormwater to the Waingongoro River, were both replaced on 9 July 2012. The new consents require maintenance of the existing Wastewater Disposal Management Plan (consent **2039-4**, condition 5) and spill contingency plan, and the provision of a specific Stormwater Management Plan (consent **1968-4**, conditions 5 and 6).

An update and review of the Wastewater Disposal Management Plan was required to be submitted within three months of the granting of consent **2039-4** (under condition 6), that is, by 9 October 2012. The reviewed Management Plan was to be provided to the Department of Conservation (DoC) and Fish and Game New

Zealand (Taranaki Region) for Council to take into account any comments received (under condition 8).

The required update and review of the Wastewater Disposal Management Plan was received by Council on 12 February 2015, more than two years late. In the meantime, the Company was operating under the existing Wastewater Disposal Management Plan and spill contingency plan. The Plan was not submitted to DoC or Fish & Game for comment.

3. Discussion

3.1 Discussion of plant performance

Generally, the on-site management and operation of the ANZCO site was undertaken in a satisfactory manner.

Two environmental incidents were recorded in relation to the activities of ANZCO Eltham Limited in 2015-2016, both about odour complaint, which were not substantiated.

Two management plans, one an update and review of the Wastewater Disposal Management Plan, the other a (new) Stormwater Management Plan, were combined in an Environmental Management Plan (EMP) and submitted to Council as required under replacement consents issued in July 2012. The EMP was provided more than two years late, and was not provided to interested parties for comment, as required. In the interim, the Company operated under the existing wastewater disposal management and spill contingency plans.

3.1.1 Water abstraction

For water abstraction, flow measurement was made, volume records kept, at intervals not exceeding 15 mins, as is required in the consent, and an annual report produced, as required. However, only weekly volumes, recorded between November and December 2015 and again in March through to July 2016. This was attributed to failure of data storage equipment. A similar event occurred in 2014-2015 and has thought to be addressed through the replacement of equipment and improvement to data storage procedures.

The available record shows minor breaches of the limit on maximum daily abstraction rate for water taken from the Waingongoro River, on 34 days between October 2015 and March 2016, by factors of up to 7%. The abstraction volume exceeded the allowable accuracy error of 5% on a total of 4 days.

The large reduction in the amount of water used at the plant that was recorded in 2010-2011, as the result of a water conservation programme initiated by the new Environmental Officer, was maintained in 2015-2016. Recorded water use per body was about average for the five-year period, at 2.79 m^3.

Close monitoring of water usage within the plant was continued.

3.1.2 Wastewater treatment

No significant change was made to the wastewater treatment system during 2015-2016.

3.1.3 Discharges to water

Weekly water chemistry monitoring undertaken by ANZCO showed that limits on minimum dissolved oxygen and maximum total ammonia concentration, imposed for the protection of fish, were complied with throughout the 2015-2016 monitoring period. The level of dissolved oxygen remained near saturation throughout.

Requirements on flow measurement, and monitoring of discharge and receiving water quality were met. Some monitoring reports were late.

During the 2015-16 monitoring period, the measured proportion of treated wastewater discharged to the river, at 19%, was markedly less than the 28-37% recorded over the previous six years, likely due to calibration error in a new flow meter. The meter is to be recalibrated.

There was no discharge to the river between 17 November 2015 and 25 May 2016, during the periods when flows were low. This was a similar period to the previous several years.

3.1.4 Discharge to land

The irrigation system was, in general, well managed. Routine recording of wastewater application, and monitoring of soil, herbage and water quality carried on.

The irrigated area encompassed 95% of the 264.7 ha area of land available to be irrigated, taking buffer zones into account. The recorded proportion of the treated effluent applied to land during the 2015-2016 review period, at 81%, was the highest recorded, probably because of calibration error on the river effluent flow meter. The previous highest was 72% in 2009-2010. The total volume of effluent produced was well within the previous range, though the mass of nitrogen, at 66.1 t, was the second highest recorded after the 68.7 t in 2014-2015. The nitrogen level, at 198 g/m^3, was higher than average, though reduced from the previous season through a reported reduction in blood losses. The limit on maximum nitrogen loading rate of 300 kg/ha per year was complied with on average, with a reported average nitrogen loading rate was 262 kg/ha/y, the same as the previous season. Nitrogen loading exceeded the limit by more than 10% on 3.4% of the irrigated area. Effluent application rate was more even than in previous years, though there is room for improvement.

Irrigation occurred over 32 weeks in 2015-2016, similar to the period for the previous eight years.

The sodium adsorption ratio in the treated effluent was found to comply with the value of 10 set on the consent to prevent adverse effects on soil structure.

3.1.5 Discharges to air

For emissions to air, weekly odour surveys and monthly reports by ANZCO continued.

ANZCO staff detected faint odour on 26.9% of routine monitoring occasions, compared to 21.5% in 2014-2015. The reported sources were the anaerobic treatment ponds and the stockyards. No very noticeable or unpleasant odour was recorded. Council staff findings were similar.

Two complaints about emissions to air, both about odour, were received by Council. Neither complaint was substantiated.

3.2 Environmental effects of exercise of consents

3.2.1 Abstraction

The abstraction was not found to have any adverse environmental effect on the Waingongoro River.

The maximum allowable abstraction rate amounts to about 4% of the mean annual low flow in the river.

From August 2000 until the 2009-2010 year, about 50 to 65% of water used by ANZCO has been taken directly from the river at the plant site, the remainder being taken from Eltham town supply. This means that the river flow between the Eltham intake at Finnerty Road and the meat plant, a distance of 10 km, has been higher than would have been the case had the ANZCO intake not been operated. The proportion drawn from the river increased to 71% during 2010-2011 from 62% in 2009-2010 as the result of less water use while taking a similar volume directly from the river. The proportion reduced to 55% in 2013-2014, which was ascribed to problems with water treatment plant, and more frequent turbidity in the river during a wetter season. The proportion increased to 65% in 2014-2015 and remained at that level in 2015-2016, as the result of the water treatment plant working at near full capacity throughout the season.

3.2.2 Discharges to water

Two routine biological surveys of the Waingongoro River were carried out during the 2015-2016 review period.

In the October 2015 survey, carried out about six days after discharge to the river ceased and before irrigation to land began, the macroinvertebrate richness was slightly below medians found in previous surveys. The macroinvertebrate community index (MCI) scores indicated stream communities were of 'fair' to 'good' generic health and 'expected' predicted health conditions recorded for reaches of similar Taranaki rivers.

In the March 2016 survey, carried out under low flow conditions after a period of four months of no river discharge, MCI scores indicated that stream communities below the discharge remained in 'fair' to 'good' generic health.

The variations in MCI scores between sites at the time of the surveys were not considered indicative of any impacts of preceding discharges or land irrigation within the reach of the river adjacent to the meatworks property.

3.2.3 Discharges to land

Comprehensive monitoring for effects of the discharge to land was carried out through testing of soil, herbage, surface waters and groundwaters for the irrigation areas.

The results of soil and herbage testing indicated that the irrigation system is sustainable in the long term, with the application of appropriate corrective fertilisers by topdressing.

The results of surface stream monitoring did not indicate significant leaching or run-off from irrigation areas.

Five dedicated monitoring bores and five existing bores and wells used for water supply continued to be monitored for any effects of wastewater irrigation on groundwater quality. There has been an increase in nitrate concentration at two of the monitoring bores and two disused wells, which is likely to be related to the irrigation.

3.2.4 Discharges to air

The main issue in respect of discharges to air is odour, mainly in relation to emissions from the anaerobic ponds in the wastewater treatment system. Particular care is needed when de-sludging of the anaerobic ponds with regard to weather conditions. The irrigation of plant wastewater on land after treatment by aeration has not raised any concerns.

In general, the improvement in quality of air at the plant boundaries noted in the previous nine seasons was found to continue.

A major improvement was brought about in 2002- 2003 by the removal of paunch material from the site at the time of slaughter. Since then, all paunch material has been carted away for use in worm farming. In September 2003, alterations were made so that all yard wastewater screenings can be taken away with the paunch material. No green waste is stored or disposed of at the plant site, thereby completely removing a potential odour source.

A further improvement was the removal of the incinerator in March 2013. Wastes previously incinerated are now recycled.

Two complaints were received by the Council about emissions to air, both about odour, neither of which was substantiated.

3.3 Evaluation of performance

A tabular summary of the Company's compliance record for the year under review is set out in Table 9 to Table 19.

Table 9 Summary of performance for Consent 1968-4

Purpose: ***To discharge stormwater from various locations at a meat processing plant site into the Waingongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option	Site inspection – checking that standard operating procedures to achieve compliance with conditions are followed	Yes
2. Limit on catchment area	Site inspection	Yes
3. Concentration limits upon potential contaminants in discharge	Chemical sampling	Yes
4. Controls on effect of discharge in receiving water	Inspection, chemical sampling and bio-monitoring	Yes
5. Maintenance of contingency plan	Receipt and certification of Plan. Plan received, approved 11 September 2008. Updated Plan received 12 February 2015	Yes
6. Maintenance of stormwater management plan	Receipt and certification of Plan. Plan received, approved 11 September 2008. Updated Plan received 12 February 2015.	Yes
7. Consultation over significant proposed changes	Liaison during visits. No significant changes undertaken during year	N/A
8. Optional review provision re environmental effects	Option not available. Next review date June 2017	N/A
Overall assessment of environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 10 Summary of performance for Consent 2039-4

Purpose: ***To discharge treated wastewater into the Wangongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limits on discharge rates and volumes	Flow measurement by Company	Yes
2. Controls on effect of discharge in receiving water	Inspection, chemical sampling and bio-monitoring	Yes
3. Consultation over significant proposed changes	Liaison during visits. No significant changes undertaken during year	N/A

Purpose: *To discharge treated wastewater into the Wangongoro River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Accurate flow measuring and recording device	Records provided to Council monthly.	Yes
5. Adherence to wastewater disposal management plan	Inspections and review of monitoring data	Yes
6. Plan to be updated by 9 October 2012	Old plan received by Council and approved in 1997. Most recent update received 11 February 2015	No. Plan received late
7. Option for review of wastewater plan	No review sought by either Council or Company	N/A
8. Provision of plan to third parties	Communication with Fish & Game and DoC	No
9. Designated staff member	Part of Company Technical Manager's job description	Yes
10. Adopt bpo	Site inspection – checking that standard operating procedures to achieve compliance with conditions are followed	Yes
11. Donation to Taranaki Tree Trust	Confirmation with Council finance dept that donation received	Yes
12. Report on options for reducing DRP	Engagement of consultant by 31 December 2013. No report to date.	Yes
13. Optional review provision re nutrient loadings		N/A
14. Optional review provision re environmental effects	Option not available. Next review date June 2017	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **Improvement required**

Table 11 Summary of performance for Consent 4644-2

Purpose: *To discharge emissions into the air arising from meat processing and associate activities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge to take place as described in application	Inspection by Council	Yes
2. Consultation over significant proposed changes	On-going liaison. No significant changes undertaken during year	N/A
3. Adopt best practicable option (bpo) to prevent or minimise adverse effects	Liaison with Company and inspection by Council	Yes
4. Minimise emissions and effects by most appropriate equipment and operational controls	Inspection by Council	Yes

Purpose: *To discharge emissions into the air arising from meat processing and associate activities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. No significant adverse effects upon environment	Inspection by Council	Yes
6. No offensive or objectionable odour beyond boundary	Odour surveys by both Company and Council, and keeping of complaints record	Yes
7. Definition of offensive or objectionable odour		N/A
8. Provision of air quality management plan	Plan received by Council and approved in 1997. Most recent update received 11 February 2015	Yes
9. Matters covered by air quality management plan	Plan received by Council and approved in 1997. Most recent update received 11 February 2015	Yes
10. Design and operation of incinerator	Inspection by Council. Incinerator removed March 2013	N/A
11. Maintenance of gas-fired equipment	Inspection	Yes
12. Optional review provision re environmental effects	Option not available. Consent expires June 2016	N/A
Overall assessment of environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 12 Summary of performance for Consent 4644-3

Purpose: *To discharge emissions into the air arising from meat processing and associate activities*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge to take place from authorised area	Inspection by Council	Yes
2. Discharge to take place as described in application	Inspection by Council	Yes
3. Consultation over significant proposed changes	On-going liaison. No significant changes undertaken during year	N/A
4. Adopt best practicable option (bpo) to prevent or minimise adverse effects	Liaison with Company and inspection by Council	Yes
5. Minimise emissions and effects by most appropriate equipment and operational controls	Inspection by Council	Yes
6. No offensive or objectionable odour beyond boundary	Odour surveys by both Company and Council, and keeping of complaints record	Yes
7. Provision of air quality management plan	Plan received by Council and approved in 1997. Most recent update received 11 February 2015	Yes

Purpose: ***To discharge emissions into the air arising from meat processing and associate activities***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Optional review provision re environmental effects	Option not available. Next review date 1 June 2023.	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 13 Summary of performance for Consent 5437-3

Purpose: ***To take and use water from the Waingongoro river for use in a meat processing plant***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on maximum abstraction rate	Continuous flow metering by consent holder and monthly report to Council	No. The daily allowable volume was exceeded
2. Installation of flow meter and provision of records	Inspection, review of data	No
3. Certification of flow meter	Receipt of certification. (Provided 18 November 2014).	Yes
4. Reporting of monitoring equipment faults	Inspection, receipt of reports	N/A
5. Access to metering system	Inspection	Yes
6. Formatting of records	Inspection, and review of data received	Yes
7. Adopt best practicable option for conservation of water	Site inspection – checking that standard operating procedures to achieve compliance with conditions are followed	Yes
8. Annual report on water use and recycling	Receipt of report. Report is required by 31 May but was not received until5 November 2016	Yes Received late
9. Intake screened and designed to protect fish	Inspection	Yes
10. Intake modifications not to affect juvenile fish	Inspection	N/A
11. Donation to Council for riparian protection	Confirmation with Council finance dept that donation received	Yes
12. Optional review provision re environmental effects	Option not available. Next review date June 2017	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **Improvement required**

Table 14 Summary of performance for Consent 5569-1

Purpose: ***To discharge up to 3500 cubic/metres/day of treated wastewater from meat processing and associated activities by irrigation onto and into land, and to discharge emissions into the air in the vicinity of various unnamed tributaries of the Waingongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Operational within 12 months of issue	Irrigation commenced January 2001	N/A
2. Provision of spray irrigation management plan	Plan received by Council and approved in 2001. Most recent update received 11 February 2015	Yes
3. Plan to be followed	Liaison, inspections and provision of monitoring reports	Yes, some reports late
4. Optional review of management plan	Plan received by Council	Plan under review
5. Designated staff member	Part of Company Technical Manager's job description	Yes
6. Prohibition of untreated blood	Inspections	Yes
7. No offensive or objectionable odour beyond boundary	Inspections and complaint register	Yes
8. No spray drift beyond boundary	Inspections, and complaint register	Yes
9. Biosolids/sludge from aerobic ponds only	Inspections. No biosolids/sludge discharged on Stuart Road property	N/A
10. Limit on sodium adsorption ratio	Chemical monitoring	Yes
11. Prohibition of ponding and run-off	Inspections	Yes
12. Spray buffer zones	Inspections	Yes
13. Limit on nitrogen application rate to 300 kg/ha/year	Monitoring by Company and data review by Council	No
14. Provisions for contamination of groundwater or water supply	Monitoring by Council	No
15. Maintenance of monitoring bores	Inspection and sampling	Yes
16. Baseline and operational monitoring	Soil, herbage and water quality sampling by Company	Yes
17. Optional review provision for operational requirements	Not sought by Company	N/A
18. Optional review provision to assess design of treatment/disposal system	Not sought by Council	N/A
19. Optional review provision re environmental effects	Option not available. Next review date June 2018	N/A
Overall assessment of environmental performance in respect of this consent		**Improvement required**
Overall assessment of administrative performance in respect of this consent		**Improvement required**

Table 15 Summary of performance for Consent 5604-1

Purpose: ***To construct, place, user and maintain an intake structure and associated bank protection works on the true left bank of the Waingongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification prior to and after works	Receipt of notifications	N/A
2. Construction and maintenance in accordance with documentation	Inspection by Council, previously	Yes
3. Minimum batter slope		N/A
4. Riverbed material not to be removed		N/A
5. Adoption of best practicable option to avoid or minimise adverse effects	Liaison with Company and inspection of structure	Yes
6. No machinery refuelling on riverbed		N/A
7. Riverbed disturbance and reinstatement		N/A
8. Removal of structure when no longer required		N/A
9. Optional review provision re environmental effects	Option not available. Consent expires June 2017	N/A
Overall assessment of environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 16 Summary of performance for Consent 5736-2

Purpose: ***To discharge treated wastewater from meat processing and associated activities by irrigation onto and into land, and to discharge the associated emissions into the air***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge only from pond 6 or 7	Inspection by Council	N/A
2. No offensive or objectionable odour beyond boundary	Inspections and complaint register	N/A
3. No spray drift beyond boundary	Inspections, and complaint register	N/A
4. Limit on sodium adsorption ratio	Chemical monitoring	N/A
5. Prohibition of ponding and run-off	Inspection and complaint register	N/A
6. Spray buffer zones	Inspection by Council	N/A
7. Limit on Nitrogen application rate	Monitoring by Company and data review by Council	N/A
8. Provisions for contamination of groundwater or water supply	No local groundwater use downslope, no contamination of roof water	N/A

Purpose: ***To discharge treated wastewater from meat processing and associated activities by irrigation onto and into land, and to discharge the associated emissions into the air***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Provision of wastewater irrigation management plan	Plan for disposal of biosolids produced August 2005	N/A
10. Review of plan for certification	Receipt and review of plan	N/A
11. Plan to be provided to third parties for review		N/A
12. Designated staff member	Part of Company Technical Manager's job description	Yes
13. Adopt best practicable option (bpo) to prevent or minimise adverse effects	Liaison with Company and inspections	N/A
14. Maintenance of monitoring bores	Bores not installed as consent not exercised, other than biosolids disposal in Sept/Oct 2005	N/A
15. Monitoring of surface waters to be undertaken downstream	Chemical and microbiological monitoring by Council	N/A
16. Baseline and operational monitoring of herbage, soil and water	Water monitoring by Council and soil/herbage monitoring by Company	N/A
17. Annual report on consent compliance		N/A
18. Optional review provision re environmental effects	Option not available. Next review due 2017	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Not exercised**

Table 17 Summary of performance for Consent 5739-1

Purpose: ***To erect, place and maintain a pipeline under the bed of the Waingongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification prior to and after works	Receipt of notifications	N/A
2. Construction and maintenance in accordance with documentation	Inspection by Council	Yes
3. Adoption of best practicable option to avoid or minimise adverse effects	Liaison with Company and inspection of structure	Yes
4. Riverbed disturbance and reinstatement		N/A
5. Removal of structure when no longer required		N/A
6. Optional review provision re environmental effects	Option not available. Consent expires June 2017.	N/A

Overall assessment of environmental performance in respect of this consent	**High**
Overall assessment of administrative performance in respect of this consent	**High**

Table 18 Summary of performance for Consent 6455-1

Purpose: ***To erect, place and maintain a culvert in, and to realign, an unnamed tributary of the Waingongoro River for site access purposes***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practicable option (bpo) to avoid or minimise adverse effects	Liaison with Company and inspection of structure	Yes
2. Construction and maintenance in accordance with documentation	Inspection by Council	Yes
3. Notification prior to and after works	Notifications given 17 and 30 April 2007	Yes
4. Timing of maintenance works	Liaison with Company and inspection	Yes
5. Riverbed disturbance and reinstatement	Inspection by Council	Yes
6. Lapse of consent if not exercised	Consent exercised	N/A
7. Optional review provision re environmental effects	Option not available. Consent expires June 2017	N/A
Overall assessment of environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 19 Summary of performance for Consent 7487-1

Purpose: ***To discharge anaerobic pond solids and paunch solids onto and into land and contaminants to air in the Waingongoro catchment***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Disposal within defined areas	Inspection by Council	N/A
2. Keeping of disposal records	Recording by Company and review by Council	N/A
3. Adopt best practicable option (bpo) to avoid or minimise adverse effects	Liaison with Company and inspection by Council	N/A
4. No discharge to surface water	Inspection by Council	N/A
5. Buffer zones	Inspection by Council	N/A
6. Limit on Nitrogen application rates	Monitoring by Company and data review by Council	N/A
7. No offensive or objectionable odour beyond boundary	Inspections and complaint register	N/A
8. Provision and maintenance of solids disposal management plan	Review by Council, plan yet to be provided, consent not exercised.	N/A

Purpose: *To discharge anaerobic pond solids and paunch solids onto and into land and contaminants to air in the Waingongoro catchment*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Notification and recording of complaints	Reporting by Company and inspection by Council	N/A
10. Lapse of consent if not exercised	Whether exercised by 30 September 2015. Yes.	N/A
11. Optional review provision re environmental effects	Option not available. Next review date June 2017	N/A
Overall assessment of environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Not exercised**

Overall, during the 2015-2016 period, ANZCO demonstrated a generally good level of environmental performance and compliance with the resource consents.

For the take from the Waingongoro River, compliance with daily consent conditions was achieved, with minor exceptions on maximum abstraction rate. However, the 15 minute data was not recorded as is required by the consent.

For the discharge to the river, full compliance with consent conditions was achieved.

For the discharge to land, the disposal of treated wastewater was generally well managed. The affect of Nitrogen application to land can be observed in the groundwater.

For the discharge to air, no consent condition was found to be breached.

In regard to administrative performance, improvement is required in respect of the timely provision of monitoring reports, and in the provision of updated/new plans for wastewater disposal and stormwater management to Council and interested parties. An improvement is needed in timely provision of data to Council, which is currently not provided in the required time.

3.4 Recommendations from the 2014-2015 Annual Report

In the 2014-2015 Annual Report, it was recommended:

1. THAT monitoring of water abstraction and discharges in relation to the meat processing plant of ANZCO Eltham Limited in the 2015-2016 year continue at the same level as in 2014-2015.

2. THAT monitoring of air emissions from the activities of ANZCO Eltham Limited in the 2015-2016 year continue at the same level as in 2014-2015.

These recommendations were fully implemented during the 2015-2016 monitoring period.

3.5 Alterations to monitoring programmes for 2016-2017

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, its obligations to monitor emissions/discharges and effects under the RMA, and report to the regional community. The Council also takes into account 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 ANZCO Eltham Limited, the programme for 2015-2016 was unchanged from that for 2014-2015. It is now proposed that for 2016-2017 the monitoring programme remain the same as that for 2015-2016. Recommendations to this effect are attached to this report.

3.6 Exercise of optional review of consent

Five of the consents held by Riverlands Eltham Limited provide for an optional review in June 2017.

Resource consents 1968-4 (discharge stormwater), 2039-4 (discharge wastewater), 5437-3 (take), 6455-1 (pipeline structure) and 7487-1 (discharge solids) provide for an optional review of the consents in June 2017. Condition 8 on consent 1968-4, condition 14 on consent 2039-4, condition 12 on consent 5437-3, condition 7 on consent 6455-1, and condition 11 on consent 7487-1 allow the Council to review the consents, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects of the respective activities on the environments.

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.

4. Recommendations

1. THAT monitoring of water abstraction and discharges in relation to the meat processing plant of ANZCO Foods Eltham Limited in the 2016-2017 year continue at the same level as in 2015-2016.

2. THAT monitoring of air emissions from the activities of ANZCO Foods Eltham Limited in the 2016-2017 year continue at the same level as in 2015-2016.

3. THAT the option for a review of resource consent **1968-4** (discharge stormwater) in June 2017, as set out in condition 8 on consent **1968-4** not be exercised, on the ground that the current conditions are adequate to deal with any potential adverse effects.

4. THAT the option for a review of resource consent **2039-4** (discharge wastewater) in June 2017, as set out in condition 14 on consent **2039-4** be exercised, on the ground that the current method of providing data to Council is not adequate to comply with the consent conditions.

5. THAT the option for a review of resource consent **5437-3** (take) in June 2017, as set out in condition 12 on consent **5437-3** be exercised, on the ground that the current method of providing data to Council is not adequate to comply with the consent conditions.

6. THAT the option for a review of resource consent **6455-1** (pipeline structure) in June 2017, as set out in condition 7 on consent **6455-1** not be exercised, on the ground that the current conditions are adequate to deal with any potential adverse effects.

7. THAT the option for a review of resource consent **7487-1** (discharge solids) in June 2017, as set out in condition 11 on consent **7487-1** not be exercised, on the ground that the current conditions are adequate to deal with any potential adverse effects.

Glossary of common terms and abbreviations

The following abbreviations and terms are used within this report:

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
DO	Dissolved oxygen
DRP	Dissolved reactive phosphorus
E.coli	*Escherichia coli,* 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
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^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
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_4	Ammonium, normally expressed in terms of the mass of nitrogen (N)
NH_3	Unionised ammonia, 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
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)
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 (degrees Celsius)
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

For further information on analytical methods, contact the Council's laboratory

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Taranaki Regional Council 2012, Riverlands Eltham Ltd Consents Monitoring Annual Report 2010-2012, Technical Report 2012-98

Taranaki Regional Council 2014, Riverlands Eltham Ltd Consents Monitoring Annual Report 2012-2014, Technical Report 2014-86

Taranaki Regional Council 2015, Riverlands Eltham Ltd Consents Monitoring Annual Report 2014-2015, Technical Report 2015-117

Appendix I

Resource consents held by ANZCO Eltham Ltd

(For a copy of the signed resource consent
please contact the TRC consent department)

Discharge Permit

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM 4353
Decision Date:	9 July 2012
Commencement Date:	9 July 2012

Conditions of Consent

Consent Granted:	To discharge stormwater from various locations at a meat processing plant site into the Waingongoro River at or about (NZTM) 1710920E-5634567N
Expiry Date:	1 June 2029
Review Date(s):	June 2017, June 2023, and/or within 3 months of receiving notification under special condition 7
Site Location:	London Street, Eltham
Legal Description:	Lot 1 DP 11593 [Discharge source & site]
Catchment:	Waingongoro

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 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 adverse effects on the environment from the exercise of this consent.

2. The stormwater discharged shall be from a catchment area not exceeding 1.8 hectares

3. Constituents of the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 10
suspended solids	Concentration not greater than 100 gm^{-3}
oil and grease	Concentration not greater than 15 gm^{-3}

This condition shall apply before entry of the treated stormwater into the receiving waters at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

4. After allowing for reasonable mixing, within a mixing zone extending 20 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all 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.

5. The consent holder shall maintain a contingency plan that details measures and procedures to be undertaken to prevent spillage or any discharge of contaminants not authorised by this consent. The contingency plan shall be followed in the event of a spill or unauthorised discharge and shall be certified by the Chief Executive, Taranaki Regional Council as being adequate to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

6. The consent holder shall maintain a stormwater management plan that documents how the site is to be managed to minimise the contaminants that become entrained in the stormwater. This plan shall be followed at all times, shall be certified by the Chief Executive, Taranaki Regional Council, and shall include but not necessarily be limited to:

a) the loading and unloading of materials;
b) maintenance of conveyance systems;
c) general housekeeping; and
d) management of the interceptor system.

A Stormwater Management Plan template is available in the Environment section of the Taranaki Regional Council's web site www.trc.govt.nz.

7. The consent holder shall notify the Chief Executive, Taranaki Regional Council, prior to making any changes to the processes or operations undertaken at the site, or the chemicals used or stored on site, that could alter the nature of the discharge. Any such change shall then only occur following receipt of any necessary approval under the Resource Management Act 1991. Notification shall include the consent number, a brief description of the activity consented and an assessment of the environmental effects of any changes, and be emailed to consents@trc.govt.nz.

8. 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:

a) during the month of June 2017 and/or June 2023 and/or
b) within 3 months of receiving a notification under special condition 7 above;

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 9 July 2012

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM 4353
Decision Date:	9 July 2012
Commencement Date:	9 July 2012

Conditions of Consent

Consent Granted:	To discharge treated wastewater into the Waingongoro River at or about (NZTM) 1710612E-5634427N
Expiry Date:	1 June 2029
Review Date(s):	June 2017, June 2023, June 2026, and/or within 60 days months of receiving notification under special condition 13
Site Location:	London Street, Eltham
Legal Description:	Lot 2 DP 12254 Lot 3 DP 1622 Lots 5-7,14 DP 1623 Lot 1 DP 11593 & Sec 101 Eltham Vill Sett [Discharge source & site]
Catchment:	Waingongoro

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 discharge shall not exceed 3500 cubic metres per day and the rate of discharge shall not exceed 81 litres per second.

2. After allowing for reasonable mixing, within a mixing zone extending 100 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the receiving water:

   (a) a reduction in the dissolved oxygen concentration below 6 gm^{-3};
   (b) the concentration of total (un-ionised and ionised) ammonia nitrogen as gm^{-3} nitrogen exceeding the values given in Table 1 below for the corresponding pH:
   (c) the concentration of filtered carbonaceous Biochemical Oxygen Demand (20 ^{o}C, 5-day test) exceeding 2 gm^{-3};
   (d) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   (e) any conspicuous change in the colour or visual clarity;
   (f) any emission of objectionable odour;
   (g) the rendering of fresh water unsuitable for consumption by farm animals;
   (h) any significant adverse effects on aquatic life, habitats, or ecology; and
   (i) a decrease in water clarity of greater than 33% as determined using the standard black disc measurement.

3. The consent holder shall advise the Taranaki Regional Council prior to making any change in the processes undertaken at the site which could significantly alter the nature of the discharge. The advice shall be given by emailing consents@trc.govt.nz.

4. Before exercising this consent the consent holder shall install, and thereafter maintain a meter and a datalogger at the site of discharge. The meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of the discharge to an accuracy of ± 5%, at intervals not exceeding 15 minutes. Records of the date, the time and the rate and volume the discharge, shall be made available to the Chief Executive, Taranaki Regional Council on request.

5. Subject to the other conditions this consent, this consent shall be exercised in accordance with a 'Wastewater Disposal Management Plan' (the 'Management Plan') that has been approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The Management Plan shall detail the management of the discharge in combination with the land disposal authorised by consents 5569-1 and 5736-2 (Joblin Farm and Paulwell Farm), and the methods and procedures undertaken by the consent holder to ensure that the conditions of this consent are met and can be shown to be met. It shall address but not necessarily be limited to the following matters:

(a) monitoring the water quality and rate of the discharge;
(b) monitoring the water quality and flow in the receiving water;
(c) management of the wastewater treatment system;
(d) minimisation of phosphorous and nitrogen in the wastewater discharge and how this is being achieved;
(e) treatment and disposal of screenings and oxidation pond sludges;
(f) criteria for the use of spray irrigation or discharge to surface water;
(g) reporting on the exercise of the consent; and
(h) methods and procedures utilised to minimise the discharge to the Waingongoro River, and the effects of that discharge, and to maximise the discharge to land.

6. Within three months of the granting of this consent, the consent holder shall update and review the management plan required by condition 5 and resubmit the plan for certification by the Chief Executive, Taranaki Regional Council.

7. Within one months notice given by the Taranaki Regional Council, the consent holder shall review the management plan required by condition 5 and resubmit the plan for certification by the Chief Executive, Taranaki Regional Council.

8. A copy of any reviewed Plan, as per conditions 6 and 7, shall be provided to the Department of Conservation and Fish and Game New Zealand (Taranaki Region), for the Taranaki Regional Council to take into account any comments received (within a two week timeframe from when the Plan was provided).

9. The consent holder shall designate an officer with the necessary qualifications and/or experience to manage the wastewater system. The officer shall be regularly trained on the content and implementation of the wastewater disposal management plan, and shall be advised immediately of any revision or additions to the management plan.

10. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

11. The consent holder shall mitigate the effects of the discharge by making annual payments of $9000 (GST exclusive) to the Taranaki Regional Council as a financial contribution for the purpose of providing riparian planting and management in the Waingongoro River catchment excluding that area being irrigated under consent 5569. The amount to be paid shall be adjusted annually according to the consumer price index, or similar index, to account for the effects of inflation, and be made no later than 1 September each year.

12. Before 31 December 2013 the consent holder shall engage a suitably qualified independent person to prepare a report investigating Dissolved Reactive Phosphorus (DRP) in the discharge and options for reducing it. The report shall include, but not necessary be limited to:

(a) Details the DRP levels in the discharge and its potential environmental effect on the Waingongoro River;
(b) Benchmarking of DRP levels with other discharges of a similar nature;
(c) Options for further reducing DRP levels; and
(d) The feasibility of implementing DRP reduction options.

13. The Council may, pursuant to section 128 of the Resource Management Act 1991, review any or all of the conditions of this consent by giving notice of review within 60 days of receiving a report required by condition 12 for the purpose of requiring specific conditions to reduce the levels of Dissolved Reactive Phosphorus (DRP) in the discharge.

14. 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 2017 and/or June 2023 and/or June 2026 for the purposes of:

    (a) 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; and/or

    (b) to require any data collected in accordance with the conditions of this consent to be transmitted directly to the Council's computer system, in a format suitable for providing a 'real time' record over the internet.

Table 1: Maximum total ammonia concentration in the Waingongoro River for a given pH

pH of receiving water	Total Ammonia (gm^{-3})	pH of receiving water	Total Ammonia (gm^{-3})	pH of receiving water	Total Ammonia (gm^{-3})
		7.1	2.96	8.1	1.09
		7.2	2.81	8.2	0.935
		7.3	2.65	8.3	0.795
		7.4	2.47	8.4	0.673
6.5	3.48	7.5	2.28	8.5	0.568
6.6	3.42	7.6	2.07	8.6	0.480
6.7	3.36	7.7	1.87	8.7	0.406
6.8	3.28	7.8	1.66	8.8	0.345
6.9	3.19	7.9	1.46	8.9	0.295
7.0	3.08	8.0	1.27	9.0	0.254

Signed at Stratford on 9 July 2012

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	ANZCO Foods Limited PO Box 124 Eltham 4353
Decision Date:	5 May 2016
Commencement Date:	5 May 2016

Conditions of Consent

Consent Granted:	To discharge emissions into the air arising from meat processing and associated activities at the factory premises
Expiry Date:	1 June 2035
Review Date(s):	June 2023, June 2029
Site Location:	75 London Street, Eltham
Grid Reference (NZTM)	1710980E-5634465N
Catchment:	Waingongoro

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 all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. This consent authorises emissions only from the area shown on the attached map.

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of the original application for this consent and any subsequent applications to change conditions. In the case of any contradiction between the documentation submitted in support of previous applications and the conditions of this consent, the conditions of this consent shall prevail.

3. Prior to undertaking any alterations to the plant, processes or operations 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.

4. 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 adverse effects on the environment from the exercise of this resource consent.

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) supervision and operation; and
    e) the proper and effective operation, supervision, maintenance and control of all equipment and processes at all times.

6. The discharges authorised by this consent shall not give rise to any odour at or beyond the boundary of the site that is offensive or objectionable.

7. The site shall be operated in accordance with an 'Odour Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The plan shall detail how the site will be managed to achieve compliance with the conditions of this consent and shall address, as a minimum:

    a. possible sources of objectionable air discharge;
    b. air emissions control; and
    c. air monitoring.

8. 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 2023 and/or June 2029, 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 5 May 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Area in which emissions are authorised by this consent.

Water Permit

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM 4353
Decision Date:	9 July 2012
Commencement Date:	9 July 2012

Conditions of Consent

Consent Granted:	To take and use water from the Waingongoro River for use in a meat processing plant at or about (NZTM) 1710920E-5634567N
Expiry Date:	1 June 2029
Review Date(s):	June 2017, June 2023
Site Location:	Lower London Street, Eltham
Legal Description:	Lot 1 DP 11593 [Site of take & use]
Catchment:	Waingongoro

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 volume of water taken shall not exceed 1972 cubic metres per day (22.8 litres per second).

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%. Records of the date, the time and the rate and volume of water taken at intervals not exceeding 15 minutes, shall be made available to the Chief Executive, Taranaki Regional Council at all reasonable times.

   Note: Water meters and dataloggers must be installed, and regularly maintained, in accordance with manufacturer's specifications in order to ensure that they meet the required accuracy. Even with proper maintenance water meters and dataloggers have a limited lifespan.

3. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring and recording equipment required by the conditions of this consent ('the equipment'):

   (a) has been installed and/or maintained in accordance with the manufacturer's specifications; and/or
   (b) has been tested and shown to be operating to an accuracy of ± 5%.

   The documentation shall be provided:

   (i) within 30 days of the installation of a water meter or datalogger;
   (ii) at other times when reasonable notice is given and the Chief Executive, Taranaki Regional Council has reasonable evidence that the equipment may not be functioning as required by this consent; and
   (iii) no less frequently than once every five years.

4. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person.

5. The water meter and datalogger shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.

6. The records of water taken shall:

   (a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing; and
   (b) specifically record the water taken as 'zero' when no water is taken.

7. 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 taking of water, including, but not limited to, the efficient and conservative use of water.

8. The consent holder shall annually investigate and report on compliance with condition 7 including water conservation measures, plant water recycling and reuse. The report to be received by the Chief Executive, Taranaki Regional Council, by 31 May each year.

9. The consent holder shall ensure that the intake is screened and designed to avoid fish entering the intake or being trapped against the screen.

10. The consent holder shall ensure that no modification is made to the intake that in any way could increase the likelihood of juvenile fish entering the intake or being trapped against the screen.

11. The consent holder shall mitigate the effects of the discharge by making annual payments of $5000 (GST exclusive) to the Taranaki Regional Council as a financial contribution for the purpose of providing riparian planting and management in the Waingongoro River catchment excluding that area being irrigated under consent 5569. The amount to be paid shall be adjusted annually according to the consumer price index, or similar index, to account for the effects of inflation, and be made no later than 1 September each year.

12. 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 2017 and/or June 2023 for the purposes of:

    (a) 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; and/or

    (b) to require any data collected in accordance with the conditions of this consent to be transmitted directly to the Council's computer system, in a format suitable for providing a 'real time' record over the internet.

Signed at Stratford on 9 July 2012

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM
Change To Conditions Date:	15 December 2000 [Granted: 23 December 1999]

Conditions of Consent

Consent Granted:	To discharge up to 3500 cubic metres/day of treated wastewater from meat processing and associated activities by irrigation onto and into land, and to discharge emissions into the air, in the vicinity of various unnamed tributaries of the Waingongoro River and the Waingongoro River [area bounded by following GRs]: Q20:186-932 Q20:189-962 Q20:198-962 Q20:195-966 Q20:200-969 Q20:210-962 Q20:209-954 Q20:203-954 Q20:202-940 Q20:191-931
Expiry Date:	1 June 2026
Review Date(s):	June 2002, June 2004, June 2006, June 2008, June 2013, June 2018
Site Location:	Lower Stuart Road, Eltham
Legal Description:	Lot 1 DP 11593 & Lot 2 DP 12254 Ngaere SD [plant site] Pt Sec 51 Blk XIII Ngaere SD Lot 1 DP 3895 & Pt Sec 51 Blk XIII Ngaere SD Pt Sec 38 Blk IX Ngaere SD Sec 47 Blk IX Ngaere SD Lot 1 DP 7965 & Pt Sec 38 Blk IX Ngaere SD Lot 1 DP 3463 & Lot 2 DP 16398 & Pt Sec DP 3535 Blk IX Ngaere SD Lot 1 DP 16398 Blk IX Ngaere SD Lot 2 DP 17749 Blk IX Ngaere SD Pt Sec 39 Blk IX Ngaere SD Lot 1 DP 5241 Blk IX Ngaere SD Pt Sec 40 Blk IX Ngaere SD
Catchment:	Waingongoro
Tributary:	Various unnamed

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

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

Irrigation system

1. The irrigation system shall be installed and operational by 15 February 2001.

Management Plan

2. Prior to the exercise of this consent, the consent holder shall provide a spray irrigation management plan, to the approval of the General Manager, Taranaki Regional Council, outlining the management of the system, which shall demonstrate ability to comply with consent conditions and shall address the following matters:

(a) designated application areas;
(b) selection of appropriate irrigation methods for different types of terrain;
(c) application rate and duration;
(d) application frequency;
(e) farm management and operator training;
(f) soil and herbage management;
(g) prevention of runoff and ponding;
(h) minimisation and control of odour effects offsite;
(i) operational control and maintenance of the spray irrigation system;
(j) monitoring of the effluent [physicochemical];
(k) monitoring of soils and herbage [physicochemical];
(l) monitoring of groundwater beneath and beyond the irrigated area [physicochemical];
(m) remediation measures;
(n) mitigation measures including screening of any storage facilities and riparian planting;
(o) reporting monitoring data;
(p) monitoring of the Waingongoro River and relevant tributaries;
(q) procedures for responding to complaints; and
(r) notification to the council of non-compliance with the conditions of this consent.

The objective of the plan shall be to minimise discharges to the Waingongoro River under consent 2039 and maximise discharges to land.

3. The consent shall be exercised in accordance with the procedures set out in the spray irrigation management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and other matters specified in the management plan, except by the specific agreement of the General Manager, Taranaki Regional Council. In the case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

4. The spray irrigation management plan described in special condition 2 of this consent shall be subject to review upon two months notice by either the consent holder or the Taranaki Regional Council.

5. The consent holder shall designate an officer with the necessary qualifications and/or experience to manage the spray irrigation system. The officer shall be regularly trained on the content and implementation of the spray irrigation management plan, and shall be advised immediately of any revision or additions to the spray irrigation management plan.

Odour and spray effects

6. No raw or untreated animal blood shall be discharged.

7. There shall be no offensive or objectionable odour at or beyond the boundary of the property or properties on which spray irrigation is occurring.

8. There shall be no spray drift as a result of the irrigation of treated wastewater at or beyond the boundary of the property or properties on which spray irrigation is occurring.

Land effects

9. The discharge of biosolids or sludge from the wastewater treatment system as a result of the exercise of this consent shall only take place from aerated or aerobic ponds or the oxidation pond.

10. The sodium absorption ration [SAR] of the wastewater shall not exceed 10.

11. There shall be no ponding of wastewater, and/or any direct discharge to a watercourse due to the exercise of this consent.

12. The edge of the spray zone shall be at least:

    a) 20 metres from the banks of any watercourse;
    b) 50 metres from any bore, well or spring actively used for water supply purposes;
    c) 20 metres from any public road;
    d) 20 metres from any property boundary that is not part of the irrigation area, unless the written approval of the landowner has been obtained to allow the discharge at a lesser distance;
    e) 150 metres from any dwellinghouse [except that listed in condition 12(f)] unless the written approval of the occupier has been obtained to allow discharge at a closer distance; and
    f) 300 metres from the boundary of the property described as Lot 1 DP 17749 Blk IX Ngaere SD, unless the written approval of the occupier has been obtained to allow the discharge at a closer distance.

13. The effluent application rate shall not exceed 300 kg nitrogen/ha/year. This condition shall be reviewed in accordance with condition 18 to assess the possible reduction of the loading rate.

14. That should monitoring of the discharge under conditions 13, 15 and 16 indicate contamination of local groundwater or a water supply from the roof of a dwellinghouse as a result of the exercise of this consent the consent holder shall:

    a) undertake appropriate remedial action as soon as practicable as described in the spray irrigation management plan prepared under condition 2, or other such action reasonably required by the General Manager, Taranaki Regional Council;
    b) shall review the spray irrigation management plan and incorporate such reasonable modifications as are considered necessary by the General Manager, Taranaki Regional Council; and
    c) where water supplies are significantly affected, immediately provide alternative supplies as reasonably required by the General Manager, Taranaki Regional Council.

Monitoring

15. The consent holder shall site, install and maintain to the satisfaction of the General Manager, Taranaki Regional Council, monitoring bores for the purpose of determining groundwater quality in the vicinity of the discharge.

16. The consent holder shall undertake such baseline and operational monitoring of the activities licensed by this consent as deemed reasonably necessary by the General Manager, Taranaki Regional Council.

Review

17. The consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of this consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements, the results of monitoring, or irrigation scheme expansion.

18. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and June 2004, for the purpose of assessing the need to increase the land area of the scheme, reduce nitrogen loading to land and/or increase treatment at the wastewater treatment system to reduce the nitrogen concentration of the effluent.

19. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002, June 2004, June 2006, June 2008, June 2013 and/or June 2018, 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 15 December 2000

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM
Consent Granted Date:	23 December 1999

Conditions of Consent

Consent Granted:	To discharge up to 3500 cubic metres/day of treated wastewater from meat processing and associated activities by irrigation onto and into land, and to discharge emissions into the air, in the vicinity of various unnamed tributaries of the Waingongoro River and the Waingongoro River [area bounded by following GRs]: Q20:186-932, Q20:189-962, Q20:198-962, Q20:195-966, Q20:200-969, Q20:210-962, Q20:209-954, Q20:203-954, Q20:202-940, Q20:191-931
Expiry Date:	1 June 2026
Review Date(s):	June 2002, June 2004, June 2006, June 2008, June 2013, June 2018
Site Location:	Lower Stuart Road, Eltham
Legal Description:	Lot 1 DP 11593 & Lot 2 DP 12254 Ngaere SD [plant site] Pt Sec 51 Blk XIII Ngaere SD Lot 1 DP 3895 & Pt Sec 51 Blk XIII Ngaere SD Pt Sec 38 Blk IX Ngaere SD Sec 47 Blk IX Ngaere SD Lot 1 DP 7965 & Pt Sec 38 Blk IX Ngaere SD Lot 1 DP 3463 & Lot 2 DP 16398 & Pt Sec DP 3535 Blk IX Ngaere SD Lot 1 DP 16398 Blk IX Ngaere SD Lot 2 DP 17749 Blk IX Ngaere SD Pt Sec 39 Blk IX Ngaere SD Lot 1 DP 5241 Blk IX Ngaere SD Pt Sec 40 Blk IX Ngaere SD
Catchment:	Waingongoro
Tributary:	Various unnamed

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

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), 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

Irrigation system

1. The irrigation system shall be installed and operational within 12 months of the granting of this consent.

Management Plan

2. Prior to the exercise of this consent, the consent holder shall provide a spray irrigation management plan, to the approval of the General Manager, Taranaki Regional Council, outlining the management of the system, which shall demonstrate ability to comply with consent conditions and shall address the following matters:

   (a) designated application areas;
   (b) selection of appropriate irrigation methods for different types of terrain;
   (c) application rate and duration;
   (d) application frequency;
   (e) farm management and operator training;
   (f) soil and herbage management;
   (g) prevention of runoff and ponding;
   (h) minimisation and control of odour effects offsite;
   (i) operational control and maintenance of the spray irrigation system;
   (j) monitoring of the effluent [physicochemical];
   (k) monitoring of soils and herbage [physicochemical];
   (l) monitoring of groundwater beneath and beyond the irrigated area [physicochemical];
   (m) remediation measures;
   (n) mitigation measures including screening of any storage facilities and riparian planting;
   (o) reporting monitoring data;
   (p) monitoring of the Waingongoro River and relevant tributaries;
   (q) procedures for responding to complaints; and
   (r) notification to the council of non-compliance with the conditions of this consent.

   The objective of the plan shall be to minimise discharges to the Waingongoro River under consent 2039 and maximise discharges to land.

3. The consent shall be exercised in accordance with the procedures set out in the spray irrigation management plan, and the consent holder shall subsequently adhere to and comply with the procedures, requirements, obligations and other matters specified in the management plan, except by the specific agreement of the General Manager, Taranaki Regional Council. In the case of any contradiction between the management plan and the conditions of this resource consent, the conditions of this resource consent shall prevail.

4. The spray irrigation management plan described in special condition 2 of this consent shall be subject to review upon two months notice by either the consent holder or the Taranaki Regional Council.

5. The consent holder shall designate an officer with the necessary qualifications and/or experience to manage the spray irrigation system. The officer shall be regularly trained on the content and implementation of the spray irrigation management plan, and shall be advised immediately of any revision or additions to the spray irrigation management plan.

Odour and spray effects

6. No raw or untreated animal blood shall be discharged.

7. There shall be no offensive or objectionable odour at or beyond the boundary of the property or properties on which spray irrigation is occurring.

8. There shall be no spray drift as a result of the irrigation of treated wastewater at or beyond the boundary of the property or properties on which spray irrigation is occurring.

Land effects

9. The discharge of biosolids or sludge from the wastewater treatment system as a result of the exercise of this consent shall only take place from aerated or aerobic ponds or the oxidation pond.

10. The sodium absorption ration [SAR] of the wastewater shall not exceed 10.

11. There shall be no ponding of wastewater, and/or any direct discharge to a watercourse due to the exercise of this consent.

12. The edge of the spray zone shall be at least:

    a) 20 metres from the banks of any watercourse;
    b) 50 metres from any bore, well or spring actively used for water supply purposes;
    c) 20 metres from any public road;
    d) 20 metres from any property boundary that is not part of the irrigation area, unless the written approval of the landowner has been obtained to allow the discharge at a lesser distance;
    e) 150 metres from any dwellinghouse [except that listed in condition 12(f)] unless the written approval of the occupier has been obtained to allow discharge at a closer distance; and
    f) 300 metres from the boundary of the property described as Lot 1 DP 17749 Blk IX Ngaere SD, unless the written approval of the occupier has been obtained to allow the discharge at a closer distance.

13. The effluent application rate shall not exceed 300 kg nitrogen/ha/year. This condition shall be reviewed in accordance with condition 18 to assess the possible reduction of the loading rate.

14. That should monitoring of the discharge under conditions 13, 15 and 16 indicate contamination of local groundwater or a water supply from the roof of a dwellinghouse as a result of the exercise of this consent the consent holder shall:

    a) undertake appropriate remedial action as soon as practicable as described in the spray irrigation management plan prepared under condition 2, or other such action reasonably required by the General Manager, Taranaki Regional Council;
    b) shall review the spray irrigation management plan and incorporate such reasonable modifications as are considered necessary by the General Manager, Taranaki Regional Council; and
    c) where water supplies are significantly affected, immediately provide alternative supplies as reasonably required by the General Manager, Taranaki Regional Council.

Monitoring

15. The consent holder shall site, install and maintain to the satisfaction of the General Manager, Taranaki Regional Council, monitoring bores for the purpose of determining groundwater quality in the vicinity of the discharge.

16. The consent holder shall undertake such baseline and operational monitoring of the activities licensed by this consent as deemed reasonably necessary by the General Manager, Taranaki Regional Council.

Review

17. The consent holder may apply to the Taranaki Regional Council for a change or cancellation of the conditions of this consent, in accordance with section 127(1)(a) of the Resource Management Act 1991, to take account of operational requirements, the results of monitoring, or irrigation scheme expansion.

18. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002 and June 2004, for the purpose of assessing the need to increase the land area of the scheme, reduce nitrogen loading to land and/or increase treatment at the wastewater treatment system to reduce the nitrogen concentration of the effluent.

19. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during June 2002, June 2004, June 2006, June 2008, June 2013 and/or June 2018, 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 23 December 1999

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

Structure - Erosion Control
Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM
Consent Granted Date:	9 March 2000

Conditions of Consent

Consent Granted:	To construct, place, use and maintain an intake structure and associated bank protection works on the true left bank of the Waingongoro River at or about GR: Q20:209-963
Expiry Date:	1 June 2017
Review Date(s):	June 2005, June 2011
Site Location:	75 Lower London Street, Eltham
Legal Description:	Lot 1 DP11593 Blk IX Ngaere SD
Catchment:	Waingongoro

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

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), 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. THAT the consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the commencement and upon completion of the initial construction and again prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water.

2. THAT the structures authorised by this consent shall be constructed generally in accordance with the documentation submitted in support of the application and shall be maintained to ensure the conditions of this consent are met.

3. THAT the consent holder shall install a rock batter with a minimum batter slope of 1:1.5 in front of the bank protection works, to avoid adverse effects on the river bank as a result of the construction of the bank protection works.

4. THAT no material shall be removed from the riverbed for the construction of the rock batter specified in condition 3.

5. THAT the consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

6. THAT no refuelling of equipment or machinery shall take place on any area of the riverbed.

7. THAT the consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

8. THAT the structures authorised by this consent shall be removed and the area reinstated, if and when the structures are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to the structure[s] removal and reinstatement.

9. THAT the Taranaki Regional Council shall review any or all of the conditions of this consent by giving notice of review during June 2005 and/or June 2011, 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 March 2000

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM
Consent Granted Date:	14 December 2000

Conditions of Consent

Consent Granted:	To erect, place and maintain a pipeline under the bed of the Waingongoro River at or about GR: Q20:208-963
Expiry Date:	1 June 2017
Review Date(s):	June 2005, June 2011
Site Location:	Lower London Street, Eltham
Legal Description:	Lot 1 DP 11593 & Sec 101 Eltham Vill Sett Blk IX Ngaere SD [Riverlands property] Pt Sec 39 Blk IX Ngaere SD [Reardon property]
Catchment:	Waingongoro

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

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. The consent holder shall notify the Taranaki Regional Council in writing at least 48 hours prior to the commencement and upon completion of the initial construction and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water.

2. The structure[s] authorised by this consent shall be constructed generally in accordance with the documentation submitted in support of the application and shall be maintained to ensure the conditions of this consent are met.

3. The consent holder shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the riverbed and to avoid or minimise the disturbance of the riverbed and any adverse effects on water quality.

4. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as is practicable, be minimised and any areas which are disturbed shall, so far as is practicable, be reinstated.

5. The structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure[s] are no longer required. The consent holder shall notify the Taranaki Regional Council at least 48 hours prior to structure[s] removal and reinstatement.

6. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2005 and/or June 2011, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this 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 14 December 2000

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management

Consent 6455-1

Land Use Consent

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM
Consent Granted Date:	20 September 2004

Conditions of Consent

Consent Granted:	To erect, place and maintain a culvert in, and to realign, an unnamed tributary of the Waingongoro River for site access purposes at or about GR: Q20:209-962
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Lower London Street, Eltham
Legal Description:	Lot 3 DP 1622 Lots 5-7 14 DP 1623 Lot 1 DP 11593 Sec 101 Eltham Vill Sett Blk X Ngaere SD
Catchment:	Waingongoro

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 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 adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent.

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3311. In the case of any contradiction between the documentation submitted in support of application 3311 and the conditions of this consent, the conditions of this consent shall prevail.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water.

4. Once initial work is complete, any further instream works shall take place only between 1 November and 30 April inclusive, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

5. The consent holder shall ensure that the area and volume of riverbed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.

6. This consent shall lapse on the expiry of five years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

7. 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 2011 and / or June 2017, 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 20 September 2004

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

Name of Consent Holder:	Riverlands Eltham Limited P O Box 124 ELTHAM 4353
Decision Date:	17 September 2010
Commencement Date:	17 September 2010

Conditions of Consent

Consent Granted:	To discharge anaerobic pond solids and paunch solids onto and into land and contaminants to air in the Waingongoro catchment at or about (NZTM) 1708439E-5635064N, 1710226E-5634406N and 1712433E-5635858N
Expiry Date:	1 June 2029
Review Date(s):	June 2017, June 2023
Site Location:	Lower Stuart Road, Eltham Road & Anderson Road, Eltham
Legal Description:	Lot 1 DP 11593 Lot 3 DP 1622 [Discharge Source] Part of Lots 1 & 3 DP 399595, Lot 1 DP 13131 Pt Sec 21 Blk IX Ngaere SD, Pt Lot 2 DP 13131 Pt Sec 21,22 Block IX Ngaere SD, Pt Sec 38 Blk IX SD, Lot 1 DP 7965 and Part of Sec 38 Blk IX SD, Lot 1 DP 3463 Blk IX Ngaere SD, Lot 2 DP 16398 Blk IX Ngaere SD and Part Sec of DP 3535 Blk IX Ngaere SD, Lot 2 DP 17749 Blk IX Ngaere SD, Pt Sec 39 IX Ngaere SD, Lot 1 DP 5241 Blk IX Ngaere SD, Pt Sec 40 Blk IX Ngaere SD [Discharge Sites]
Catchment:	Waingongoro

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

Exercise of Consent

1. The discharge of anaerobic pond solids and paunch solids to land shall only occur within the boundaries of the disposal sites authorised by this consent i.e. within the areas shaded on the plan attached.

2. The consent holder shall keep a record of:

    - The volume of anaerobic pond solids and/or paunch solids discharged to land;
    - The date of disposal;
    - The area of disposal;
    - Nitrogen loading calculations [which demonstrate compliance with special condition 6].

    These records shall be made available to the Chief Executive of Taranaki Regional Council upon request.

3. 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 adverse effects on the environment from the exercise of this consent.

4. No anaerobic pond solids, paunch solids, or water which has been in contact with the deposited solids, shall enter surface water.

5. The disposal of anaerobic pond solids and paunch solids to land shall not occur within:

    - 25 metres of a watercourse [whether flowing continuously or intermittently];
    - 20 metres of any property boundary;
    - 50 metres of a water supply well or spring actively used for potable supply;
    - 150 metres of any residential dwelling [unless written approval has been obtained from the owner/occupier to dispose closer].

6. Over any 12 month period the total nitrogen application rate shall not exceed:

    - 300 kg of plant available nitrogen per hectare [of land used for disposal] for grazing areas; and
    - 600 kg plant available nitrogen per hectare [of land used for disposal] for cut-and-carry areas.

7. The discharges authorised by this consent shall not give rise to any odour at or beyond the boundary of the disposal sites that is offensive or objectionable.

8. The consent holder shall prepare and thereafter maintain a management plan that, to the satisfaction of the Chief Executive of the Taranaki Regional Council, details how the disposal of anaerobic pond solids and paunch solids to land will be managed to ensure that the conditions of this consent will be met. The plan shall include but not necessarily be limited to:

   a) A description of disposal areas and buffer zones;
   b) The application rate and method;
   c) The depth and frequency of coverage;
   d) Details of composting management;
   e) Methods for preventing run-off to surface water;
   f) Methods for determining compliance with nitrogen loading conditions;
   g) How leaching to groundwater will be minimised;
   h) Methods for minimisation and control of odour effects offsite;
   i) Contingency procedures; and
   j) Monitoring and reporting methods [undertaken by the consent holder].

9. The consent holder shall maintain a permanent record of any complaints received alleging adverse effects from or related to the exercise of this consent. This record shall include the following, where practicable:

   a) the name and address of the complainant, if supplied;
   b) date, time and details of the alleged event;
   c) weather conditions at the time of the alleged event [as far as practicable];
   d) investigations undertaken by the consent holder in regards to the complaint and any measures adopted to remedy the effects of the incident/complaint; and
   e) measures put in place to prevent occurrence of a similar incident.

   The consent holder shall make the complaints record available to officers of Taranaki Regional Council, on request.

   The consent holder shall notify the Chief Executive, Taranaki Regional Council, or his delegate, of any complaints received, which relate to the exercise of this permit, within 24 hours of being received.

   At the grant date of this consent, the Council's phone number is 0800 736 222 [24 hr service].

Lapse and review dates

10. This consent shall lapse on 30 September 2015, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

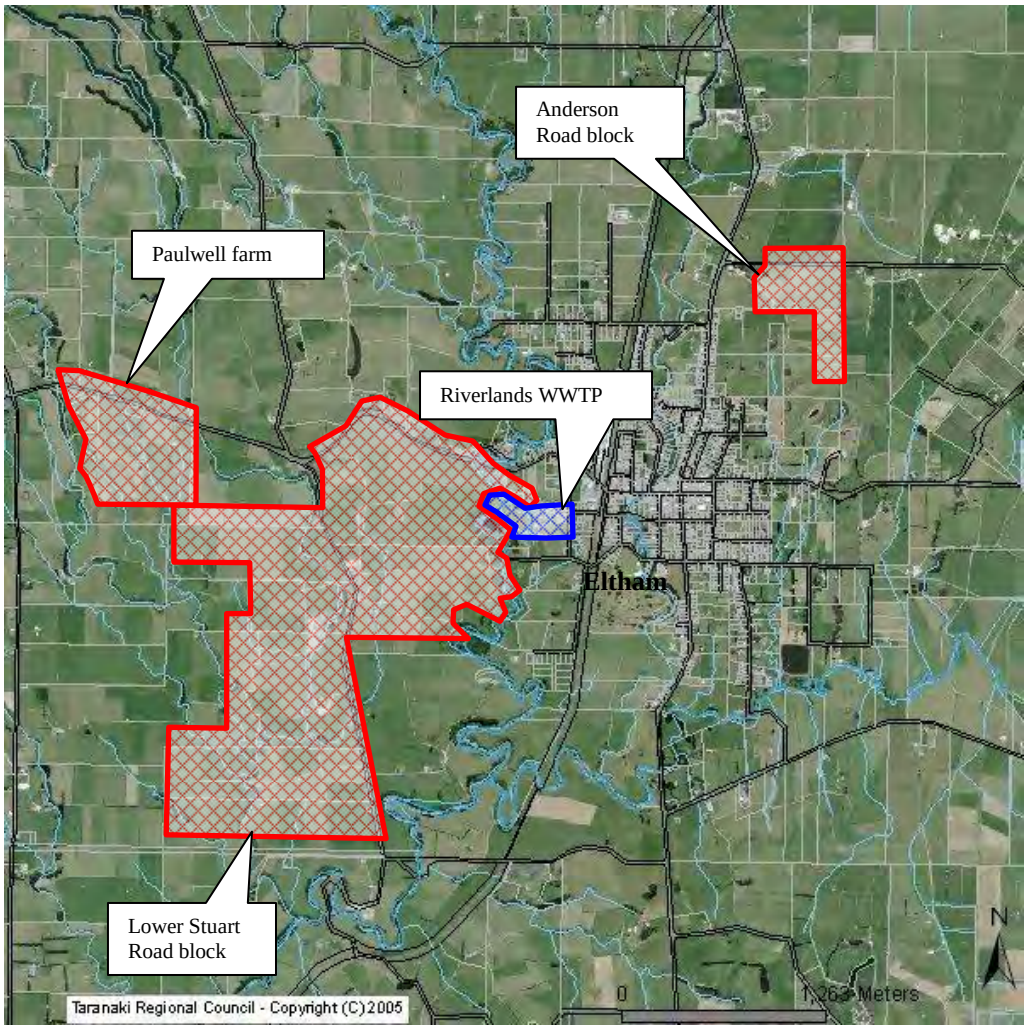
11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or 2023 for the 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 17 September 2010

For and on behalf of
Taranaki Regional Council

_____

Director-Resource Management



Plan attached: Aerial photo illustrating the site areas for land disposal relative to the Wastewater Treatment Plant.

Appendix II

ANZCO discharge monitoring data 2015-2016

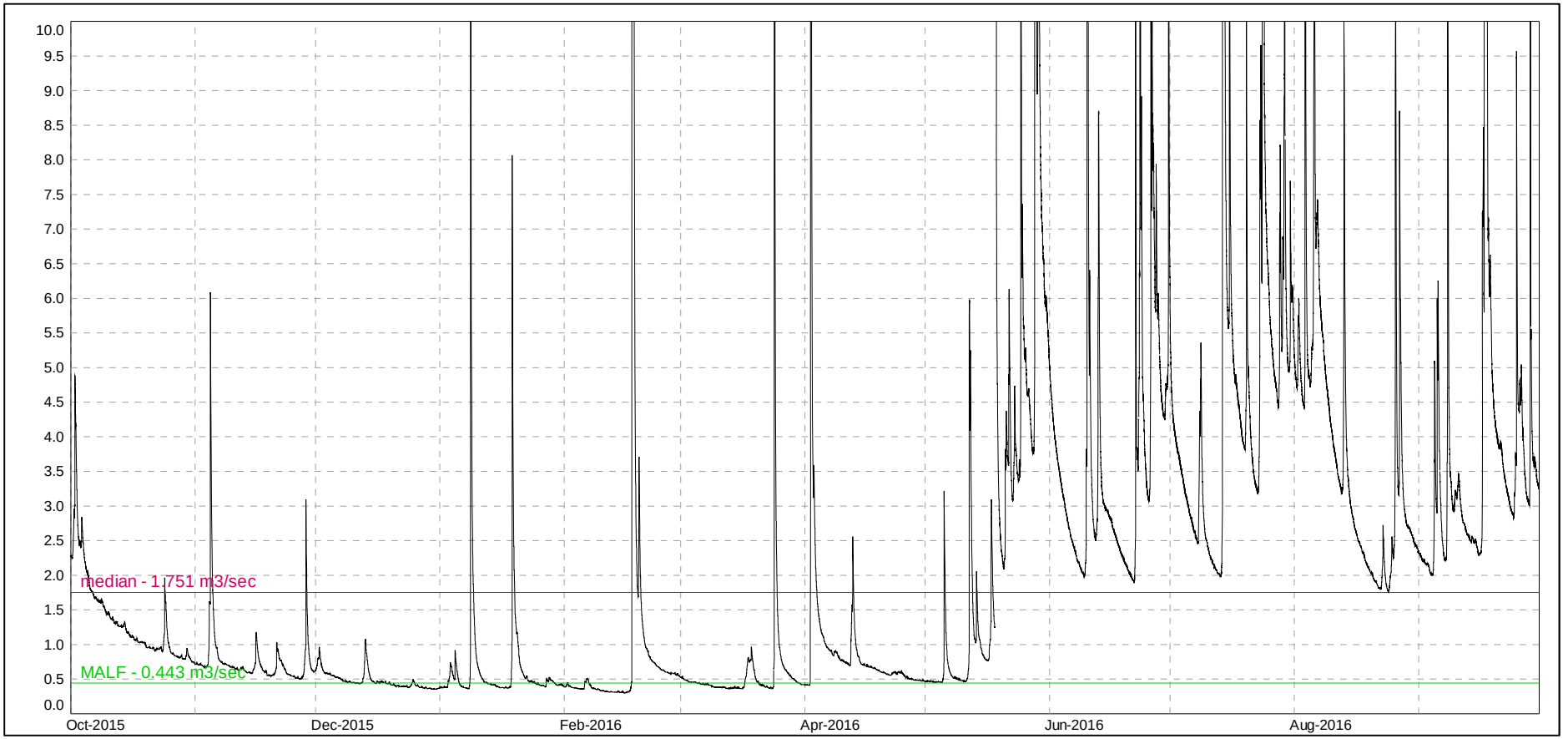
Appendix II: **ANZCO** monitoring data on effluent composition, 2015-2016

Date	Time.	Temp-erature	Dissolved oxygen	pH	Suspended solids	COD	Ammonia	Nitrate	Weekly Kill
	NZST/DT	°C	g/m³	pH	g/m³	g/m³	g/m³	g/m³	
03-Nov-15	1:56 PM	24.7	6.4	8.0	40	189	165	0.9	2667
10-Nov-15	9:42 AM	18.8	3.9	7.8	120	213	194	<0.25	3972
17-Nov-15	9:19 AM	14.3	4.4	8.1	160	212	220	2.5	4893
24-Nov-15	12:20 PM	27.2	7.4	7.9	60	231	223	3	4666
01-Dec-15	9:34 AM	20.4	5.5	8.1	100	174	205	1.25	4529
08-Dec-15	9:36 AM	20.0	7.4	8.0	106	170	206	5	4685
15-Dec-15	10:25 AM	21.0	5.8	7.8	160	275	183	5	4574
22-Dec-15	11:40 AM	20.3	0.4	7.7	24897	>15000	237	<0.25	4925
									3861
08-Jan-16	9:05 AM	19.6	6.4	7.9	150	289	183	<0.25	2715
15-Jan-16	11:17 AM	25.7	5.2	7.9	420	332	180	10	3738
22-Jan-16	11:22 AM	24.5	5.5	8.1	19	238	127	10	5471
29-Jan-16	11:10 AM	27.1	3.3	7.9	45	312	204	3.75	5284
05-Feb-16	9:15 AM	23.7	4.9	7.9	26	271	150	15	4650
12-Feb-16	9:41 AM	23.3	5.1	8.0	66	228	186	3.75	4162
19-Feb-16	8:50 AM	21.2	4.7	8.0	106	185	220	3.5	4474
26-Feb-16	9:10 AM	23.0	5.5	8.0	60	206	219	3.75	6258
04-Mar-16	9:54 AM	20.9	3.6	8.1	2	267	255	4	6727
11-Mar-16	10:20 AM	22.3	5.6	8.0	0	268	242	2	6117
18-Mar-16	9:00 AM	20.5	6.5	8.0	0	254	180	2.5	5598
24-Mar-16	6:45 AM	20.3	6.8	8.1	140	198	149	2.5	5404
31-Mar-16	12:45 PM	26.1	5.8	7.9	40	247	132	12.5	4695
08-Apr-16	9:33 AM	21.3	5.6	8.0	191	276	152	1	5285
15-Apr-16	9:41 AM	17.3	4.8	7.9	58	158	127	6	5498
22-Apr-16	9:00 AM	15.2	5.8	7.9	80	180	149	2.5	4389
29-Apr-16	8:55 AM	16.1	6.0	7.7	294	234	137	1.2	3968
06-May-16	11:27 AM	23.0	6.3	8.0	113	322	154	0.5	4019
13-May-16	9:45 AM	21.0	6.9	8.1	120	199	186	<0.25	5429
20-May-16	9:10 AM	15.1	4.4	7.9	60	232	185	0.5	5963
27-May-16	10:34 AM	13.7	5.0	7.6	24	282	172	0.75	5234
03-Jun-16	9:48 AM	10.4	8.1	7.9	100	229	194	0.5	4954
10-Jun-16	9:25 AM	16.4	5.6	8.0	20	171	142	0.5	5394
17-Jun-16	9:22 AM	10.9	6.2	7.9	nd	150	130	15	3566
24-Jun-16	8:40 AM	12.8	8.2	7.9	10	176	123	12.5	3470
01-Jul-16	9:16 AM	8.8	8.1	8.0	nd	162	105	12.5	3370
06-Jul-16	11:25 AM	11.6	6.1	7.6	20	185	108	50	2867
									2533
22-Jul-16	9:26 AM	7.8	6.8	7.9	98	202	920	2	
29-Jul-16	9:45 AM	9.9	9.6	7.7	160	176	100	60	6562
05-Aug-16	1:23 PM	9.8	10.0	8.1	40	167	110	54	9565
12-Aug-16	9:09 AM	7.5	9.9	7.8	35	135	105	40	13832
19-Aug-16	9:17 AM	8.0	8.9	8.0	40	98	112	42	14785
									14728
02-Sep-16	9:30 AM	13.0	7.9	8.0	58	109	88	>30	11794
09-Sep-16	9:20 AM	7.0	9.4	8.0	20	125	97	50	9206
									6920
									6991
									6139
									4652

Weekly kill relates fo (cattle) kill during the working week prior to sampling (normally Tuesday), *calves* in italics.
Dates in **bold** indicate interlaboratory comparisons.

Appendix III

Hydrograph for Waingongoro River at Eltham Road


10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
median - 1.751 m3/sec
MALF - 0.443 m3/sec
Oct-2015
Dec-2015
Feb-2016
Apr-2016
Jun-2016
Aug-2016

Appendix IV

ANZCO Eltham Limited
Water Use Annual Report
for the year 2015-2016

To: **General Manager – Taranaki Regional Council**

From: **Rawiri Mako – Anzco Foods Limited**

Date: **6 September 2016**

Subject: **Water Use Report 2015/16 Season**

This report is written to satisfy special condition 3 of Resource Consent 5437 - to take and use water from the Waingongoro River.

Table 1 below compares the 2015/16 beef season for the period from 27 October 2015 to 6 July 2016 with the five previous seasons. A complete record of water use for the 2015/16 season is attached in Appendix 1.

Table 1. Water Use Comparison (Beef Season only)

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Total Kill	169,195	163,932	172,038	157,957	171,466	170,004
Town Supply Potable (m^3)	135,245	170,530	219,270	194,495	165,862	166,590
River Water Abstracted (m^3)	336,119	297,682	290,272	232,170	320,994	307,453
- River Potable made (m^3)	213,687	194,148	172,818	149,034	206,377	200,990
- River Non-potable (m^3)	122,432	103,534	117,454	83,136	114,617	106,463
Total Potable Water (m^3)	348,932	364,678	392,088	343,529	372,239	367,580
Total Water Use (m^3)	471,364	468,212	509,542	426,665	486,856	474,043
Potable per body (m^3)	2.06	2.22	2.28	2.17	2.17	2.16
Non Potable per body (m^3)	0.72	0.63	0.68	0.53	0.67	0.63
Total Water Use per body (m^3)	**2.79**	**2.85**	**2.96**	**2.70**	**2.84**	**2.79**

Analysis of Water Use figures for 2015/2016

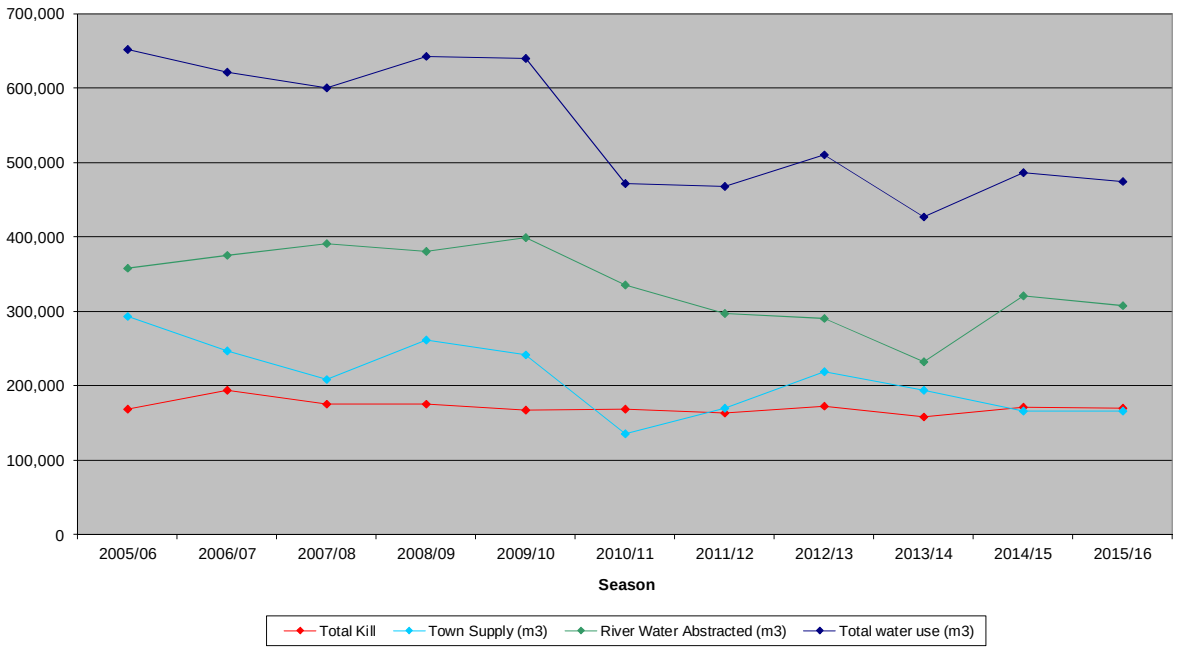
Table 1 above and Graphs 1 & 2 below show the comparative water use figures and trends for the last 6 seasons. A comparison of the water use figures in 2015/16 is detailed below.

- The total beef kill for 2015/16 was 170,004. This was a decrease of 1,462 cattle on the previous season.

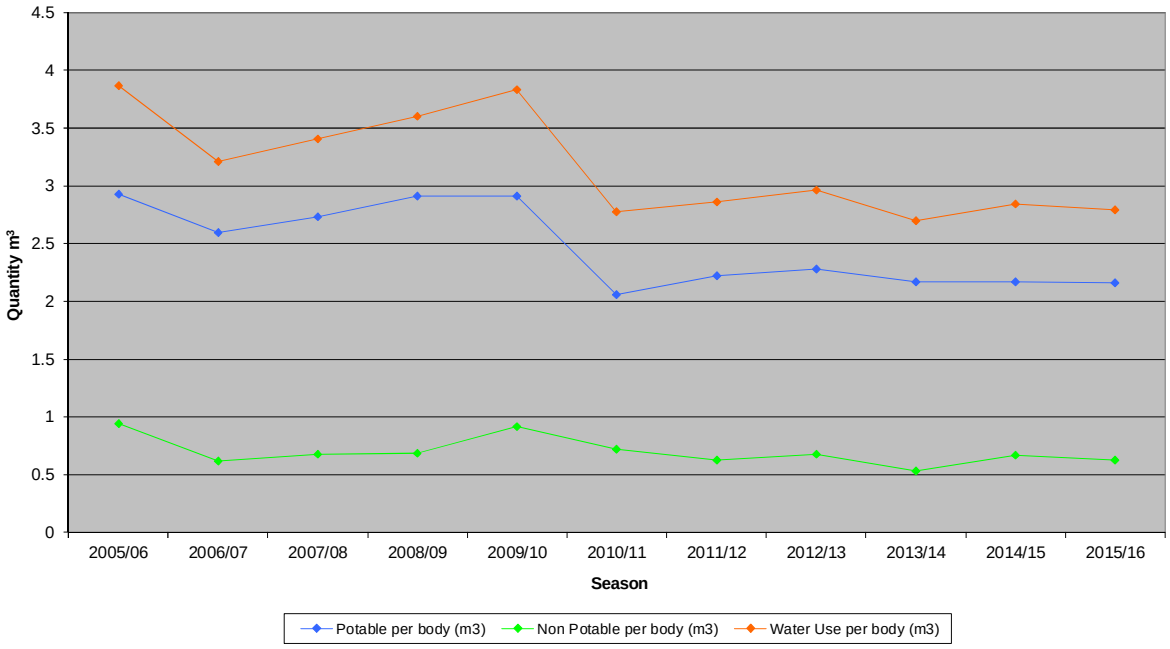
- Once again the Water Treatment Plant has run at capacity or as close to capacity as possible. This is an excellent result.

- Overall, total water use for Anzco Foods Limited has seen a decrease compared with the previous season.
- The total water use per body figure of 2.79m^3 has decreased from 2.84m^3 last year.
- The total potable water per body figure of 2.16m^3 has decreased from 2.17m^3 last year.
- The non-potable water per body figure of 0.63 m^3 has decreased from 0.67m^3 last year.

Graph 1. Water Use Trends



Graph 2. Water Use Trends Per Body



Potable Water

- A slight decrease in potable water use has been recorded for the 2015/16 season.
- Potable water use this season was 367,580m^3 compared to 372,239m^3 used last season. This is a potable water use decrease of 4,659m^3 compared with last seasons' potable water use.1,700m^3 of the reduced potable water use was due to water savings and the rest was down to less cattle being processed compared to the previous season.
- Town potable use was up by 728m^3 and potable made was down by 5,387m^3.
- Compliance requirements continue to be ongoing with regards to processing, hygiene and cleanups in and around the plant. With this in mind, there will always be challenges involving the saving of water as opposed to compromising compliance regulations.

Non Potable Water

- The non-potable water use this season was 106,463m^3 compared to 114,617m^3 used last season. This is a decrease this season of 8,154m^3 compared to last seasons. 6,800m^3 of the reduced non-potable water use was due to water savings and as with the potable water use, the rest was down to less cattle being processed compared to the previous season.
- Non-potable water is used in the yards for washing down the cattle; washing down stock trucks; cleaning up around the by-products and effluent pre-treatment areas; and in the outside rumblers and gut washer.
- An increased amount of customer and compliance requirements are reviewed constantly and the cleaning of stock prior to slaughter is one of these requirements. This is also a

challenge in regard to the saving of water as opposed to meeting customer demand and compliance regulations.

Improvements made / Future Initiatives

- When Anzco first introduced the water conservation programme during the 2010/11 season, the benchmark or figure we were looking to better was set at 3.83m^3/body. This was the total amount of water used per body during the 2009/10 season. During the last six seasons since introducing the water conservation programme we have recognised a saving in water use of approximately 1,000,000m^3.

- The total water use for the 2015/16 beef season was 474,043m^3 compared to the previous seasons' total water use 486,856m^3.

- This was a decrease of total water of 12,813m^3. The beef kill for the season was 170,004, a decrease of 1,462 from the previous season.

- The total water use/body has seen a decrease by 50lts/body to 2.79m^3/body compared to 2.84m^3/body for the previous season.

- For the 2016/17 season, we are investigating installing magic eyes on all of the wash basins which should further reduce our water use significantly.

Trends in Water Supply and Use

Table 2 below shows comparative percentages on water supply and water use over the past six seasons. Trends in this data are discussed below.

Table 2. Water Supply and Use

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
% of total water from River	71%	64%	57%	55%	65%	65%
% of total water from Town supply	29%	36%	43%	45%	35%	35%
% of Potable water use	74%	78%	77%	80%	76%	78%
% of Non-Potable water use	26%	22%	23%	20%	24%	22%
% of Potable water from River	61%	53%	44%	43%	55%	55%
% of Potable water from Town Supply	39%	47%	56%	57%	45%	45%

- The proportion of water sourced from the river compared to town supply has shown the same result as last season.

- There has been a 2% increase of potable water use in the plant. This has been countered by a 2% decrease of non-potable water compared to the previous season.

- Under our consent, abstraction from the Waingongoro River is limited to 1972 m^3/day. Our water abstraction rates for 2015/16 have all been within this limit.

Appendix V

Biomonitoring reports

To	Job Manager, James Kitto
From	Scientific Officer, Darin Sutherland
Consent Nos	2039, 1968
Doc No	1663024
Report No.	DS040
Date	April 2016

Biomonitoring of the Waingongoro River in relation to ANZCO Eltham Ltd wastes discharges, October 2015

Introduction

Two biological surveys (spring and summer) are scheduled annually for the assessment of effects of treated meatworks wastes discharges on the biological communities of the Waingongoro River. An assessment of TRC biomonitoring data [1995 to 2010] undertaken as a component of the consent renewal process (Stark, 2010) concluded that overall, monitoring data collected by Taranaki Regional Council (the Council) over the previous 15 years indicated some improvement in river health downstream of the discharge, since discharge to the river was reduced by adoption of land disposal 2001. Macroinvertebrate communities indicated that the river downstream of the discharge has improved from 'fair' to 'good' condition over the 15 years and that the impact of the discharge had been no more than minor given the ability of the river to assimilate the wastewater and to cleanse itself frequently during floods. Almost all MCI values recorded from sites downstream of the ANZCO (previously Riverlands) discharge exceeded 80 units and had been within the 95% confidence limits of the predictive relationships between MCI and site altitude or distance from source that Stark & Fowles (2009) developed based on data from 'control' sites (i.e., upstream of consented discharges) in the Waingongoro catchment.

This current survey, the first of the scheduled surveys for the 2015–2016 monitoring period, was performed in spring under a period of moderate flow conditions.

Methods

The standard '400 ml kick sampling' technique was used to collect streambed (benthic) macroinvertebrates from two long-established sampling sites (1 and 3) and a site (3a) established at the time of the spring 1999 survey.

Site 3a replaced site 2a about seventeen years earlier, due to changes in the river channel following flood events and the subsequent unsuitability of the previously surveyed site (2a) which had been located at the periphery of the 50 m mixing zone.

These sites were:

Site No	Site code	GPS reference	Location
1	WGG 000500	E1710576 N5634824	Eltham road bridge (upstream of discharge)
3	WGG 000540	E1710727 N5634084	approximately 400m downstream of discharge
3a	WGG 000550	E1710830 N5633975	approximately 600m downstream of discharge

This 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Samples were preserved with Kahle's Fluid for later stereomicroscopic sorting and identification according to documented Taranaki Regional Council methodology. Macroinvertebrate taxa found in each sample were recorded as:

R (rare)	= less than 5 individuals;
C (common)	= 5-19 individuals;
A (abundant)	= 20-99 individuals;
VA (very abundant)	= 100-499 individuals;
XA (extremely abundant)	= 500 or more individuals.

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly `sensitive' taxa were assigned the highest scores of 9 or 10, while the most `tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa collected from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. More 'sensitive' communities inhabit less polluted waterways. A difference of 11 units or more in MCI values is considered significantly different (Stark 1998).

A semi-quantitative MCI value, $SQMCI_S$ (Stark, 1999) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these scores, and dividing by the sum of the loading factors. The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA).

Sub-samples of algal and detrital material taken from the macroinvertebrate samples were scanned under 40-400x magnification where necessary to determine the presence or absence of any mats, plumes or dense growths of bacteria, fungi or protozoa ('undesirable biological growths') at a microscopic level. The presence of these organisms is an indicator of organic enrichment within a stream.

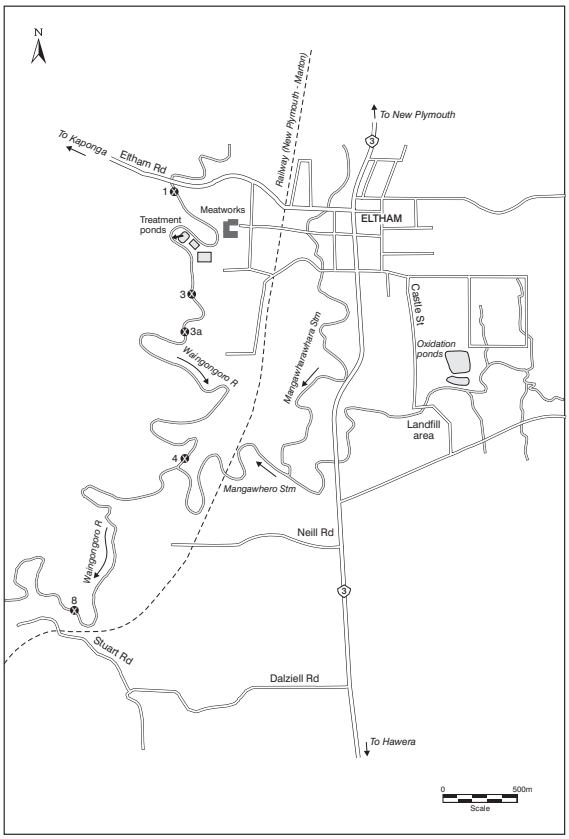


Figure 1 Biomonitoring sampling site locations in the Waingongoro River in relation to ANZCO meatworks discharges

Figure 2 Location of biomonitoring sites in relation to the Eltham WWTP and landfill

Results

Site habitat characteristics and hydrology

This spring survey was performed under moderate flow conditions (approximately median flow), 15 days after a fresh in excess of both 3 times and 7 times median flow in the Waingongoro River. The survey followed a wet early spring period with seven significant river freshes recorded over the preceding month.

The water temperatures during the survey were in the range 11.8-12.6 °C. Water levels were moderate and water speed was swift. The water was uncoloured and clear. The substrate at all three sites comprised cobble/ course gravel though site 3a also had some boulder.

Site 1 had patchy algal mats and no filamentous algae. There were patchy leaves on the streambed. Site 3 had widespread algal mats. The cyanobacteria *Phormidium* was widespread with cover approaching 20% in the riffle. There was patchy filamentous algae and patchy leaves on the streambed. Site 3a had widespread periphyton mats which again included *Phormidium*. The periphyton mats were noted to be particularly abundant at this site. There was patchy filamentous algae and patchy moss on the streambed.

No discharges from the outfall were occurring at the time of this survey. No treated wastes had been discharged to the river for a period of six days prior to this survey.

Macroinvertebrate communities

A summary of data obtained from previous surveys of the various river sites is presented in Table 1.

Table 1 Summary of macroinvertebrate taxa numbers and MCI values for previous surveys performed between August 1981 and February 2015

Site No.	N	No of taxa			MCI value			$SQMCI_s$ value		
		Median	Range	Oct 2015	Median	Range	Oct 2015	Median	Range	Oct 2015
1	61	23	16-32	15	101	78-124	112	6.0	3.3-7.5	6.9
3	61	24	14-32	21	99	71-119	102	5.9	1.9-7.7	7.6
3a	40	23	16-30	17	101	79-124	94	5.5	2.8-7.7	6.6

The macroinvertebrate fauna results for the present survey are listed in Table 2 and illustrated in Figure 2 (for sites 1, 3 and 3a)

Table 2 Macroinvertebrate fauna of the Waingongoro River in relation to ANZCO Ltd's discharges sampled on 7 October 2015

Taxa List	Site Number	MCI score	1	3	3a
	Site Code		WGG000500	WGG000540	WGG000550
	Sample Number		FWB15247	FWB15248	FWB15249
ANNELIDA (WORMS)	Oligochaeta	1	R	C	R
MOLLUSCA	*Potamopyrgus*	4	R	C	R
EPHEMEROPTERA (MAYFLIES)	*Coloburiscus*	7	A	A	A
	Deleatidium	8	VA	XA	VA
	Zephlebia group	7	-	R	-
PLECOPTERA (STONEFLIES)	*Acroperla*	5	-	C	R
	Zelandobius	5	A	C	C
	Zelandoperla	8	R	-	-
COLEOPTERA (BEETLES)	Elmidae	6	A	C	C
	Hydraenidae	8	-	R	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	C	C
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	C	C	R
	Costachorema	7	R	R	R
	Hydrobiosis	5	-	C	R
	Neurochorema	6	R	-	-
	Beraeoptera	8	R	-	-
	Pycnocentria	7	-	R	-
	Pycnocentrodes	5	A	R	R
DIPTERA (TRUE FLIES)	*Aphrophila*	5	-	R	C
	Eriopterini	5	R	-	-
	Hexatomini	5	-	R	-
	Maoridiamesa	3	-	C	C
	Orthocladiinae	2	-	C	A
	Tanytarsini	3	-	R	R
	Empididae	3	R	R	R
		No of taxa	15	21	17
		MCI	112	102	94
		SQMCIs	6.9	7.6	6.6
		EPT (taxa)	9	10	8
		%EPT (taxa)	60	48	47

'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

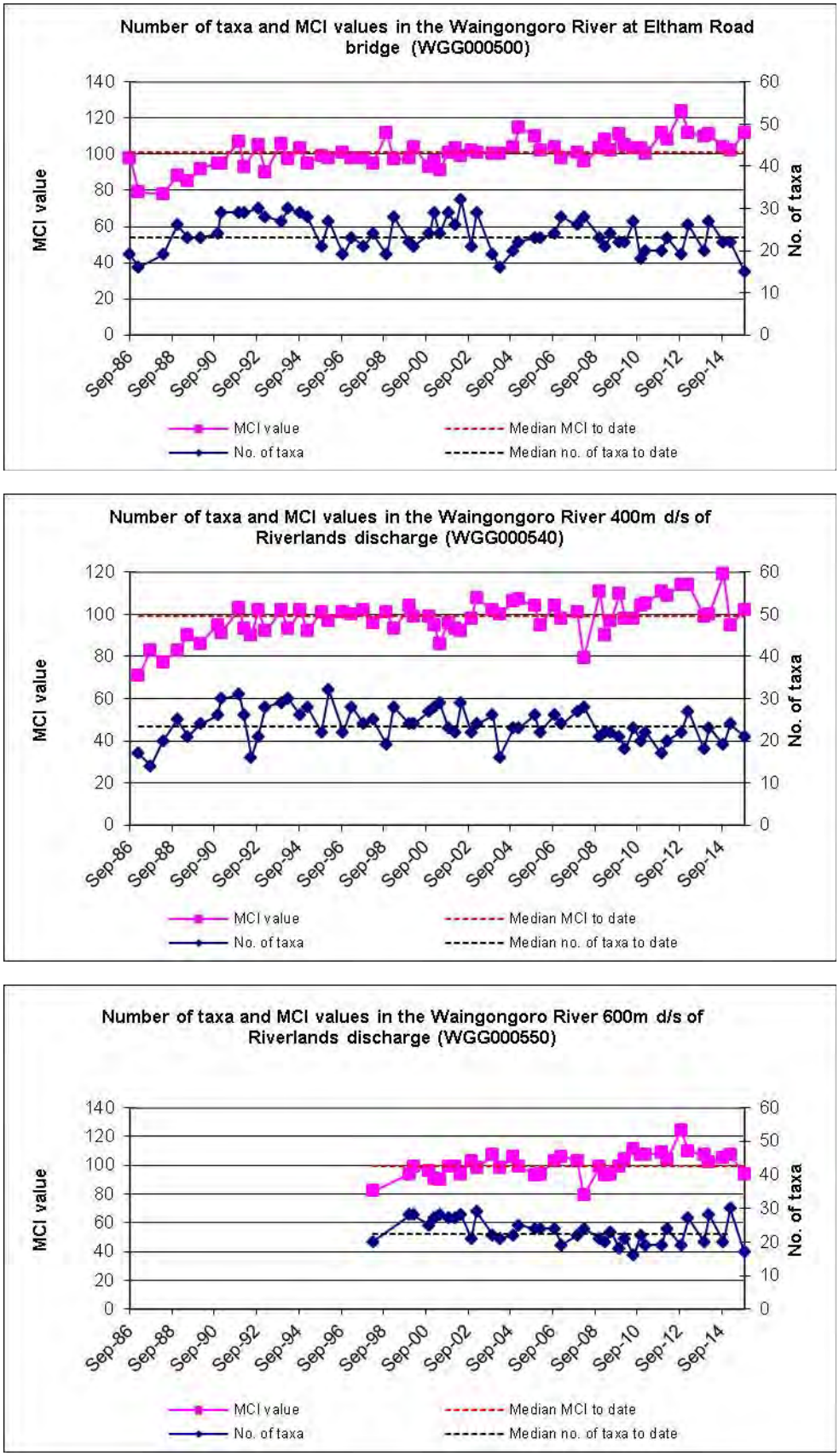


Figure 2 Taxa richness and MCI values for the three sites in the vicinity of ANZCO Eltham Ltd to date

Site 1 (Eltham Rd)
A moderately low macroinvertebrate community richness of 15 taxa was found at site 1 ('control' site) at the time of the spring survey. This was the lowest taxa number ever recorded from this site (Table 2).

The MCI score of 112 units indicated a community of 'good' biological health which was significantly higher (Stark, 1998) than the median MCI score of 101 units. The MCI score was also close to being significantly higher than the proceeding survey on February 2015 (102 units). The $SQMCI_S$ score of 6.9 units was higher than the median $SQMCI_S$ score of 6.0 units (Table 1).

The community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 2).

Site 3 (400m d/s of discharge)
A moderate macroinvertebrate community richness of 21 taxa was found at site 3 ('primary impacted' site) at the time of the spring survey (Table 2).

The MCI score of 102 units indicated a community of 'good' biological health which was not significantly different (Stark, 1998) to the median MCI score of 99 units. However, the MCI score was close to being significantly lower than the 'control' site score (10 units). The MCI score was not significantly different to the preceding survey on February 2015 (95 units). The $SQMCI_S$ score of 7.6 units was higher than the median $SQMCI_S$ score of 5.9 units (Table 1).

The community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 2).

Site 3a (600m d/s of discharge)
A moderately low macroinvertebrate community richness of 17 taxa was found at site 3a ('secondary impacted' site) at the time of the spring survey. This was the second lowest taxa number ever recorded from this site (Table 2).

The MCI score of 94 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the median MCI score of 101 units. However, the MCI score was significantly lower than the 'control' site score (18 units). The MCI score was significantly lower than the proceeding survey on February 2015 (107 units). The $SQMCI_S$ score of 6.6 units was higher than the median $SQMCI_S$ score of 5.5 units (Table 1).

The community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 2).

Streambed microflora

The microscopic heterotrophic assessments at the three sites above and below the ANZCO discharges showed no significant growths of heterotrophic organisms in the Waingongoro River.

Discussion and conclusions

Macroinvertebrate richnesses were lower than historical medians. This could be due to the high number of freshes in the proceeding month scouring the streambed. Differences among sites were not particularly large but the two 'impacted sites' did have higher numbers of more 'tolerant' taxa, specifically chironomid midges, which were probably associated with the higher amount of periphyton at the two downstream sites. In particular, site 3a had 'abundant' orthoclad midges which feed on streambed algae and are often abundant in unshaded, nutrient enriched streams with substantial algal growths.

MCI scores at the two 'impacted sites' downstream of the discharge were lower than the control site score and in particular the 'secondary impacted' site was significantly lower (Stark, 1998) than the 'control site' MCI score. However, the 'control' site had a significantly higher MCI score compared with the historical median. In particular, two 'rare' (1-4 individuals) 'highly sensitive' taxa were present at site 1, the stonefly (*Zelandoperla*) and the caddisfly (*Beraeoptera*), which were absent from sites 3 and 3a, and were largely responsible for the higher MCI score.

Using the equation MCI=79.12 + 0.116A where A is altitude (recorded as 200 m asl for sites 1 and 3 and 195 m asl for site 3a) for streams arising inside Egmont National Park (Stark and Fowles, 2009) the expected MCI score was 102 units for all three sites. Therefore, all three observed MCI scores did not significantly differ (Stark, 1998) from the expected value though the 'control' site was approaching being significantly higher.

Comparisons with the previous survey conducted in February 2015 indicted that the 'control' and 'primary impacted' sites had non-significant improvements in MCI score (10 and 7 units respectively) and the 'secondary impacted' site had a significant decrease (13 units). In Taranaki spring surveys often have higher MCI scores than summer surveys. This is largely due to rivers and streams during summer having higher periphyton biomasses and higher water temperatures compared with spring.

All three sites recorded high SQMCI scores which were largely due to the 'highly sensitive' and very to extremely abundant mayfly (*Deleatidium*) recorded in this reach. This abundance has been found in many previous surveys for this reach and indicates that there is relatively good water quality and habitat for macroinvertebrates.

Periphyton, another indicator of nutrient enrichment, was substantially higher at the two 'impacted' sites than the 'control' site and also slightly higher at the 'secondary impacted' site compared with the 'primary impacted' site. Differences in periphyton coverage were therefore a factor structuring macroinvertebrate communities in the reach and hence explaining differences in MCI score. Site 3a had some boulder substrate which was absent from the two upstream sites. Boulder is less likely to be mobilised during floods and freshes and therefore it may maintain higher levels of periphyton than smaller substrates. The presence of leaf packs at sites 1 and 3 but not 3a would also be an important as leaf packs provide habitat and a food source for macroinvertebrates.

No heterotrophic growths were recorded indicating that discharges from ANZCO were not causing high levels of dissolved organic compounds in the Waingongoro River downstream of the discharge. Furthermore, if discharges were significantly increasing nutrients downstream

of the discharge, the 'primary impacted' site would be more impacted from nutrient enrichment than the 'secondary impacted' site, being closer to the source of the discharge and less shaded.

Overall, the results of this October 2015 macroinvertebrate survey indicated that the discharge of waste from the ANZCO meatworks had not had any recent significant detrimental effects on the macroinvertebrate communities of the Waingongoro River. Differences among sites were likely due to habitat differences such as substrate composition, periphyton biomass and presence/absence of leaf packs.

Summary

The Council's standard 'kick-sampling' technique was used at three established sites to collect streambed macroinvertebrates from the Waingongoro River. Samples were sorted and identified to provide number of taxa (richness) and MCI and $SQMCI_s$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_s$ takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring. Significant differences in either the MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

Macroinvertebrate richnesses were slightly lower than historical medians but differences among sites were not particularly large. MCI scores indicated that the river communities were of 'fair' to 'good' generic health and generally of 'expected' predicted conditions recorded for reaches of similar Taranaki rivers and streams though the 'control' site had a higher than normal MCI score. The results of this spring survey indicated that the discharge of waste from the ANZCO meatworks into the Waingongoro River had not had any recent significant detrimental effects on the macroinvertebrate communities downstream of the discharge. Differences among sites for MCI scores were likely due to habitat differences.

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To	Job Manager, James Kitto
From	Scientific Officer, Darin Sutherland
Consent Nos	2039, 1968
Doc No	1666612
Report No.	DS041
Date	April 2016

Biomonitoring of the Waingongoro River in relation to ANZCO Eltham Ltd wastes discharges, March 2016

Introduction

Two biological surveys (spring and summer) are scheduled annually for the assessment of effects of treated meatworks wastes discharges on the biological communities of the Waingongoro River. An assessment of TRC biomonitoring data [1995 to 2010] undertaken as a component of the consent renewal process (Stark, 2010) concluded that overall, monitoring data collected by Taranaki Regional Council over the previous 15 years indicated some improvement in river health downstream of the discharge since discharge to the river was reduced by adoption of land disposal 2001. Macroinvertebrate communities indicated that the river downstream of the discharge has improved from 'fair' to 'good' condition over the 15 years and that the impact of the discharge had been no more than minor given the ability of the river to assimilate the wastewater and to cleanse itself frequently during floods. Almost all MCI values recorded from sites downstream of the ANZCO (previously Riverlands) discharge exceeded 80 units and had been within the 95% confidence limits of the predictive relationships between MCI and site altitude or distance from source that Stark & Fowles (2009) developed based on data from 'control' sites (i.e., upstream of consented discharges) in the Waingongoro catchment.

This current survey, the second of the scheduled surveys for the 2015–2016 monitoring period, was performed in summer under low flow conditions.

Methods

The standard '400 ml kick sampling' technique was used to collect streambed (benthic) macroinvertebrates from two long-established sampling sites (1 and 3) and a site (3a) established at the time of the spring 1999 survey; one site (4) immediately upstream of the confluence of the Mangawhero Stream, and a site (8) downstream of this confluence in the Waingongoro River (illustrated in Figures 1 and 2) on 1 March 2016. Site 4 was sampled as a component of the Eltham WWTP/landfill survey and was included to provide comparative information associated with the survey performed in conjunction with the South Taranaki District Council Eltham WWTP system where the treated wastewater discharge had been diverted out of the catchment (to Hawera WWTP) since late winter, 2010. Site 8 was sampled as a component of the Council's State of the Environment programme.

Site 3a replaced site 2a about seventeen years earlier, due to changes in the river channel following flood events and the subsequent unsuitability of the previously surveyed site (2a) which had been located at the periphery of the 50 m mixing zone.

These sites were:

Table 1 Biomonitoring sites in the Waingongoro River Stream surveyed in association with the ANZCO meatworks

Site No	Site code	GPS reference	Location
1	WGG 000500	E1710576 N5634824	Eltham road bridge (upstream of discharge)
3	WGG 000540	E1710727 N5634084	approximately 400m downstream of discharge
3a	WGG 000550	E1710830 N5633975	approximately 600m downstream of discharge
4	WGG 000620	E1710708 N5632961	approximately 100m upstream of Mangawhero Stream confluence
8	WGG 000665	E1709784 N5632049	approximately 2 km downstream of Mangawhero Stream confluence (off Stuart Road)

This 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001).

Samples were preserved with Kahle's Fluid for later stereomicroscopic sorting and identification according to documented Taranaki Regional Council methodology and macroinvertebrate taxa abundances scored based on the categories in Table 2.

Table 2 Macroinvertebrate abundance categories

Abundance category	Number of individuals
R (rare)	1-4
C (common)	5-19
A (abundant)	20-99
VA (very abundant)	100-499
XA (extremely abundant)	>499

Table 3 Macroinvertebrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000)

Grading	MCI
Excellent	>140
Very Good	120-140
Good	100-119
Fair	80-99
Poor	60-79
Very Poor	<60

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly `sensitive' taxa were assigned the highest scores of 9 or 10, while the most `tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa collected from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. A gradation of biological water quality conditions based upon MCI

ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985 and Boothroyd and Stark, 2000) (Table 3). More 'sensitive' communities inhabit less polluted waterways. A difference of 11 units or more in MCI values is considered significantly different (Stark 1998).

A semi-quantitative MCI value, $SQMCI_S$ (Stark, 1999) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these scores, and dividing by the sum of the loading factors. The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA).

Sub-samples of algal and detrital material taken from the macroinvertebrate samples were scanned under 40-400x magnification where necessary to determine the presence or absence of any mats, plumes or dense growths of bacteria, fungi or protozoa ('undesirable biological growths') at a microscopic level. The presence of these organisms is an indicator of organic enrichment within a stream.

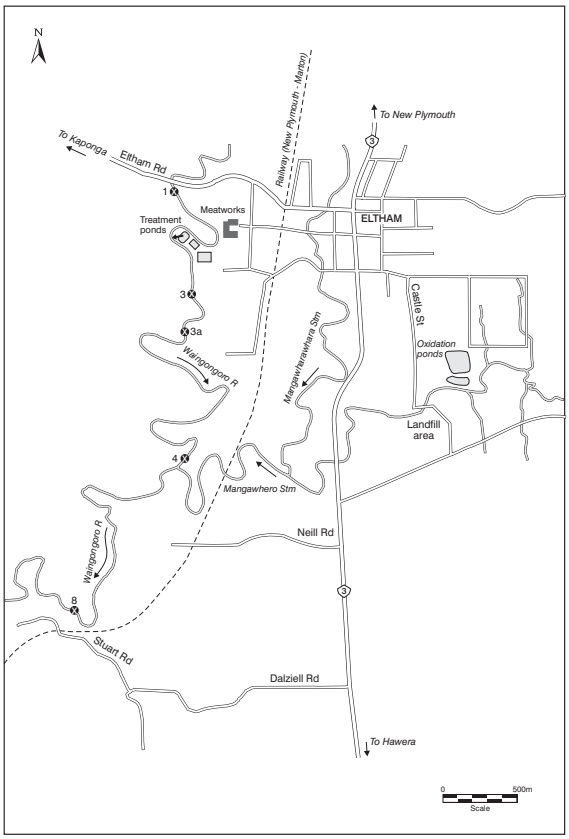


Figure 1 Biomonitoring sampling site locations in the Waingongoro River in relation to ANZCO meatworks discharges

Figure 2 Location of biomonitoring sites in relation to the Eltham WWTP and landfill

Results

Site habitat characteristics and hydrology

This summer survey was performed under low flow conditions (approximate 510 l/s) approaching MALF (443 l/s), 12 days after a fresh in excess of both 3 times and 7 times median flow in the Waingongoro River. The survey followed a dry summer period with only one significant river fresh recorded over the preceding month but this was extremely large (>50 times median flow).

The water temperatures during the survey were in the range 17.4-19.7 °C. Water speed was swift at each of the riffles sampled. The water was uncoloured and clear. The substrate at all three sites comprised cobble/ course gravel though sites 3a, 4 and 8 also had some boulder.

Site 1 had no algal mats and no filamentous algae. There were patchy leaves on the streambed. Site 3 had slippery algal mats and patchy filamentous algae. There was also patchy moss and leaves on the streambed. Site 3a had slippery algal mats and no filamentous algae. There were patchy leaves on the streambed. Sites 4 and 8 had slippery algal mats and no filamentous algae. There was also patchy moss and leaves on the streambed.

No discharges from the outfall were occurring at the time of this survey. No treated wastes had been discharged to the river for a period of five months prior to this survey.

Macroinvertebrate communities

A summary of data obtained from previous surveys of the various river sites is presented in Table 1.

Table 4 Summary of macroinvertebrate taxa numbers and MCI values for previous surveys performed between August 1981 and March 2016

Site No.	N	No of taxa			MCI value			$SQMCI_s$ value		
		Median	Range	Mar 2016	Median	Range	Mar 2016	Median	Range	Mar 2016
1	62	23	15-32	15	101	78-124	109	6.0	3.3-7.5	7.1
3	62	24	14-32	23	99	71-119	102	5.9	1.9-7.7	6.7
3a	41	23	16-30	22	100	79-124	100	5.5	2.8-7.7	6.0
4	30	27	16-35	20	95	77-116	96	5.7	3.7-6.5	5.6
8	43	20	14-30	28	94	77-111	89	4.3	2.4-7.6	4.8

The macroinvertebrate fauna results for the present survey are listed in Table 5 and illustrated in Figure 2 (for sites 1, 3, 3a) and Figure 3 (for sites 4 and 8).

Table 5 Macroinvertebrate fauna of the Waingongoro River in relation to ANZCO Eltham Ltd's discharges sampled on 1 March 2016

Taxa List	Site Number	MCI score	1	3	3a	4	8
	Site Code		WGG000500	WGG000540	WGG000550	WGG000620	WGG000640
	Sample Number		FWB16114	FWB16115	FWB16116	FWB16117	FWB16118
NEMERTEA	Nemertea	3	-	R	-	-	R
NEMATODA	Nematoda	3	-	-	-	-	R
ANNELIDA (WORMS)	Oligochaeta	1	-	A	C	C	A
	Lumbricidae	5	-	-	-	R	R
MOLLUSCA	*Physa*	3	-	-	-	-	R
	Potamopyrgus	4	R	A	-	R	A
CRUSTACEA	Ostracoda	1	-	-	-	-	R
	Paracalliope	5	-	-	-	-	C
	Paraleptamphopidae	5	-	-	-	-	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	C	C	C	C
	Coloburiscus	7	A	A	A	C	C
	Deleatidium	8	XA	XA	VA	VA	VA
	Zephlebia group	7	-	-	R	R	R
COLEOPTERA (BEETLES)	Elmidae	6	A	C	C	R	C
	Hydraenidae	8	C	C	R	-	-
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	A	C	R	C
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	VA	VA	A	A	VA
	Costachorema	7	-	R	-	-	-
	Hydrobiosis	5	A	A	C	C	A
	Neurochorema	6	-	R	-	-	-
	Beraeoptera	8	R	C	R	-	R
	Olinga	9	-	R	-	-	-
	Oxyethira	2	-	-	R	R	A
	Pycnocentria	7	-	-	R	R	R
	Pycnocentrodes	5	R	C	C	C	A
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	C	R	R	R
	Maoridiamesa	3	-	R	-	-	R
	Orthocladiinae	2	C	A	A	A	A
	Polypedilum	3	-	R	R	C	C
	Tanypodinae	5	-	-	R	R	-
	Tanytarsini	3	R	C	A	A	A
	Empididae	3	-	C	-	-	C
	Ephydridae	4	-	-	R	-	-
	Austrosimulium	3	R	C	C	A	C
	Tabanidae	3	-	-	R	-	-
	No of taxa		15	23	22	20	28
	MCI		109	102	100	96	89
	SQMCIs		7.1	6.7	6.0	5.6	4.8
	EPT (taxa)		7	10	9	8	9
	%EPT (taxa)		47	43	41	40	32

'Tolerant' taxa | 'Moderately sensitive' taxa | 'Highly sensitive' taxa

R = Rare C = Common A = Abundant VA = Very Abundant XA = Extremely Abundant

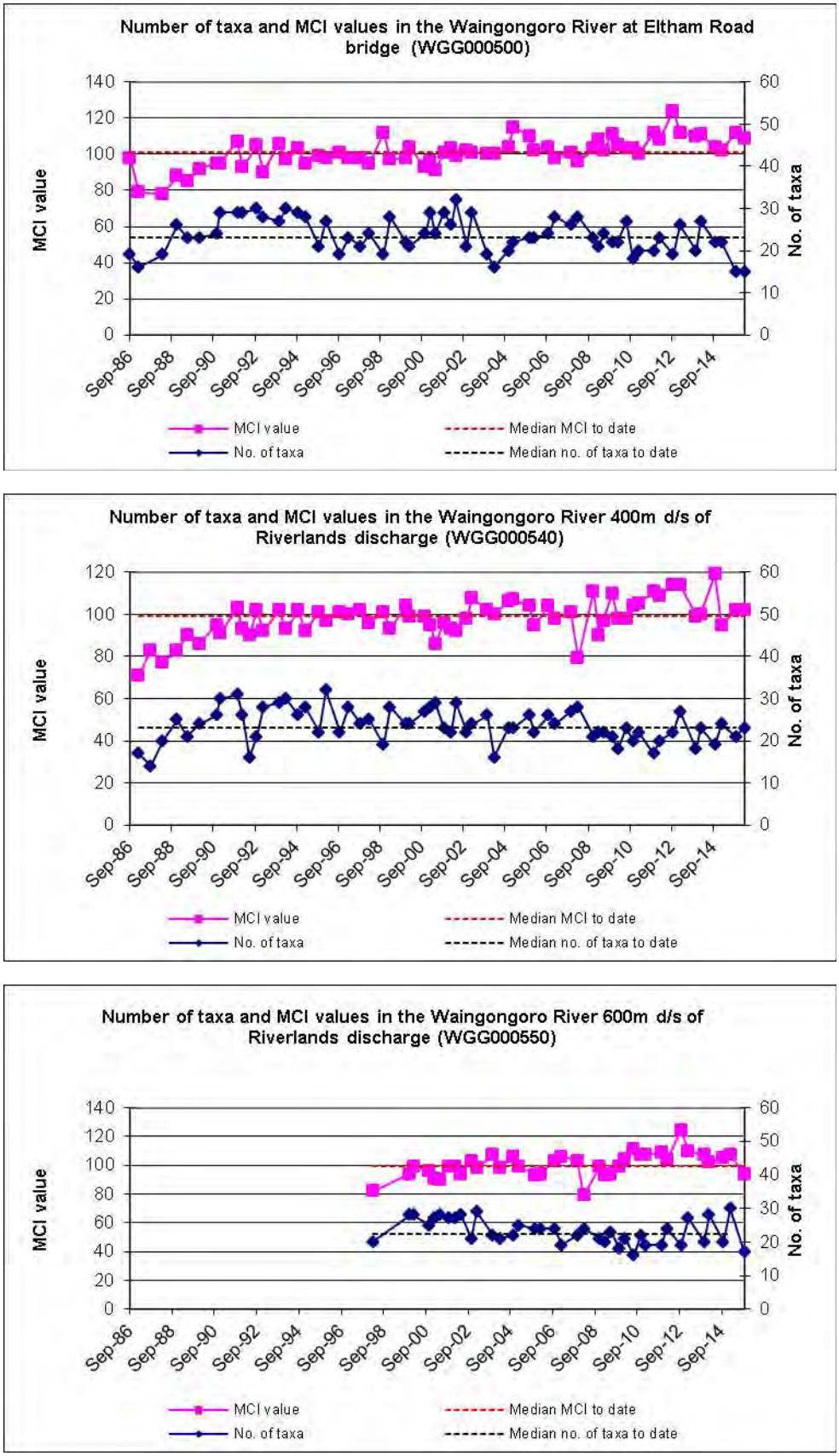


Figure 2 Taxa richness and MCI values for the three sites in the vicinity of ANZCO Eltham Ltd to date

Sites in the immediate vicinity of the meatworks (sites 1, 3 and 3a)

Site 1 (Eltham Rd)

A moderately low macroinvertebrate community richness of 15 taxa was found at site 1 ('control' site) at the time of the summer survey. This equalled the lowest taxa number ever found for this site out of 62 surveys (Table 4).

The MCI score of 109 units indicated a community of 'good' biological health which was not significantly higher (Stark, 1998) than the median MCI score of 101 units. The MCI score was very similar to the preceding survey on October 2015 (112 units). The $SQMCI_S$ score of 7.1 units was higher than the median $SQMCI_S$ score of 6.0 units (Table 4).

The community had one 'extremely abundant' taxon, a 'highly sensitive' mayfly (*Deleatidium*) and one 'very abundant' taxon, the caddisfly (*Hydropsyche/Aoteapsyche*) which dominated the invertebrate fauna (Table 5).

Site 3 (400m d/s of discharge)

A moderate macroinvertebrate community richness of 23 taxa was found at site 3 ('primary impacted' site) at the time of the survey (Table 4).

The MCI score of 102 units indicated a community of 'good' biological health which was not significantly different (Stark, 1998) to the median MCI score of 99 units. The MCI score was the same as the preceding survey on October 2015 (102 units). The $SQMCI_S$ score of 6.7 units was higher than the median $SQMCI_S$ score of 5.9 units (Table 4).

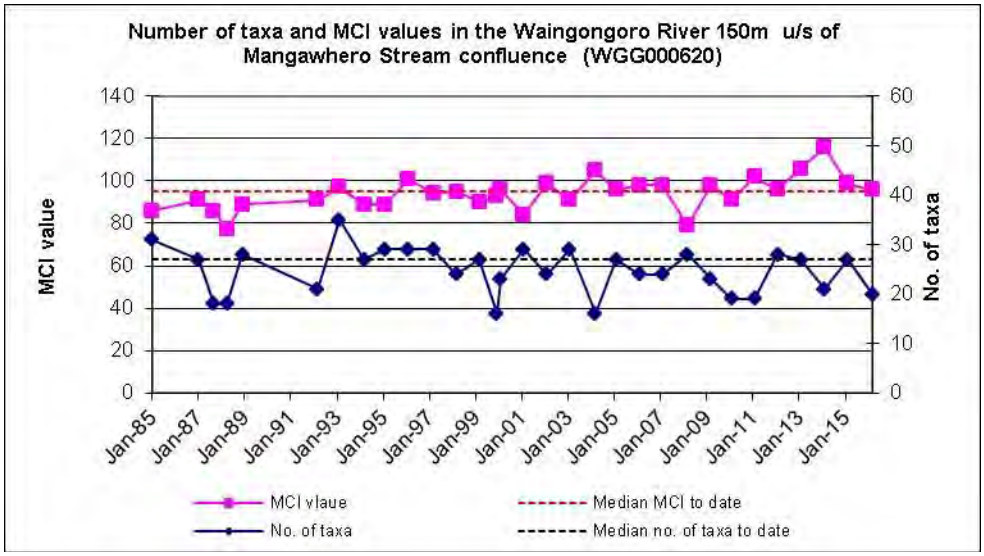
The community had one 'extremely abundant' taxon, a 'highly sensitive' mayfly (*Deleatidium*) and one 'very abundant' taxon, the caddisfly (*Hydropsyche/Aoteapsyche*) which dominated the invertebrate fauna. There were also six other taxa that were 'abundant' (Table 5).

Site 3a (600m d/s of discharge)

A moderate macroinvertebrate community richness of 22 taxa was found at site 3a ('secondary impacted' site) at the time of the survey (Table 4).

The MCI score of 100 units indicated a community of 'good' biological health which was the same as the historical median MCI score of 100 units. The MCI score was not significantly higher than the preceding survey on October 2015 (94 units). The $SQMCI_S$ score of 6.0 units was slightly higher than the median $SQMCI_S$ score of 5.5 units (Table 4).

The community had one 'very abundant' taxon, a 'highly sensitive' mayfly (*Deleatidium*)) which dominated the invertebrate fauna. There were also three other taxa that were 'abundant' (Table 5).



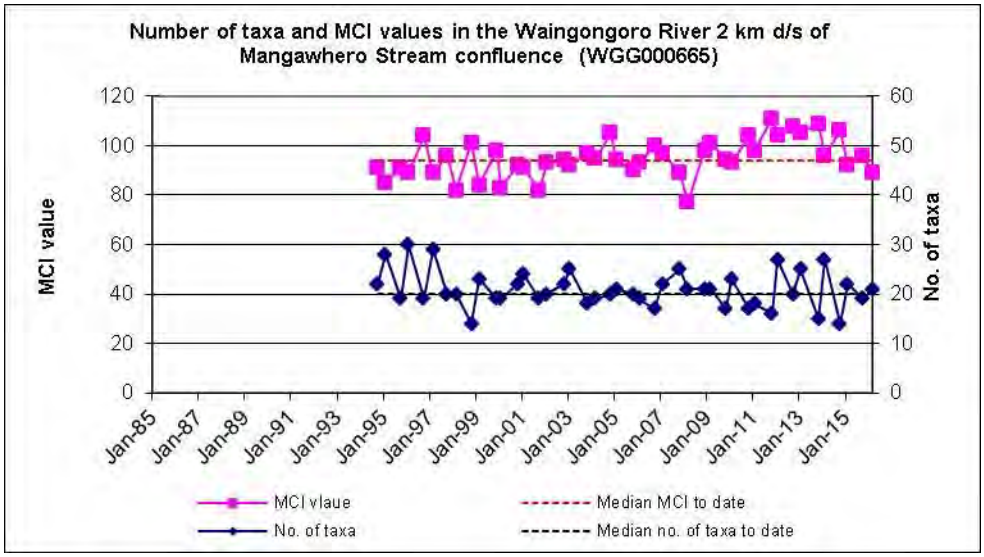


Figure 3 Taxa richness and MCI values for sites upstream and downstream of the Mangawhero Stream (sites 4 & 8)

Sites upstream and downstream of the Mangawhero Stream (sites 4 & 8)

Site 4 (U/s of Mangawhero River confluence)

A moderate macroinvertebrate community richness of 20 taxa was found at site 4 at the time of the survey (Table 4).

The MCI score of 96 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the median MCI score of 95 units. The $SQMCI_S$ score of 5.6 units was slightly lower than the median $SQMCI_S$ score of 5.7 units (Table 4).

The community had one 'very abundant' taxon, a 'highly sensitive' mayfly (*Deleatidium*)) which dominated the invertebrate fauna. There were also three other taxa that were 'abundant' (Table 5).

Site 8 (Stuart Road)

A moderate macroinvertebrate community richness of 28 taxa was found at site 8 at the time of the survey (Table 4).

The MCI score of 89 units indicated a community of 'fair' biological health which was not significantly different (Stark, 1998) to the median MCI score of 94 units. The $SQMCI_S$ score of 4.8 units was slightly higher than the median $SQMCI_S$ score of 4.3 units (Table 4).

The community had one 'extremely abundant' taxon, a 'highly sensitive' mayfly (*Deleatidium*) and one 'very abundant' taxon, the caddisfly (*Hydropsyche/Aoteapsyche*) which dominated the invertebrate fauna. There were also seven other taxa that were 'abundant' (Table 5).

Streambed microflora

The microscopic heterotrophic assessments at the three sites above and below the ANZCO discharges showed no significant growths of heterotrophic organisms in the Waingongoro River. The two sites upstream and downstream of the Mangawhero Stream also showed no significant growths of heterotrophic organisms in the Waingongoro River.

Discussion and conclusions

Macroinvertebrate richness at the 'control' site was unusually low, equalling the lowest taxa richness ever recorded at the site from a large number of surveys. However, taxa richness at other sites was within normal ranges with sites showing variation above or below historical medians and with no trend evident. The upstream site may have been more adversely affected from the extremely large fresh that occurred 12 days prior to sampling compared with the downstream sites.

MCI scores at the two 'impacted sites' directly downstream of the discharge indicated that the macroinvertebrate community was of 'good' health. The MCI scores were not significantly lower than the 'control' site score and were not significantly different to historical medians (Stark, 1998) indicating that there was no significant impacts from nutrient enrichment from the ANZCO discharge. Furthermore, the median MCI score for control sites arising within the

National Park at that altitude (recorded as 200 m asl for sites 1 and 3 and 195 m asl for site 3a) was 101 units and 108 units respectively (TRC, 2015) which was also not significantly different (Stark, 1998) from recorded MCI scores for the 'control' or two 'impacted' sites immediately downstream of the discharge.

Sites 4 and 8 are situated a considerable distance downstream from the discharge and are highly unlikely to show any significant impacts from the ANZCO discharge if no adverse effects from the discharge are detected at sites 3 and 3a. MCI scores at sites 4 and 8 were similar to historical medians and therefore typical for those sites. Overall, there was a clear trend of decreasing MCI score the further downstream the sample was taken which is consistent with what is typically found in Taranaki ringplain streams (Stark and Fowles, 2009) and is usually attributed to diffuse and point source pollution from agricultural sources.

Comparisons with the previous survey conducted in October 2015 for sites 1, 3 and 3a indicated no significant change in condition. In Taranaki summer surveys often have lower MCI scores than spring surveys. This is largely due to rivers and streams during summer having higher periphyton biomasses and higher water temperatures compared with what would be normally found in spring. However, there was no change for the MCI score at the 'primary impact' site and a non significant improvement (6 units) at the 'secondary impact' site.

Sites 1, 3 and 3a recorded excellent SQMCI scores (Stark and Maxted, 2007) which were largely due to the 'highly sensitive' and very to extremely abundant mayfly (*Deleatidium*) recorded in this reach. This abundance has been found in many previous surveys for this reach and indicates that there is relatively good water quality and habitat for macroinvertebrates. Sites 4 and 8 also had 'very abundant' mayfly (*Deleatidium*) but there were also higher abundances of more 'tolerant' taxa, particularly at site 8, which lead to lower SQMCI scores. SQMCI scores followed the same trend as MCI scores with scores gradually becoming lower the further downstream a sample was taken.

Periphyton, another indicator of nutrient enrichment, was similar among sites but the 'primary impact' site did have patchy filamentous algae which was absent at the other sites. The extremely large fresh 12 days prior to sampling is highly likely to have reduced periphyton biomasses and in general periphyton biomass within the surveyed reach was very low for a summer survey of the Waingongoro River.

No heterotrophic growths were recorded indicating that discharges from ANZCO were not causing high levels of dissolved organic compounds in the Waingongoro River downstream of the discharge.

Overall, the results of this March 2016 macroinvertebrate survey indicated that the discharge of waste from the ANZCO meatworks had not had any recent significant detrimental effects on the macroinvertebrate communities of the Waingongoro River. Differences among sites were likely due to habitat differences and incremental increases in nutrients from agricultural inputs unrelated to the ANZCO meatworks discharge.

Summary

The Council's standard 'kick-sampling' technique was used at five established sites to collect streambed macroinvertebrates from the Waingongoro River to determine if discharges from

the ANZCO meatworks at Eltham were having a detrimental impact on freshwater macroinvertebrates. Samples were sorted and identified to provide number of taxa (richness) and MCI and $SQMCI_s$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_s$ takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring. Significant differences in either the MCI or $SQMCI_s$ between sites may indicate the degree of adverse effects (if any) of the discharges being monitored.

Macroinvertebrate richnesses were similar to historical medians except for the 'control' site which had low taxa richness, possibly due to the large fresh which occurred 12 days prior to sampling. MCI scores indicated that the river communities were of 'fair' to 'good' generic health with sites further downstream having lower recorded MCI scores which is typical of Taranaki ringplain streams. The results of this summer survey indicated that the discharge of waste from the ANZCO meatworks into the Waingongoro River had not had any recent significant detrimental effects on the macroinvertebrate communities downstream of the discharge. Differences among sites for MCI and $SQMCI_s$ scores were likely due to habitat differences and incremental increases in nutrients from agricultural.

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Appendix VI

ANZCO Eltham Limited
Waste Disposal System Annual Report
for the year ending 30 September 2016

To: **Chief Executive – Taranaki Regional Council**

From: **Rawiri Mako – Anzco Foods Eltham Limited**

Date: **5 January 2017**

Subject: **Annual Environmental Management Report**

ANZCO FOODS ELTHAM LIMITED – ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2015-2016 SEASON

(October 2015 – September 2016)

1 Introduction

Anzco Foods Eltham Limited are required to submit an annual report detailing monitoring results, incidents, system changes, and significant events from all areas of the waste treatment and disposal systems. Relevant figures such as kill numbers, water use, and effluent discharges are included and shown in a weekly format. This information is displayed in Appendix 1.

2 Processing Activity

The beef season ran from 28 October 2015 to 6 July 2016. During this period a total of 170,004 cattle were processed. This is a decrease of 1,464 cattle processed in 20014/15 season. Appendix 1 shows the weekly kill numbers for beef for 2015/16.

Bobby calves were processed from 18 July to 30 September 2016. A total of 105,174 calves were processed over this 11 week period.

Total treated effluent produced for 2015/16 was 413,056m^3. This was a decrease of 104,063m^3 of treated effluent compared to the previous year of 517,119m^3.

From this total of treated effluent, 79,717m^3 was discharged into the Waingongoro River, which equates to 19% of the total effluent. And 333,339m^3 of treated effluent was irrigated to Joblin's farm, which equates to 81% of the total effluent.

3 Ponds/Treatment System Changes

There appears to be an anomaly with the discharge from the ponds system to the river with approximately 100,000m^3 difference between the 2014/15 and the 2015/16 seasons. Even though the total water use for 2015/16 season was 35,000m^3 less than the 2014/15 season and we irrigated 10,000m^3 more effluent than the previous season there appears to be a shortfall of approximately 40-50,000m^3.

A new meter was installed in our v-notch in May 2016. A recalibration of this meter will be undertaken to determine if the calibration used during the season was correct. At face value it appears it was not.

We continued to have regular weed spraying undertaken on the grass around the ponds and on the covers of ponds 1 and 2.

Last season Anzco Foods Limited looked at the possibility of installing a solids press. This would help with longevity of the system and also enhance the discharge. Due to missing the capex deadline for the 2016 financial year, the reasoning for installing a solids press will now be put up as a capex proposal for 2017.

During the 2015/16 season changes to the belly wash did not eventuate due to the company and MPI not be able to agree on the changes which were to be reintroduced. This will be revisited again in January 2017.

During the past two seasons there has been a gradual rise in the nitrogen levels being produced in our effluent. One of the problems we had was with the amount of blood being diverted to the effluent stream. That problem has been rectified but another issue we have had during the last season is our aeration system has not been at its optimum. Because of this we will be upgrading our aeration system early in the New Year 2017.

4 Site Management

Site inspections continue to be undertaken weekly. These inspections involve a walk around the plant and the effluent treatment area, while inspecting and reporting on any problem areas. Any problems/faults are reported to the appropriate personnel to repair/re-work the area.

Weekly air quality checks are carried out around the plant boundary. The results are included under Section 8.

5 Effluent Quality

The effluent quality throughout 2015/16 has shown a slight decrease in the nitrogen levels from the previous season. As stated above, there will be changes made to the aeration system which should return the nitrogen in our discharge to what we consider would be normal levels.

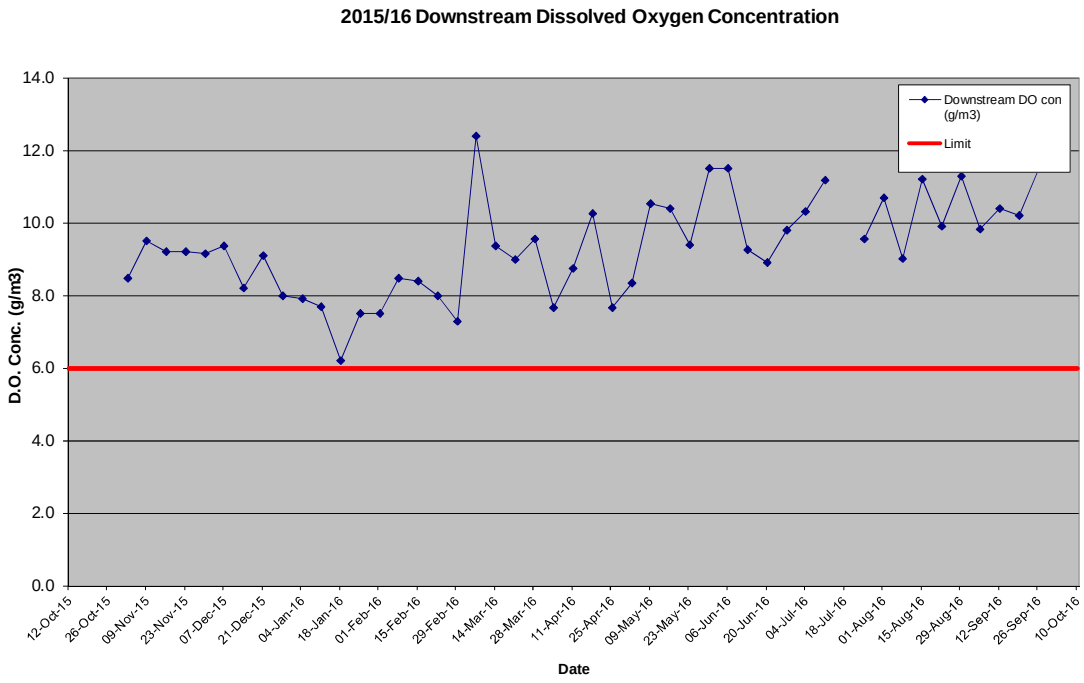
Testing of effluent continues to be done once a week by our laboratory, and usually takes place on Tuesday. ICS laboratory also monitor the effluent quality of pond 7 on a monthly basis.

With regards to our discharge to water consent (2039), the conditions regarding Dissolved Oxygen and Ammoniacal Nitrogen are detailed below.

5.1 Dissolved Oxygen

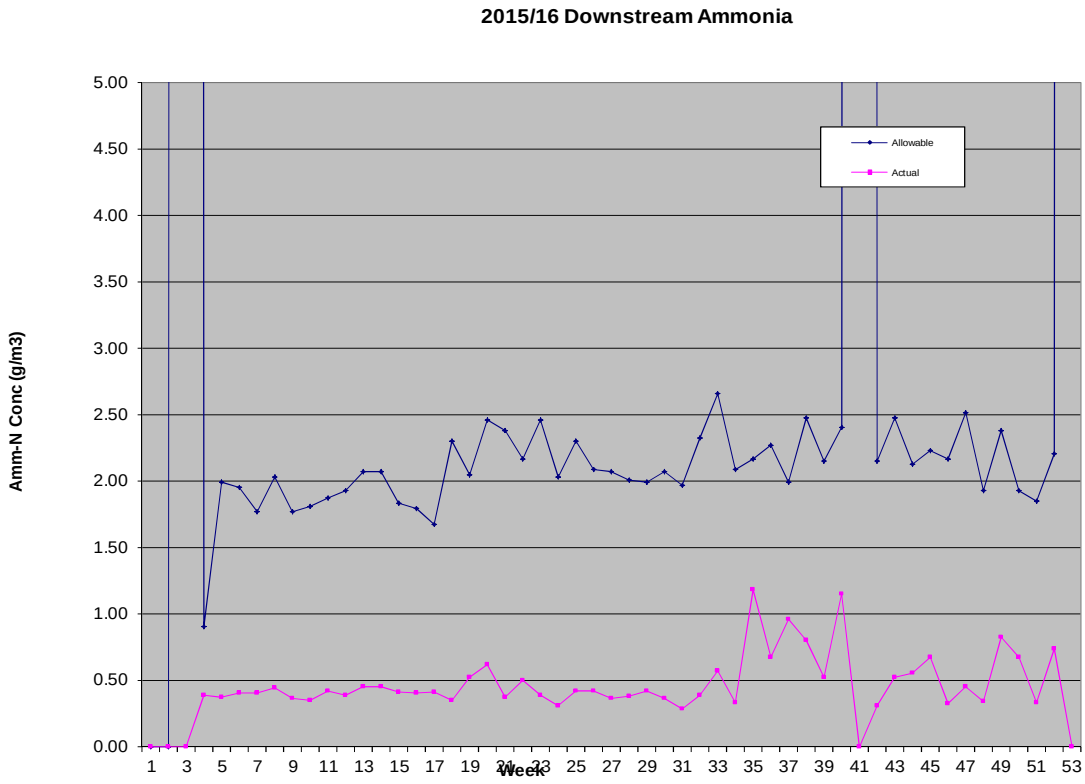
The dissolved oxygen concentration of the downstream point in the Waingongoro River never fell below the consent limit of 6 gm3. The lowest recorded dissolved oxygen concentration was 6.2 g/m3, which occurred once during January 2016.

Graph 5.1 below shows the downstream dissolved oxygen concentrations.



5.2 Ammoniacal Nitrogen

The downstream Ammoniacal Nitrogen levels versus the allowable in stream levels for 2015/16 is shown in Graph 5.2 below. Allowable levels were not exceeded at any time during the season.



6. Irrigation

This section relates to irrigation on Joblin's farm under consent 5569.

6.1 System Performance

Irrigation on Joblin's farm ran for 32 weeks. Included in the 32 weeks were 1 part week at the end of the irrigation season when Anzco Foods Limited discharged to the river as well as irrigating.

Irrigation commenced on 30 October 2015 and finished on 8 June 2016. A total of 333,339m^3 of effluent was irrigated to land, which accounted for 63% of the total effluent produced. Table 6.1 below compares the 2015/16 season with the previous six seasons.

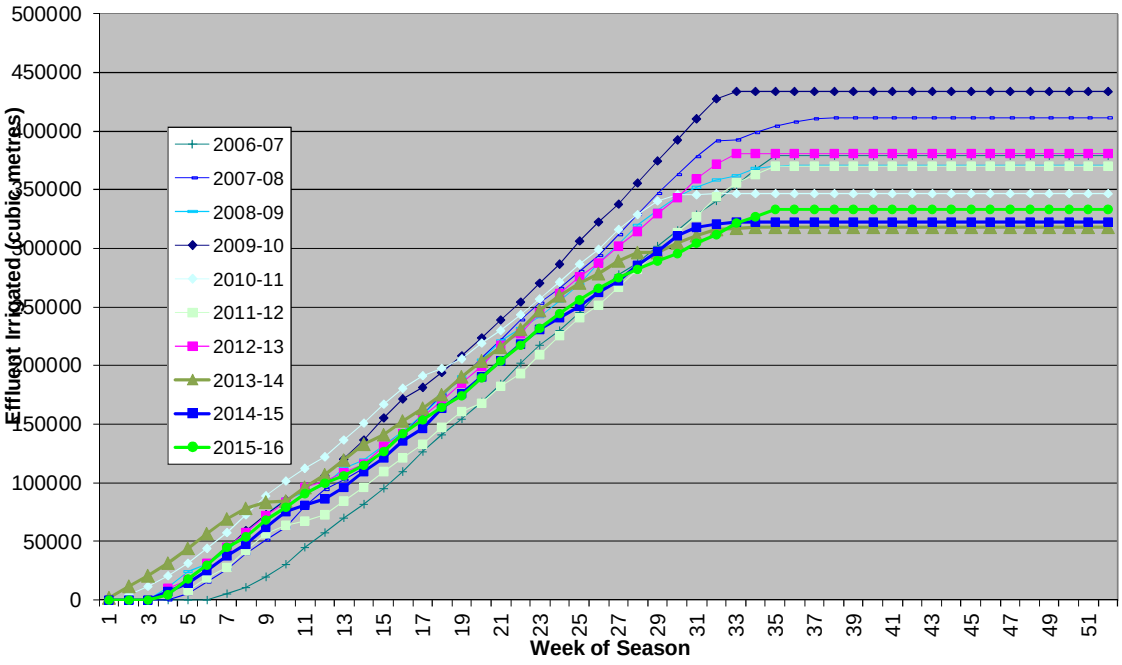
Table 6.1 – Seasonal Comparison of Irrigation Volumes

	2009/10	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**
No. Of Weeks	30	30	32	30	34	30	32
Total Vol. (m^3)	433,879	346,774	370,108	380,429	325,652	322,209	333,339
Weekly Max. (m^3)	19,006	16,442	17,059	17,867	15,870	16,479	15,338
Weekly Ave. (m^3)	14,463	11,185	11,939	12,681	9,578	10,740	10,416
% of annual	72%	69%	71%	65%	70%	63%	81%
Nitrogen Applied (kg)	59,408	47,877	55,484	59,071	50,258	68,694	66,065

From Table 6.1, it can be seen that the irrigation period increased by two weeks compared to the previous season, with the total volume of effluent irrigated increasing by 1% out of the total volume of effluent produced by the plant.

Graph 6.2 below shows the annual comparison of cumulative irrigation volumes for the past ten years.

Annual Comparison of Cumulative Irrigation Volumes



6.2 Operational Delays

There were no operational delays with the irrigation system to report on during the irrigation season.

6.3 Irrigation Non-compliances

There were no non-compliance issues during the 2015/16 season.

6.4 Nitrogen Loading per Hectare

Table 6.3 below shows the nitrogen application loading rate on each paddock on Joblin's farm during 2015/16. The method used to calculate this Nitrogen Loading, was by using the application depth (standard 45mm is used), times the size of each paddock and the weekly Total Nitrogen value, gives a Nitrogen loading on each paddock. A copy of the irrigation map which shows the Paddock numbers is included in Appendix 2.

Table 6.3 - Nitrogen Application							
Paddock	**Kg/ha**	**Paddock**	**Kg/ha**	**Paddock**	**Kg/ha**	**Paddock**	**Kg/ha**
B1	290.3	Y6	0.0	P8	279.0	G6	258.3
B2	278.1	Y7	289.8	P9	241.2	G7	257.9
B3	296.6	Y8	223.2	P10	236.7	G8	269.1
B4	277.7	Y9	203.4			G9	265.5
B5	220.1	Y10	247.1	O1	220.1	G10	263.3
B6	330.8	Y11	251.6	O2	245.3	G11	256.5
B7	233.1	Y12	248.0	O3	255.6	G12	299.7
B8	225.0	Y13	185.9	O4	299.3	G13	263.7
B9	208.4	Y14	195.8	O5	229.5	G14	261.9
B10	226.4	Y15	280.8	O6	243.0	G15	255.6
B11	228.2	Y16	217.4	O7	240.3	G16	226.8
B12	0.0	Y17	326.3	O8	274.1	G17	294.3
B13	0.0	Y18	308.7	O9	242.1	G18	224.6
B14	245.7	Y19	268.7	O10	253.4	G19	300.6
B15	296.1	Y20	263.3	O11	246.6	G20	256.5
B16	296.1	Y21	0.0	O12	239.4	G21	0.0
B17	274.5	Y22	0.0	O13	307.4	G22	227.7
B18	235.8			O14	269.6	G23	232.2
B19	330.8	P1	234.9	O15	228.2	G24	210.2
		P2	282.3			G25	222.8
Y1	171.9	P3	265.5	G1	235.4	G26	310.5
Y2	171.9	P4	270.5	G2	266.0	G27	241.7
Y3	211.1	P5	245.7	G3	249.8	G28	282.2
Y4	139.1	P6	306.0	G4	343.8	G29	288.9
Y5	0.0	P7	232.2	G5	178.7		
Total N Applied 64,304.2kg				**Average N Applied** (on irrigated paddocks) **252.3 kg/ha**			

There is a total irrigable land area of 264.71ha (after taking off the exclusion zones). Of this total area, there were 234.5ha which was actually utilised for irrigation. All of the reticulated buried pipe work has been completed which has given the Joblins the ability to basically utilise the entire farm for irrigation. Most of the paddocks had 3 separate applications throughout the season; however 8 paddocks had 4 applications. As can be seen in the table above, there were 8 paddocks which exceeded the 300 kg/ha limit.

6.5 Soil Nitrogen Loading

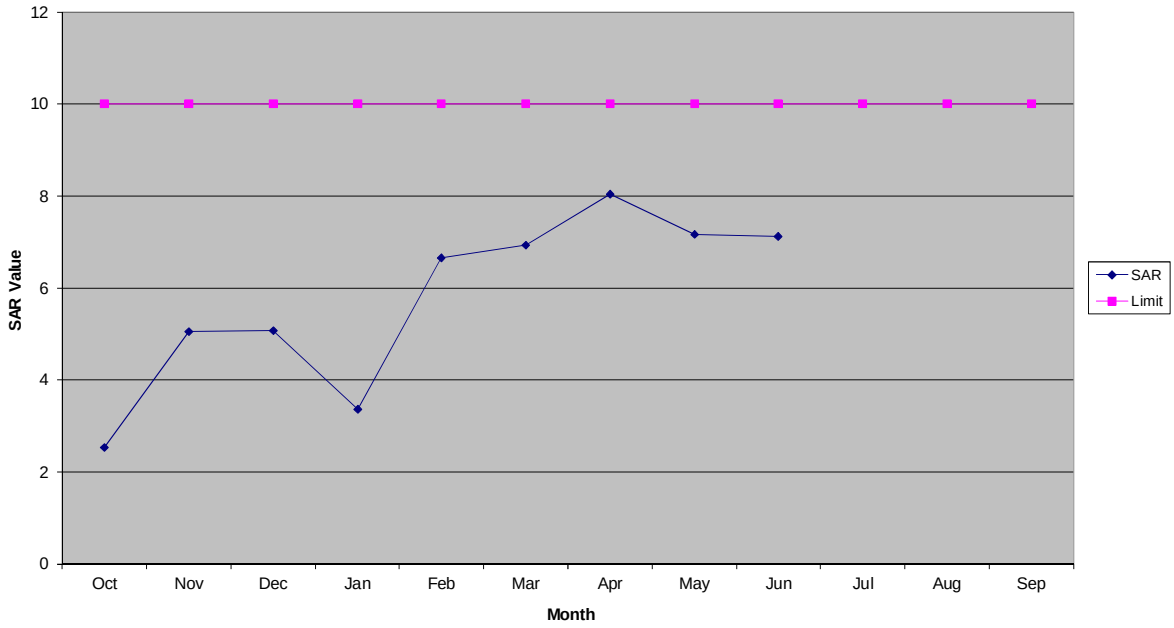
The average nitrogen application on the irrigated paddocks (as seen in Table 6.3 above) was 252.3 kg/ha and the total Nitrogen applied 64,304.2kg, which was a decrease compared to the previous season.

Soil Nitrogen Loadings are also measured at five sites on Joblin's dairy farm, once a month by Industrial Chemistry Services (ICS). A copy of the Reardon Block soil Nitrogen loadings are attached as Appendix 3. It can be seen that Nitrate levels have remained similar to previous years. Total Nitrogen levels have shown a slight decrease to previous years.

Effluent Sodium Absorption Ratio

Graph 6.4 below shows the Sodium Absorption Ratio did not exceed 10 at any stage throughout the season, as required by condition 10 of irrigation consent 5569. The Sodium Absorption Ratio was not tested by ICS in July, August, and September of 2015. There was no irrigation to land from approximately 8 June 2016 through until the end of October 2016.

Graph 6.4 2015/16 Effluent Sodium Absorption Ratio



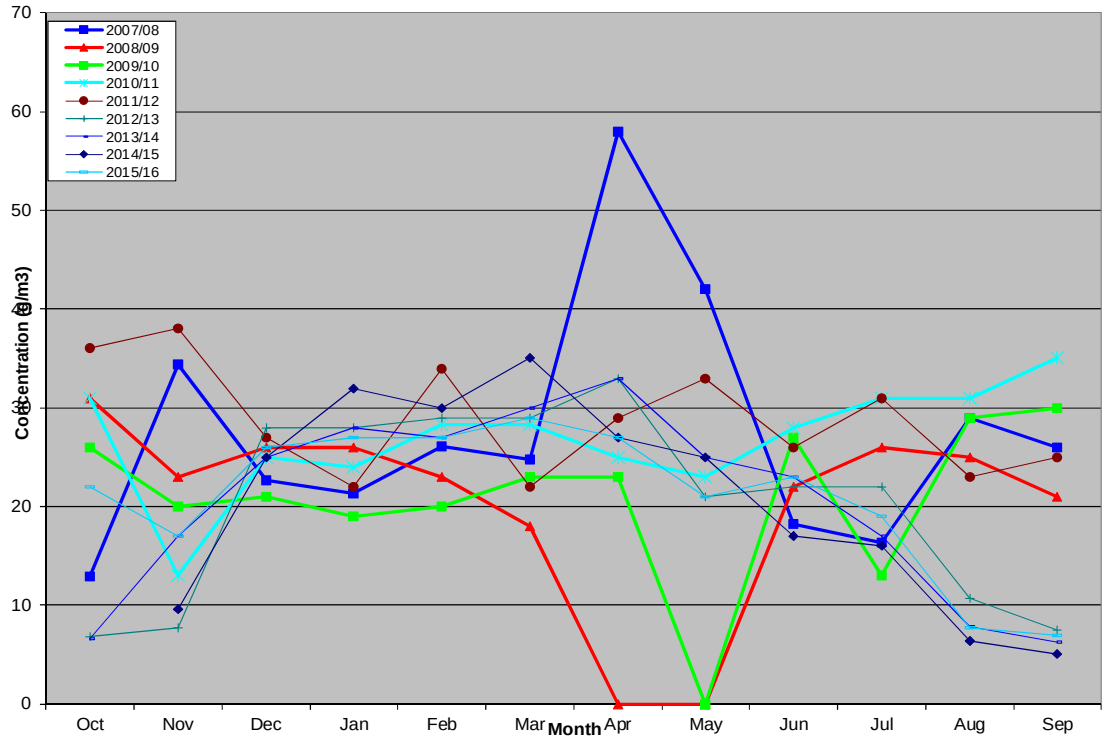
6 Paunch Material Disposal

The paunch material is taken off site by Remediation Ltd. This method of off site disposal has proved successful for Anzco Foods Eltham Limited, with no paunch grass odours detected around the plant, and no public complaints being received for paunch grass odour. The improvements that have been put in place to remove excess water from the paunch have shown a huge reduction in the quantity of paunch leaving the site.

7 Phosphorus

The Phosphorus concentration in the effluent is monitored on a monthly basis by Industrial Chemistry Services. The average Phosphorus concentration in the effluent for the 2015/16 season was 21.1g/m^3 which were basically the same as the previous season. Graph 7.1 below shows the phosphorus concentration of the effluent for the past seven seasons.

Graph 7.1 - Total Phosphorus Concentration in Effluent



8 Odour

Air quality monitoring was conducted by Anzco Foods Limited staff on a weekly basis, and it usually occurred every Monday morning. The monitoring involved checking for any odours at the four sites around the plant; which were at the end of Conway Rd, North Street, the main gate, and Eltham Road.

Table 8.1 below shows the weekly monitoring results for the 2015/16 season.

Table 8.1 - Air Quality Monitoring Results 2015/16

Monitoring Point	**Frequency**						
	Strength of Odour						
	0	**1**	**2**	**3**	**4**	**5**	**Total**
Conway Road	36	16	4	0	0	0	52
North Street	49	3	0	0	0	0	52
Main Gate	42	10	7	0	0	0	52
Eltham Road	40	12	4	0	0	0	52
Total	**167**	**41**	**15**	**0**	**0**	**0**	**208**
Percentage	**80.2%**	**19.7%**	**7.2%**	**0%**	**0%**	**0%**	

Scale

0 = no noticeable odours
1 = slight occasional wafts
2 = slight but constant odour
3 = very noticeable odour
4 = unpleasant odours
5 = putrid

In the 2015/16 season, the major source of odour was from the yards. At Conway Road, the only odours detected were from the anaerobic ponds, whereas the yards odour was detectable from the main gate and North Street. Pond odours were also detected at Eltham Road.

During the 2015/16 season, there were 2 complaints received by the TRC concerning odour coming from the site, one on the 21 October 2015 and the other on the 1 June 2016. At the time of inspection by each of the TRC officers, no odour was found to be emanating off site.

9 Water Use

Anzco Foods limited water use report for the 2015/16 season was submitted to TRC in early November 2016. A summary of the season is as follows:

Total water use at the plant has decreased by 1% on the previous season, with the total beef kill approximately the same.

Total potable water use has basically remained the same as the previous season. The potable water/body figure is 2.16m^3 which is 10lts/body less than the previous season.

The total non-potable water use has decreased by 0.04m^3/body compared to the previous season, with the non-potable water/body figure of 0.63m^3 for the 2015/16 season compared to 0.67m^3 last season.

10 Stormwater

Stormwater discharge samples were collected by TRC on 1 July 2015. Samples were taken from the cooling water/stormwater drain immediately above the weir on the Waingongoro River. As can be seen in table 10.1 below, all results were well within consent limits.

Table 10.1 - Stormwater Discharges		
Date Sampled	**Suspended Solids (g/m3)**	**pH**
Limits	**100**	**6.0-10.0**
1 July 15	4	7.2

11 Inter Laboratory Comparisons

One inter laboratory comparison was completed during the 2014/15 season; the samples were collected on 1 July 2015. The results are shown in Table 11.1 below.

Parameter		Discharge		Upstream		Downstream	
2014-2015		**Riverlands**	**TRC**	**Riverlands**	**TRC**	**Riverlands**	**TRC**
1 July 2015							
Temperature	°C	12.9	12.9	10.8	10.6	10.8	11.2
Dissolved oxygen	g/m³	7.1		11.1	11.1	11.1	11.0
pH		7.9	7.8	7.7	7.6	7.8	7.7
Ammonia	g/m³N	157	150	0.37	0.023	1.02	0.64
Nitrate + nitrite	g/m³N	<0.25	0.11				
Chemical oxygen demand	g/m³	355	430				
Suspended solids	g/m³	140	110				

The comparison of results has been acceptable for all parameters.

12 Summary

The Irrigation season for 2015/16 saw approximately the same volume of the waste water going to land. The irrigation season ran for 32 weeks compared to the 30 weeks the previous season.

As has been for previous seasons, accurate monitoring of air quality, effluent, site inspections at Anzco Foods Eltham Limited and monitoring on the Joblin farm will continue to be carried out to a high standard in order to achieve an excellent standard of compliance with consent conditions.

Overall, we consider that we have achieved an excellent level of environmental performance for the 2015/16 year.

In the 2016/17 season, Anzco Foods Eltham Limited is planning to have another successful year where we achieve compliance with all our consents and will continue to make innovative changes within the plant to improve our environmental outcomes.