Silver Fern Farms Ltd Waitotara Monitoring Programme Annual Report 2016-2017

Technical Report 2017-107

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Executive summary

Silver Fern Farms Limited (the Company) operates a meat processing plant located on Wai-inu Beach Road, Waitotara in the Waitotara catchment. This report for the period 1 October 2016 to 30 September 2017 coincides with killing season, it describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental and consent compliance 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 a total of five resource consents, which include a total of 51 conditions setting out the requirements that the Company must satisfy. The Company holds resource consents to allow it to take and use ground water and spring water, to discharge wastes by spray irrigation to land, to discharge stormwater and cooling water to an unnamed tributary of the Waitotara River, and to discharge emissions into the air.

During the monitoring period, Silver Fern Farms Limited demonstrated an overall good level of environmental performance.

The Council's monitoring programme for the year under review included four inspections, and the collection of four wastewater and 24 groundwater samples for physicochemical analysis. The Company supplied an annual environmental monitoring report, as well as records of the volume of water abstracted and the volume of wastewater discharged.

New metering and telemetry to Council for monitoring of groundwater abstraction was installed in September 2014. The new system showed that the instantaneous volume limit was breached frequently by small amounts, although the daily limit was being met. These breaches continued occasionally throughout the current monitoring period and subsequent investigations found that the telemetry configuration in the data logger for one of the bores was logging the wrong output. This was corrected and no further exceedances were reported.

In September 2012, the Company commissioned a 20.7 ha extension of the irrigation area, and a further extension of 6.0 ha became operational in January 2013. Both areas were already covered by resource consent. This voluntary action, for which the Company was given an Environmental Award by Council in November 2014, increased the area irrigated for wastewater disposal by 36 % to 110.5 ha to provide for increased production at the meat processing plant and to lower nitrogen loadings. In 2016-2017, average annual nitrogen loading was 202 kg/ha. Irrigation of the undeveloped areas will also increase pasture production. Monitoring of a site of significance to Ngaa Rauru Kiitahi, a spring at the coast, was continued in relation to the extension.

Stormwater and cooling water discharges were not found to have significant environmental effect.

During this reporting period a number of odour complaints were received from residents at the Wai-inu Beach Settlement. While investigating the complaints it became apparent that there were a number of operational issues with the automatic shutdown system. Additionally, wastewater within the wastewater storage pond had turned anaerobic largely as a result of the fatty crust across the pond surface. Mitigation measures have been scheduled for the 2017-2018 season.

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

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74 % of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21 % of the consents, a good level of environmental performance and compliance was achieved.

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 good level.

This report includes recommendations for the 2017-2018 year.

Table of contents

List of tables

List of figures

1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period October 2016-September 2017 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Silver Fern Farms Limited (the Company). The Company operates a meat processing plant situated on Wai-inu Beach Road at Waitotara, in the Waitotara catchment. The monitoring period coincides with the killing season.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to abstraction of water, discharge of wastes by spray irrigation to land, discharge of stormwater and cooling water in the Waitotara catchment, and the air discharge permit held by the Company 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 the Company's use of water, land and air, and is the twenty-sixth combined annual report by the Council for this meat processing plant.

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 though annual programmes;
- the resource consents held by the Company in the Waitotara catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at 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 interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2017-2018 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 an activity, and may include cultural and social-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 (for example 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 the 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, this report also assigns them a rating for their 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 (that is 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 performance

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.

For reference, in the 2016-2017 year, consent holders were found to achieve a high level of environmental performance and compliance for 74 % of the consents monitored through the Taranaki tailored monitoring programmes, while for another 21 % of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

The meat processing plant was constructed in 1987 within pastoral lands beside Wai-inu Beach Road, approximately 3.5 km south of Waitotara and 3 km north of Wai-inu Beach. The location of the plant site is shown in Figure 1 and the layout of the irrigation system in Figure 2. The nearest dwellings are farmhouses, situated about 900 metres to the north and 1200 metres to the south-east. The Waitotara River is located approximately 450 metres to the north of the plant.

The plant primarily slaughters and processes sheep and lambs, but is also capable of handling bobby calves and goats. The plant employs up to 335 people at any given time, and has an optimum annual capacity of one million sheep and bobby calves over a 50-week processing period. The majority of the processed output is exported. There are no fellmongery or rendering facilities, with all blood and renderable material taken off-site for processing.

Annual kills since the 1995-96 season are shown in Figure 3. A total of 616,615 animals were processed over the 2016-2017 monitoring period, compared with 620,585 in 2015-2016, a decrease of 0.6%.

Figure 1 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

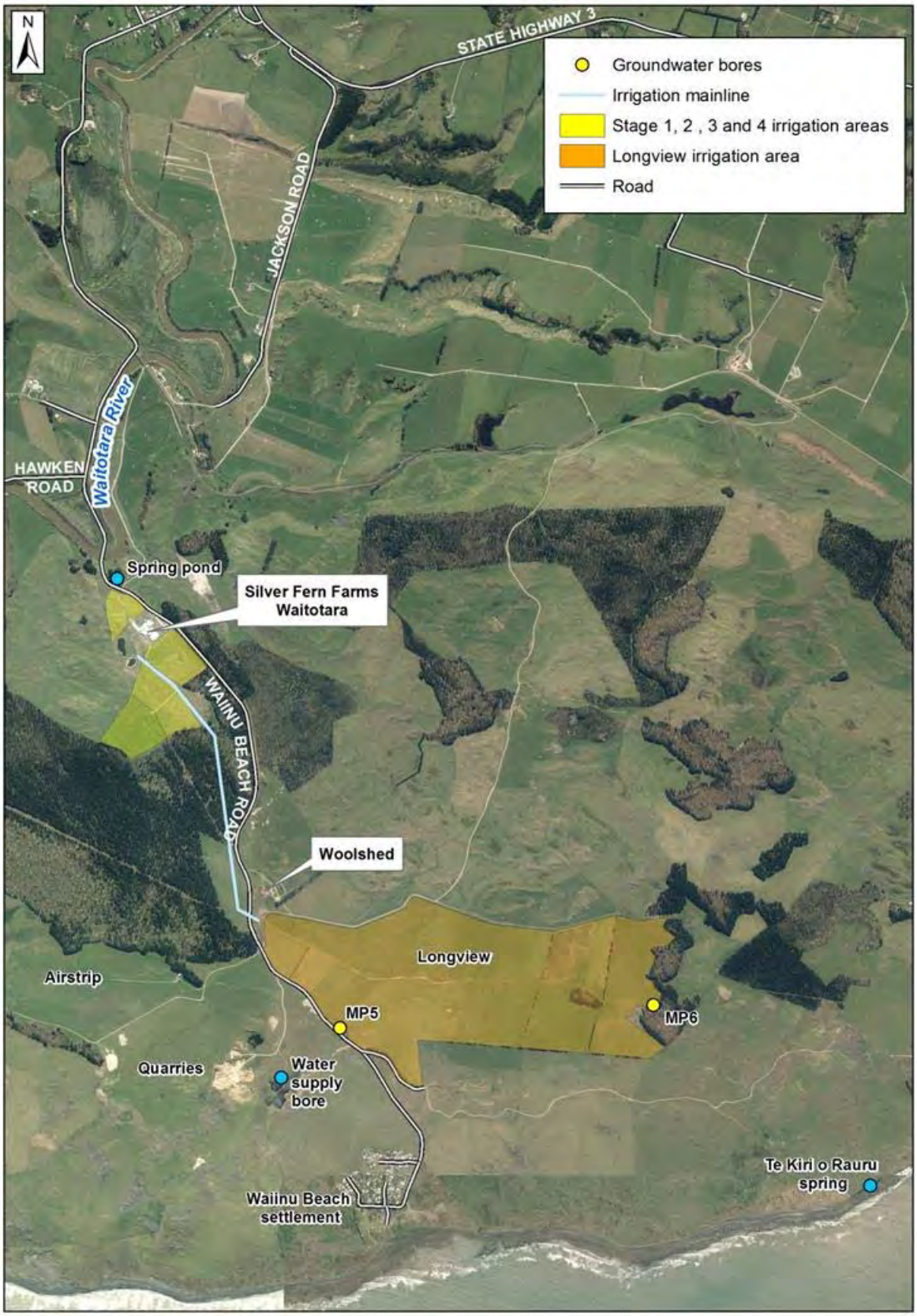

Figure 2 Location of SFF Waitotara meat processing plant showing irrigation areas and groundwater monitoring points

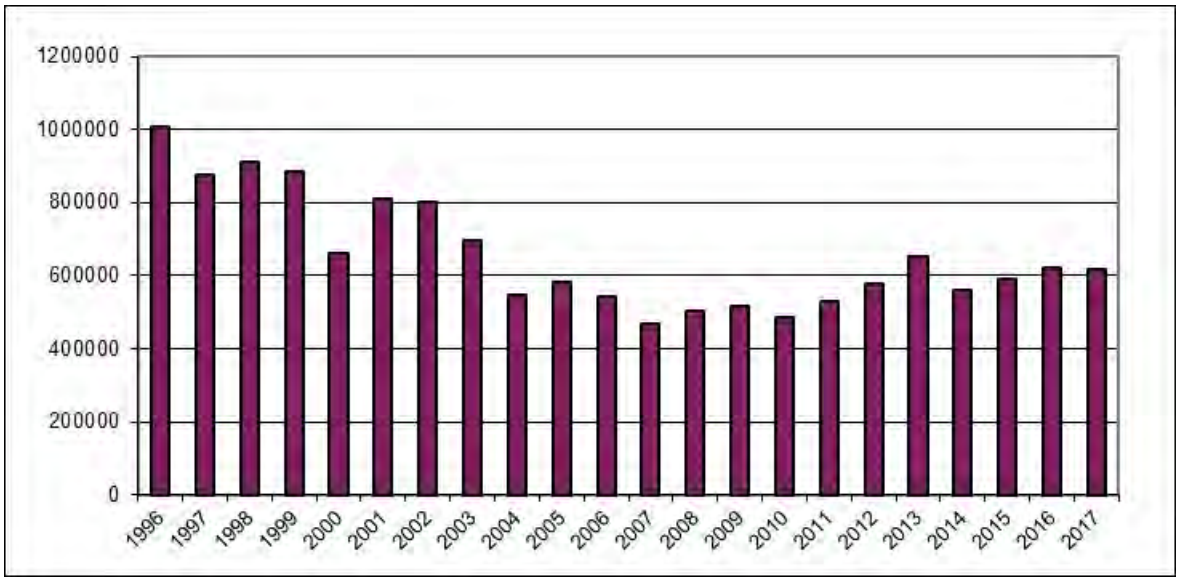

Figure 3 Annual kills since the 1995-1996 season

Ownership of the plant has changed twice. The original owner, Waitotara Meat Company, merged with Richmond Limited in October 1999, which in turn amalgamated with PPCS Limited in December 2004. PPCS Limited was rebranded Silver Fern Farms Limited in June 2008.

1.2.1 Water abstraction

The plant's water usage is proportional to the number of stock being processed through any particular period and the maximum daily water usage follows the same pattern as daily stock kill rate.

Water for operation of the plant is taken from two sources. Water of high quality is drawn from a deep aquifer via bores at the plant site. Water of lesser quality (high hardness) is piped from springs near the Waitotara River.

Three bores, each with the capacity to pump 770 m^3/d, pump from a depth of 122 to 140 m. Two bores are pumped at any one time, with the other being a reserve supply. The aquifer is recharged by rainfall/riverbed infiltration in the hill country north of Waitotara. Aquifer analysis undertaken by the Company, and checked by the Council, shows that the maximum sustainable yield is 3,000 cubic m^3/d.

A secondary supply, for stock and yard washing purposes, is drawn at a rate of up to 200 m^3/d from springs which arise beside the Waitotara River. This is piped approximately 400 m to the plant across Wai-inu Beach Road.

1.2.2 Discharges to land

Wastewater derives primarily from two sources: the plant and the stockyards. Plant wastewater consists of wash-water from the washing of carcasses, pelts and offal, and from cleansing of process areas. Wastewater is produced from the external yards as a result of washing incoming stock, stockyard washings and of discharge from the truck-wash facility.

After primary treatment by screening, the wastewater is stored in two holding ponds before discharge onto land by spray irrigation. Screenings are spread mechanically on the irrigation areas.

In September 2012, a total area of 80.7 ha (revised from 77.3 ha since 2010-2011) was irrigated, in two locations (Figure 3). An area of 13.3 ha adjacent to the plant that was owned by the Company was irrigated by 15 independently controlled fixed sprinkler networks. An area of 70.4 ha (revised from 64 ha) on the farm of Longview Limited, at a location about 2 km away towards the coast along Wai-inu Beach Road, was

irrigated by one of three rotary boom travelling irrigators. Reticulation is by a ring main, around which a travelling irrigator is rotated manually according to weather conditions and wastewater availability. Irrigator run lengths are about 400 m, with a wetted width of 45 m, giving an area of about 1.8 ha per application. An independent automated control system is in place for control of spray drift towards Wai-inu Beach.

The Longview Farm reticulation was extended by 20.7 ha to 91.2 ha in September 2012, and the fixed sprinkler irritation area next to the plant was extended by 6.0 ha to 19.3 ha in January 2013, making a total irrigated area of 110.5 ha.

The land that is irrigated is largely undulating stabilised sand dunes, with an overlay of free draining yellow brown soils of very low natural fertility, that frequently have periods of soil moisture deficit. Properly managed, the irrigation system is expected to increase nutrient and moisture levels and moisture retention ability of the land while minimising the effect on groundwater quality.

The discharge of stormwater and wastewater is primarily managed by SFF Waitotara via the Wastewater Management Plan, which defines operational, monitoring and reporting procedures. The plan is essentially 'response driven' in that changes in operation of the treatment system are made in response to regular performance evaluations based on monitoring results.

1.2.3 Water abstraction permit

The sources of aerial emission from the plant are a boiler for hot water production, the stockyards, the wastewater ponds, the wastewater irrigation system, and miscellaneous plant processes.

1.3 Resource consents

1.3.1 Water abstraction permits

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.

SFF Waitotara holds water permit **2261-3.1** to take groundwater from three bores in the vicinity of the Waitotara River for meat processing purposes. This permit was issued by the Council on 23 August 2016 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2040.

The permit includes 13 special conditions.

Condition 1 places limits on maximum instantaneous and daily rates of abstraction, not to exceed 1,300 cubic meters/day.

Condition 2 relates to labelling of the bores, ensuring that they can be identified.

Conditions 3 to 6 relate to the installation and maintenance of measuring and recording equipment, including certification of accuracy and notification of failure.

Conditions 7 and 8 relate to continuous measurement and recording of groundwater level.

Condition 9 deals with access to water meters and data loggers by the Council.

Condition 10 addresses water conservation and the avoidance of adverse effects on the environment by minimising water use.

Condition 11 requires that the bores be designed and configured to prevent any re-entry of water into them.

Condition 12 requires the production from 30 September 2020 of a triennial assessment of the sustainability of the aquifer. This condition was imposed owing to the lack of groundwater level data at the time the consent was issued.

Condition 13 is a review provision.

SFF Waitotara also holds water permit **10256-1.0** to take and use water from a spring for non-potable plant purposes. This permit was issued by the Council on 14 December 2016 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2040.

The permit includes eight special conditions.

Condition 1 places limits on maximum instantaneous and daily rates of abstraction, not to exceed 350 cubic meters/day.

Conditions 2 to 4 relate to the installation and maintenance of measuring and recording equipment, including certification of accuracy and notification of failure.

Condition 5 deals with access to water meters and data loggers by the Council.

Condition 6 requires that abstraction data is submitted to the Councils computer system in 'real time'.

Conditions 7 and 8 deal with lapse and review of the consent.

The permits are attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

1.3.2 Water discharge permit

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.

SFF Waitotara holds water discharge permit **5027-2** which allows for the discharge of stormwater, defrost water and evaporative cooling water into an unnamed tributary of the Waitotara River. This permit was issued by the Council on 8 November 2010 as a resource consent under section 87(e) of the RMA. The permit is due to expire in June 2028.

The consent has nine special conditions that relate to managing the quality of the stormwater discharge from the site.

Condition 1 requires the best practicable option for prevention of adverse effects on the environment to be used at all times.

Condition 2 limits the catchment area of the site.

Condition 3 relates to the containment of hazardous substances.

Condition 4 sets the concentration limits of pH, oil and grease, and suspended solids that should not be exceeded in the discharge.

Condition 5 deals with the discharge and its effects on the receiving waters.

Condition 6 requires the provision of a contingency plan which outlines procedures in the event of spillage or discharge of contaminants.

Condition 7 requires the preparation and maintenance of a stormwater management plan which outlines how the site is to be managed in order to minimise the contaminants that become entrained in stormwater.

Condition 8 relates to notification requirements.

Condition 9 provides for a review of the consent.

The permit is attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

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.

SFF Waitotara holds air discharge permit **4629-3.1** to cover the discharge of emissions into the air from various activities associated with meat processing operations. This permit was issued by the Council on 13 September 2017 under Section 87(e) of the RMA. It is due to expire on 1 June 2034.

The consent has five special conditions attached.

Condition 1 states that the emissions to air are generally of the nature and scale described in the application.

Condition 2 requires the consent holder to adopt the best practicable option to prevent or minimise adverse effects on the environment.

Condition 3 states that there be no odour at or beyond the site boundary.

Condition 4 requires that the discharge be free of smoke.

Condition 5 provides for review of the consent.

The permit is attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

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.

SFF Waitotara holds water discharge permit **2260-3.1** which allows for the discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air. This permit was issued by the Council on 13 September 2017 as a resource consent under Section 87(e) of the RMA. It is due to expire on 1 June 2034.

The consent has 16 special conditions. These special conditions relate to the quality of the discharge, and the effects on groundwater and the surrounding environment.

Conditions 1 and 2 deal with the volume and rate of discharge and allowable disposal areas.

Conditions 3 and 4 require that the discharge does not result in offensive odour, or spray drift beyond the boundary of the property.

Conditions 5, 6 and 7 requires that the consent holder to prepare an 'Integrated Management Plan' (IMP) and that a designated officer oversee the management of the spray irrigation system according to it. The IMP should be reviewed annually.

Condition 8 requires the consent holder to undertake a monitoring programme that identifies and monitors the risk to the Wai-inu Water Supply.

Condition 9 requires the consent holder to adopt the best practicable option to prevent or minimise adverse effects of the discharge on the environment.

Condition 10 states that the sodium adsorption ratio of the wastewater not exceed 15.

Conditions 11, 12 and 13 prohibit discharge in certain areas.

Condition 14 requires the consent holder to keep records of the rate and volume of wastewater and stockyards solid waste discharged.

Condition 15 requires the consent holder to notify Council and STDC should an event occur that may have adverse effects on water quality at the drinking-water supply abstraction point for Wai-inu Beach.

Condition 16 is a review provision.

The permit is attached to this report in Appendix I.

This summary of consent conditions may not reflect the full requirements of each condition. The consent conditions in full can be found in the resource consent which is appended to this report.

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 at SFF Waitotara's meat processing plant is carried out by both the Company and the Council. The purposes of monitoring are:

- to determine compliance with conditions on resource consents;
- to determine the effects on surface waters and groundwater, and air quality from the exercise of the resource consents; and
- to provide information for management of the wastewater disposal system.

The monitoring programme has developed with experience in operation of the plant. A comprehensive wastewater management plan has been prepared which specifically addresses monitoring of discharges to land.

1.4.2 Monitoring by SFF Waitotara

Monitoring undertaken by the Company covers two main areas as described below.

Water abstraction

The Company monitors the volume of water abstracted and reports the results to the Regional Council annually. Telemetry of abstraction rate and of bore water level was commissioned on 24 September 2014. Groundwater level monitoring was instituted as a requirement of consent 9608, held by DR Wilson for abstraction of groundwater at a location across the Waitotara River for irrigation of pasture land.

Irrigation system management

The irrigation system is managed through monitoring and control of volumes of wastewater applied to 23 sectors at the plant site and 65 runs across 19 paddocks at Longview Farm. Results of irrigation monitoring are reported to the Council annually.

In October 2009, the Company commenced monitoring the chemical composition of wastewater irrigated, on a monthly basis. This information is used mainly for more accurate measurement of nitrogen loadings on irrigation areas.

Soil of the irrigated areas is tested biennially to determine top-dressing requirements for pasture nutrients and maintenance of soil structure.

1.4.3 Monitoring by Taranaki Regional Council

The consent monitoring programme for the SFF Waitotara site undertaken by the Council consists of four primary components as described below.

Programme liaison and management

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

Review of SFF Waitotara monitoring data

Monitoring data gathered by the Company are reviewed to determine compliance with resource consent conditions and to assess trends in water usage, and in wastewater volumes and land application.

Site inspections

An officer of the Council visits the Waitotara plant site at quarterly intervals. Inspections are made of the water abstraction system, stockyards, truck wash, processing facilities, boiler, blood and offal holding areas, and wastewater treatment and waste disposal systems. An off-site odour assessment is conducted in the vicinity of the plant and irrigation areas. Monitoring results, irrigation records and activities which may influence plant wastewater quality are discussed. The site neighbourhood is surveyed for environmental effects.

Chemical sampling

The composition of wastewater irrigated and groundwater around irrigation areas is monitored quarterly. The wastewater is analysed to determine its organic and mineral strength, particularly for calculation of nitrogen loading on irrigation areas. Groundwater at six locations, comprising five monitoring bores and a spring, is analysed to determine the effects of irrigation on water quality, particularly on nitrate concentration.

2 Results

2.1 Water

2.1.1 Inspections

An officer of the Council carried out four routine inspections of the SFF Waitotara site during the 2016-2017 monitoring period. These took place on 16 December 2016, and 28 March, 30 June and 15 September 2017. Each inspection by an officer of the Council is usually conducted in conjunction with a Company employee.

- Particular attention is given to the following items:
- water supply (bores and spring)
- wastewater treatment system
- land irrigation system
- by-product load-out and truck-wash areas
- chemical and fuel/oil storage areas
- stormwater/road drains
- domestic sewage disposal

Site management was generally found to be good and no significant environmental issues were noted.

2.1.2 Results of water abstraction monitoring

Process water for the site is drawn from three groundwater bores and a spring via separate pumps. Consent 2261-3.1 covers the abstraction from the groundwater bores, the daily volume limit is 1,300 m^3 (15.0 L/s), at a maximum rate of 20 L/s. Consent 10256-1.0 covers the abstraction from the spring, with a daily volume limit of 350 m^3 at a maximum rate of 4.4 L/s.

Under the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, SFF Waitotara was required by 10 November 2014 to take continuous measurements and keep daily record of volume taken, and thereafter supply by 31 July each year the record for the preceding 1 July to 30 June period.

SFF Waitotara installed new meters for each of the water abstraction pumps, with telemetry to Council from 24 September 2014. Previously, weekly records had been kept. The meters were calibrated by a suitably qualified independent person.

Total daily abstraction volumes for the 2016-2017 monitoring period are shown in Figure 4. The daily abstraction rate from the groundwater bores was within the limit of 1,300 m^3/d set on consent 2261-3.1 throughout the monitoring period.

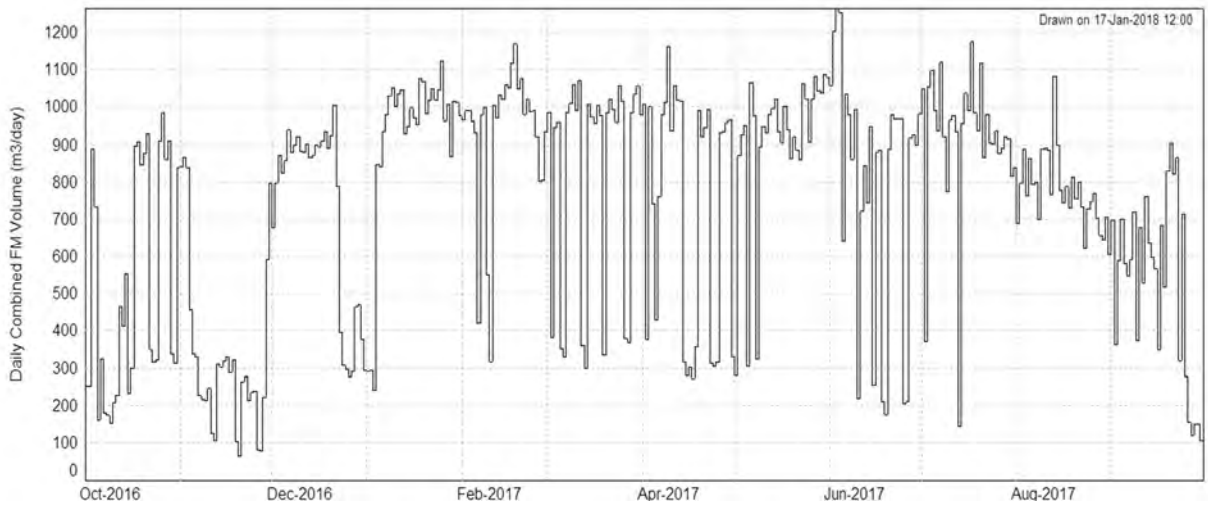

Figure 4 Daily abstraction volume m^3, October 2016 to September 2017

The total volume abstracted over the 12-month period ending 30 September 2017 was approximately 310,199 m^3, of which 271,589 m^3 was taken from the deep aquifers and 38,609 m^3 from the spring beside the Waitotara River. This equates to 0.503 m^3 per animal slaughtered, which is equivalent to an increase of 0.028 m^3, or 5.9%, per animal compared to the 2015-2016 monitoring period.

Monthly maximum total instantaneous abstraction rates (L/s) for 2016-2017 are presented in Table 1, with the monthly average values for comparison.

Table 1 Monthly average and maximum instantaneous groundwater abstraction rates 2016-2017

Month	Average daily abstraction (L/s)	Maximum total instantaneous abstraction (L/s)	Number of days per month total instantaneous abstraction limit exceeded	
			Over limit (20 L/s)	Over limit+5% (21.0 L/s)
October 2016	15.7	17.8	-	-
November 2016	7.8	18.9	-	-
December 2016	5.4	10.1	-	-
January 2017	8.5	12.7	-	-
February 2017	9.1	11.2	-	-
March 2017	9.1	12.4	-	-
April 2017	10.8*	48.9*	1*	1*
May 2017	9.0	9.0	-	-
June 2017	8.9	9.0	-	-
July 2017	10.2*	47.9 (9.0)*	1*	1*
August 2017	21.1*	56.7 (14.5)*	6*	6*
September 2017	12.9	15.6	-	-

* The recorded value has been reported. However, this period contains data that is not considered reliable due to a datalogger error (see below for further details). Maximum abstraction rates excluding suspect data are given in brackets.

The instantaneous abstraction rate limit of 20 L/s appeared to be breached on several occasions, however the pumps have been configured to ensure that they are physically incapable of pumping at such rates. Subsequent investigations by a third party technical provider found that the telemetry configuration in the data logger for bore GND0230 was logging the wrong output. The output reported during this period is believed to been multiplied by a factor of ten. This was corrected and no further exceedances were reported.

Spring

The maximum abstraction from the spring was no more than 273 m^3/day, within the consented limit of 350m^3/day. Like the production bores, the pump has been configured to only pump at the maximum consented rate. There were a number of occasions when the rate of take apparently exceeded the consented limit of 4.4 L/s (Table 2), however it is likely these events were related to pressure spikes at start-up.

Table 2 Monthly average and maximum instantaneous spring water abstraction rates 2016-2017

Month	Average daily abstraction (L/s)	Maximum total instantaneous abstraction (L/s)	Number of days per month total instantaneous abstraction limit exceeded	
			Over limit (4.4 L/s)	Over limit+5% (4.6 L/s)
October 2016	3.5 (3.1)*	11.1 (4.4)*	1	1
November 2016	7.8 (1.1)	7.8 (4.4)*	1	1
December 2016	4.4 (3.7)	24.4 (4.4)*	1	1
January 2017	4.1	4.4	-	-
February 2017	3.8	4.4	-	-
March 2017	4.2	5.6 (4.4)*	1	1
April 2017	4.1	4.4		
May 2017	4.4	4.4	-	-
June 2017	4.4	4.4	-	-
July 2017	4.4	4.4	-	-
August 2017	4.4 (4.3)*	7.8 (4.4)*	1	1
September 2017	4.1	4.4	-	-

* Recorded values are provided. Brackets give values calculated to replace suspected unreliable data points (average of immediately prior and following data points).

2.1.3 Results of discharge monitoring

2.1.3.1 Wastewater monitoring

Irrigation volumes

Records of the volume of wastewater irrigated at the SFF Waitotara site have been supplied by the Company in accordance with the Wastewater Management Plan. The reported total volume irrigated for the 12 month period ending 30 September 2017 was approximately 231,930 m^3, a decrease of 0.6 % from 2015-2016. This value represents 75 % of the reported water abstraction volume.

Some of the reasons put forward by the Company for the difference in the volumes abstracted and discharged are;

- Not all waste streams are directed to wastewater for disposal, for example domestic sewage;
- Loss of boiler-generated steam to atmosphere;
- Discharged as defrost or cooling water;
- Held within storage tanks.

Wastewater composition

The results from chemical monitoring of wastewater irrigated are given in Table 3. Samples were taken from a tap that was installed on the irrigation line in the pump shed beside Pond 2 in December 2012 (site code IND003001). Previously, samples were taken just beneath the surface of Pond 2 adjacent to the inlet to the irrigation pump. The new sampling point enables better representation of the wastewater irrigated. The results of monitoring of Pond 2 are used below, as this is the regular wastewater holding pond, with Pond 1 only used in the event of an emergency (i.e. a problem with the irrigators or plant which results in the need to hold wastewater for a period of time).

Table 3 Chemical monitoring results for the irrigation pond 2016-2017

Parameter		Summary of past results 1991-2016				16 Dec 2016	28 Mar 2017	30 Jun 2017	15 Sep 2017
		N	Max	Min	Med				
Time	NZST					12:10	11:10	11:55	11:05
Temperature	°C	85	30.8	11.6	21.3	29.4	29.6	26.4	18.0
Conductivity, 20°C	mS/m	91	246	81.1	140	126	134	129	97.5
pH		90	7.7	6.5	7.1	7.0	6.9	6.8	6.8
Suspended solids	g/m^3	88	2500	28	205	350	320	1100	70
COD	g/m^3	90	4700	100	505	1100	940	1100	170
Total nitrogen	g/m^3N	62	174	47.2	106	124	79	104	87
Ammonia nitrogen	g/m^3N	91	190	12.9	93	77	67	72	69
Nitrate+Nitrite	g/m^3N	28	1.3	<0.01	0.05	0.03	0.01	0.13	0.02
Total phosphorus	g/m^3P	78	200	6.8	17	15	18	15	9.0
Sodium	g/m^3	90	241	75.3	106	118	128	109	95.3
Potassium	g/m^3	89	347	22.3	97.2	106	92.0	114	19.0
Calcium	g/m^3	88	76	8.3	28	11	18	13	16
Magnesium	g/m^3	88	11	2.5	5.9	5.5	6.3	4.4	3.4
SAR		55	7.6	3.7	4.9	7.3	6.7	6.6	5.6
KAR		55	6.0	1.1	3.3	3.9	2.8	4.1	0.7

A summary of past results is included for comparison. The relocation of the sampling point, from the wastewater pond surface to the irrigation line, is likely to have reduced variation in test result values.

In general, the strength of the irrigated wastewater, in terms of mineral and nitrogen content (conductivity and total nitrogen), was similar to that of the previous several killing seasons. The organic strength, represented by chemical oxygen demand (COD), showed some variation, which may be related to the amount of blood present at the time of sampling.

Nitrogen loading

Nitrogen loading on the irrigation areas is expressed as kilograms of nitrogen per hectare per year (kgN/ha/y). On the basis of the reported irrigation volumes and wastewater total nitrogen concentrations, as provided by the Company, the average nitrogen loading over the entire 110.8 ha (enlarged) area irrigated for the 2016-2017 review period was 202 kg/ha/y (Sectors 1-7 were not irrigated and are excluded from this figure), being 217 kg/ha/y on Longview Farm and 119 kg/ha/y adjacent to the plant. (A total of 21,035 kg of nitrogen was applied to the entire area, including the extension, at an average concentration of 90 g/m^3). The highest loading for a single sector was 340 kg/ha/y, on Longview Farm.

In comparison, for the 2015-2016 review period, a total of 23,773 kg of nitrogen was applied to the entire area, at an average concentration of 101 g/m^3. The average nitrogen loading was 215 kg/ha/y, being 250 kg/ha/y on Longview Farm and 53 kg/ha/y adjacent to the plant. The highest loading for a single sector was 382 kg/ha/y, on Longview Farm.

2.1.3.2 Groundwater monitoring

The locations of the six groundwater monitoring points (MPs) are depicted in Figure 1 and Figure 2 and described in Table 4. The four points near the plant are positioned approximately in a straight line running upslope (southward) from the Waitotara River towards the wetland which used to receive overflow from the wastewater holding ponds (pre 1999). The fifth and sixth points are downslope of the Longview Farm irrigation area.

MP1 is the spring from which water is drawn for stock and yard washing. The spring is located approximately 120 metres from the Stage I irrigation area at the nearest point. The other five monitoring points are piezometer bores which are located at the periphery of irrigation areas. MP2 is underneath (section 5 of) Stage II irrigation area. MP3 is about 35 metres downslope of the old wastewater overflow trench and of the new Stage IV area. MP4 is in the lower part of the Stage IV area, about 200 metres downslope of the Stage III area and about 35 metres upslope of the wastewater overflow trench. The wastewater overflow trench runs between MP3 and MP4 to the wetland.

MP5 is beside Wai-inu Beach Road. It lies between Longview Farm irrigation area and the old quarry where the water supply bore for Wai-inu Beach is situated. MP6 is near the boundary of Longview Farm closest to the sea and to the coastal spring Te Kiri o Rauru.

Table 4 Groundwater monitoring sites

Name	Site Code	Location	Grid reference, NZTM	
MP1	GND1124	Spring N (downslope) of Stage 1 irrigation area, adjacent to Waitotara River	1747905	55892552
MP2	GND000097	Piezometer, N (downslope) corner of Stage 2 irrigation area	1748176	5588876
MP3	GND000098	Piezometer, S (upslope) corner of Stage 2 irrigation area	1748231	5588618
MP4	GND000099	Piezometer, NE (downslope) of Stage 3/4 irrigation area, adjacent to wetland	1748351	5588498
MP5	GND0686	Piezometer, W (downslope) of Longview irrigation area	1749098	5586785
MP6	GND2510	Piezometer, SE (downslope) of Longview irrigation area	1750792	5586905

The summary of chemical analysis results for the quarterly samples taken from the six groundwater monitoring points is given in Table 5. Range and median (in brackets) values are given.

Table 5 Water quality results for monitoring bores October 2016 to September 2017

Parameter	Unit	MP1 Spring by river	MP2 Below Stage 2	MP3 Above Stage 2	MP4 Below Stages 3 & 4	MP5 Longview West	MP6 Longview East
Water level	m	-	2.44 – 3.23 (2.87)	2.43 – 3.27 (2.82)	5.10 – 5.97 (5.52)	4.27 – 5.78 (4.74)	5.67 – 6.57 (6.01)
Temperature	°C	13.7 – 17.0 (15.0)	15.0 – 16.5 (15.3)	14.9 – 16.3 (15.2)	14.8 – 15.5 (15.4)	14.5 – 15.9 (15.0)	14.3 – 15.0 (14.8)
Conductivity, 20°C	mS/m	48.2 – 49.4 (48.8)	56.1 – 61.8 (60.4)	48.7 – 55.1 (52.6)	43.2 – 55.4 (49.5)	51.2 – 51.9 (51.8)	87.3 – 90.7 (88.8)
pH	pH	7.3 – 7.5 (7.4)	7.4 – 7.6 (7.4)	7.5 – 7.7 (7.5)	7.5 – 7.9 (7.6)	7.6 – 7.8 (7.6)	7.2 – 7.4 (7.2)
COD	g/m^3	8 – 14 (10)	10 – 12 (11)	10 – 14 (12)	<5 – 10 (10)	<5	<5
Ammonia, total	g/m^3 N	1.9 – 3.5 (2.9)	<0.003-0016 (0.010)	0.02 – 0.23 (0.05)	0.009-0.134 (0.018)	0.003-0.062 (0.004)	<0.003
Nitrate + nitrite	g/m^3 N	2.2 – 3.8 (3.2)	6.2 – 8.7 (8.4)	3.5 – 7.7 (5.2)	4.3 – 6.3 (4.5)	5.3 – 8.8 (8.2)	3.7 – 4.8 (4.4)
Chloride	g/m^3	41.6 – 42 (42)	22 – 32 (30)	34 – 45 (39)	24 – 41 (26)	33 – 40 (37)	112 – 129 (118)
Calcium	g/m^3	58 – 61 (59)	80 – 92 (88)	76 – 82 (80)	64 – 79 (72)	80 – 90 (84)	137 – 147 (142)
Magnesium	g/m^3	7.2 – 7.7 (7.2)	6.9 – 8.1 (7.4)	4.7 – 5.3 (4.8)	4.0 – 5.2 (4.4)	9.1 – 9.5 (9.3)	11.9 – 13.7 (13.0)
Potassium	g/m^3	19 – 22 (20)	35 – 40 (36)	16 – 19 (17)	8.3 – 16.4 (14.6)	1.7 – 1.8 (1.8)	3.1 – 3.3 (3.2)
Sodium	g/m^3	28 – 32 (30)	22 – 25 (24)	21 – 31 (23)	30 – 38 (37)	22 – 23 (22)	40 – 46 (42)

The parameters of most interest with regard to the operation of the wastewater disposal system and the monitoring of its effects on the surrounding environment are the nitrogen species (nitrate and ammonia), the organic strength (COD), and the mineral strength (conductivity). Figures 5, 6 and 7 show how the levels of conductivity, ammonia and nitrate, respectively, have varied through time for groundwater at the six monitoring points.

The spring water at MP1 is likely to be subject to the effects of activities at the surface, such as local farming, and particularly the irrigation of wastewater by SFF Waitotara. Since monitoring began in 1992, conductivity has risen and fallen twice over a range of up to two-fold, with peaks in the winters of 2001 and 2007. In 2016-2017, the nitrate concentration did not show seasonal variation, with low levels of between 2.2 and 3.8 g/m^3N (Figure 8).

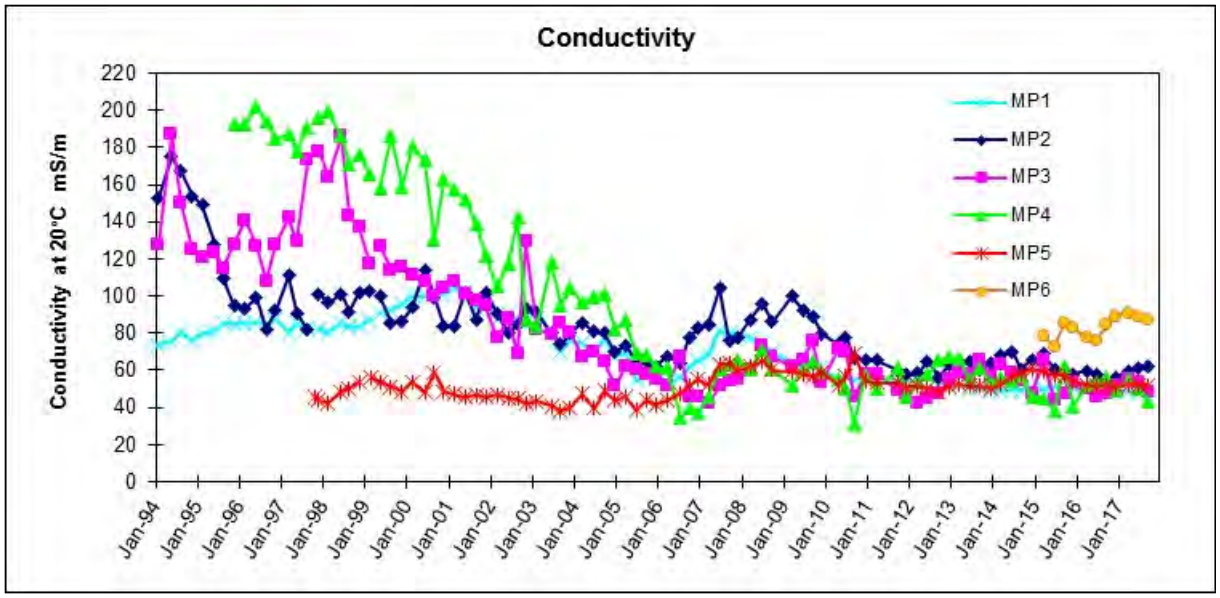

Figure 5 Conductivity at groundwater monitoring points, 1994-2017

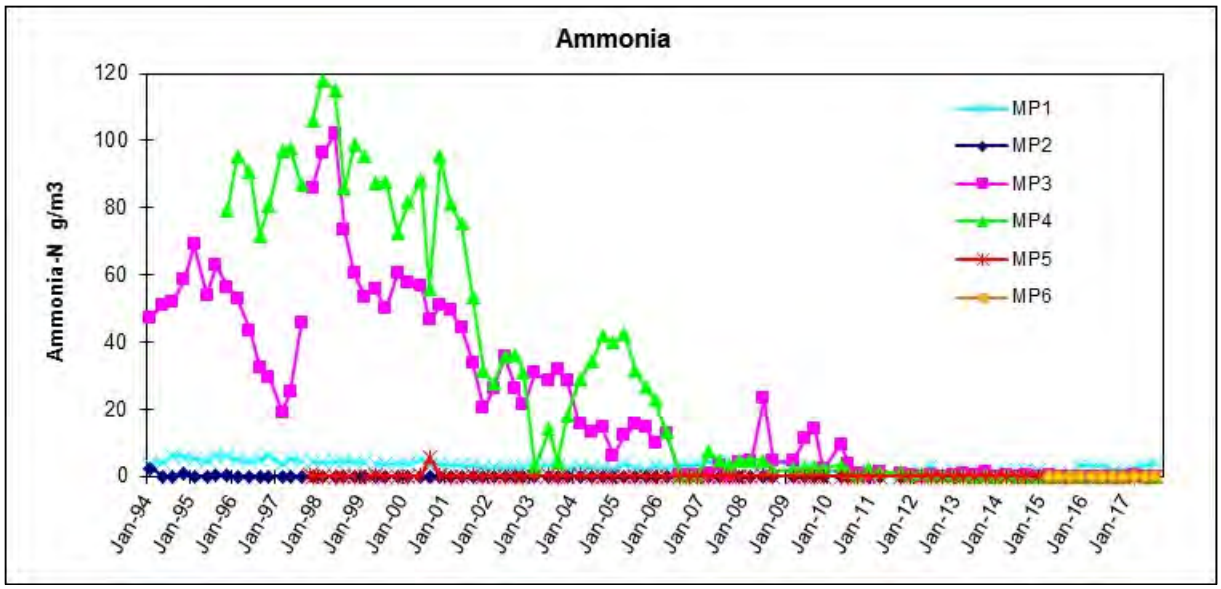

Figure 6 Ammonia at groundwater monitoring points, 1994-2017

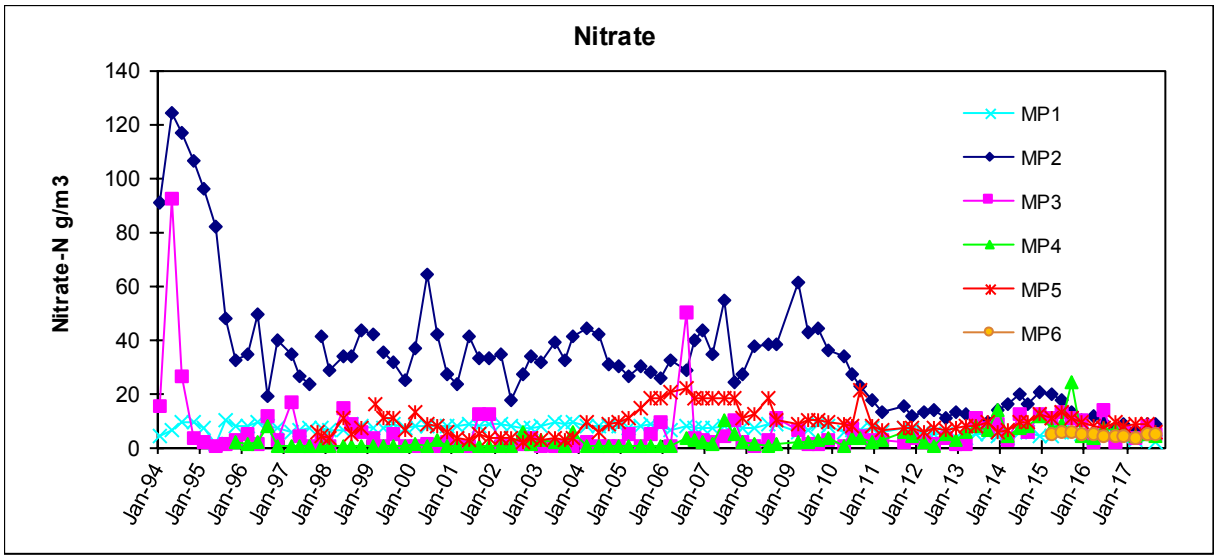

Figure 7 Nitrate at groundwater monitoring points, 1994-2017. The black line represents the drinking water standard for nitrate.

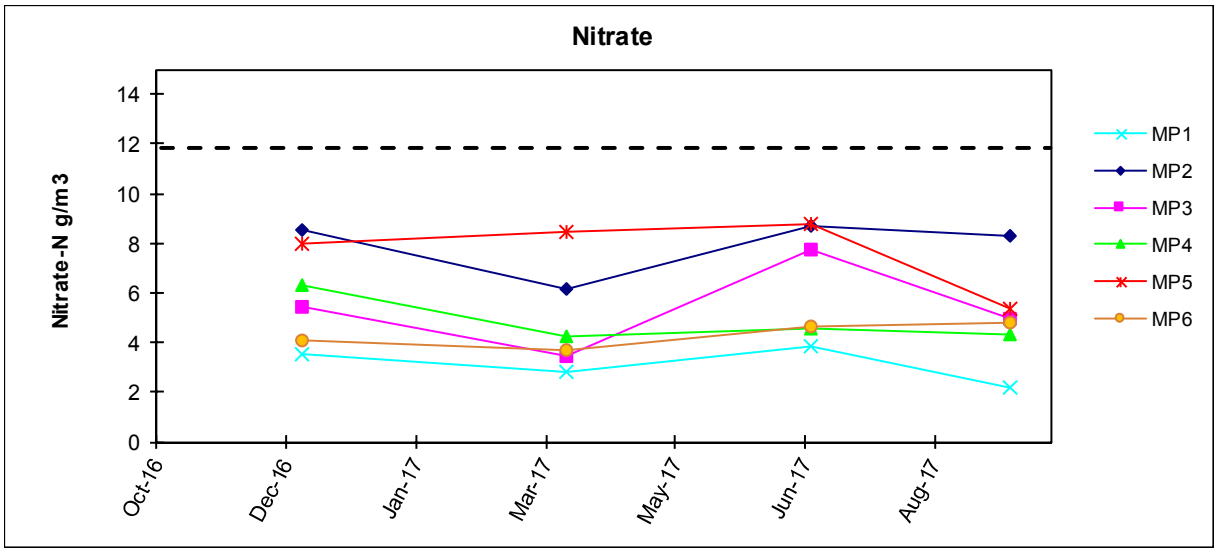

Figure 8 Nitrate at groundwater monitoring points in the 2016-2017 monitoring year. The black line represents the drinking water standard for nitrate.

The composition of groundwater at MP2 appears to respond relatively quickly to changes in wastewater loading on the Stage 2 irrigation area. This is consistent with rapid wastewater infiltration through approximately 2 metres of sandy soil to the underlying water table. The levels of ammonia present are very low, indicating almost complete nitrification in aerobic soil. The most significant impact on groundwater was observed in MP2 and MP3, where nitrate levels in 1994 were well in excess of the drinking water standard of 11.8 g/m^{3}N at 124 and 90 g/m^{3}N respectively. Levels then dropped to below the drinking water standard in MP3 and fluctuated between about 20 and 50 g/m^{3}N between 1995 and 2009 in MP2. In the 2010-2011 monitoring period nitrate concentration in MP2 fell in response to reduced irrigation volumes, and since has ranged between about 10 and 20 g/m^{3}N, lifting when volumes increased in 2014-2015 and falling when volumes decreased in 2015-2016. During the current monitoring period levels decreased even further, with all results below 10 g/m^{3}N (Figure 8).

At MP3, up-gradient of stage 2 area, the effects of wastewater disposal via the old soakage trench and wetland have been apparent. Both mineral (conductivity) and organic (COD) component concentrations

were elevated, but have fallen since peaking in the 1997-1998 year. The amount of ammonia present has continued to reduce significantly since 1998, which is attributed to no longer using the soakage trench and wetland for discharge. The reduction is also consistent with the movement of wastewater through saturated soil, such as would occur below a soakage trench or wetland. Nitrate concentrations have been relatively low, generally less than 4 g/m^{3}N, from the period immediately after installation of the piezometer, as the lack of oxygen in the saturated soil has prevented nitrification. Since 2005, there have been occasional spikes in the nitrate level of up to about 12 g/m^{3}N, with one value of 50 g/m^{3}N recorded in July 2006. After development of stage IV irrigation area in January 2013, nitrate concentration has lifted, with seasonal variation from 2 to 14 g/m^{3}N, peaking in winter. During the current monitoring year, a maximum value of 7.7 g/m^{3}N was recorded in June.

In the past, the effects of wastewater disposal have been recorded at MP4, the site closest to the wetland. The concentrations of several groundwater parameters (sodium, potassium, alkalinity and chloride) were similar to those in the wastewater itself, until after disposal of wastewater to the area ceased in 1999. Subsequently, nitrate concentrations were generally low, with occasional spikes, until winter 2006, since when levels have increased, to about 5 g/m^{3}N in 2012, and further to about 8 g/m^3 after the development of stage 4 irrigation area in January 2013, with spikes, of up to 24 g/m^{3}N in September 2015, coincident with increases in groundwater level. Levels during the current monitoring period were relatively low, varying between 4.3 to 6.3 g/m^{3}N.

Groundwater quality at MP5, downslope of the western side of Longview Farm irrigation area, was monitored for two years before irrigation commenced there in January 1999, and showed considerable variation in nitrate concentration (4 to 16 g/m^{3}N) during that period. Post-irrigation, nitrate concentration increased from 2 g/m^{3}N in 2002 to 22 g/m^{3}N in 2006 then fell again from 2008, remaining in the range 5 to 9 g/m^3 during the 2016-2017 monitoring period.

MP6 was established on 1 February 2015 in the new irrigation area on the south-eastern side of Longview Farm, where irrigation commenced in September 2012. Conductivity was higher than at the other groundwater monitoring sites, reflecting closer proximity to the sea. Nitrate concentration has remained moderately low and steady at between 4.0 to 6.0 g/m^{3}N.

Grass growth in the irrigation areas has been good, and is especially apparent when dry spells limit growth in adjoining non-irrigated areas. Monitoring in 2015-2016 showed grazing was well managed and it was noticeably greener than surrounds during dry periods.

2.1.3.3 Te Kiri o Rauru spring

When consent was sought from STDC in the 2011-2012 monitoring year to provide for extension to the irrigation area on Longview Farm, consultation with tangata whenua, Ngaa Rauru Kiitahi, raised a concern about potential effect of the irrigation on a sacred spring, Te Kiri o Rauru, that is situated at the coast approximately 1,350 metres from the nearest part of the wastewater application area.

In response, the Company undertook to monitor the quality of water from the spring. Three monthly sampling, for turbidity, total coliforms and total nitrogen analysis, was initiated at the site identified by Te Kaahui o Rauru representative Dallas McLeod (Site Code GND2531). The spring constitutes seeps at the base of an 8-10 metre-high shellrock face over a distance of about 100 metres at the shore.

To provide comprehensive background information, a sample of the spring taken by the Company on 24 September 2012 was analysed by the Council for a wide range of physicochemical parameters. Another sample, taken on 16 December 2012 about 30 metres west of the first sampling site, which had been covered by sand, was analysed by Council for microbiological quality. During the period under review the Company collected samples approximately three monthly, a summary of results is given in Table 6 below.

Table 6 Chemical composition of Te Kiri o Rauru spring

Parameter		Range 2016-2017	Range 2015-2016
Total nitrogen	g/m^3	<5 – 2 (0.2)	<5
Total coliforms	Cfu/100ml	<1 – 5 (3)	<1
Turbidity	NTU	0.05 – 0.6	0.05 – 0.4 (0.2)

Average of all samples is shown in brackets.

Sample results showed no indication that the spring had been influenced by the wastewater irrigation, with low total coliform and total nitrogen values in all samples. Water quality was similar to 2015-2016 and well within the national drinking water standard for nitrates of 11.3 mg/L (equivalent to g/m^3).

2.2 Air

2.2.1 Inspections

The sources of aerial emission from the plant are a boiler for hot water production, the stockyards, the wastewater ponds, the wastewater irrigation system, and miscellaneous plant processes. Routine inspections of the site were conducted on four occasions, as described in section 2.1.1: 16 December 2016 and 28 March, 30 June and 15 September 2017.

In general the site was found to be well managed with regard to odours. During the inspection on 16 December 2016 the wastewater pond was found to have a sludge cover across the entire surface and localised odours were noted. On 30 June 2017 noticeable waste water odours were noted at Longview where irrigation was occurring, however no odours were noted in the Wai-inu township.

2.3 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 Company. 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 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 2016-2017 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

2.4 Annual report by SFF Waitotara

SFF Waitotara produces an annual report on the monitoring programme associated with its resource consents.

The report for the period October 2016 to September 2017 was received on 22 December 2017.

In summary, the report states:

This report provides an overview of the environmental performance from activities undertaken as Silver Fern Farms Waitotara from 1 October 2016 to 30 September 2017.

Processing throughput was marginally less than the preceding season.

Meteorological conditions during this reporting period showed that wind patterns were dominated by north-westerly winds.

There were a number of false exceedances as a result of a data logger error, however water abstraction volumes and rates were within consented limits.

Wastewater discharge volumes were within consented limits.

Nitrogen loadings were within the internal operational target of 300 kg N/ha/yr.

Monitoring has indicated that:

- Wastewater concentrations were generally lower than the preceding season.
- There has been little variation in groundwater quality in monitoring sites MP1 – MP6 and the Te Kiri O Rauru spring compared to the preceding season.
- Stormwater analysis showed results were well within consented limits.

During this reporting period the Company received a number of odour complaints from residents at the Wai-inu Beach Settlement. While investigating the complaints it became apparent that there were a number of operational issues with the automatic shutdown system. Additionally, wastewater within the wastewater storage pond had turned anaerobic largely as a result of the fatty crust across the pond surface. Mitigation measures have been scheduled for the 2017-2018 season.

3 Discussion

3.1 Discussion of site performance

Inspections of the SFF Waitotara site during the 2016-2017 review period found that the site was generally well managed and staff well trained. The Company has a history of responding to and resolving any issues in a timely manner.

In September 2014, telemetry to the Council was installed on measurement of water abstraction rates for individual bores and the spring. This enabled compliance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, which applied to the Company from November 2014. The new abstraction telemetry system showed that there were breaches of the consent to abstract groundwater. The instantaneous abstraction rate limit appeared to be breached on several occasions during the current monitoring period, however the pumps are physically incapable of pumping at such rates and subsequent investigations found that the telemetry configuration in the data logger for bore GND0230 was logging the wrong output. This was corrected and no further exceedances were reported. The spring take also logged a number of occasions where the rate of take apparently exceeded the consented limit, however it is likely these events were related to pressure spikes at start-up as this pump was also physically incapable of pumping at more than the maximum rate.

With regard to the discharge of stormwater and wastewater, in general, the disposal systems were found to be operated and maintained in a satisfactory manner over the 2016-2017 period.

In September 2012, the Company commissioned a 20.7 ha extension of the area where travelling irrigators apply wastewater to land. A further extension, of the fixed sprinkler irrigation area by 6.0 ha, became operational in January 2013. Both areas were already covered by resource consent. This voluntary action, for which the Company was given an Environmental Award by Council in November 2014, increased the area irrigated for wastewater disposal by 36 % to 110.5 ha to provide for increased production at the meat processing plant and to lower Nitrogen loadings. Irrigation of the undeveloped areas will also increase pasture production. Average nitrogen loadings reduced from 349 kgN/ha/y in 2011-2012 to 223 kgN/ha/y in 2013-2014, a factor of 36 %, though there was also a 4 % reduction in kill. Nitrogen loadings increased to 248 kg/ha/y in 2014-2015, following a 5 % increase in kill, with more even spreading over the irrigation areas. In 2015-2016, nitrogen loadings remained constant, at 250 kg/ha/y, with a marginal increase in kill. During 2016-2017 these reduced to 202 kg/ha/y with a small decrease in kill.

Monitoring of Te Kiri o Rauru spring, situated over a kilometre downgradient of the irrigation extension, to satisfy concerns of tangata whenua continued in 2016-2017.

3.2 Environmental effects of exercise of consents

Effects on groundwater in the vicinity of this site were varied, but historically have shown an adverse impact in terms of nitrate. This has mostly been addressed through the extension of the irrigation disposal system, which reduced the nitrogen loadings. Groundwater nitrate levels in MP3 still occasionally exceed drinking water standards, with seasonal peaks observed in winter.

No adverse effects on the surrounding environment, including effects on groundwater from the abstraction of water and discharge of stormwater and wastewater at the SFF Waitotara site have been recorded during the 2016-2017 review period. This is consistent with the monitoring carried out in previous years, including sampling of the six groundwater monitoring points which confirmed that the volume of water being abstracted is within the limits of the resource consent.

In terms of environmental effects from the discharge of emissions to air, localised odours were noted during inspections and the Company received a number of complaints from residents at the Wai-inu Beach

Settlement. The Company identified a number of operational issues with the automatic shutdown system. Additionally, wastewater within the wastewater storage pond had turned anaerobic largely as a result of the fatty crust across the pond surface. Mitigation measures have been scheduled for the 2017-2018 season.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 7-10.

Table 7 Summary of performance for consent 2260-3.1

Purpose: ***To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Stockyards solid waste discharge rate not to exceed 28m^3/7 days, wastewater not to exceed 1700 m^3/day	Site inspections and data provided	Yes
2. Discharge to occur in agreed disposal areas	Site inspections and information provided	Yes
3. No offensive or objectionable odour beyond the boundary of the property	Site inspections and complaints register	No – the Company received a number of complaints
4. Discharge not to result in spray drift beyond the boundary of the property	Site inspections and complaints register	Yes
5. Preparation of Integrated Management Plan (IMP)	Plan received with consent application 26/12/2015	Yes
6. IMP to be reviewed annually by 31 December	Liaison with Company	Yes - update is underway
7. Designated officer to manage spray irrigation system according to IMP	Liaison with Company	Yes
8. Consent holder to undertake a monitoring programme to monitor risk to Wai-inu water supply	Received	Yes – under development
9. Adopt best practicable option to prevent or minimise adverse environmental effects	Site inspections and sampling	Yes
10. Sodium adsorption ratio not to exceed 15	Sampling	Yes
11. Discharge not to result in wastewater reaching surface water	Site inspections and sampling	Yes

Purpose: *To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
12. Contaminants not to be discharged within certain areas	Inspection	Yes
13. Discharge not to occur within 20 m of new roads	No new roads in area	N/A
14. Consent holder to keep records of rate and volume of discharge	Records provided	Yes
15. Council and STDC to be notified if an event occurs that may have adverse effect on Wai-inu drinking water supply	No events occurred	Yes
16. Review of consent	Not scheduled for consideration during year under review. Next optional review June 2022.	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

N/A = not applicable

Table 8 Summary of performance for consent 2261-3.1

Purpose: *To take ground water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on maximum abstraction rate	Metering by consent holder and review of records by Council	Yes – although datalogger error recorded false breaches
2. Labelling of bores	Site inspection by Council	Yes
3. Installation and operation of monitoring equipment	Site inspection and receipt of monitoring records.	Yes
4. Keeping of monitoring records	Receipt of records by Council	Yes
5. Certification of monitoring equipment	Receipt of certificate	Yes
6. Actions upon breakdown of monitoring equipment	Notification received	Yes

Purpose: *To take ground water from three groundwater bores in the vicinity of the Waitotara River for meat processing purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Installation of groundwater level monitoring device in dedicated bore before 31 August 2017	Inspection by Council. Extension granted until 31 October 2017	Yes
8. Installation of groundwater level monitoring devices in abstraction bores before 30 August 2017	Inspection by Council. Extension granted until 31 October 2017	Yes
9. Access to monitoring equipment	Site inspection	Yes
10. Adoption of best practicable option and efficient use	Site inspections and liaison with consent holder	Yes
11. Backflow protection	Records provided and site inspection	Yes
12. Provisions of triennial report on sustainability of aquifer	Due September 2020	N/A
13. Optional review provision re environmental effects	Not scheduled for consideration during year under review. Next optional review June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 9 Summary of performance for consent 4629-3.1

Purpose: *To discharge emissions into the air from various activities associated with meat processing operations*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Emissions to be generally of the nature and scale described in the application	Site inspections	Yes
2. Best practicable option to prevent or minimise adverse effects	Site inspections	Yes
3. Discharge not to give rise to offensive or objectionable odour at or beyond the site boundary	Site inspections, complaints register	No – complaints received by Company from public regarding odour
4. Discharge to be smoke free	Site inspections	Yes

Purpose: *To discharge emissions into the air from various activities associated with meat processing operations*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Review of consent conditions	Not scheduled for consideration during year under review. Next optional review June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**Good** **High**

Table 10 Summary of performance for consent 5027-2

Purpose: *To discharge stormwater, defrost water and evaporative cooling water from a meat processing plant site into an unnamed tributary of the Waitotara River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option	Site inspections and chemical sampling	Yes
2. Limits on catchment area of site	Site inspections	Yes
3. Containment of hazards	Site inspections	Yes
4. Limits on pH, oil and grease and suspended solids	Site inspections and chemical sampling	Yes
5. Discharge shall not give rise to effects on stream beyond mixing zone	Site inspections and chemical sampling	Yes
6. Provide and maintain a contingency plan	Council records and site inspections. Plan updated 19 December 2016	Yes
7. Provide and maintain a stormwater management plan	Council records and site inspections. Plan updated 19 December 2016	Yes
8. Notification on changes on site	No required during monitoring period	N/A
9. Review of consent conditions	Not scheduled for consideration during year under review. Next consideration June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 11 Summary of performance for consent 10256-1.0

Purpose: *To take and use water from a spring for non-potable plant purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on maximum abstraction rate	Metering by consent holder and review of records by Council	Yes – some results over but these were false readings
2. Installation and operation of monitoring equipment	Site inspection and receipt of monitoring records	Yes
3. Certification of monitoring equipment	Receipt of certificate	Yes
4. Actions upon breakdown of monitoring equipment	Notification received	Yes
5. Access to monitoring equipment	Site inspection	Yes
6. Keeping of monitoring records	Receipt of records by Council	Yes
7. Lapse of consent	Consent exercised	N/A
8. Optional review provision re environmental effects	Not scheduled for consideration during year under review. Next optional review June 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 12 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement required	Poor
2009-10	2260-2	1			
	2261-2	1			
	4629-2	1			
	5027-1	1			
2010-11	2260-2	1			
	2261-2	1			
	4629-2	1			
	5027-2	1			
2011-12	2260-2	1			
	2261-2	1			
	4629-2	1			
	5027-2	1			

Year	Consent no	High	Good	Improvement required	Poor
2012-14	2260-2	1			
	2261-2	1			
	4629-2	1			
	5027-2		1		
2014-15	2260-2		1		
	2261-2			1	
	4629-2	1			
	5027-2	1			
2015-16	2260-2		1		
	2261-2/3			1	
	4629-2	1			
	5027-2	1			
Totals		19	3	2	

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

3.4 Recommendations from the 2015-2016 Annual Report

In the 2015-2016 Annual Report, it was recommended:

1. THAT monitoring of air emissions from the meat processing operations of Silver Fern Farms Management Limited in the 2016-2017 year continues at the same level as in 2015-2016.
2. THAT monitoring of discharges of stormwater and wastewater from the meat processing operations of Silver Fern Farms Management Limited in the 2016-2017 year continues at the same level as in 2015-2016, with the addition of annual sampling of Te Kiri o Rauru Spring to detect and assess any effects from wastewater irrigation.
3. THAT monitoring of water abstraction for the meat processing operations of Silver Fern Farms Management Limited in the 2016-2017 year continues at the same level as in 2015-2016, with the addition of two-monthly inspections of water level and abstraction measuring and telemetry equipment.

These recommendations were implemented.

3.5 Alterations to monitoring programmes for 2017-2018

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting 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 exercising resource consents.

It is proposed that for 2017-2018 that the monitoring programme for Silver Fern Farms remains unchanged from that of 2016-2017.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site in question. The Council reserves the right to adjust this baseline programme should the need arise if potential or actual non-compliance is determined at any time during 2017-2018.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Silver Fern Farms Limited in the 2017-2018 year continue at the same level as in 2016-2017.
2. THAT should there be issues with environmental or administrative performance in 2017-2018, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the annually reviewed integrated land management plan considers how to further prevent increases to nitrate in groundwater.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
g/m^3	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
KAR	Potassium adsorption ratio. A measure of the suitability of water use in agricultural irrigation, as determined by the concentrations of solids dissolved in the water.
L/s	Litres per second.
mS/m	Millisiemens per metre.
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).
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 including all subsequent amendments.
SAR	Sodium adsorption ratio. A measure of the suitability of water use in agricultural irrigation, as determined by the concentrations of solids dissolved in the water.
SS	Suspended solids.

STDC	South Taranaki District Council
Temp	Temperature, measured in °C (degrees Celsius).
UI	Unauthorised Incident.

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

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Appendix I

Resource consents held by Silver Fern Farms Limited (Waitotara)

(For a copy of the signed resource consent
please contact the TRC Consents 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:	Silver Fern Farms Management Limited PO Box 941 Dunedin 9054
Decision Date:	13 September 2017
Commencement Date:	13 September 2017

Conditions of Consent

Consent Granted:	To discharge to land wastewater by spray irrigation, stockyard solid wastes and stabilised sludge by spreading, from meat processing operations in the vicinity of the Waitotara River, including associated discharges to air
Expiry Date:	1 June 2034
Review Date(s):	June 2022 and at 3-yearly intervals thereafter
Site Location:	Waiinui Beach Road, Waitotara
Grid Reference (NZTM)	1747946E-5588813N (Pond 1) 1747993E-5588722N (Pond 2) 1748071E-5588544N (Area 1) 1749151E-5586993N (Area 2)
Catchment:	Waitotara

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. The discharge of stockyards solid waste shall occur by spreading at a rate not exceeding 28 cubic metres over any 7-day period, and the discharge of wastewater shall occur by spray irrigation at a rate not exceeding 1700 cubic metres/day.

2. The discharges authorised by this consent shall only occur on the 'disposal areas' shown in Figure 1 attached.

3. The discharge shall not result in odour that is offensive or objectionable beyond the boundary of the disposal areas shown in Figure 1 attached.

4. The discharge shall not result in spray drift beyond the boundary of the disposal areas.

5. The consent holder shall manage the site in accordance with an 'Integrated Management Plan' (IMP) prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The IMP shall detail the management of the spray irrigation and solid waste management system at the site to achieve compliance with the conditions of this consent. An objective of the IMP shall be to keep the annual nitrogen loading from wastewater, stockyards solids and solid organic waste material discharged on the 'disposal areas' to 300 kg/ha or less. The IMP shall address the following matters, as a minimum:

    a) designated disposal areas;
    b) selection of appropriate irrigation and spreading 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 ponding, runoff and spray drift;
    h) minimisation and control of odour effects offsite;
    i) operational control and maintenance of the spray irrigation system;
    j) monitoring of the wastewater (physicochemical);
    k) monitoring of soils and herbage (physicochemical);
    l) monitoring of groundwater beneath the irrigated area (physicochemical);
    m) remediation measures;
    n) contingency events;
    o) reporting monitoring data;
    p) procedures for responding to complaints; and
    q) notification to the Council of non-compliance with the conditions of this consent.

6. The *IMP* described in special condition 5 of this consent shall be subject to review upon two months notice by either the consent holder or the Taranaki Regional Council. Further, the consent holder shall review the *IMP* annually and shall provide the reviewed plan to the Chief Executive, Taranaki Regional Council, by 31 December.

7. 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 *IMP* and shall be advised immediately of any revision or additions to the *IMP*.

8. The consent holder shall undertake a monitoring programme that identifies and monitors the risk to the Waiinu Water Supply provided by the bore located at approximate grid reference 1748791E-5586518 (NZTM) resulting from the exercise of this consent. The programme of monitoring shall be submitted to the Chief Executive, Taranaki Regional Council for certification before 31 December 2017 and shall include as a minimum, the drilling and monitoring of bores down gradient of the MP5 (GND0686) monitoring bore at locations and depths determined after consultation with the Chief Executive, Taranaki Regional Council.

9. 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 of the discharge on the environment.

10. The sodium adsorption ratio (SAR) of the wastewater shall not exceed 15.

11. The discharge shall not result in any wastewater reaching surface water, any subsurface drainage system or any adjacent property.

12. No contaminants shall be discharged within:

    (a) 25 metres of any surface water body; or
    (b) 25 metres of any fenced urupa (burial ground) without the written approval of the relevant Iwi; or
    (c) subject to condition 13 below, 20 metres from any public road;
    (d) 50 metres of any bore, well or spring used for water supply purposes; or
    (e) 150 metres of any dwelling that is not owned by the consent holder, or any marae, unless the written approval of the owner and occupier has been obtained to allow the discharge at a closer distance.

13. Where any new public road is established that shares a boundary with a disposal area, there shall be no discharge to land within 20 metres of the road surface until the shelter vegetation on that boundary is at least two metres high. Once the shelter vegetation exceeds two metres in height, the discharge may occur no less 10 metres from the road surface.

14. The consent holder shall keep records of the rate and volume of wastewater and stockyards solid waste discharged to an accuracy of ±5%, including, but not limited to the:

    (a) effluent type (e.g. liquid, slurry, solid);
    (b) source of any solid waste;
    (c) location and area (ha) of application of wastewater and/or solid waste; and
    (d) date each site location received the wastewater and/or solid waste application.

15. If, as a consequence of the activity authorised by this consent, an event occurs that may have a significant adverse effect on water quality at the registered drinking-water supply abstraction point for Waiinu Beach [Map Ref: 1748791E-5586518 (NZTM)] the consent holder shall, as soon as reasonably practicable, telephone the Taranaki Regional Council and South Taranaki District Council and notify them of the event.

16. 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 2022 and at 3-yearly intervals thereafter, 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) setting limits for any contaminant if the concentration of that contaminant in groundwater at a disposal area is increasing at a rate that could make it unsuitable for any existing potential use; and/or

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

Signed at Stratford on 13 September 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Advice Note (included at the request of DITAG)
The consent holder's attention is drawn to MPI's "New Zealand Code of Practice for the Design and Operation of Farm Dairies (NZCP1) which restricts:

- *The discharge of specified wastes to land used for grazing of milking animals; and*
- *The use of feed from land which has had specified wastes applied to it.*

Should you require further information, please contact a Dairy Industry Technical Advisory Group (DITAG) representative ***or*** *visit http://www.foodsafety.govt.nz/elibrary/industry/dairy-nzcp1-design-code-of-practice/amdt-2.pdf (specifically section 4.4 Disposal of effluent and other wastes and section 5.8 Purchased Stock Food) or contact an operation dairy processing company regarding conditions of supply.*

Figure 1: Approximate locations of 'Disposal Areas for the stockyards solid waste and wastwater spray irrigation

Water Permit

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

Name of Consent Holder:	Silver Fern Farms Management Limited PO Box 941 Dunedin 9054
Decision Date:	23 August 2016
Commencement Date:	23 August 2016

Conditions of Consent

Consent Granted:	To take groundwater from three bores in the vicinity of the Waitotara River for meat processing purposes
Expiry Date:	1 June 2040
Review Date(s):	June 2022 and every six years thereafter and in accordance with special condition 13
Site Location:	Waiinui Beach Road, Waitotara
Grid Reference (NZTM)	1747961E-5588986N 1748173E-5588850N 1748280E-5588815N
Catchment:	Waitotara

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. The total rate of taking shall not exceed 20 litres per second and the total volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 1,300 cubic metres.

2. All bores shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by the Taranaki Regional Council.

3. The consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking (or a nearby site in accordance with Regulation 10 of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010). 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 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 have a limited lifespan.

4. 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;
   b) specifically record the water taken as 'zero' when no water is taken; and
   c) for each 12-month period ending on 30 June, be provided to the Chief Executive, Taranaki Regional Council within one month after end of that period.

5. The consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that water measuring 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;
   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.

6. 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.

7. Before 31 August 2017 the consent holder shall ensure that a continuous record of groundwater level data is maintained by installing an automatic groundwater level recording device in to a dedicated monitoring bore. The device shall measure and record the water level at intervals not exceeding 15 minutes to an accuracy of ± 10 mm and be tamper-proof.

8. Before 30 August 2017 the consent holder shall, unless it is not practically achievable in a particular case, ensure that a continuous record of groundwater level data is maintained by installing an automatic groundwater level recording device into any operational groundwater abstracting bore. The device shall measure and record the water level at intervals not exceeding 15 minutes to an accuracy of ± 10 mm and be tamper-proof.

9. The water meters and data loggers shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval.

10. At all times the consent holder shall take all practicable steps to take and use water efficiently and generally prevent or minimise any adverse effects on the environment including as minimum, by ensuring that the minimum amount of water necessary for the purpose is taken.

11. The consent holder shall ensure that the bores and associated pipework are designed and configured in such a way that no water from any source can re-enter any bore.

12. Before 30 September 2020 and every three years thereafter an assessment of the sustainability of the aquifer shall be undertaken and be provided in the form of a report to the Chief Executive, Taranaki Regional Council. The report shall include as a minimum:

    i) A borefield description;
    ii) A description of the on site water use, water sources and discharges;
    iii) All groundwater level data, abstraction data and groundwater quality data collected to 30 June of that year (*Monitoring data is to be presented in tables and graphical format, raw data in appendix, summary data in text);*
    iv) A discussion on groundwater levels, observed trends and the aquifers response to abstraction;
    v) A discussion on groundwater quality and the results of any groundwater quality analysis;
    vi) An assessment of the impacts; including the capacity of the aquifer to sustain the demands on it.

    Note: This assessment may be undertaken by the Taranaki Regional Council or a suitably qualified and experienced groundwater professional on behalf of the consent holder.

13. 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 2022 and every six years thereafter; and/or
    b. within 3 months of the submittal of a report required under special condition 12 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 23 August 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
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:	Silver Fern Farms Management Limited PO Box 941 Dunedin 9054
Decision Date:	13 September 2017
Commencement Date:	13 September 2017

Conditions of Consent

Consent Granted:	To discharge emissions into the air from various activities associated with meat processing operations
Expiry Date:	1 June 2034
Review Date(s):	June 2022, June 2028
Site Location:	Waiinui Beach Road, Waitotara
Grid Reference (NZTM)	1748090E-5588905N (approximate centre of site)

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 to air from activities on the site (as shown in Appendix One) generally of the nature and scale described in the application for this consent.

2. The consent holder shall 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.

3. The discharges authorised by this consent shall not give rise to any odour at or beyond the site boundary (as shown in Appendix One) of the site that is offensive or objectionable.

4. Any discharge from the factory site shall be free of smoke.

5. 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 2022 and/or June 2028, for the purpose of ensuring that that conditions are adequate to deal with any adverse effects of the abstraction on the environment arising from the exercise of this consent, which were not foreseen at the time the application was considered and which it was not appropriate to deal with at that time.

Signed at Stratford on 13 September 2017

For and on behalf of
Taranaki Regional Council

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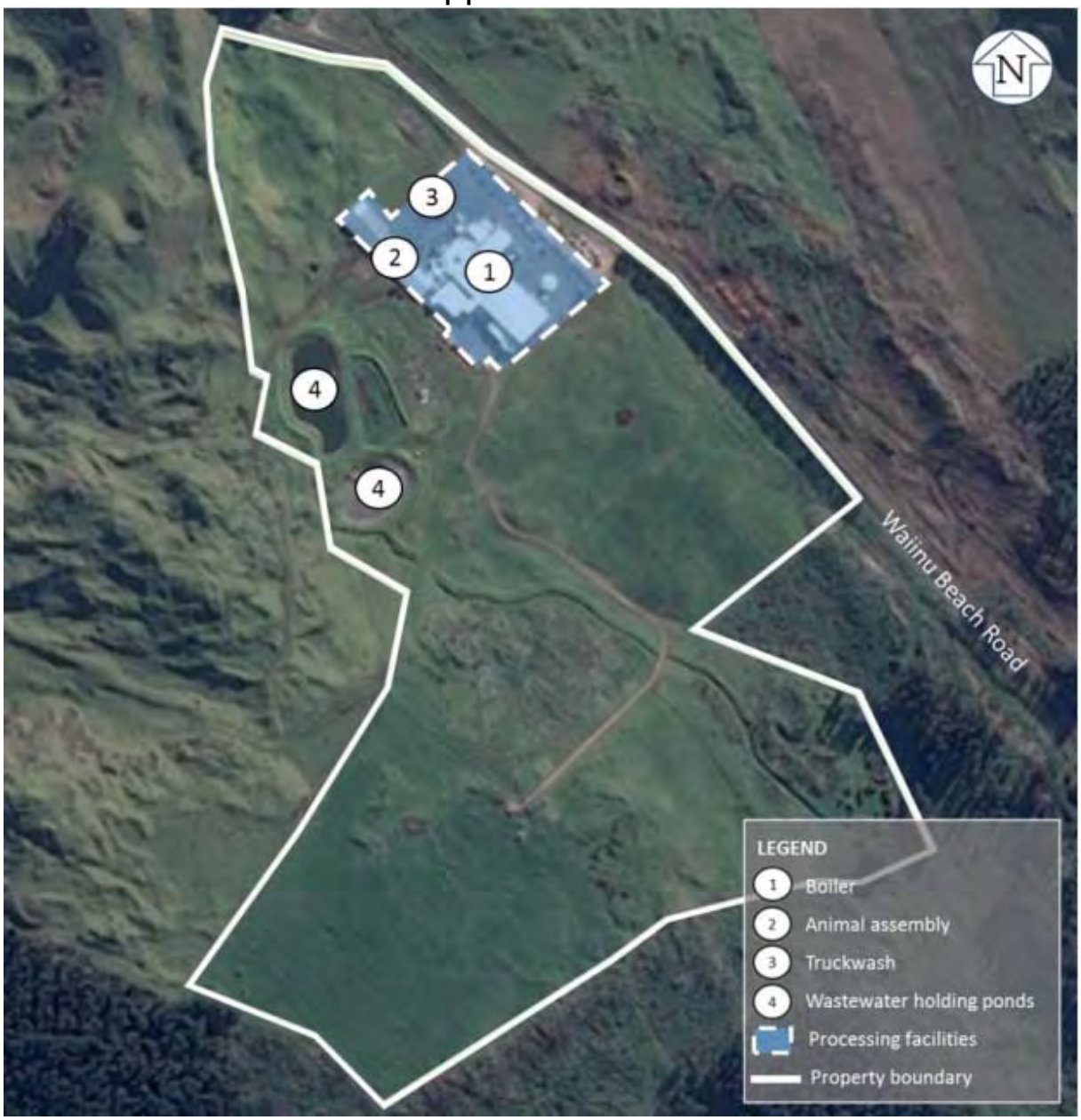
A D McLay
Director - Resource Management

Appendix One



Area of discharge bounded by the white line

Discharge Permit

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

Name of Consent Holder:	Silver Fern Farms Management Limited PO Box 941 Dunedin 9054
Decision Date:	8 November 2010
Commencement Date:	8 November 2010

Conditions of Consent

Consent Granted:	To discharge stormwater, defrost water and evaporative cooling water from a meat processing plant site into an unnamed tributary of the Waitotara River
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Waiinu Beach Road, Waitotara
Legal Description:	Lot 1 DP 63598 (Discharge source & site) Sec 81 Blk XIII XIV Wairoa SD (Discharge site)
Grid Reference (NZTM)	1748084E-5589290N
Catchment:	Waitotara

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. 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 discharge shall be from a catchment area on the site not exceeding 2.3 hectares.

3. Any significant volumes of hazardous substances (e.g. diesel fuel, hydrochloric acid and sulphuric acid) on site shall be:

   a) contained in a double skinned tank, or
   b) stored in a dedicated bunded area with drainage to sumps, or to other appropriate recovery systems, and not directly to the site stormwater system.

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

Constituent	Standard
pH	Within the range 6.0 to 9.0
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.

5. After allowing for reasonable mixing, within a mixing zone extending 30 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.

6. The consent holder shall maintain a contingency plan. The contingency plan shall be adhered to in the event of a spill or emergency and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council, detail measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge.

7. The consent holder shall maintain a stormwater management plan. This plan shall be adhered to at all times and shall, to the satisfaction of the Chief Executive, Taranaki Regional Council document how the site is to be managed in order to minimise the contaminants that become entrained in the stormwater. The plan 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.

8. 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. 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 worknotification@trc.govt.nz.

9. 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 2016 and/or June 2022; and/or
   b) within 3 months of receiving a notification under special condition 8 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.

Transferred at Stratford on 18 November 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	Silver Fern Farms Management Limited PO Box 941 Dunedin 9054
Decision Date:	14 December 2016
Commencement Date:	14 December 2016

Conditions of Consent

Consent Granted:	To take and use water from a spring for non-potable plant purposes
Expiry Date:	1 June 2040
Review Date(s):	June 2022 and at 3-yearly intervals thereafter
Site Location:	Waiinui Beach Road, Waitotara
Grid Reference (NZTM)	1747918E-5589220N
Catchment:	Waitotara

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. The rate of taking shall not exceed 4.4 litres per second, and the volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 350 cubic metres.

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010*. 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 and a maintenance report provided to the Chief Executive, Taranaki Regional Council within 30 days of the work occurring.

5. Any water meter or datalogger shall be accessible to Taranaki Regional Council officers at all reasonable times for inspection and/or data retrieval. In addition the data logger shall be designed and installed so that Taranaki Regional Council officers can readily verify that it is accurately recording the required information.

6. The records of water taken:

   (a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;

   (b) specifically record the water taken as 'zero' when no water is taken; and

   (c) be transmitted directly to the Taranaki Regional Council's computer system, in a format suitable for providing a 'real time' record over the internet.

7. This consent shall lapse on 31 December 2021, 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.

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 2022 and at 3 yearly intervals thereafter for the purposes 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 14 December 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management