

**BEFORE WAIKATO REGIONAL COUNCIL  
HEARINGS PANEL**

**UNDER** the Resource Management Act 1991 (**RMA**)

**IN THE MATTER OF** Proposed Plan Change 1 to the Waikato Regional Plan  
and Variation 1 to that Proposed Plan Change: Waikato  
and Waipā River Catchments

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**Benjamin James Wilson**

**PRIMARY EVIDENCE ON BEHALF OF THE AUCKLAND/WAIKATO &  
EASTERN REGION FISH AND GAME COUNCILS (“FISH & GAME”)**

**SUBMITTER ID: 74985**

**Hearing Block 2**

Dated: 3 May 2019

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**Counsel instructed**

Sarah Ongley  
Barrister  
PO Box 8213  
New Plymouth  
Telephone: 06 769 9400  
Email: sarah@ongley.co.nz

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**1. QUALIFICATIONS AND EXPERIENCE**

- 1.1 My full name is Benjamin James Wilson.
- 1.2 I am employed as Chief Executive for the Auckland/Waikato Fish and Game Council at the Hamilton Office. I have held this role since 2013, prior to which I was the Fisheries Manager for the Council (since 1988).
- 1.3 I have a BSc (Hons) and a MSc in Marine Science from Otago University.
- 1.4 I am very familiar with the Waikato and Waipā River catchments. In my previous role as Fisheries Manager I carried out many surveys of the freshwater fisheries in the Auckland/Waikato Fish and Game Region ("Auckland/Waikato Region") over 25 years. As a recreational angler, I

have spent much of my leisure time over the last 30 years fly fishing in the Auckland/Waikato Region, including most of the fishable trout water in the Waikato and Waipā catchments. I have taken part in some 100+ consultative processes for point source discharges in the Auckland/Waikato Region both as an advocate for Fish & Game and, for some processes, providing technical advice on sports fisheries.

- 1.5 The purpose of this evidence is to set out the broad reasons the Auckland/Waikato and Eastern Fish and Game Councils are involved as a submitter on PC1, including conveying the views of individual Councillors.
- 1.6 I do not present the evidence as an expert witness, but as Chief Executive for Auckland/Waikato Fish and Game. This evidence follows the Block 1 evidence of Auckland/Waikato Fish and Game's Fisheries Manager, Dr Adam Daniel, which set out the nature of Fish and Game Regions across NZ, their funding, Fish and Game Management Plans and relevant statutory provisions, as well as the significance of the Waikato and Waipā sports fisheries for recreation (for the Waikato Region and beyond).

## **2 SUMMARY STATEMENT**

- 2.1 In their lifetimes, Fish and Game Councillors have seen dramatic and profound changes to the waterbodies in the Waipā and Waikato river catchments, resulting in a significant decline in the Auckland/Waikato Region's sports fish and gamebird resource.
- 2.2 Pristine headwater rivers have been degraded by the land conversions that occurred in the hill country from the late 1970s onwards, with a consequential decline in the Region's trout fisheries.
- 2.3 Lakes in the lower Waikato that were once valuable community assets, where local residents held picnics, swam, kayaked, sailed, hunted gamebirds and fished, are now severely degraded. Any form of contact recreation in these waters is currently strongly discouraged by the Waikato District Health Board due to high levels of cyanobacteria.

Currently five of the nine monitored lakes in the lower Waikato are covered by health warnings due to high cyanobacteria levels.

- 2.4 There are still considerable areas of native vegetation on steep hillsides being poisoned and clear felled in the Waipā headwaters with the objective of land conversion. Despite the efforts of many farmers, stream care and catchment groups, the extent and effects of ongoing vegetation removal undermines, and probably significantly outweighs, current restoration efforts including riparian planting and hillside revegetation.
- 2.5 A large amount of Auckland/Waikato Fish and Game's resources is spent on advocacy work relating to consent applications for point source discharges within the Waikato catchment.
- 2.6 The same issues and arguments arise in many of these applications including the relatively minor role that any individual discharge plays in the context of existing degradation of the receiving waterbody. Nevertheless in total, point source discharges are a significant contributor to the mass flow of nitrogen and phosphorus to the Waikato River.
- 2.7 The lack of clear guidelines and an overarching framework for the management of water quality in the Waikato catchment has meant that often consent applications have required long periods of consultation at considerable cost to both applicants and potential objectors. Experience with the processing of such applications under the Operative Waikato Regional Plan shows that the current lack of guidance makes for highly *inefficient* consent processing.
- 2.8 The 'offset' or 'compensation' measures that have been suggested in consultative processes in the Waikato catchment for point source discharges are generally for riparian plantings, wetland restoration or funding of environmental trusts. I provide an example in my evidence. It is difficult to quantify the nutrient reductions from proposed and implemented offset/compensation measures. These measures are promoted by applicants as practical and cost-effective 'alternatives' to avoid, mitigate and remedy. Although for some cases Fish & Game has entered into discussions with applicants on offset/mitigation, there has

been a lack of guidance around this matter and a lack of robust measurement of positive effects to ensure that they achieve a 'net gain'. Although Fish and Game is open to the use of offsets and compensation on a case by case basis, lack of principled guidance around offsets means that they have the real potential to imperil the achievement of PC1's Objectives.

- 2.9 There is a need for urgency. The completion date for PC 1 should not be pushed back, especially the proposed water quality targets in the lower Waikato lakes and wetlands. There will be increasing demand for recreational usage of these waters, due to population increase and the urbanisation of nearby land. Fish and Game Councillors do not want to see a generation miss out on the hunting and fishing opportunities that the Waikato lakes and rivers should be providing.

### 3 FISH AND GAME COUNCILLORS' RECOLLECTIONS

- 3.1 As was also outlined in Dr Adam Daniel's evidence for Block 1, Fish and Game has a function under the Conservation Act (1987) to "*...manage, maintain, and enhance the sports fish and game resource in the recreational interest of anglers and hunters, and in particular, –*"
- *"to assess and monitor the success rate and degree of satisfaction of users of the resource and the condition and trend of ecosystems as habitat for sports fish and game; and"*
  - *"to represent the interests and aspirations of anglers and hunters in the statutory planning process; and"*
  - *"to advocate the interests of the Council; including its interest in habitat"<sup>1</sup>*
- 3.2 The Auckland/Waikato Fish and Game Council is comprised of 12 Councillors:
- Grant Annan (Te Awamutu).
  - David Cocks (Auckland).
  - William Howard (Tuakau).
  - Andrew Kerr (Waerenga).
  - Nigel Juby (Ohaupo).

<sup>1</sup> Conservation Act 1987, s 26Q(1).

- Peter Shaw (Ohaupo).
- Colin Sherrard (Glen Murray).
- Shane Smith (Cambridge).
- Euan Williamson (Auckland).
- Murray Young (Helensville).
- George Avery (Te Aroha).
- Ben Moore (Matamata).

3.3 Fish and Game has been actively involved in RMA processes within the Waikato catchment since its establishment in 1990, primarily in relation to point source discharges but also takes and statutory plans. This has involved a considerable commitment for an organisation that receives no direct government funding, and whose Councillors receive no remuneration. Their continuing involvement reflects the concerns held by Fish and Game Councillors regarding the impacts of declining water quality and loss of habitat on the sports fish, and game bird resource, in the Waikato Region.

3.4 Fish and Game Councillors have seen dramatic declines in the water quality of Waikato lakes and rivers in their lifetimes. The hunting, fishing and water-related recreational pursuits that they enjoyed in their youth have either been destroyed or are just a shadow of what they formerly enjoyed. Councillors are concerned that the rate of degradation has not diminished. Their recollections are set out in the following paragraphs.

3.5 Mr John Atkinson was a Councillor on the Auckland/Waikato Fish and Game Council for 24 years from 1997 to 2012. He first started fishing the Waipā River in the early 1960's and remembers the upper reaches of the river as being the "*best trout fishery in the King Country*" with very clear, pristine water and a good population of trout up to 14lb. At that time the steep hill country bordering the upper river was still covered in native forest.

3.6 In 1978, the Muldoon national government introduced the *Land Development Encouragement Loan Scheme* for the purpose of assisting the development of low producing hill country. Loans for 15 years covered the initial cost of developing the land into permanent sown pastures, including the cost of vegetation clearance, re-sowing pastures, fertiliser,

and fencing materials. Provided the improvements were maintained, the accumulated interest was written off and only half the principal sum was repayable (Sheppard, 1993). The same year, a Supplementary Minimum Price scheme was also brought in, which guaranteed prices to farmers for several years ahead.

- 3.7 During this era of subsidised land clearance, Mr Atkinson saw large areas of hill country in the Waipā headwaters cleared of vegetation and converted to pastoral farming. He believes that as a consequence of this land conversion in the steep hill country, the Waipā headwaters became more prone to flooding, water clarity declined and the frequency of large landslides increased including the devastating Tunawae Slip in 1991. The impact on the trout fishery was profound with both average fish size and numbers declining considerably, especially for the brown trout population. Mr Atkinson considers that trout fishing in the Waipā River has never recovered.
- 3.8 Data held by Fish and Game supports Mr Atkinson's concerns with the average size (weight, kg) of brown trout caught by anglers in the Waikato-Waipā trout fishery declining by about 50% since 1981.<sup>2</sup>
- 3.9 Mr Atkinson has also expressed his frustration observing one landowner's positive efforts planting native trees and shrubs along one side of a stream bank, while observing large areas of recently sprayed/poisoned native regenerating vegetation on the opposite bank (Figure 1).
- 3.10 There are still considerable areas of native vegetation being poisoned and clear felled in the Waipā headwaters (Figure 2) despite the efforts of many farmers, stream care and catchment groups. The extent and effects of vegetation removal still being undertaken would significantly outweigh the extent of revegetation and mitigations implemented as a result of efforts put towards restoration.

<sup>2</sup> Competition data held by Auckland/Waikato Fish and Game.



Figure 1: Upper Waipā, February 2007. On the true right bank the landowner, John Cowan, has planted out the lower slopes in native vegetation, while the Waikato Regional Council has carried out extensive plantings of willows and poplars for erosion control. On the slopes above the true right bank an extensive area of regenerating vegetation, mainly manuka, has been sprayed by the adjoining landowner.



Figure 2: Headwaters of the Kaniwhaniwha Stream, a significant trout fishery and tributary of the Waipā River. Photograph taken in February 2019, showing regenerating indigenous forest that has been recently sprayed. Downstream in the catchment, Fish and Game has funded wetland restoration; however, the potential impacts in terms of vegetation loss and resulting sediment discharge to the Kaniwhaniwha as a result of this change from indigenous vegetation would outweigh the non-regulatory efforts in this catchment.

3.11 Auckland/Waikato Fish and Game Councillor, Mr Colin Sherrard, used to hunt, swim, water ski, kayak, and sail in Lake Waikare as a child during the 1950's including participating in the annual Ohinewai School swimming sports day. The local church group had picnics at the lake and during the summer many families, including his own, used to swim at Spencers Bay where there was a sandy beach. He remembers as a child seeing large areas of water literally boiling with mullet. The mullet have long gone and the waterfowl numbers rapidly declined due to the huge loss of wetland habitat surrounding the lake along with the collapse of the lake's weed beds. Mr Sherrard was an active gamebird hunter on Lake Waikare until early into the new millennium but considers that the algal blooms currently affecting the lake have made it unsafe for gun-dogs, swimming and indeed any form of water contact activity (Figures 3, 4 & 5).



Figure 3: Lake Waikare May 2016. Note the extensive algal blooms present in the image captured during the 2016 gamebird hunting season.



Figure 4. Lake Waikare, April 2014. A red bloom caused by *Monoraphidium* algae.

3.12 The Chairman of the New Zealand Fish and Game Council and also of the Eastern Fish & Game Council, Mr Lindsay Lyons' association with Lake Ngaroto (near Te Awamutu) goes back to the late 1960's when power boats were permitted to operate on the lake (Figure 5). He used to water ski from the shore where the yacht club is currently situated. The lake water was typically brown tinged in colour, but still clear and similar to most peat lakes in the region at that time. He started hunting at Lake Ngaroto in 1975 and hunted there every year until 2014. Over the years he witnessed the water quality deteriorate to such an extent that potential health issues (ingestion, cuts, abrasions) became a major concern. That coupled with the very real concern that the ongoing algae blooms had the potential of poisoning his hunting dog contributed to his decision to hunt elsewhere. During the summer, Mr Lyons would often visit Lake Ngaroto to work on his maimai. In later years, he would often find emaciated, dying and dead ducks in the raupo. He considers that duck numbers decreased in proportion to the declining water quality, as have the bitterns that he used to regularly see while paddling around the lake margin. Recognising the issue of the increasing deteriorating water quality, (in a non-scientific attempt) he planted trees along the margins of a drain on the South Western corners of the lake hoping in some small way the trees may reduce some of the nutrients that were running into the lake from the adjacent farm land.



Figure 5: Lake Ngaroto April 2012.

3.13 The views of Councillors Lyons and Sherrard are not alarmist but are supported by current monitoring data for the lower Waikato lakes. Currently five of the nine monitored lakes in the lower Waikato, including Lake Waikare and Lake Ngaroto, are covered by health warnings due to high cyanobacteria levels. The Waikato DHB's medical officer of health Dr Richard Vipond has recommended that the lakes should not be used for any activity that involves skin contact with the affected water and that *"If people still choose to use the lakes when warnings are in place, or any other lake where there are visible changes to water colour, they should shower and change their clothing as soon as possible afterwards, even if*

*no symptoms are noticeable*" (Waikato District Health Board, Health Alert, April 18<sup>th</sup> 2019).

- 3.14 Councillor Grant Annan has fished the Waikato hydro-lakes for the past 35 years and has been the organiser of an annual fishing contest on Lake Arapuni for the past 25 years. Over this period, he has observed a considerable decline in water quality in Lake Arapuni with increasing algal blooms that last over much of the summer. Silting is becoming a problem in the backwaters, smothering the aquatic plant life. Catch rates have dropped dramatically, from one fish every 20 minutes in the first competitions to a fish every 5 to 6+ hours in recent years. Many anglers that enter the contest comment on the small size of fish and anglers who have fished the Lake for many years often complain on how much the water has degraded. The collapse in the rainbow trout population has mirrored the degradation of the water quality. Not surprisingly, the numbers of anglers entering the contest has declined in recent years.
- 3.15 Mr Annan's concerns regarding the Lake Arapuni trout fishery has been confirmed by monitoring carried out by Fish and Game as detailed in the evidence of Dr Adam Daniel for Hearing Block 1.<sup>3</sup>
- 3.16 Councillors consider that there is a need for urgency. The completion date for Plan Change 1 should not be pushed back, especially the proposed water quality targets in the lower Waikato lakes and wetlands. There will be increasing demand for recreational usage of these waters, due to population increase and the urbanisation of nearby land. Councillors do not want to see a generation miss out on the hunting and fishing opportunities that the Waikato lakes and river should be providing. In this respect Fish and Game supports the Director-General of Conservation's request to prioritise the Lake catchments and require reductions in those catchments.

<sup>3</sup> Daniel primary evidence Block 1 at [4.5.13].

#### 4 POINT SOURCE DISCHARGES

- 4.1 Over the last 29 years, much of Auckland/Waikato Fish and Game's efforts and resources have been spent on contributing to the consultative processes that have been established to process consents for point source discharges (and takes) within the Waikato catchment. Fish and Game has been an active participant in many such consultative process in the Waikato catchment including for the consents required by the Kinleith Pulp & Paper Mill, Huntly Power Station, urban waste water treatment plants, urban stormwater, Waikeria Prison, Fonterra dairy factories, and the AFFCO meat processor plant at Horotiu.
- 4.2 Auckland/Waikato Fish and Game is currently involved in consultative processes for consent applications for point source discharges from the Lumbercorp Ltd timber mill at Ohinewai, Cambridge Waste Water Treatment Plant upgrade, Fonterra Te Rapa dairy factory, Fonterra Hautapu dairy factory, Waitomo Waste Water Treatment Plant upgrade, proposed Meremere cleanfill site, and the Te Kauwhata Waste Water Treatment Plant discharge to Lake Waikare.
- 4.3 In Fish & Game's experience, the same arguments are put forward by virtually all applicants for point source discharges in the Waikato:
- That the individual point source discharge is a minor contributor to the overall nutrient load in the receiving waterbody and that any change in the nutrient load of the discharge will not result in meaningful differences in downstream water quality.
  - That intensive farming land use has resulted in the water quality upstream of their discharge being in poor condition and the existing environment is already degraded.
  - That chlorophyll *a* concentrations in the Lower Waikato River are limited by total phosphorus.
  - That the contribution of the discharge is relatively minor compared to other existing sources and will have negligible direct environmental effects (in the context of the already degraded system).

- 4.4 Without strong planning direction for the Region as to what is expected from individual point source discharges, Fish and Game finds it difficult and time consuming to counter these arguments.
- 4.5 Although the above-listed statements may be factually correct depending on the circumstance of each individual case, point source discharges are a significant contributor to the total nutrient load in the lower Waikato River. Vant (2014) calculated the mass load of nitrogen and phosphorus for the 2003-2012 period to be about 11,200 t/yr and 950 t/yr respectively for the combined Waikato and Waipā Rivers. Point sources contributed about 7% and 18% of the nitrogen and phosphorus respectively. Diffuse agricultural sources in the rivers' catchments contributed 61% and 45% of the combined mass flow of nitrogen and phosphorus (with natural sources contributing the remaining sources). Therefore point sources in total are a significant contributor of nutrients, and especially phosphorus, to the lower Waikato River. Just as we don't consider the contribution of every individual farm when assessing the total nutrient load from diffuse runoff, nor should we look at any single point source discharge in isolation.
- 4.6 While I agree with the comments in the Section 42A Report<sup>4</sup> that point source discharges have historically been dealt with through comprehensive consent processes,<sup>5</sup> in many cases the process has been drawn out, to the cost of both the applicant and potential objectors, due to the lack of an overarching framework for the management of water quality in the Waikato catchment. Indeed some applications have been put on-hold for years, allowing adverse effects to continue.<sup>6</sup> There has been little guidance from the Waikato Regional Council when assessing the impact of point source discharges, especially on what reductions applicants should be striving for over the period of the consent, and on the water quality objectives of the receiving water body. The lack of clear

<sup>4</sup> C6 4.4.

<sup>5</sup> Section 42A Report at[1010].

<sup>6</sup> Applications for point-source discharges are often put on hold using Section 124 RMA. Current examples include Cambridge Waste Water Treatment Plant (consent expired 1/12/2016), Tokanui Village Waste Water Treatment Plant (22/11/2009), Waitomo Village Waste Water Treatment Plant (15/04/2015), Fonterra Te Rapa Dairy Factory (1/09/2017).

guidelines has meant that often consent applications have involved long periods of consultation, and thus have required considerable commitment by Fish and Game staff, especially when there have been monthly or bi-monthly meetings spread over several years and the environmental issues have been complex and technical.

- 4.7 For example consents for dairy factory utilise nutrient *load*-based restrictions, while limit based *concentrations* are generally applied to municipal waste water discharges. There is not a consistent approach.
- 4.8 Fish and Game considers that there should be appropriate trajectories of improvement for point source discharges, measured against long and short term goals in the planning framework. Ms Marr's evidence is that the policy framework for point source discharges should be included in an overarching allocation framework. She states that, if it does not, there is a very real risk that individual consent decisions will result in over allocation. Fish and Game has a real concern that over-allocation not be 'locked in' through long-term consent terms.
- 4.9 PC1 should not prejudice the ability to achieve equitable 'claw back' in the future, that is, in the next plan change after PC1.

## **5 OFFSET MEASURES**

- 5.1 The offset measures that have been suggested in consultative processes in the Waikato catchment for point-source discharges have been promoted by applicants as practical and cost-effective 'alternatives' to avoid, mitigate and remedy hierarchy in section 5 RMA. Such proposals are generally for riparian plantings, wetland restoration or funding of environmental trusts.
- 5.2 An example of an offset or compensation, is provided by the applications made by Inghams Enterprises (NZ) Pty Limited for 2 resource consents to expand site production: Land application of treated wastewater and Discharge of treated wastewater to the Waiheke Stream. A full copy of the Decision, 14 August 2017, is attached to my evidence. The Decision

at page 18 (under the heading 8.2.16 “Compensation Enhancement and Offset Mitigation”) records:<sup>7</sup>

Conditions 36 and 37 set out offset mitigation requirements. These two conditions provide a mechanism whereby Inghams may implement offset mitigation to achieve the annual nutrient load limits required by conditions 5 and 6. Conditions 36 and 37 underwent considerable discussion during development. Fish & Game in particular held concerns that conditions 36 & 37 could be used to degrade the WWTP performance, and in response to this, condition 14 was re-worded to ensure that the WWTP effluent quality pre-2016 was maintained.

Bill Vant pointed out in his technical review of the stream discharge, the annual nitrogen load of about 3 tonne/yr is equivalent to that leached from a 160 ha dairy farm, and retirement of a small dairy farm may well be a more cost effective option than a \$10M WWTP upgrade.

For Condition 36(iii), it is not clear how the “best available science” will be utilised by Council and Inghams to agree on the N or P load equivalent of the offset mitigation, or how well this can be recorded by both parties when assessing compliance with the N & P load limits in conditions 5 and 6. Nevertheless there is a large body of science relating to the likely leaching from different land uses, and I am confident that good decisions can be made.

To give an indication of the types of offset mitigation which might occur, Condition 36(ii) states that:

*“Qualifying works may include but are not necessarily limited to: retirement of pastoral farmland, riparian planting and fencing and edge of field mitigations including detention bunds and wetlands.”*

There was discussion amongst Inghams, Fish & Game and Council staff whether the offset mitigation work should be certified or approved by Council. While the Environment Court has expressed concerns about Councils reserving the right to approve plans, the alternative, “certification (acting in a technical capacity)” raised uncertainties. I consider that any offset mitigation, where a project might prevent 1.0 tonne/yr of nitrogen from entering the catchment, and therefore allowing Inghams to discharge an extra tonne of

<sup>7</sup> The relevant conditions commence at page 62 of the Decision.

nitrogen to the Waiheke Stream, is a more fundamental decision than certification of a Management Plan, and does need a higher level of Council “approval”. It is not a case of ticking boxes or certifying. There may be a need for Council to consult with key submitters or iwi to ensure that they are comfortable with the proposed mitigation. The legal counsel for Inghams proposed the phrase “the consent holder shall demonstrate to Council’s satisfaction that the qualifying works are in accordance with the process set out in condition 37 and the general principals [sic] below”; this “approval” method was acceptable to all parties.

- 5.3 This example is one of the more comprehensive offset measures in the experience of Auckland/Waikato Fish & Game. It involved substantial discussion about how an offset might work in the absence of planning guidance. As can be seen from the above, Fish & Game had concerns regarding the robustness of measurement of TN and TP that the ‘offset’ would achieve. If the ability to offset is to be accepted in PC 1, it should meet the requirements for an offset outlined in Ms Marr’s evidence otherwise it will become a ‘loophole’ for achieving PC1’s objectives (and will involve significant further efforts by Fish & Game to advocate against its misuse).
- 5.4 Auckland/Waikato Fish and Game has also been involved in environmental offset processes in regards to habitat loss, especially wetlands. However there are risks in becoming the ‘recipient’ of such schemes in that the offset measures may be one-off or remain in place only for the duration of the consent, and thus leaving Fish and Game with long-term liabilities for wetland maintenance.
- 5.5 In summary, I consider that there should be a net environmental benefit to any offset measures, but it is difficult to quantify the nutrient reductions from previous proposed and implemented offset measures.

## 6 REFERENCES

- Sheppard, R. 1993. New Zealand agricultural policy change: some effects. Agribusiness and Economics Research Unit Discussion Paper 135, Lincoln University. 33 pp.
- Vant, B. 2014. Sources of nitrogen and phosphorus in the Waikato and Waipā Rivers, 2003–12. Waikato Regional Council Technical Report 2014/56. December 2014.

APPENDIX

Inghams Enterprises (NZ) Pty Limited Decision, 14 August 2017

# Waikato Regional Council - S42A Hearing Report

**To:** David Stagg

**Date:** 14 August 2017

**From:** Barry Campbell

**Subject:** Report on applications made by Inghams Enterprises (NZ) Pty Limited, for 2 resource consents to expand site production:

- APP137282.01 Land application of treated wastewater, and
- APP137282.02 Discharge of treated wastewater to the Waiheka Stream.

Inghams intend that the two consents replace consents for the same activity.

## Executive Summary

Inghams Enterprises Ltd, Waiheka, proposes to expand poultry processing from approximately 800,000 birds per week to about 1.2 million birds per week. To enable this expansion, Inghams proposes that the current consents authorising disposal of wastewater – land application and discharge to the Waiheka Stream – are replaced, with a larger irrigation area and a larger daily discharge volume.

The applications were publicly notified in October 2016, and attracted 4 submissions, of which 2 were opposed and a further submission in conditional support. Subsequent discussions between Inghams Enterprises, submitters and Council staff enabled a set of conditions to be developed which are supported by all parties.

Ngati Haua hold mana whenua for the area, and provided support for the application. Ngati Haua expressed a desire for Inghams to assist restoration of the Waiheka Stream, and to be provided with an annual summary of the river discharge.

Council planning staff consider that the proposed activities are consistent with relevant regulations, plans, policies, objectives and rules.

Inghams proposes to upgrade its wastewater treatment plant, so that overall nutrient and contaminant loads to the Waiheka Stream and the irrigation area are not increased. The upgraded wastewater treatment plant will represent best practicable option (BPO). Environmental effects are assessed as likely to be relatively minor.

Staff recommendation is that the two applications are granted, subject to the proposed conditions set out in Schedules 1 and 2 attached to this report.

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### **Qualifications and Experience**

My full name is Barry Alexander Campbell. I am a senior resource officer at Waikato Regional Council where I have been employed for the last 21 years. I have a Bachelor of Science in chemistry from Auckland University, Bachelor of Science (Honours) in biochemistry from Victoria University, Wellington, and Diploma in Wildlife Management from Otago University. I hold a certificate as a hearing commissioner under the MfE/Opus Making Good Decisions Programme.

I have 21 years experience in consent processing under the Resource Management Act 1991. Relevant Hearing reports that I have prepared in recent years for discharge of wastewater to land or water include Tatua Coop (2016 discharge to land), Wallace Corporation (2015, discharge to land, air and water), Puke Coal Ltd landfill (2013, discharges to land, air, water), Arapuni Milk Processing Plant (2010, discharge to air, land and water), McIntyre Piggery (2008, discharge to land, air and water),

Taupo sewage irrigation (2007, discharge to land), and Open Country Cheese (2007, discharges to land and air).

# 1 Background

The Inghams Enterprises (NZ) Pty Limited (“Inghams”) site on Waihekau Road, near Waitoa, is the largest poultry processing site in NZ. Up to 800,000 birds are processed at the site each week.

Inghams wishes to expand processing at the site to a capacity of 1.25 million birds per week. There is no fixed timeframe for the expansion, but there has been steady production increases for a few years now, and the company is close to the volume limits for wastewater disposal with its current consents. The current consents authorise a discharge to the Waihekau Stream of up to 2400 cubic metres per day, and a discharge to land by irrigation of up to 2400 cubic metres per day. Inghams estimates that at full production of 1.25 million birds per week it will require a daily discharge volume of up to 4000 cubic metres per day.

The applications under assessment are:

**APP137282.01:** Discharge up to 4000 cubic metres of treated wastewater and waste activated sludge to land, and associated discharge to air.

**APP137282.02:** Discharge up to 4000 cubic metres of treated wastewater to the Waihekau Stream.

If the above two applications are granted, Inghams has advised that it will surrender consents 108877, 108880 and 110161. The current consents are set out below, and expire in 2023.

Consent	Purpose	Expiry date
108877	Discharge up to 1800 m <sup>3</sup> /d of treated wastewater to land (owned by Inghams)	30/9/2023
108880	Discharge up to 2400 m <sup>3</sup> /d of treated wastewater into the Waihekau Stream	30/9/2023
110161	Discharge up to 2400 m <sup>3</sup> /d of treated wastewater onto land (owned by Lyndhurst Farms)	15/3/2024

Inghams holds the following additional consents, which are not affected by the two applications, and which Inghams does not wish to replace at this time. Council staff agree that this existing consents can be “unbundled” and that grant of applications 137282.01 and 137282.02 is not dependent on concurrent replacement of the following consents:

Consent	Purpose	Expiry date
108878	Discharge stormwater to the Waipuna Stream	
108879	Discharge contaminants to air, from poultry processing factory and wastewater treatment plant, including odour and flared gas	30/9/2023
124793.01	Take up to 3500 m <sup>3</sup> /d groundwater	30/11/2032
120821.01	Use water for pasture irrigation purposes	1/7/2029

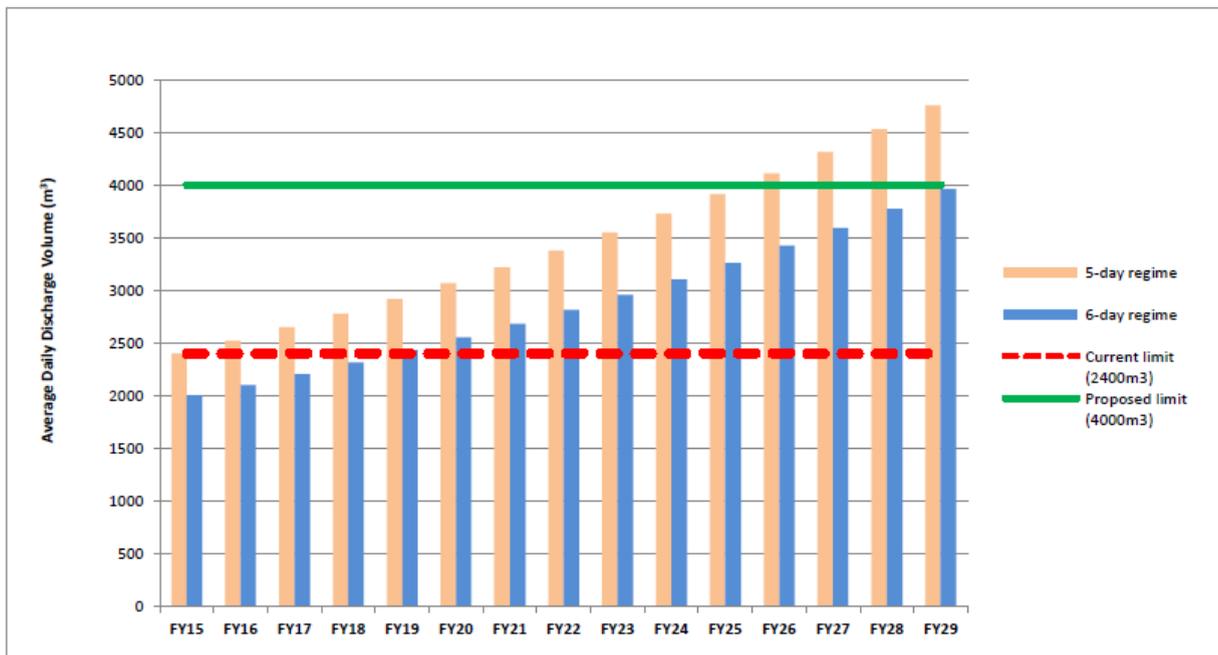
Inghams also has access to up to 3300 cubic metres water from the Matamata-Piako District Council.

The site is a major employer, with about 600 staff, and contributes about \$1 million per week in wages to the local community. If the site expansion proceeds, Inghams considers that staff numbers would increase approximately 25% or about 150 additional staff.

## 2 Description of Proposal

A full description of the proposed site expansion is set out in the Assessment of Environmental Effects (AEE) dated August 2016 (wrc doc#9055668).

In brief, Inghams has been increasing production for some years, and has now reached the limits of its existing consents, in terms of the daily discharge volumes, and availability of land to irrigate the treated wastewater. Inghams has applied for new consents to increase the daily discharge volume from 2400 cubic metres per day (m<sup>3</sup>/d), to 4000 m<sup>3</sup>/d. The gradual increase in daily wastewater volumes in recent years, and potential growth to 2029 (Figure 22 from AEE), are shown below.



**Figure 22: Projected daily wastewater discharge volumes.**

The present wastewater treatment plant has a high treatment efficiency, with the final effluent typically having a BOD of about 2 g/m<sup>3</sup>, suspended solids of about 4 g/m<sup>3</sup>, ammoniacal-N of about 0.2 g/m<sup>3</sup>, and E coli of less than 1 cfu/100ml. Nutrient concentrations are higher however, with TN about 11 g/m<sup>3</sup>, and TP about 2 g/m<sup>3</sup>.

For the discharge to the Waiheke Stream, Inghams has proposed a wastewater treatment plant (WWTP) upgrade, to keep nutrient loads similar to present levels for the river discharge; broadly, TN loads will be kept much the same, and TP loads decreased. Inghams has not finalised the upgrade details, but it is likely to include alum dosing (to remove more phosphorus), additional filtration, and enhanced biological treatment (to remove more nitrogen). Other treatment options include a denitrification filter and/or membrane bioreactor.

The two discharge consents (to stream, to land) are complementary, in that the discharge is mainly to land in summer and mainly to river in winter. During shoulder months there can be a discharge to both the river and land, but the combined daily volume remains about 4000 m<sup>3</sup>. The AEE estimates that typically there would be about 110 days each year when the discharge occurs to the stream, and 130 days each year when land irrigation occurs. The numbers do not add up to 365 because the company does not operate 7 days per week or statutory holidays at present, as reception of the live birds for

processing at the factory is discretionary. The discharge patterns are shown in Figures 13 & 14 of the AEE, and Figure 13 is reproduced in section 8.3.2 of this Hearing Report.

### 3 Status of Activities under the Plans

The proposed discharges of treated wastewater to land and to the Waiheke Stream are Discretionary Activities under Rule 3.5.4.5 (Discharges – General Rule) of the Waikato Regional Plan. Rule 3.5.4.5 states that any discharge of a contaminant into water or onto or into land, in circumstances which may result in that contaminant entering water, that is not specifically provided for by any rule, and does not meet the conditions of a permitted or a controlled activity rule in the WRP is a discretionary activity and requires resource consent. I consider that there are no other rules in the WRP which specifically provide for the proposed discharges.

### 4 Process Matters

Date	Process Detail
05/09/2016	Lodged
09/09/2016	Active
21/9/16	Decision to publicly notify - wrdoc#9115377
30/09/2016	Publicly notified – wrdoc#9138497
28/10/16	Submissions closed
8/11/16	On hold under s37A.5 pending reports from Inghams and discussion on draft conditions, wrc doc#9481969
3/8/17	Off hold s37A.5 after approval from all submitters received.

### 5 Consultation Prior to Notification

#### 5.1 Iwi

The Inghams factory lies within the Ngati Haua rohe. Ngati Haua have provided support, and prepared a Cultural Impact Statement which outlined their preferences.

The discharge to the Waiheke Stream, Waitoa River, Piako River and Firth of Thames is of potential interest to many Hauraki iwi. However no submissions were received by the WRC from any iwi group, although the main organisations were directly notified of the application.

I consider that there has been good consultation between Inghams and iwi.

#### 5.2 Other Parties

The AEE section 10 (page 101) provides details of consultation undertaken by Inghams in August 2015 with key stakeholders such as iwi, Department of Conservation, Fish & Game, Waikato District Health Board, nearby large industries, and adjacent landowner.

## 6 Notification

The application was publicly notified on 30 September 2016, and closed on 28 October 2016. A notice was inserted into the Hauraki Herald on 30/9/16, and letters were sent to 23 parties considered affected or potentially affected by the activities. The list and rationale is wrdoc#9120702. Notified persons included iwi, Fish & Game, Department of Conservation, Public Health and immediate neighbours. The notification notice was also available on the WRC website.

### 6.1 Submissions Received

Four submissions were received, listed below with key concerns or comments.

Submitter	Concerns/comments	Wish to be heard?
G & J Feaver	Supports the applications	No
B & S Dickey	Tentatively supports the applications, provided Inghams continues to monitor their property bore for nitrate and E coli. The property and bore are located at 392 Ngarua Rd, just north of the wastewater irrigation.	No
Fish and Game NZ, Auckland/Waikato Region	Opposed. Concerns about the potential increase in nutrient and BOD loads to the Waiheka Stream, effects on RAMSAR sites downstream. Lack of mitigation for the adverse effects.	Yes
Public Health Unit – Waikato District Health Board	Opposed. Concerns about potential increased levels of cyanobacteria in the Waiheka Stream and further downstream. Concerns about the potential discharge of pathogens such as Campylobacter and E coli to the Waiheka Stream.	Yes

In February 2017 the WDHB advised that it no longer opposed the applications, with the following email comments (wrc doc#99847978):

*“Dr Richard Vipond (Medical Officer of Health) and myself visited the Inghams Processing Site on 18 January 2017. Conversations with staff onsite and subsequent follow up conversations with the U.V. supplier and servicing agent, have addressed concerns that were raised by Public Health in our initial submission. Therefore, any concerns that were raised in the WDHB Public Health submission have/are being addressed in the proposed Resource Consents. WDHB - Public Health Unit withdraws our opposition and accepts any conditions imposed by Waikato Regional Council.”*

In December 2016 the Dickey's indicated support for the application, after accepting a draft condition for monitoring of their groundwater bore (see wrc doc#9704508). I have included a condition to that effect in the land irrigation consent.

In July 2017 Fish & Game accepted the draft conditions and advised that they no longer wished to be heard, see wrc doc#10915974.

## 7 Statutory Considerations

The proposed discharges of treated wastewater to land by spray irrigation and to the Waiheka Stream are both Discretionary under the Waikato Regional Plan, Rule 3.5.4.5 (General rule - any discharge of a contaminant into or onto or into land, in circumstances which may result in that contaminant entering water). I consider that there are no other rules which are relevant to the proposed activities.

Section 104B RMA therefore applies, and Council may grant or refuse the applications, and if granted may impose conditions under section 108 RMA.

## 8 Assessment of Environmental Effect

### 8.1 Existing environment & Permitted Baseline

The AEE provides a detailed assessment of the existing environment and only a brief summary is provided here.

The Waiheka Stream is moderately affected by surrounding land uses, and has low-moderate aquatic diversity. The stream has minimal shading, and a sandy bed, and a low habitat quality score of 55-58 out of a possible 180. The AEE pages 25-28 provides details of the stream quality; in particular nutrients are elevated, for instance Total nitrogen (TN) varies upstream of the site from 1-8 g/m<sup>3</sup>, and E coli/Enterococci levels are high. Previous Council s42A reports have recorded that there are no known recreational uses of the Waiheka Stream (such as kayaking, duck shooting, swimming or fishing) downstream of Inghams. Upstream near Waharoa there is a small sport fishery (according to the Matamata Freshwater Anglers) and previous fish surveys have recorded indigenous fish species throughout the Waiheka Stream.

The proposed irrigation area is zoned Rural under the Matamata-Piako District Plan. The predominant farm use is dairying. The land is flat to rolling, with a range of soil types varying from Waitoa silt gley with low permeability, to Waihou silt loams with moderate-good permeability. Inghams wastewater has been irrigated for about 20 years on its own property (38 ha) and for about 12 years on the adjacent Lyndhurst Farm property (153 ha).

Groundwater under the existing sites consists of an unconfined shallow aquifer from 0.5m to 3m below ground, with confined deeper aquifers. The existing monitoring bores are targeting the shallow aquifer, and there appears to be minimal if any connection with the deeper aquifers. Background shallow groundwater quality is generally good, with moderate increases in nitrate consistent with surrounding land uses. There is minimal groundwater use of the shallow aquifer, due to low water availability.

#### **Permitted Baseline**

Section 104(2) provides that when forming an opinion about the actual or potential effects of the activity, the consent authority may disregard an adverse effect of the activity on the environment if the regional plan permits an activity with that effect. This is often referred to as the "permitted baseline" and calls for a discretionary decision to be exercised by the consent authority as to whether or not to discount such permitted effects. This provision requires consideration of:

*"the existing environment overlaid with such relevant activity (not being a fanciful activity) as is permitted by the plan. Thus, if the activity permitted by the plan will create some adverse effect on the environment, that adverse effect does not count in the s104 or s105 assessments...it is deemed to be already affecting the environment...The consequence is that only other or further adverse effects emanating from the proposal under consideration are brought to account."*

(Arrigato v ARC)

I consider that there are no permitted or baseline effects which should be taken into account with the Inghams applications.

### 8.2 Discharge to Waiheka Stream

**8.2.1 Classification of the Waihekau Stream and Waitoa River**

The Waikato Regional Plan classifies the Waihekau Stream as Waikato Surface Water and Significant Indigenous Fishery & Fish Habitat. The Plan requirements for these classifications are:

Waikato Region Surface Water standards

- No significant changes in dissolved oxygen.
- No significant changes in pH.
- No significant increase in deposition of bed sediments.
- No significant increase in undesirable biological growths.
- No increase in water temperature more than three degrees Celcius.
- No conspicuous change in visual colour or clarity.
- The discharge shall not increase the suspended solids concentration in the receiving water by more than 10 percent.
- The water shall not be tainted or contaminated so as to make it unpalatable or suitable for consumption by humans after treatment.
- The water shall not be tainted or contaminated so as to make it unsuitable for irrigation.

Indigenous Fishery standards

- Ammoniacal-nitrogen shall not exceed 0.88 g/m<sup>3</sup>.

**8.2.2 Recommended level of protection**

It is a common practice by regulators when developing consent conditions to first set a desired water quality standard (for instance based on the Plan requirements or 95% protection under ANZECC Water Quality Guidelines), however this is not practicable for the Waihekau Stream at present, due to the poor water quality. As the AEE (page 25) states:

*“The Waihekau Stream upstream of the discharge demonstrates median water quality that is outside WRC guidelines for pH (6.5-9), TP (<0.5 g/m<sup>3</sup>) and National guidelines for E coli (1000 cfu/100mls). The upstream concentrations of TN, TP and E coli are reflective of the intense agricultural land use upstream of the Ingham’s discharge point.”*

The table below is from the AEE, page 25:

**Table 6: Summary of Waihekau Stream Water Quality 2012 – 2015 (measured immediately upstream of Ingham’s discharge point).**

Value	pH	Cond (mS/m)	TSS (g/m <sup>3</sup> )	BOD (g/m <sup>3</sup> )	DRP (g/m <sup>3</sup> )	TP (g/m <sup>3</sup> )	TN (g/m <sup>3</sup> )	NH <sub>4</sub> -N (g/m <sup>3</sup> )	NO <sub>2</sub> -N (g/m <sup>3</sup> )	NO <sub>3</sub> -N (g/m <sup>3</sup> )	E.coli (cfu/100mL)	enterococci (cfu/100mL)
N	28	25	25	29	29	29	29	29	29	29	28	28
Med	6.47	240	22	<2	0.009	0.062	2.2	0.13	0.017	1.8	1623	250
Min	6.08	155	<1	<2	<0.004	0.014	0.88	<0.01	<0.002	0.61	63	<10
75%-ile	7.57	252	59	3	0.012	0.18	3.0	0.19	0.035	2.3	5870	1288
Max	6.90	346	103	3	0.028	0.28	8.0	0.55	0.44	5.9	15650	2750
WQG	6.5-9 <sup>A</sup>	-	-	<2 <sup>B</sup>	NA	<0.04 <sup>A</sup>	<0.5 <sup>A</sup>	0.88 <sup>A</sup>	-	6.9 <sup>C</sup>	1000 <sup>C</sup>	-

*Note: N = number of samples, med = median, min = minimum, max = maximum, WQC = water quality guideline as follows: <sup>A</sup>WRC satisfactory, <sup>B</sup>MfE prevention of sewage fungus, <sup>C</sup>NPS national bottom line.*

To clarify this point, the Waihekau Stream is likely to remain in poor health for the foreseeable future, even if there were no Inghams discharge (directly to the stream, or to nearby farmland).

Nevertheless restrictions should be imposed on parameters pH, TN, TP and E coli to ensure that the Inghams discharge does not worsen an already poor situation.

For other parameters such as ammonia, nitrate, and BOD, the stream water quality does meet ANZECC Water Quality Guidelines for 95% species protection, and consent conditions should ensure that the existing discharge at least is maintained.

Vant & Brown (October 2016, wrc doc#9235833) comment that “WRC routinely uses the ANZECC 95% protection level to avoid chronic effects” in the majority of Waikato surface water, but in the case of the Waiheka Stream, a lower standard of 80 or 90% protection may be more appropriate.

The Waiheka Stream has indigenous fish throughout its length, and it is important to ensure that indigenous fish passage is maintained at all times, and that the water quality meets minimum standards for indigenous fish. The assessment of the indigenous fishery by Bruno David in 2012 (wrc doc#2229724) was that the indigenous fish diversity in the Waiheka Stream was likely to be low, that the discharge may have minimal effect on the limited fish species, and that the overall effects of the discharge on the Waitoa Stream might be more important to consider.

The maximum discharge rate proposed by Inghams is 47 L/s, which would generally occur when the river flow exceeds 525 L/s (predominantly in winter). However it is possible under the proposed conditions for the river flow to be as low as 300 L/s. As a worst case scenario, the available dilution is 6x, but more typically would be about 16x (47 L/s effluent; 776 L/s stream flow as winter median (see AEE page 68).

### **8.2.3 Review of river effects**

The AEE includes a reasonably complete and detailed assessment of effects (particularly Appendix 3: report by Freshwater Solutions Ltd, dated June 2016). In addition WRC science staff Bill Vant and Eloise Brown provided a review of the AEE, see wrc doc # 9235833 & 9154661. The review of ecological effects by Kevin Collier (June 2012, wrc doc#220185) remains relevant.

There is close agreement amongst the above reports & reviews that the Inghams discharge has the following effects:

- The upstream aquatic habitat, water quality and stream ecology are degraded.
- The effects of contaminants SS, BOD, ammonia and E coli on the stream are likely to be minimal.
- Contaminants N & P are considerably higher than the upstream concentrations, however even under worst case scenario are unlikely to cause acute toxicity effects.
- The wastewater nutrients stimulate periphyton growths, however the effects of this are not well understood.
- In-river biological effects surveys in recent years indicate a small reduction in ecological values below the discharge, fully recovering after 2-3 km.

### **8.2.4 Mixing zone**

There are no contaminants in the treated wastewater which are likely to be immediately toxic to aquatic life, and determination of a mixing zone is not critical for this consent. Nevertheless s107 RMA requires some consideration of a reasonable mixing zone, as s107 allows some adverse effect within this zone, but not outside it.

Inghams has not provided comment on an appropriate reasonable mixing zone for the Waiheka Stream. Previous advice from WRC water scientist Bill Vant is that it should be 30m downstream for the Inghams discharge to the Waheka Stream.

### 8.2.5 Nutrients N & P annual loads

Inghams discharges about 3 tonne N/yr and about 0.5 tonne P/yr to the Waiheke Stream and eventually the Firth of Thames. For nitrogen this is about 11% of the total Waiheke Stream, and about 0.16% of the total Hauraki catchment discharging to the Firth of Thames. For phosphorus, the Inghams load is about 30% of the Waiheke Stream, and about 0.3% of the total Hauraki load discharging to the Firth of Thames. Details of the loads can be found in Tables 26 & 27 of the AEE, page 88.

Bill Vant (wrc doc#9154661) estimated that the Inghams loads were equivalent to the N loads leaching from a 160 ha dairy farm in the same catchment, and P loads lost from about 900 ha farmland. His strong recommendation was that nutrient loads discharged to the Firth of Thames should not increase, and although he recognised that the Inghams discharge contributed a small percentage of N & P loads, he considered that all dischargers, including Inghams, must contribute to improving the Firth water quality. Mr Vant wrote that:

*“These river-borne loads are the combined result of hundreds of separate activities carried out by people: farming, sewage from towns, and wastewaters from industry. I consider that the individual loads of N and P from each of these many activities should not increase any further.*

*I therefore disagree with the proposal in the AEE (p.75) that the load of total N discharged from the Waitoa poultry processor to the Waiheke Stream should increase to between 5.000 t/yr (prior to 31/12/2028) and 4.025 t/yr (post 31/12/2028). I also disagree with the proposal to increase the load of total P to between 0.800 t/yr and 0.575 t/yr.”*

The matter is not straightforward however, as Inghams does not have any consent limits at present for TN and TP, as daily limits or annual loads. Mr Vant is referring to the N & P load limits proposed by Inghams, in comparison to the actual loads discharged by Inghams in recent years. For instance the actual annual load of TN has varied from 1.7 to 3.4 tonne/yr, while Inghams proposes a consent limit of 5 tonne/yr, reducing to 4 tonne/yr after 2028. For phosphorus, Inghams proposes an annual load limit of 0.80 tonne/yr, reducing to 0.575 tonne/yr after 2028. Actual discharge loads are set out in the table below for reference:

Year	Annual volume to stream, m3	TN load, T/yr	TP load, T/yr	BOD load T/yr
2009/10	198,109	1.7	0.15	0.62
2010/11	261,723	2.2	0.98	0.55
2011/12	225,206	3.1	0.51	0.51
2012/13	217,809	3.4	0.29	0.29
2013/14	217,786	2.0	0.25	0.29
2014/15	218,369	1.9	0.35	0.39
2015/16	243,155	2.3	0.39	0.58
Average 2009-16		2.4	0.42	0.46

The annual loads are variable, and can in part be explained in terms of wet years (when Inghams discharges more to the stream) vs dry years (when more wastewater might be irrigated). Inghams provided an explanation of the variances in March 2017 (wrc doc#10212826) in response to a query from Fish & Game.

For nitrogen, Ingham’s explanation is that until recently, the company has focused on achieving low ammonia concentrations in the effluent (as this is the only nitrogen form that has any consent limit at present), but, aware that there may be consent limits in the future for nitrate and/or TN, has been managing the WWTP to achieve a more balanced nitrogen reduction.

For phosphorus, Inghams has been trialling alum dosing for many years, and stated that *“this process has progressively been refined from 2012, resulting in lower and more reliable phosphorus loads, less alum consumption and improved sludge management”*.

Thus Inghams has anticipated future statutory requirements for nutrient reductions, and optimised nutrient removal within their existing WWTP. In my experience this stance is somewhat uncommon amongst industrial & sewage treatment sites.

Given this proactive approach, some credit may be extended to Inghams. It may be appropriate in this situation for Council to accept the existing annual N & P loads, rather than striving for a reduction in annual loads as often occurs during consent renewal projects. This stance is supported by the low percentage on nutrient loads contributed by Inghams to the total Firth of Thames loads.

It is not clear from the AEE whether the proposed WWTP upgrades will increase the annual TN load or not. Table 12 (page 45) of the AEE sets out potential effluent quality after the upgrade, and it seems that the TN load will increase once the site reaches full expansion about 2029. I have estimated potential contaminant loads below:

Parameter	Present WWTP		Future WWTP after upgrade	
	Average concentration g/m <sup>3</sup>	Daily load (kg) at 2400 m <sup>3</sup> /d	Average concentration g/m <sup>3</sup>	Daily load (kg) at 4000 m <sup>3</sup> /d
Suspended solids	5.8	13.9	<5 (assume 3)	12
cBOD	1.8	4.3	<2 (assume 1)	4
TP	2.1	5.0	1.0	4.0
TN	9.7	23	7	28

The Table above predicts that the TP load will decrease after the upgrade, but the TN load will increase. It is unclear whether SS and BOD loads will increase or not.

My view is that future consent conditions should limit N & P daily loads and annual loads, but be flexible enough to ensure that a particularly wet year (when irrigation is difficult, and the river discharge occurs more than usual) does not cause non-compliance with the nutrient limits.

My recommendation is that an annual N and P load limit be included in the consent conditions, to ring-fence existing loads. My recommendation is that it be a maximum limit (for any year) of 5.0 tonne TN/yr, and 0.80 tonne TP/yr, and that there be a 7-year rolling average limit of 3.0 tonne TN/yr and 0.5 tonne TP/yr. The 7-year rolling average would start immediately on grant of consent, using the previous seven years’ data. I am confident that Inghams can achieve compliance with these proposed limits at present, but the site will require a WWTP upgrade to continue to comply if it wishes to increase production. To clarify the purpose of these annual load limits, they are to protect the Firth of Thames, while the N & P concentration limits are to protect the Waiheke Stream.

I have considered whether a deferment of the maximum or rolling average load limits is required to facilitate the Inghams expansion. Such a scenario would allow a measured increase in stream effects, for a limited time, and might be beneficial to Inghams if it provided flexibility when commissioning the WWTP upgrade. In the AEE Inghams requested an 11 year period to upgrade the WWTP, but did not provide a clear rationale for such a long upgrade period.

### 8.2.6 Nutrients N & P daily limits

While TN and TP load limits have been included in the draft conditions, to protect the Firth of Thames, there appears to be no reason why there needs to be daily load limits to protect the Waiheke Stream. The WRC science staff have not recommended any daily load limits.

### **8.2.7 BOD and Dissolved Oxygen**

In the AEE, Inghams proposed a BOD concentration limit of 7.5ppm (expressed as a running average last 20 samples) and a maximum of 30 ppm. These are reduced from the present consent limits of 10 ppm average and 50 ppm maximum. Inghams also proposed an annual load limit of 2 t/yr until 2028 then 1.15 t/yr afterwards. My recommendation is that these limits are granted by WRC.

The actual annual load at present is much lower than that proposed by Inghams. The average annual load for the last seven years is 460 kg/yr. Inghams claim that greater BOD consent limit flexibility is needed if a WWTP upgrade uses enhanced biological treatment, and this is accepted by Council staff.

Note that the Freshwater Solutions report (appendix 3 of AEE) used a median of 1.8 ppm, and maximum concentration of 12 ppm, to model chronic and acute BOD effects, and found effects were acceptable. However these values used in the modelling are different from the consent limits proposed by Inghams.

The AEE states that the proposed WWTP upgrades could achieve a BOD concentration of <2 ppm (average), and it is not clear why Inghams consider that a consent limit of 7.5 ppm (average) is necessary.

Nevertheless the BOD concentration in the final wastewater is very low at present, and is likely to remain so, with or without a WWTP upgrade. WRC science staff consider that the effect of BOD on downstream water quality is likely to be minimal.

The dissolved oxygen level in the Waiheke Stream is not known with any certainty. Stream surveys undertaken by Inghams have recorded high levels, up to 10 ppm, but these are spot results during the day. It is not uncommon for Waikato lowland streams, if impacted by excessive nutrients and excessive aquatic plant growths (phytoplankton and macrophytes) to have a large diurnal swing in DO levels, sometimes saturated during daylight hours, but dropping to below 6 ppm at night. These swings are more common during the summer low flows (when Inghams does not discharge) in stream with dense macrophyte growths (which the Waiheke Stream generally does not have).

I consider that it would be wise to protect the Waiheke Stream life from low DO concentrations by including a DO concentration limit of 6.0 ppm in the wastewater discharge. It should be noted that Inghams records the DO of the effluent storage pond weekly at present, and the DO is generally higher than 6ppm.

In addition, Inghams should include a diurnal DO test as part of the annual stream survey.

### **8.2.8 Suspended Solids**

Inghams proposed limits of 15 ppm average, 50 ppm max, which are reduced from present limits of 20 & 100ppm. These proposed limits are significantly higher than what has been achieved by Inghams in recent years (median of 3.5ppm). The AEE states that more alum dosing to remove P may increase the SS concentration in the final effluent, and that filtration may be required.

Upstream SS concentrations are about 22 ppm as a median, and about 103 ppm maximum (see Table 6, p 25 AEE), and at the SS limits proposed by Inghams, the effluent is likely to improve the stream, wrt SS.

My recommendation is that the Inghams proposed SS limits are accepted; while it would be a significant increase in SS loads if Inghams did discharge at those limits, the effects on the stream would be less than minor.

### **8.2.9 Ammonia**

Inghams propose limits of 2.7ppm average, and 11.2 ppm maximum. This is significantly higher than achieved by Inghams in recent years, with the final effluent having a median concentration of 0.16 ppm. It is not clear why Inghams needs such an increase.

Nevertheless the upstream ammoniacal-N concentration is low at present (about 0.13 ppm median), and the Freshwater Solutions modelling indicated no chronic or acute toxicity in the Waiheka Stream under worst case scenarios. The WRC science staff have confirmed that toxicity effects are most unlikely to occur at the ammonia concentration limits proposed by Inghams.

### **8.2.10 E coli**

I have proposed an E coli limit of 500 cfu as a 95<sup>th</sup> percentile. The present discharge has an E coli concentration of <1 cfu/100mls most days after UV treatment, and there appears to be no reason why this would change after the WWTP upgrades proposed by Inghams.

WRC scientist Bill Vant commented in October 2016 (WRcdoc#9490358) that the background E coli level in the Waiheka Stream is poor, with a median of about 1600 cfu/100mls. That water quality exceeds the “national bottom line” in the NPSFM 2014 of 1000 cfu/100mls. Mr Vant commented that *“...most, if not all, of the time the wastewater discharge...reduces the in-stream concentration of E coli below the discharge point”*.

### **8.2.11 Nitrate**

In the AEE Inghams proposed nitrate-N concentration limits of 12 ppm (expressed as a running average last 20 samples) and a maximum of 30 ppm at any time. These proposed limits were supported by the Freshwater Solutions Ltd technical assessment (Appendix 3 to the AEE) which showed that the NPSFM2014 “national bottom line” for chronic and acute nitrate effects (6.9 and 9.8 ppm nitrate-N respectively) would not be exceeded during worst case scenarios (for instance 4000 m<sup>3</sup>/d, low stream flow, high upstream nitrate concentrations, highest effluent nitrate concentrations).

The Inghams proposed nitrate limits are similar to the effluent quality achieved by Inghams in the period 2010-2014, when the final discharge to surface water had an average of 9 ppm, and a maximum of 20 ppm nitrate-N.

WRC water scientists Vant and Ryan (wrcdoc#9235833) agreed that the nitrate-N consent limits proposed by Inghams were appropriate for the highly-modified condition of the stream, and will *“provide a degree of protection to the Waiheka Stream”*.

### **8.2.12 Other contaminants**

No other contaminants of concern in the treated wastewater have been identified by Council staff. Some WWTP discharges may include sulphides or nitrites, sometimes formed as part of the biological treatment process, however there is no indication that these contaminants are likely to be in the final effluent.

Should the Inghams processing method change, and a new contaminant is recognised as an environmental concern, then there is a process through s128 RMA review to address these concerns as they arise.

### **8.2.13 Limit on discharge when Waiheka Stream flow is less than 525 L/s**

The proposed conditions for the river discharge include limitations on when the treated effluent may be discharged to the Waiheka Stream, for instance:

- During the months of June, July and August;
- At other times, when the Waiheka Stream flow exceeds 525 L/s;
- At other times, after more than 25 mm rain in the previous 24 hours;

The 525 L/s value is considered to be the 50 percentile flow in the Waiheka Stream, at the Waiheka Road bridge, and is an estimate first recorded in a 2009 s42A Report. This trigger value was set in 2009 to provide for a minimum dilution in the Waiheka Stream of 15x, based on the maximum wastewater flow rate at the time of 35 L/s. The maximum proposed effluent flow rate is now 47 L/s, however the advice of the WRC science staff is that only minor adverse effects are expected at a lower dilution rate of 11x (525 L/s stream, 47 L/s effluent), and I recommend that the stream flow trigger of 525 L/s is retained.

Inghams do not have a flow gauge in the Waiheka Stream, and the stream flows are estimated from the Mellon Road flow gauge (Waitoa River) about 15 km to the north of the Inghams site. At present the agreed formula is (Waiheka Stream flow =  $0.276 \times$  Waitoa River flow [Mellon Rd gauge] + 0.075), expressed as cumecs.

A report commissioned by Inghams in May 2015 (Pattle Delamore Partners, wrdoc#6204897) identified that this formula occasionally caused noticeable errors in the Waiheka Stream flow estimate, and PDP proposed an alternative formula, that the Waiheka Stream flow =  $68/357$  Waitoa River flow (Mellons Rd). The PDP report identified that this method would still produce an average differential of about 26% between the actual Waiheka flow and the synthetic estimate. The alternative formula appears to underestimate the true flow at times (for instance the PDP model estimated that the flow was 518 L/s when it was actually 318 L/s) but in general it was more accurate than the existing model (26% average difference vs 83% average difference).

Note that if Inghams is using the Mellons Rd flow gauge, there will be times when the Waiheka Stream flow is poorly correlated to the Waitoa River flow, due to localised rainfall. Nevertheless the stream flow trigger value of 525 L/s (equivalent to a Mellon rd flow of 2750 L/s) is likely to be representative, far more often than not) of a stream in median flow, and able to accept the Inghams effluent as a contingency discharge.

My recommendation is that the consent conditions (both consents - land and stream discharges) include that the equivalent Mellon Rd flow is 2750 L/s.

### **8.2.14 Cyanobacteria & pathogen concerns**

The Waikato District Health Board submitted that there was potential for cyanobacterial growths in the effluent storage pond, or in the Waiheka Stream stimulated by the effluent discharge. Cyanobacterial growths in the Waiheka Stream would have potential to cause public health risks. WDHB also expressed concerns about potential pathogens of human health risk which may be present in the Inghams final discharge, and the possibility that, even if pathogens were very low in the UV-treated final effluent, these pathogens may reactivate after the UV treatment.

WRC water scientist Bill Vant responded to the cyanobacteria concern in October 2016 (wrdoc#9490358), when he advised that there would be only a minor risk that the final discharge would contain appreciable numbers of cyanobacteria. Further, he considered that cyanobacterial growths in the Waiheka Stream were unlikely, noting that these forms normally only form blooms in lakes and ponds rather than in flowing waters. For the Firth of Thames, he noted that while

cyanobacteria are often present in coastal waters, but generally do not form the nuisance and harmful blooms found in freshwater lakes and ponds.

Inghams also responded to the WDHB concerns by commissioning a report by Pattle Delamore Partners, received December 2016 (wrcdoc#9726205). The PDP report recorded that cyanobacterial numbers were relatively low in the effluent storage pond, around 200-360 cells/mL, compared to the “Green” or safe mode guideline by Ministry for the Environment of <500 cell/mL to indicate a generally safe recreational freshwater. Furthermore, the UV treatment of the storage pond effluent before discharge to the stream, is likely to reduce the cyanobacteria numbers much lower.

The PDP report also discussed potential health concerns if pathogen were present in the final effluent. PDP concluded that there was minimal risk of pathogen being present in the final wastewater, due to the extensive treatment process, and UV disinfection prior to discharge to the Waiheka Stream. Tests for pathogens post UV treatment found that Campylobacter, Salmonella, E coli and Enterococci were not detected or <1 cfu/100ml. PDP considered that Ingham’s UV system was operating effectively, with a very high level of pathogen inactivation.

In response to this information, WDHB withdrew its concerns on 2nd February 2017 (wrc doc#9984798).

On 17 February 2017, in response to a consent condition proposed by WRC restricting E coli in the discharged wastewater to 500 cfu/100ml, PDP provided comment that a 95 percentile limit of 500 cfu/100ml would be preferable (wrcdoc#10213010):

*“It is difficult to continuously maintain compliance with a maximum E coli limit in this range. Even though the UV disinfection system may be well maintained and operated, on occasions spikes in suspended solids levels can occur which can reduce the efficiency of the UV system. These events are generally short lived, lasting only a matter of minutes, however the random nature of sampling can coincide with these events. While the existing system achieves very low E coli levels, there is evidence of the occasional spikes in E coli level which under this condition would have resulted in non-compliance”.*

I reassessed the WDHB position in light of this information from PDP, but concluded that the public health risk remained very low, and that a 95 percentile limit for E coli of 500 cfu/100mls was appropriate.

### **8.2.15 Periphyton growths**

The nutrients in the wastewater has potential to cause periphyton growths in the Waiheka Stream. The AEE (appendix 3, page 19) stated that the discharge “does stimulate periphyton growths”, however the key question is how much this growth is stimulated above background growths, and whether the overall periphyton growth is likely to be an ecological concern.

The AEE identified that the annual stream ecological survey uses three methods to record periphyton growths – the Periphyton Enrichment Index (PEI), the Periphyton Proliferation Index (PPI) and the Periphyton Slimyness Index (PSI). The majority of the stream surveys since August 2008 have found that the discharge does stimulate periphyton growth, on average about 20% immediately downstream. The PEI score for the stream varied from 55-80 (out of a possible 90).

The October 2015 survey recorded that the PEI scores could not be calculated because the periphyton cover was so sparse; this is highly relevant because the Waiheka Stream is soft bottomed, and the periphyton growth is almost entirely on macrophyte surfaces. The AEE states that the “total macrophyte cover scores” ranged widely among sites and surveys from 1-60%, and this would significantly affect the PEI score.

The AEE concluded that the most likely cause of the stimulation in periphyton growths is the DRP in the discharge (typically around 2 ppm), but also that the stream is not well suited to supporting periphyton growths.

WRC scientists Bill Vant and Eloise Ryan hold concerns that some lowland Hauraki Streams have periphyton growths close to the NPSFM 2014 national bottom line (200 mg chlorophyll-a per square metre), and that the Waiheka Stream may well be in this position. There is significant difficulty converting a PEI score to a chl-a / m<sup>2</sup> value for a soft-bottomed waterway, and the applicant's consultants and WRC science staff were unable to agree on an appropriate assessment method.

It is difficult to know how to manage this: the stream is clearly affected by periphyton growth upstream, and this is worse downstream of the Inghams discharge, but there is no evidence that the effect is significantly adverse. In terms of effects on the Waiheka Stream, other ecological indexes show a moderate decrease in the score immediately downstream of the discharge (Site DRB), but a recovery further downstream at DR2 and DRC, which could be related to the increase in periphyton at DRB, or could be from other factors.

I have not recommended any specific consent limits for DRP, other than indirectly through the annual TP load limit, which is to be capped at present levels. The large majority of the wastewater TP is DRP.

I have recommended that the annual stream surveys continue, including measurement of PEI. Should it become apparent in the future that periphyton growths caused by Inghams do cause a significant adverse effect on the stream, then the s128 review condition provides a mechanism to correct the situation.

#### **8.2.16 Compensation Enhancement and Offset Mitigation**

Condition 35 of the river discharge consent requires Inghams to contribute \$45,000 every three year period as compensation for the residual effects of the discharge of nutrients to the Waiheka Stream. The financial contribution is for environmental enhancement works, and may include retirement of pastoral farmland, riparian planting, wetland development, aquatic habitat improvement, or amenity improvements. Inghams is to provide an Environmental Enhancement Plan for each 3 year period, for Council certification. Inghams is to consult with Ngati Haua, Department of Conservation and Fish & Game during development of the 3-yearly plan.

Conditions 36 and 37 set out offset mitigation requirements. These two conditions provide a mechanism whereby Inghams may implement offset mitigation to achieve the annual nutrient load limits required by conditions 5 and 6. Conditions 36 and 37 underwent considerable discussion during development. Fish & Game in particular held concerns that conditions 36 & 37 could be used to degrade the WWTP performance, and in response to this, condition 14 was re-worded to ensure that the WWTP effluent quality pre-2016 was maintained.

Bill Vant pointed out in his technical review of the stream discharge, the annual nitrogen load of about 3 tonne/yr is equivalent to that leached from a 160 ha dairy farm, and retirement of a small dairy farm may well be a more cost effective option than a \$10M WWTP upgrade.

For Condition 36(iii), it is not clear how the "best available science" will be utilised by Council and Inghams to agree on the N or P load equivalent of the offset mitigation, or how well this can be recorded by both parties when assessing compliance with the N & P load limits in conditions 5 and 6. Nevertheless there is a large body of science relating to the likely leaching from different land uses, and I am confident that good decisions can be made.

To give an indication of the types of offset mitigation which might occur, Condition 36(ii) states that *“Qualifying works may include but are not necessarily limited to: retirement of pastoral farmland, riparian planting and fencing and edge of field mitigations including detention bunds and wetlands.”*

There was discussion amongst Inghams, Fish & Game and Council staff whether the offset mitigation work should be certified or approved by Council. While the Environment Court has expressed concerns about Councils reserving the right to approve plans, the alternative, “certification (acting in a technical capacity)” raised uncertainties. I consider that any offset mitigation, where a project might prevent 1.0 tonne/yr of nitrogen from entering the catchment, and therefore allowing Inghams to discharge an extra tonne of nitrogen to the Waiheke Stream, is a more fundamental decision than certification of a Management Plan, and does need a higher level of Council “approval”. It is not a case of ticking boxes or certifying. There may be a need for Council to consult with key submitters or iwi to ensure that they are comfortable with the proposed mitigation. The legal counsel for Inghams proposed the phrase “the consent holder shall demonstrate to Council’s satisfaction that the qualifying works are in accordance with the process set out in condition 37 and the general principals below”; this “approval” method was acceptable to all parties.

#### **8.2.17 Section 107 RMA restrictions**

Section 107(1) states that a consent authority shall not grant a discharge permit, if, after reasonable mixing, the contaminant or water discharged is likely to give rise to all or any of the following effects in the receiving waters:

- (c) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:
- (d) Any conspicuous change in the colour or visual clarity:
- (e) Any emission of objectionable odour:
- (f) The rendering of freshwater unsuitable for consumption by farm animals:
- (g) Any significant adverse effects on aquatic life.

The stream discharge has well treated, has minimal colour, low concentration of suspended solids, and in my opinion will not cause any of the above effects.

#### **8.2.18 Cumulative effects other discharges**

The Fonterra Waitoa dairy factory and the Wallace Corporation animal processing factory are located nearby within the Waitoa River catchment. The discharges from these factories are much higher than that of Inghams. River discharges for these two industries were re-consented in the last two years, and in doing so, the cumulative effects of all three industries was taken into account. Cumulative effects are presumed to have been assessed as acceptable overall. As long as the Inghams discharge quality or contaminant loads remain much the same as at present, then the cumulative assessment remains valid.

#### **8.2.19 Response to submitters’ concerns**

The Waikato District Health Board concerns have been met, and WDHB does not wish to be heard (see sections 6.1 and 8.2.14 of this Hearing Report for details).

Fish & Game NZ concerns have been met, and F&G does not wish to be heard (see sections 6.1 and 8.2.16 of this Hearing Report for more details).

A neighbour, B & S Dickey, submitted that their bore water continue to be monitored for nitrate and E coli. Inghams agreed to the monitoring, and it was included in the consent conditions (condition 22 of the land irrigation consent).The Dickeys did not wish to be heard.

## 8.3 Discharge to land

### 8.3.1 Soils and available area

Inghams has identified that additional land will be required for irrigation if the expansion proceeds. The existing irrigation area is approximately 191 hectares, of which 38 ha is owned by Inghams, and 153 ha of adjacent farm land is owned by Lyndhurst farms Ltd. Inghams has secured access to another 159 ha of Lyndhurst Farms Ltd land.

The existing irrigation area is low-lying, and the predominant soil type is Waitoa silt loam, which tends to have poor drainage, and is not well suited for wastewater irrigation. The additional farm land contains a range of soil type, including Te Puninga silt loam, Kereone silt loam, Waihou silt loam and Waitoa silt loam, but overall has a higher water infiltration rate, and is better suited for wastewater irrigation.

Figure 5 of the AEE (p16) provides a map of soil types at the existing and proposed irrigation areas. As a broad generalisation, the pink areas shown in the map have better soil permeability than the blue areas.

### 8.3.2 Hydraulic application rate

Inghams proposes to continue irrigation at a maximum hourly rate of 10 mm, and 30 mm/day. The AEE (Appendix 1, Land Treatment, section 3.4.1) provided a table with hydraulic conductivity test results for the existing area, since 2006. The results indicate that for some parts of the farm, an application rate of 10 mm/hr would exceed the ability of the soil to absorb it, and surface runoff would be likely. No runoff to surface water has been reported by Lyndhurst farms, Inghams or WRC monitoring officers, but can be difficult to detect.

Table 4: Summary of Geometric mean of Near-Saturated Hydraulic Conductivity ( $K_{40}$ )							
Transect	2006	2008	2011	2012	2013	2014	2015
Inghams Tp	15	52	4	5.7	9.9	11.2	1.3
Inghams Wt	8	42	12	na	12.2	20.8	2.0
Mulgrew	1	63	7	9.6	2.7	2.9	7.9
Hallets	9	16	5	17.1	4.9	12.6	1.5
Henderson	na	na	na	12.7	11.5	4.7	11.6

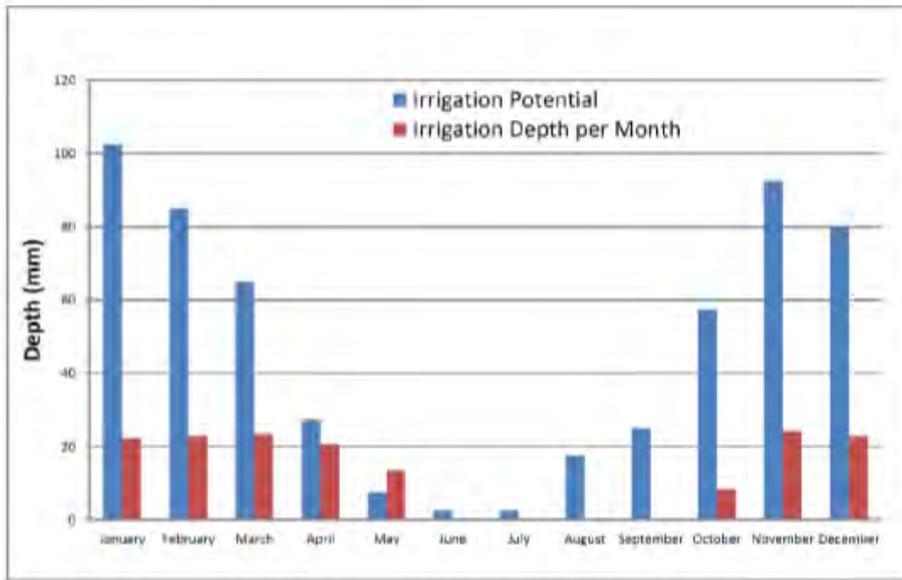
Notes:

1. All units are in mm/hr;
2. Data obtained from the Landcare Research Investigation into Hydraulic Conductivity 2015;
3. na = not assessed.

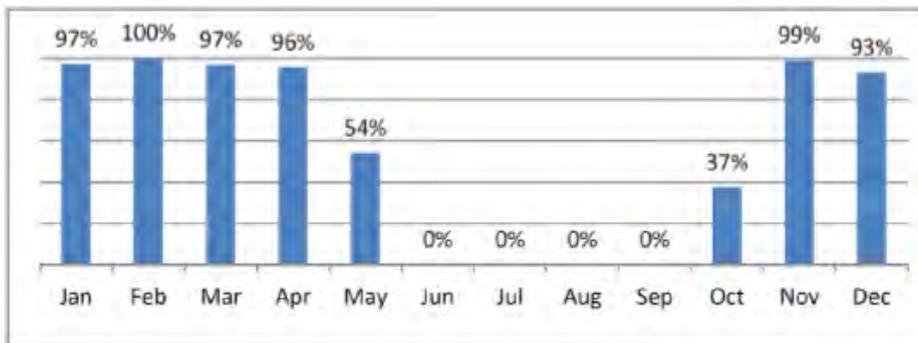
Hydraulic conductivity tests were not provided by Inghams for the new 159 hectares but, given the soil types, are expected to be higher than 10 mm/hr.

The technical report by WRC soil scientist Matthew Taylor (doc#9487751) commented that irrigation on the existing soils should not occur in the wetter months of the year to avoid saturation of the gley soils.

Figures 12 & 13 of the AEE show the irrigation potential (in terms of soil moisture deficiency, and depth of wastewater applied) and percentage of wastewater irrigated to land, per month.



**Figure 12: Monthly Actual and Maximum Potential Irrigation Depths.**



**Figure 13: Percentage of Generated Wastewater Irrigated to Land.**

Inghams proposes conditions which allow the company to discharge to the Waiheka Stream during the months of June to August, when the rainfall in the last 24 hours is higher than 25 mm, and when the Waiheka Stream flow is higher than 525 L/s. These set of circumstances correspond highly with the percentage irrigation data in Figure 13 (AEE).

In terms of days discharged to the stream, it has been about 100-120 days per year for the last 6 years, and days applied to land have been about 140-160 each year. This is based on a 5-day working week, but if this changes to a 6- or 7-day working week, the number of days discharged to land and the stream may increase proportionally.

My recommendation is that the application rates proposed by Inghams be granted, in conjunction with the standard consent conditions for irrigation consents, that there shall be no runoff to surface water, and no significant ponding.

### 8.3.3 Nitrogen application rate and N leaching

The nitrogen application rate of wastewater onto the existing area is low, typically less than 40 kg N/ha/yr. For instance, in the 2014/15 year, with a TN concentration of about 11 ppm, a land discharge volume of 330,000 m<sup>3</sup>, and an available area of 191 hectares, the overall application rate was about 19 kg N/ha/yr. Lyndhurst Farms Ltd also adds another 100 – 130 kg N/ha of fertiliser.

There are five monitoring bores in the irrigated farm area, of which 2 record background groundwater quality, and 3 downgradient effects. Table 15 of the AEE, page 58 summarises the effects of the irrigation (and farm activities). While there are noticeable increases in conductivity, calcium, magnesium, potassium, chloride and sulphate downgradient, there is only a marginal increase in TN.

The large majority of the irrigation land is not owned by Inghams, and the Overseer nutrient modelling provided in the AEE indicated that the background farm nitrogen leaching rate is at about 65-70 kg N/ha/yr, or “about twice what is expected for a well-run dairy farm” according to Dr Taylor. This situation is not supportive of intensive irrigation of industrial wastewater as well. The modelling indicates that the wastewater irrigation adds another 5 kg N/ha/yr to the leaching. However Dr Taylor also notes that expansion onto the new irrigation land would reduce overall N leaching to about 35-38 kg N/ha/yr.

Notwithstanding this high leaching, the groundwater monitoring bores indicate relatively low nitrogen in the shallow groundwater, and there appears to be a possibility that some, if not the majority, of the leached nitrogen is removed before it is able to seep to the Waiheka Stream.

Inghams proposes a consent limit of 150 kg N/ha/yr, to include the treated wastewater, dairy shed effluent, and any other permitted/consented waste. The existing consent 108877 has a limit of 200 kg N/ha/yr, but includes fertiliser.

Given the low concentration of nitrogen in the wastewater, and the low contribution to leaching, I consider that the N limits proposed by Inghams are low risk, and should be granted.

**8.3.4 Phosphorus application rate**

The wastewater adds about 54 kg P/ha/yr, and the irrigated soil has Olsen P values about 3-4x normal dairy farm levels. However, the farm soils have moderate to high phosphorus retention, and DRP concentrations in the groundwater is low.

Although the AEE suggests that the DRP concentration doubles downgradient, from 0.01 to 0.02 ppm, I consider that this is likely to be an over-simplification of the irrigation effect, and the actual effect of the wastewater irrigation to be much less pronounced. The graph below shows groundwater monitoring in the Lyndhurst Farm in the 2015/16 year (from the Inghams Annual Report, wrdoc#9193910), and the two bores with the highest DRP on average were Bores 1 & 3, both of which are upgradient or control bores.

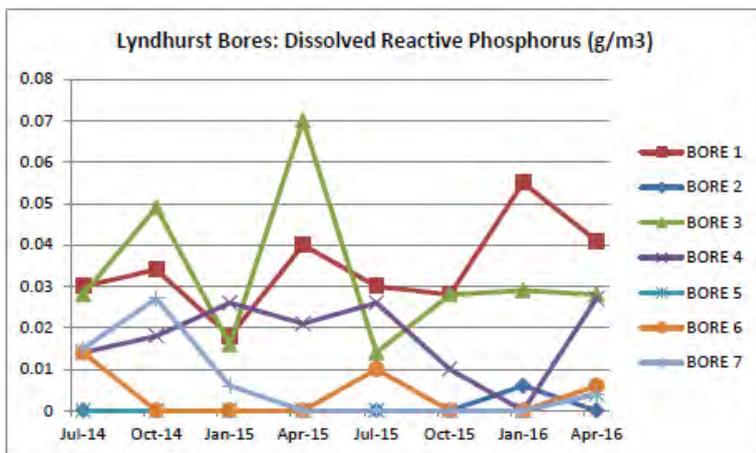


Figure 12-15: DRP trends of the bores

For phosphorus, surface runoff and sediment loss are more important factors causing increase in phosphorus in nearby waterways. Dr Taylor has recommended standard conditions such as buffer zones to waterways, prevention of ponding, and cessation of irrigation in wet weather to reduce P losses.

**8.3.5 Sodium, SAR and ESP**

The wastewater typically adds about 400 kg sodium per hectare, per year, which is far in excess of any agricultural requirement. The wastewater sodium absorption ratio (SAR) is about 15 on average, and the AEE (Appendix 1, pages 24-25) comments that with active soil management such as addition of gypsum or lime, the excessive sodium load is unlikely to cause soil damage.

The AEE Appendix 1 recommended that exchangeable sodium percentage (ESP) was a key soil monitoring parameter, and that if the ESP was kept between 2-7% then soil structural issues would not be expected, but *“if soil monitoring indicates ESP levels increasing towards 10% then the frequency of gypsum addition may need to be increased.”* Dr Taylor also commented that this was a key matter, and I have drafted a consent condition requiring action be taken by Inghams within 1 month of them becoming aware that soil ESP exceeded 10%.

**8.3.6 Other irrigation issues**

Potassium: The AEE Appendix 1 p25 notes that there is a relatively high potassium load applied through the wastewater irrigation, and that as a result, magnesium supplements may be necessary for dairy cattle to minimise the risk of hypomagnesemia. The exchangeable potassium percentage (EPP) monitoring indicates levels ranging from 2-7% *“which is below where (soil) structural issues could be expected”*.

Stock withholding times: I have recommended a stock with holding period of 7 days after wastewater irrigation and 14 days for any biomass application. The purpose of the former is to provide some time for the paddocks to recover, and is not intended for stock health as the wastewater has been UV treated and not expected to contain pathogens. The biomass has not been disinfected.

Heavy metals: The AEE Appendix 1 commented that heavy metals such as copper, zinc, cadmium & nickel are very low in the wastewater, and that soil monitoring of the irrigated area indicated that they are present only in low concentrations, well below guideline levels.

**8.3.7 Relationship with the river discharge consent**

While discharge to land all year round would be desirable, in terms of minimising effects in the Waiheka Stream, it is not practicable, and at present Inghams must discharge some wastewater to the stream. The discharge pattern is shown below, and is relatively stable.

Year (to June)	Days discharged to river each year	Days irrigated each year
2009/10	86	168
2010/11	122	144
2011/12	112	142
2012/13	105	148
2013/14	104	152
2014/15	95	156
2015/16	105	150
<b>Average</b>	<b>104</b>	<b>151</b>

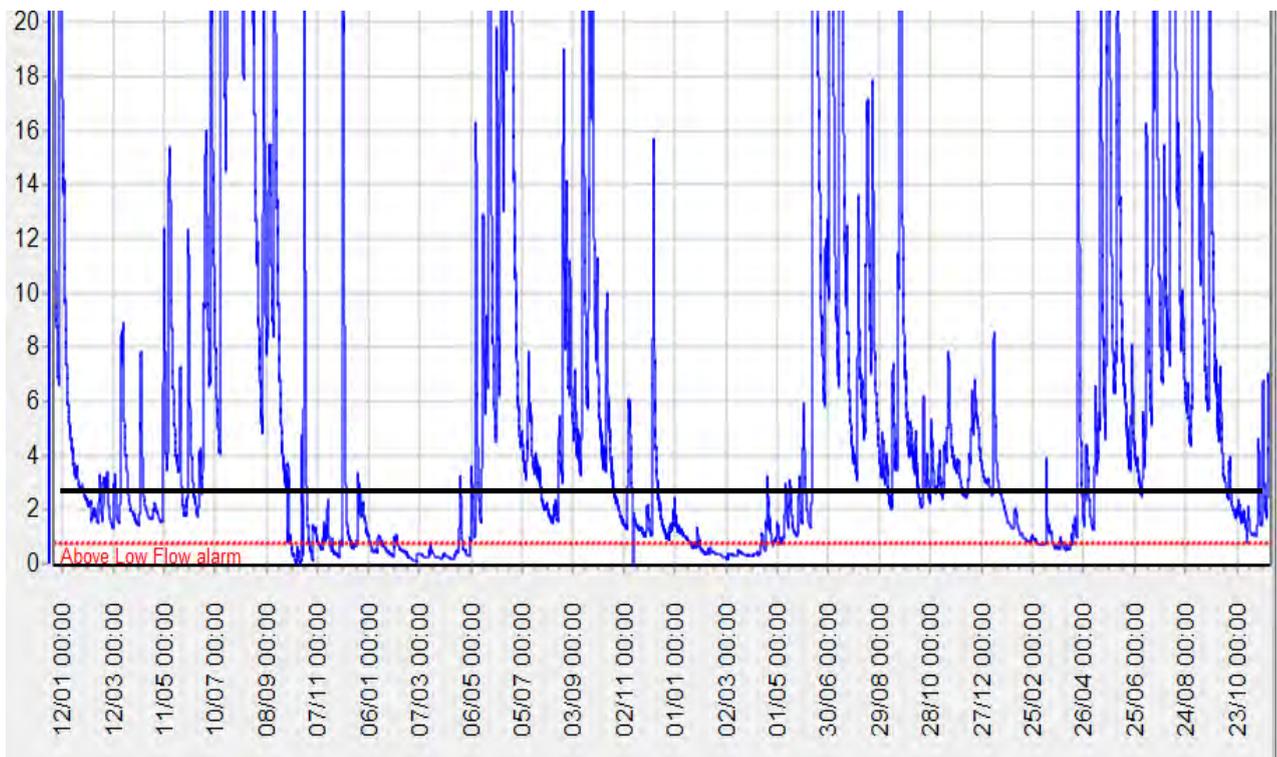
It seems likely that the land discharge has low value to the farm owner, other than as water during the drier months of the year, and there must be tension at times between the two parties at other times. Nevertheless this ratio (land irrigated about 59% of the time) is not too dissimilar from the nearby Wallace Corporation site, which also has a wastewater disposal scheme of land irrigation in summer and river discharge in winter, and achieves about 67% of the annual wastewater is irrigated. Wallace Corporation owns the land on which it irrigates.

The existing consent 108880 allows Inghams to discharge to the stream as a contingency whenever the stream flow exceeds 525 L/s (about median flow). Consent 108880 does not provide Inghams the right to cease land irrigation in the months of June-July-August-September, but river flows during those months are almost always above 525 L/s. In the months of May and October there is some land irrigation and some stream discharge. Figure 13 of the AEE (and reproduced above in section 8.3.2) shows this discharge pattern. The river flow for the Waitoa River at the Mellon Rd flow gauge is provided below, for the period January 2012 to December 2015. Also shown on the graph is the proposed flow trigger of 2750 L/s at Mellons Rd, which is considered to be equivalent to a flow of 525 L/s in the Waiheke Stream. The graph indicates that most years there are only the odd days when the stream flow is less than 525 L/s, in the months of June-July-August.

Inghams has proposed that the wastewater be discharged to the Waiheke Stream under the following circumstances:

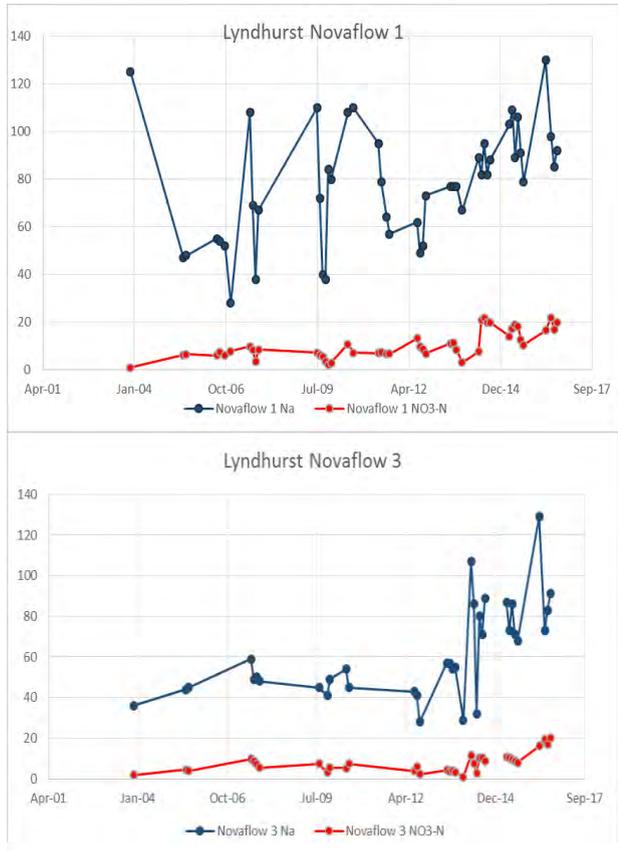
- In the months of June-July-August, no matter what the stream flow.
- At other times, if the Waiheke Stream flow exceeds 525 L/s
- If there has been more than 25 mm rainfall in the 24 hours preceding irrigation.
- If the state of the irrigation farm indicates that irrigation would be harmful to the farm, such as excessive pugging or ponding.
- Unavoidable equipment failure which prevents irrigation.

I concur with this set of conditions, which is broadly similar to that which occurs in practice at present.



### 8.3.8 Novaflow drains

Consent 110161 condition 27 requires monitoring of two “subsurface drains” called Novaflow 1 and Novaflow 3, at three-monthly intervals, for conductivity, nitrate-N, ammoniacal-N and sodium. The conductivity and sodium in particular are seen to be key indicators of the irrigated wastewater; for instance sodium is about 240 ppm in the effluent, but about 10 ppm typically in background surface water or groundwater upgradient of the irrigation. The ammoniacal-N concentrations have remained low in both Novaflow drains.



The results of the sodium and nitrate-N monitoring since 2003 is shown above. Both parameters in both novaflow drain sites have shown an increasing trend since monitoring began. It is not clear whether the increase in nitrate is due to the effluent irrigation or farming practices, but the increase in sodium is likely to be related to Ingham’s effluent irrigation.

My recommendation is that the novaflow monitoring continues at a monthly frequency, where there is a flow, for conductivity, sodium, ammoniacal-N and nitrate-N.

### 8.3.9 Groundwater monitoring

There are 7 groundwater monitoring bores on the Mulgrew Farm and 6 groundwater monitoring bores on the Inghams land. The locations of these bores is shown in Figure 6 of the AEE. Additional monitoring bores are required for the proposed new irrigation areas (see Figure 4 of AEE). Inghams have not proposed specific locations for these bores, as the new irrigation areas may be developed over several decades. However there is agreement between WRC and Inghams that the density of bores will be:

- One control or upgradient bore per 100 ha
- One bore within the irrigated area per 25 ha
  - Of these, at least 2 bores in the new area between the Waipuna Stream and west of Seddon Rd.

- At least 2 bores in the new land between Waiheka Rd and to the east of Chudleigh Rd.
- At least 4 bore in the area to the east of Seddon Rd and to the north of Waiheka rd.

Consent 110161 requires monitoring of two neighbouring bores, located at 392 and 418 Ngarua Rd. The former property is owned by B & S Dickey who submitted that their groundwater bore should continue to be monitored. I consider that this is a reasonable request, and have included conditions to this effect.

### **8.3.10 Health concerns**

The wastewater is extensively treated, including UV disinfection, before land application. The AEE (Table 8, p33) states that the median E coli level is less than 1.0 cfu/100mls, with a range of <1 to 921. The proposed irrigation conditions include buffers to neighbouring houses of 150m, and to stream and boundaries of 10m. The proposed limit for E coli in the treated wastewater is a 95th percentile of 500 cfu/100mls. I consider that these standard buffer zones and very low E coli levels are adequate to protect the public.

### **8.3.11 Surface water monitoring**

The existing consent does not require monthly monitoring of the Waiheka Stream during the irrigation season, and I have recommended at least four grab samples be taken in the period October to May, at upstream site URA, and downstream site DRC, and tested for conductivity, sodium, ammoniacal-N, nitrate-N and total phosphorus.

The new irrigation land to the east of Seddon Rd drains down to the Piraunui Stream, and I have recommended that two tributaries on this new land be monitored at the same frequency and same parameters. The two locations, PT1 and PT2 should have some pre-irrigation testing of these drains, and I have recommended a minimum of 4 samples be taken in the 12 months preceding commencement of irrigation, at three monthly intervals.

Monitoring of the two novaflow drains should continue, as outlined in section 8.3.8 above.

### **8.3.12 Other irrigation consent conditions**

I consider the consent should include standard conditions for irrigation consents, such as:

- No runoff to surface water or beyond the boundary
- No ponding for more than 24 hours
- No spraydrift or objectionable odour beyond the boundary
- Buffers to boundaries, roads, neighbouring houses.
- Preparation of an Irrigation Management Plan which addresses key matters:
  - A comprehensive description of the disposal area, disposal methods and equipment;
  - On-site responsibilities, including operation and maintenance of the transfer pipeline to the site, and record-keeping;
  - Management responses to wind speed and direction, or rainfall on the site;
  - Contingency measures in place to deal with unusual events including spills;
  - Routine inspections and monitoring by the consent holder, including farm drains;
  - Hydraulic application rates (particularly in relation to rain), rotation periods and nutrient loadings;
  - Procedures and precautions to prevent emission of offensive odours, or spraydrift beyond the boundary;

- Circumstances in which irrigation will be initiated and in which irrigation will cease.
  - Description of progressive remediation measures to be taken by the consent holder when the soil ESP exceeds 5%, in terms of tonnes of lime or gypsum or equivalent material to be added per hectare, for each of the major soil types found on the farms.
- Complaints procedures
  - Monitoring of soil, groundwater, effluent quality, provision of an annual report
  - Annual nutrient budget
  - Section 128 RMA Review

A high voltage power line crosses part of the new irrigation area. Powerco has often submitted on other irrigation consents where high voltage lines cross irrigation farms, and has recommended the following condition and advice note be included in the irrigation consent:

- The consent holder shall take all practicable measures to avoid or minimise spray or spray drift onto (electricity) support structures so that any discharges of wastewater or biosolids from irrigation and spreading activities do not create a hazard or nuisance to the electricity distribution lines.
- Advice Note: All machinery, mobile plant and irrigation systems will need to maintain a minimum clearance distance of 4 metres from the electricity line conductors at all times. Please refer to NZECP 34:2001 for further details about safe distances of mobile plant from conductors.

## 9 Policy Statements, Plans and Regulations

### 9.1.1 National environmental standards

As of June 2010 there are five NESs that have come into effect - the National Environmental Standards for Air Quality (where various standards have been in effect since October 2004); Sources of Human Drinking Water; Electricity Transmission Activities; Telecommunication Facilities; and Soil Contamination.

NES Air Quality – not relevant to the Inghams consent applications.

#### NES for Sources of Human Drinking Water

The NES regulations require that a regional council must not grant a water or discharge permit for an activity that will occur upstream of a drinking water abstraction point if specific criteria at the point of abstraction are exceeded. The matters to be considered as part of an assessment are dependent on the permit being sought and the level of effects on any drinking water supplier located downstream or down gradient of the activity.

Under this regulation a regional council may also impose a condition of consent on any resource consent application requiring the consent holder to notify, as soon as reasonably practical, the registered drinking-water supply operators and the regional council if the activity leads to an event that, or as a consequence of an event, results in a significant adverse effect on the quality of the water at the abstraction point.

There are no public drinking water supplies downstream of Inghams, therefore no assessment under the NES is required.

It is possible that individual landowners downstream of Inghams may abstract the river water for their household use. The Waiheke Stream is not fit for human consumption without further treatment. There is no reason to consider that the Inghams discharge renders the river unfit for treatment at present.

#### NES Electricity Transmission Activities 2009

A high voltage transmission line transects part of the Lyndhurst farm, located to the east of Seddon Road. As a result, Inghams must comply with the NES for Electricity Transmission Activities by maintaining safe distances from the power lines. A standard condition to this effect has been included in the irrigation consent.

NES Telecommunications – not relevant to the Inghams consent applications.

#### NES for Assessing and Managing Contaminants in Soil 2011

The NES –AMCS requires Councils (particularly district councils) to ensure that contaminants in soil are adequately addressed when soil disturbance, soil sampling, or subdivision of land occurs. There is no proposed change of the site use, and therefore the NES does not apply. The Inghams site is assumed to be a contaminated site, in terms of the NES definition. The irrigation areas, both present and proposed, are not considered to be contaminated land and the NES does not apply.

## **9.1.2 National policy statements**

### **9.1.2.1 NZ Coastal Policy Statement**

The discharge is to the Waiheke Stream, and then to the Waitoa River, although the effects of the discharge continue to the Firth of Thames. The discharge has relatively minor effects on Firth of Thames, adding about 0.2% of the total nutrient load. My recommended consent conditions include measures to maintain the existing Inghams nutrient load. However even if the Inghams discharges ceased, it would make no discernible difference to the water quality or ecology within the Firth of Thames, and the 0.2% improvement in nutrient loads potentially negated within a year by increases in nutrients overall from non-point sources within the Firth catchments. No controls exist at present for those non-point sources of N & P.

I have not assessed the Inghams discharge in terms of the NPS Coastal Policy Statement, as I consider that the Inghams discharge has less than minor adverse effects on the Firth of Thames.

### **9.1.2.2 National Policy Statement - Freshwater Management 2014**

The NPS-FM 2014 came into effect on 1 August 2014. The policy statement sets out objectives and policies that direct local government to manage water in an integrated and sustainable way while providing for economic growth within set water quantity and quality limits. These objectives and policies aim to provide for managing land use and development activities that affect water so that growth is achieved with a lower environmental footprint. The NPS-FW 2014 is a Section 104(1)(b) RMA matter, that is, Council must have regard to the provisions of the NPS-FW2014.

The relevant sections of the NPS-FM 2014 are:

#### **A. Water quality**

##### **Objective A1**

*To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the use and development of land, and of discharges of contaminants.*

Comment: It is important to note that the NPS-FM 2014 requires regional councils to set water quality standards for various surface waters, and that many of the objectives and policies apply to the region as a whole, not to a point discharge into an individual river.

In terms of Objective A1, WRC water scientist B Vant considers that the Waiheke Stream should have a 90% species protection, and I am confident that the proposed consent conditions for the Inghams wastewater discharge to the Waiheke Stream will largely safeguard the life-supporting capacity, ecosystem processes and indigenous species, at the 90% protection level.

#### **Objective A2**

*The overall quality of fresh water within a region is maintained or improved while:*

- a) protecting the quality of outstanding freshwater bodies*
- b) protecting the significant values of wetlands and*
- c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

Comment: The objective applies region-wide, and does not provide specific policy for a point discharge. The Waiheke Stream is over-allocated, and the NPS-FM states that the water quality should be improved in that situation, but it is to be achieved by the Waikato Regional Council making or changing regional plans. There are no attribute states proposed for the Waiheke Stream or the Waitoa River at present

#### **Policy A4**

*By Regional Councils amending Regional Plans such that:*

- (1) When considering any application for a discharge the consent authority must have regard to the following matters:
  - a. The extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water and*
  - b. The extent to which it is feasible and dependable that any more than minor adverse effects on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.**
- (2) When considering any application for a discharge the consent authority must have regard to the following matters:
  - a. The extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their secondary contact with fresh water; and*
  - b. The extent to which it is feasible and dependable that any more than minor adverse effect of the health of people and communities as affected by their secondary contact with fresh water resulting from the discharge would be avoided.**
- (3) This policy applies to the following discharges:
  - a. A new discharge or*
  - b. A change or increase in any discharge – of any contaminant into fresh water.**
- (4) Paragraph 1 of this policy does not apply to any application for consent first lodged before the NPS-FW 2011 took effect on 1 July 2011.*
- (5) Paragraph 2 of this policy does not apply to any application for consent first lodged before the NPS-FW 2014 takes effect (1/8/14).*

Comment: The NPS-FM 2014 Policy A4 allows councils to put the policy into effect quickly under section 55 RMA, without going through the normal Schedule 1 RMA procedures. WRC has not amended the WRP yet, and published timetable includes a proposed Plan by 2018, and operative Plan by 2025. I consider that Policy A4(1) applies to the Inghams application - the application includes some changes to the existing discharge, including an increase in discharge volume, although contaminant loads remain generally unchanged. My assessment is that

Policy A4 does apply to the Inghams application, I have had regard to the requirements of Policy A4(1) & A4(2), and consider that the proposed consent conditions are consistent with Policy A4 of the NPS-FM.

***Water quality appendices:***

The NPSFM 2014 includes water attribute tables (Appendix 2) which set out the proposed water quality for different levels of protection (e.g 95% species protection). For rivers, these standards include periphyton, nitrate, ammonia, dissolved oxygen and E coli. The proposed standards have not been set by Council yet, and do not apply to the Inghams application. However it is likely that water quality standards will be set by WRC within several years of granting the Inghams river discharge consent, and provision needs to be made for reviewing the conditions in light of any standards which are stricter than the conditions granted.

### **9.1.3 Regional Policy Statement**

The RPS is a high-level broad-based document containing objectives and policies the purpose of which is to provide an overview of the resource management issues of the region and to achieve integrated management of the natural and physical resources of the Region. Council's RPS became operative in 2016. Relevant objectives and policies are set out below:

**Objective 3.10: Air quality**

Avoid adverse effects on local amenity values including from particulate matter, smoke, odour and dust, and recognizing that it is appropriate that some areas will have a different amenity level to others.

Comment: the key air emission of concern to neighbours is odour from the wastewater irrigation. The treated wastewater has low odour, and objectionable odour effects beyond the boundary are not expected. The proposed consent conditions will ensure that odour is minimised. There have been no odour complaints related to the existing irrigation for many years.

**Objective 3.12: Mauri and health of marine waters**

Maintain or enhance the mauri and identified values of marine waters

Comment: The Inghams wastewater discharges contribute to the nitrogen and phosphorus load in the Firth of Thames. The health of the Firth depends on nitrogen loads being at least maintained, and preferably lowered. The proposed consent conditions maintain N & P loads from the Inghams discharge at present levels.

**Objective 3.13: Mauri and values of fresh water bodies:**

Maintain or enhance the mauri and identified values of fresh water bodies.

Comment: The proposed consent conditions will maintain the existing mauri and values of the Waiheke Stream.

**Objective 3.15: Riparian areas and wetlands**

Increase the extent and quality of riparian areas and wetlands.

Comment: Inghams has an existing riparian improvement plan, albeit minor.

**Objective 3.20: Amenity**

Amenity maintained or enhanced in areas.

Comment: Inghams has not proposed any changes to the wastewater discharges which would affect amenity.

**Objective 3.24: Soil values**

The soil resource is managed to safeguard its life supporting capacity, for the existing and foreseeable range of uses.

Comment: The wastewater discharge has occurred for approximately 12 years now, and has not affected normal agricultural or horticultural uses of the Inghams or Lyndhurst farms. I consider that the continued irrigation of wastewater will not affect soil values, or foreseeable uses of the soil.

**Policy 8.3: All fresh water bodies:**

Manage the effects of activities to maintain or enhance the identified values of fresh water bodies and coastal water including by:

- a) Reducing sediment in fresh water bodies that is derived from human based activities, microbial and nutrient contamination, and other identified contaminants, and
- b) Where appropriate, protection and enhancement of riparian and wetland habitat, instream habitat diversity, and indigenous biodiversity, and
- c) Providing for the migratory patterns of indigenous freshwater species, and
- d) Avoiding physical modification of fresh water bodies, and
- e) Managing groundwater and surface water flow regimes, and pest and weed species where they contribute to fresh water degradation.

Comment: The wastewater loads discharged to the Waiheke Stream will be improved for some contaminants (SS, BOD) and maintained for others (ammonia, N, P).

#### **9.1.4 Regional Plan**

The Waikato Regional Plan (“WRP”) is operative. The purpose of regional plans is to help the Council carry out its functions under s30 of the RMA. Section 104(1)(b)(iv) RMA requires that the Council must have regard to the Plan’s objectives, policies and rules when assessing consent applications. WRP objectives, policies, and implementation methods which I consider relevant to the WCL activities are:

- 3.1.2 – Objective (Management of water bodies)
- 3.2.3 – Policy 1: Management of Water Bodies
- 3.2.3 – Policy 2: Managing Degraded Water Bodies
- 3.2.3 – Policy 4: Waikato Region Surface Water Class
- 3.2.3 – Policy 5: Natural State Water Class
- 3.2.3 – Policy 6: Contact Recreation Water Class
- 3.2.3 – Policy 7: Fishery Class
- 3.2.3 - Policy 8: Reasonable mixing
- 3.2.4.1 – Water Management Classes
- 3.2.4.2 – Waikato Region Surface Water Class Standards
- 3.2.4.4 – Contact Recreation Water Class
- 3.2.4.5 – Fishery Class – a. Significant Indigenous Fisheries and Fish Habitat
- 3.5.2 – Discharges – objective
- 3.5.3 – Discharges – Policies
- 5.2.2 – Discharges onto land – Objective
- 5.2.2 – Discharges onto land - Policies

**WRP Section 3.1.2** sets out Council’s objectives regarding management of water bodies. Relevant objectives for this application are:

- People able to take and use water for their social, economic and cultural wellbeing.
- Net improvement of water quality across the Region.
- Avoidance of significant adverse effects on aquatic ecosystems.
- The range of foreseeable uses of ground and surface water are protected.
- Significant effects on the relationship tangata whenua have with the water are avoided.

- Concentrations of contaminants leaching from land use activities.... to shallow ground water and surface waters do not reach levels that present significant risks to human health or aquatic ecosystems.

Comment: The “net improvement of water quality” is a region-wide objective, and is not intended to strictly apply to any particular point discharge or to any particular stream. It does not imply that there must be an improvement in the receiving water every time an existing consent comes up for renewal. However the objective of “net improvement” will not be achieved unless point discharges are improved where practicable, and the most appropriate time to achieve any improvement is during a consent renewal. The key focus of Objective 3.1.2 is to avoid significant adverse effects, and in that sense “avoid” means prevent, not discourage, since it is derived from s107 RMA.

In terms of the irrigation, adverse effects on the Waiheke Stream from leaching of nitrates and other contaminants from the WCL activities appears to be not significant. For the direct river discharge, I consider that there are no significant adverse effects from the Inghams discharge.

**WRP Section 3.2.3** sets out the policies describing how water resources are to be managed, in accordance with the objectives of section 3.1.2. Relevant policies include:

Policy 1 (Management of Water Bodies)

- (b) Maintaining overall water quality in areas where it is high, and in other water bodies avoiding, remedying or mitigating cumulative degradation of water quality from the effects of resource use activities.
- (c) Enhancing the quality of degraded waterbodies.

Policy 2 (Managing Degraded Water Bodies)

- (a)(i) For activities controlled by rules in the Plan, discharges to water shall not further degrade water quality with respect to those parameters of the relevant classes for that water body that are not currently met.
- (a)(ii) Land-based treatment systems will be promoted where soil type and drainage allow, and where adverse effects are less than the adverse effects of direct discharges into water.

Policy 8 (Reasonable mixing)

The zone of reasonable mixing is the area within which a discharge into water (including any discharge that occurs subsequent to a discharge onto or into land) does not need to achieve the standards specified in the water management class for the receiving water body. The size of the mixing zone must be minimised as far as is practicable and will be determined on a case-by-case basis, including consideration of the following matters:

- a. The nature of the effluent, including its flow rate, composition and contaminant concentrations.
- b. River flow rate and flow characteristics.
- c. The design of the outfall.
- d. The depth, velocity and rate of mixing in the receiving water body.
- e. Existing contaminant concentrations in the receiving water body both upstream and downstream of the discharge point and the assimilative capacity of the water body.
- f. The frequency of the discharge.
- g. The speed with which any contaminants will be diluted.
- h. The ability of the discharger to alter the location of the discharge and the mixing characteristics of the outfall so as to ensure that adverse effects of the discharge beyond the zone of non-compliance are not inconsistent with the purpose for which the water body is being managed.

- i. Whether the discharger has taken all practicable steps to minimise the concentration and volume of contaminants at source.
- j. Any effects of the mixing zone on other users of the water body.
- k. The extent of adverse effects within the mixing zone.

Comment: The Waiheke Stream meets the water classification standards for Waikato Region Surface Water. The water quality is degraded in a scientific sense, but not degraded in terms of the WRP Objective 3.2.3. The Waiheke Stream is therefore considered an “other” water body, and should be managed with an objective of “avoiding, remedying or mitigating cumulative degradation of water quality from the effects of resource use activities”.

I consider that the proposed Inghams discharge will not compromise the Waikato Surface Water standards.

I provide an assessment of the reasonable mixing zone in section 8.2.4.

**WRP Section 3.2.4** sets out water classifications and standards. The Waikato Regional Plan has a number of water classes that provide statements about how water bodies are to be managed. The Waiheke Stream is the primary receiving water, however the stream then flows into the Waitoa River downstream of the site, with a Contact Recreation and Significant Indigenous Fishery & Fish Habitat Classifications. Both waterways also have a Waikato Region Surface Water Classification. To summarise the relevant requirements of these standards:

Waikato Region Surface Water standards

- No significant changes in dissolved oxygen.
- No significant changes in pH.
- No significant increase in deposition of bed sediments.
- No significant increase in undesirable biological growths.
- No increase in water temperature more than three degrees Celcius.
- No conspicuous change in visual colour or clarity.
- The discharge shall not increase the suspended solids concentration in the receiving water by more than 10 percent.
- The water shall not be tainted or contaminated so as to make it unpalatable or suitable for consumption by humans after treatment.
- The water shall not be tainted or contaminated so as to make it unsuitable for irrigation.

Indigenous Fishery standards

- Ammoniacal-nitrogen shall not exceed 0.88 g/m<sup>3</sup>.

Contact Recreation Water standards

- The black disc horizontal visibility of the water shall be greater than 1.6 m
- The median concentration of E coli through the summer bathing season shall not exceed 126 E coli per 100ml. The maximum E coli shall be 235 per 100mls.
- The waters shall not be rendered unsuitable for contact recreation activities by the presence of contaminants.
- Bacterial and/or fungal slime growth shall not be visible to the naked eye as plumose growths or mats.
- The seasonal maximum cover of stream or river beds by periphyton as filamentous growths or mats shall not exceed 40%.

**WRP Section 3.5.3** sets out Council’s expectations regarding discharges to water and effects on Tangata Whenua. Relevant policies include:

- Policy 2: Control, through resource consents, discharges to water that are likely to have more than minor adverse effects, so that the adverse effects are avoided as far as practicable and otherwise remedied or mitigated.
- Policy 3: Land-based treatment systems will be promoted where soil type and drainage will allow and where adverse effects are minor or are less than those from a direct discharge to water.
- Policy 4: Discharges to land – ensure that the discharge of contaminants to land maximises the reuse of nutrients and water contained in the discharge.
- Policy 5: Groundwater – Minimise the adverse effects of discharges onto land on groundwater quality to ensure that the existing or reasonably foreseeable uses of the groundwater is not compromised.
- Policy 6: Ensure that the relationship of tangata whenua as Kaitiaki with water is recognised and provided for.

Comment: Inghams preferentially disposes of the site wastewater onto land, with a river discharge occurring for about 40% of the year, mostly in winter and spring when the river flow is high and farm soil is wet. This preference for land-based disposal is consistent with section 3.5.3 of the WRP. I have recommended application rates of wastewater to land which will minimise groundwater contamination.

WRP Section 5.2.2 has the objective that discharges of wastes onto land be undertaken in a manner that:

- does not contaminate soil to levels that present significant risks to human health or the wider environment.
- does not have adverse effects on aquatic habitats, surface water quality or groundwater quality that are inconsistent with the Water Management objectives in Section 3.1.2.

Section 5.2.2 Policy 2 (Other discharges onto or into land) states that discharges of contaminants onto land should avoid, where practicable the following relevant effect:

- contamination of soils with hazardous substances or pathogens to levels that present a significant risk to human health or the wider environment

Comment: The irrigated farm soils are not contaminated to the extent that it presents a risk to human or stock health. The soils are not contaminated with hazardous substances.

**Summary of WRP assessment:** I consider that the activity will not be contrary to the above relevant provisions, provided that it is carried out as per the consent conditions that I have proposed.

#### **9.1.5 Regional Coastal Plan**

The Inghams discharge of treated wastewater to the Waiheka Stream is not a direct discharge to the coast, nevertheless the nutrient loads in particular contribute to the overall loads discharged into the Firth of Thames from the Waihou, Piako and Waitakaruru rivers.

There are no specific rules in the RCP relevant to a wastewater discharge into the Waiheka Stream, some 50 kilometres upstream of the coastal area. WRCP Policy 4.1.1 is to maintain or enhance water quality characteristics of coastal waters.

I consider that the Inghams discharge has only minor adverse effects on the Firth of Thames, and I have recommended consent conditions which will reduce the N & P loads discharged by Inghams when

compared with existing consent limits, and at least maintain N & P loads compared to actual discharge levels in recent years.

## **10 Other matters**

### **10.1 S104(2A) – value of investment**

Section 104(2A) RMA states that when considering an application affected by s124, the Council must have regard to the value of the investment of the existing consent holder. I consider that the applications to expand production are not covered by s124 RMA, as the existing consents are not due to expire until September 2023, and it is arguable whether a significant increase in production can be called “the same activity” under s124(1)(b).

Should the applications be declined, then Inghams may continue to operate under consents 108877, 108880 and 110161 until September 2023.

### **10.2 Consideration of alternative methods of discharge**

Under section 105 (1) RMA, since the cooling water discharge, stormwater discharge, treated wastewater discharges to land & surface water and discharge to air, are all discharges of contaminants into the environment, WRC must have regard to:

- nature of discharge & sensitivity of receiving environment
- Applicants reasons for proposed choice
- Possible alternative methods of discharge, including any other receiving environment.

In addition Schedule 4(1)(b) RMA, states that, where it is likely that an activity will result in any significant adverse effect on the environment, the AEE should include a description of any possible alternative locations or methods for undertaking the activity.

The AEE described the nature of the discharges and sensitivity of the receiving environment, and my Hearing Report provides additional assessment. In addition the AEE section 4.4, sets out Ingham’s proposed choice of discharge regime.

I consider that the preferential discharge of wastewater to land, rather than surface water, is best practice, and there is no practicable better alternative.

For the wastewater discharge to the Waiheke Stream, Inghams has an extensive wastewater treatment plant, which achieves a high treatment efficiency, and improvements are proposed by Inghams to match the increase in production, and to achieve BPO.

### **10.3 Hauraki Iwi Management Plan**

Under the RMA, WRC must have regard to the Hauraki Iwi Environmental Plan 2004 in considering the WCL applications. Relevant objectives of the HIEP are:

- Peatlands and wetlands are protected and restored as ecological, cultural and economic resources of Hauraki Whanui.
- Riparian margins of rivers and streams in the Hauraki tribal region are protected and restored.

The HIEP desires the following outcomes:

- Increased diversity of native species, habitat and ecosystems through wetland, peatland, river and stream and duneland restoration activities.
- Enhancement of the freshwater fisheries habitat.
- Restoration of wetland, river and stream plant life.
- Improved water quality.
- Increased populations of fisheries, birds and plant resources.

Comment: Inghams proposes to maintain existing water quality in general. I consider that renewal of the Inghams discharges to land and water is generally consistent with the objectives and outcomes desired by Hauraki iwi. There was no submission by iwi in response to public notification.

#### **10.4 Hauraki Gulf Marine Park Act 2000**

The Hauraki Gulf Marine Park Act 2000 provides broad statements about sustainable and integrated management of the Hauraki Gulf and the activities that occur within it. The Hauraki Gulf is an area of national importance that supports a rich ecosystem as well as providing a range of recreational and economic activities. Relevant requirements of the HGMPA are set out below:

##### **7 Recognition of national significance of Hauraki Gulf**

- (1) The interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance.
- (2) The life-supporting capacity of the environment of the Gulf and its islands includes the capacity—
  - (a) to provide for—
    - (i) the historic, traditional, cultural, and spiritual relationship of the tangata whenua of the Gulf with the Gulf and its islands; and
    - (ii) the social, economic, recreational, and cultural well-being of people and communities:
  - (b) to use the resources of the Gulf by the people and communities of the Gulf and New Zealand for economic activities and recreation:
  - (c) to maintain the soil, air, water, and ecosystems of the Gulf.

##### **8 Management of Hauraki Gulf**

To recognise the national significance of the Hauraki Gulf, its islands, and catchments, the objectives of the management of the Hauraki Gulf, its islands, and catchments are—

- (a) the protection and, where appropriate, the enhancement of the life-supporting capacity of the environment of the Hauraki Gulf, its islands, and catchments:
- (b) the protection and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments:
- (c) the protection and, where appropriate, the enhancement of those natural, historic, and physical resources (including kaimoana) of the Hauraki Gulf, its islands, and catchments with which tangata whenua have an historic, traditional, cultural, and spiritual relationship:
- (d) the protection of the cultural and historic associations of people and communities in and around the Hauraki Gulf with its natural, historic, and physical resources:
- (e) the maintenance and, where appropriate, the enhancement of the contribution of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments to the social and economic well-being of the people and communities of the Hauraki Gulf and New Zealand:
- (f) the maintenance and, where appropriate, the enhancement of the natural, historic, and physical resources of the Hauraki Gulf, its islands, and catchments, which contribute to the recreation and enjoyment of the Hauraki Gulf for the people and communities of the Hauraki Gulf and New Zealand.

In recent years NIWA and WRC science staff have expressed concerns about the increasing nutrient load discharged into the Firth of Thames, amidst uncertainties as to the effects, and whether there may be a “tipping point” in the future. Zones of low dissolved oxygen have been recorded by NIWA in

the outer Firth, which are possibly caused by accumulated phytoplankton (which in turn is related to the nutrient levels in the Firth). Inghams contributes about 0.1% N and about 0.2% P of the load discharged into the Firth. I consider that the Inghams discharge to the Waiheke Stream will have less than minor adverse effects on the Firth of Thames.

### 10.5 Sea Change marine spatial plan 2016

The Sea Change Plan – Tai Timu Tai Pari - was released in mid-December 2016. The plan aims to protect the health, productivity and sustainability of the Hauraki Gulf. According to the Sea Change website, the aim of the plan is “to give more clarity and certainty to people and groups who use the space, as well as the agencies who manage the gulf and its resources”, by providing guidance to Auckland and Waikato councils to help form policy around water quality and land use for the Piako and Waihou rivers. The plan will be non-statutory with no legally binding outcomes.

Given the uncertainty around how fully WRC may adopt the Sea Change Plan’s recommendations, timelines, and its non-statutory status, I consider that the plan’s recommendations should be given little weight when assessing the Inghams applications.

### 10.6 Ingham’s Compliance history

Inghams has had a mixed record of consent compliance, as shown in the table below. The compliance status for each year is an overall assessment for the whole Inghams site. For the 2014/15 year, the audit identified Partial Compliance for consents 108877 (irrigation onto land owned by Inghams) and 108880 (discharge to Waiheke Stream), and a High Level of Compliance for consent 110161 (irrigation onto land owned by Lyndhurst Farms Ltd). The majority of the non-compliances were related to monitoring and reporting, and Inghams generally complied with discharge limits.

Audit period	Compliance Rating
2015-2016	High level of compliance
2014-2015	Partial compliance
2013-2014	High level of compliance
2012-2013	Partial compliance
2011-2012	High level of compliance
2010-2011	High level of compliance
2009-2010	Partial compliance
2008-2009	High level of compliance
2007-2008	High level of compliance

RMA case law is that previous non-compliance is not a valid reason to decline consent, but it may be appropriate to grant consent conditions which ensure better compliance. For instance such conditions might include more extensive monitoring (to detect non-compliances earlier), compulsory auditing at regular intervals by an external reviewer, more regular reporting by Inghams, imposition of external peer reviewers, or a more tiered approach where there are ramped-up consequences for non-compliances.

Ingham’s compliance history indicates that it does react positively to non-compliance, and carries out improvements to allow compliance. I consider that there is no need for unusually strict conditions for the land irrigation or the river discharge consents, and that the consents have standard conditions as far as practicable, and consistent with similar industrial sites in the Waikato.

## 10.7 Ngati Haua cultural impact assessment (CIA)

In response to consultation with Inghams, Ngati Haua Iwi Trust prepared a Cultural Impact Assessment in December 2015. The CIA is appendix 4 of the AEE. The CIA confirms that the Inghams factory is within Ngati Haua's area of interest, is focused on the stream discharge, and states that *"the land-based discharges are considered to be inoffensive to our cultural values and are encouraged as the principal disposal method"*.

The CIA concluded that Ngati Haua Iwi Trust gives their support for the proposal on the following basis (quoted):

- *NHIT would like to continue a positive relationship with Inghams and would appreciate the opportunity to work on a MOU together;*
- *Inghams continue to seek opportunities to participate in restoration projects either on the Waiheke Stream or in the wider catchment;*
- *NHIT receive an annual results summary of the discharge quality;*
- *Inghams continues to investigate further options for land based disposal in the future.*

Items 1, 2 & 4 are not matters which I consider should be consent conditions, however it is hoped that Inghams will continue to work with NHIT on them.

Item 3 can be a consent condition, and I have included a requirement for Inghams to provide the Annual Compliance Report to NHIT.

## 10.8 Section 105 Matters

Section 105 RMA states that if an application is for a discharge permit that would contravene section 15 the consent authority must, In addition to the matters in section 104(1), have regard to:

- (a) The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- (b) The applicant's reasons for the proposed choice; and
- (c) Any possible alternative methods of discharge, including discharge into any other receiving environment.

I consider that the methods chosen by Inghams to dispose of the wastewater, mostly discharge to farm land, supplemented by discharge to the stream, is optimal for that type of wastewater. The Waiheke Stream and the farm land have low sensitivity. The AEE in sections 4.4 and 11.5 did not identify any viable alternative methods of discharge, and I concur with this assessment.

## 10.9 Relevant Part 2 Considerations

### Section 5 RMA

Section 5 states that the purpose of the Resource Management Act 1991 is to promote the sustainable management of natural and physical resources. For the Inghams applications, relevant requirements of section 5 include safeguarding the life-supporting capacity of the Waitoa River, the farm soils, and local air quality, while avoiding, remedying, or mitigating any adverse effects of the various discharges.

Section 5 also requires Waikato Regional Council to protect natural resources in a way which enables people and communities to provide for their economic and cultural well-being, and for their health and safety. In the context of this consent application, Inghams is a significant employer in the area and contributor to the economic well-being of the local community. The poultry processing plant also has a significant role in supporting the chicken rearing industry in the Waikato. I consider that the discharges do not compromise cultural expectations, or render the Waiheke Stream unsafe for drinking water abstraction.

### Section 6 RMA

There are no matters of national importance such as protection of outstanding natural features, protection of significant habitats, or maintenance of public access, which are relevant to this consent application. The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga, has been recognised and has been discussed elsewhere in this report.

#### Section 7 RMA

Section 7 sets out those matters which Waikato Regional Council shall have particular regard to, when assessing this consent application. Matters of relevance to the WCL application include kaitiakitanga, maintenance and enhancement of amenity values (including prevention of objectionable odour), intrinsic values of ecosystems, maintenance and enhancement of the quality of the environment and protection of the habitat of trout or salmon. The Waiheke Stream is not a significant trout fishery. The Waitoa River downstream of the Waiheke Stream has a Contact Recreation classification. I consider that I have had particular regard to these matters, as discussed elsewhere in this report.

#### Section 8 RMA

Section 8 states that Waikato Regional Council shall take into account the principles of the Treaty of Waitangi. It is a principle of the Treaty that decision-makers such as Environment Waikato must, in order to act in good faith, make informed decisions based on all the relevant information about the interests of Maori. This will usually, but not invariably, require consultation with iwi.

Local iwi were provided an opportunity to make a submission and the applicant has carried out consultation with them.

In a general sense, the interests of the wider iwi community has been taken into account by an assessment of the effect of the effluent discharges on the Waiheke Stream and Hauraki Gulf. I have taken the Hauraki Iwi Environmental Plan 2004 into account in preparing this Hearing Report.

## **11 Recommendation, Discussion and Term**

The two consent applications have been assessed as discretionary activities under s104B RMA. My recommendation is that both are granted, subject to the consent conditions that I have proposed.

The two activities are complementary, in that Inghams discharges the treated wastewater to land in summer, and to the Waiheke Stream in winter. Both consents are required for Inghams to operate.

Inghams does not own the majority of the irrigation land, and given that the irrigated effluent contains minimal nutrients, the land owner is likely to view the irrigation as a benefit only when there is a soil water deficiency. To clarify this point, the majority of the irrigation land is operated primarily as a dairy farm, with some wastewater irrigated as a secondary activity. It is not clear to Council staff how much control Inghams has over when wastewater is irrigated, and when it is not irrigated.

When consent 108880 (treated wastewater discharge to the Waiheke Stream) was granted in 2003 Council envisaged that it would be a contingency activity, to supplement the irrigation consent, and possibly occurring about 5-20 times each year. Subsequently, Inghams sought several s127 changes (2009, 2013) to authorise a larger number of days each year on which the stream discharge might occur. These were granted by Council, and Inghams discharges to the stream about 100-110 days each year. Another s127 change granted in 2009 decreased the minimum stream flow for which a wastewater discharge might occur from 760 L/s to 525 L/s (for the winter period only). The 2016 application from Inghams proposed that the base flow of 525 L/s be removed as a consent condition.

The Council has a strong preference for land disposal, compared to the stream disposal, and this preference is shared by iwi, and the public in general. I have considered consent conditions which require Inghams to increase the percentage of time that irrigation occurs, but foresee difficulties in achieving this in practice. The focus therefore falls back on the stream discharge, and the possibility that sometimes the discharge will occur when the stream flow is minor, or when the upstream water quality is poor. The consent conditions for the stream discharge must be protective, and must ensure that the proposed increase in production by Inghams does not impact on the stream ecology or water quality.

The company has proposed to upgrade the WWTP by 2028, but their expansion plan includes a steady increase in nutrient loads until then, beyond what they have discharged in recent years. Even after the WWTP upgrade it seems clear that the future nitrogen load in particular may be greater than in 2017, although this is balanced by a potential decrease in phosphorus loads.

WRC scientist Bill Vant has recommended that nitrogen loads into Hauraki rivers should not increase, in order to protect the Firth of Thames and the wider Hauraki Gulf. My recommendation is that the present nutrient loads are capped. I have recommended that this is achieved by way of a 7-year rolling average of 3000 kg/yr nitrogen and 500 kg/yr phosphorus.

While a 5 day per week processing regime is in place at present (although the effluent volume is spread over 6 days per week to keep within the existing 2400 m<sup>3</sup>/d limit), there is no guarantee that this will be the case for the rest of the consent term. It is possible for instance that the present weekly volume nearly doubles from 14,400 m<sup>3</sup> (2400 m<sup>3</sup>/d x 6) to 28,000 m<sup>3</sup> (4000 m<sup>3</sup>/d x 7). The present discharge loads from the Inghams plant appear to have only minor adverse effects on the Waiheke Stream and the Firth of Thames, but for this situation to persist there must be a cap on existing loads for key parameters such as TN, TP and BOD. Concentration limits on key parameters such as ammonia, nitrate and BOD also need to be imposed.

There are no policies, plans, or national environmental standards which would prevent the grant of the consents.

**Term:**

Inghams requested a term of 35 years, and implied that the expansion would be placed at risk if such a long term was granted. This argument has little weight, as the company did not apply to renew the remaining consents (air discharge, stormwater discharge, groundwater take) on which it equally relies on to operate the plant. These consents expire in November 2032.

I have recommended a term of 25 years which is generally consistent with similar discharge consents (Fonterra, Wallace Corporation, Silver Fern Farms) granted by Council in the last few years in the Hauraki catchment.

In my opinion there are likely to be substantial changes to the planning regime, and public expectations, applicable to the Hauraki catchment, and the Firth of Thames in the next few decades. The proposed consent conditions enable a Section 128 RMA review in the event of new rules and regulations, however the outcome of a s128 review is uncertain, and s128 reviews to date have been rare. In contrast, a consent renewal process provides an opportunity for the public to participate, and regulations/policies/plans current at the time to be given effect.

To reinforce this point, it should be noted that in 2003 when existing consents 108877 and 108880 were granted, it was assessed under the Transitional Plan and Proposed Regional Plan (1998), the NPS-FM 2014 did not exist, the Hauraki Iwi Environmental Plan did not exist, the Waiheke Stream had better water quality, dairying was less intense in the catchment, and the deleterious impact on nitrogen on the Firth of Thames water quality was largely unknown. Although consents 108877 and

108880 have standard s128 review conditions, they have not been exercised during the consent term, and WRC has a record of only rarely exercising this option.

## 12 Appendices

Schedule 1 – land irrigation  
Schedule 2 – river discharge

## 13 Delegated authority approval

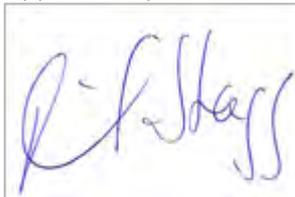
Under the Procedural Delegations Manual, wrdoc#4068255, Section 10.2.1 (f), decisions on applications where the applicant and parties making submissions agree on the conditions or where no parties wish to be heard, may be made by the Team Leader, Industry and Infrastructure.



**Barry Campbell**  
Senior Resource Officer  
Resource Use Directorate

**Date: 14 August 2017**

Approved by



**David Stagg**  
Team leader, Industry.

**Date: 14 August 2017**

# Appendix 1: AUTH1327282.01 Discharge treated wastewater to land Consent conditions.

**Term: 25 years**

## Definitions

For the purposes of this consent, the following definitions apply.

<b>Term</b>	<b>Definition</b>
Authorised Irrigation area	<p>Areas on which wastewater and/or biomass can be irrigated pursuant to this consent, as shown indicatively on the map in Schedule One of this resource consent, being approximately 500 hectares, and comprising the following property titles:</p> <ol style="list-style-type: none"> <li>1 Section 19 Block IV Maungakawa SD</li> <li>2 Lot 2 DP 446379</li> <li>3 Part Section 14 Block IV Maungakawa SD</li> <li>4 Section 12 Block IV Maungakawa SD</li> <li>5 Section 13 Block IV Maungakawa SD</li> <li>6 Lot 1 DPS 8929</li> <li>7 Part Lot 2 DPS 8929</li> <li>8 Lot 7 DP 23161</li> <li>9 Lot 8 DP23161</li> <li>10 Lot 9 DP23161</li> <li>11 Section 28 Block IV Maungakawa SD</li> <li>12 Lot 2 DP 473506</li> <li>13 Lot 2 DP 317288</li> <li>14 Lot 3 DP 7322</li> <li>15 Part Lot 4 DP7322</li> <li>16 Lot 3 DP 394754</li> <li>17 Section 3 SO 432231</li> <li>18 Lot 3 DP 394754</li> <li>19 Waihekeau 4B Block</li> </ol>
Certified (or Certification)	In relation to a Management Plan or Monitoring Plan: means that the Council has certified that the Management Plan or Monitoring Plan contains all information specified in the relevant condition(s) and that the Management Plan or Monitoring Plan meets all the requirements set out in the conditions of the resource consent.
Council	Waikato Regional Council
IPENZ	Institute of Professional Engineers New Zealand
Irrigation area	<p>In terms of compliance with Condition 4, the irrigated area is taken to be the total area (hectares) of the paddocks in which irrigation is undertaken based on:</p> <ol style="list-style-type: none"> <li>i) If greater than 80% of the paddock area is wetted then the irrigated area is taken to be the total paddock area.</li> <li>ii) If less than 80% of the paddock area is irrigated the irrigated area is taken to be</li> </ol>

the percentage (on a pro-rata basis) of the total paddock area. For example if 50% only of a paddock is wetted the irrigated area is 50% of the paddock area.

Irrigation dose	The depth of irrigation in millimetres over any one 24-hour period.
Irrigation event	In relation to wastewater irrigation: An irrigation dose, or two or more irrigation doses within one rotation period.
Irrigation rate	The rate of irrigation in millimetres per hour.
Irrigation season	Commences on 1 July and ends on 30 June of the following year.
Nitrogen Leaching rate	The annual mass load nitrogen leaching rate for the Irrigation Area.
Overseer parameter report	A report prepared by a suitably qualified person for the purposes of estimating the nitrogen leaching rate or the farm nutrient budget
Rotation period	The start of one irrigation event to the start of the next, for any particular paddock.
Significant ponding	Where wastewater or dairy liquids remain on the surface, over any one area of 10 square metres or more, after 24 hours of being irrigated.
Treated wastewater	<p>Treated wastewater is those materials sourced from the Inghams poultry processing site's wastewater treatment plant, which when applied at the quantities authorised by the conditions of this consent have beneficial effects on plant growth. Treated wastewater includes:</p> <ul style="list-style-type: none"> <li>i. Final effluent from the wastewater treatment plant;</li> <li>ii. Associated waste activated sludge and/or pond solids (settled solids from the balance lagoon), which singularly or in combination is termed "biomass".</li> </ul> <p>"Biomass" is the body of micro-organisms that decompose the organic matter in the wastewater.</p>
Year, yearly, annual, annually	Shall all be the period of the dairy season being from 1 July of one year to 30 June inclusive of the following year

1	Except as specifically provided for by other conditions of this consent, all activities to which this consent relates shall be undertaken generally in accordance with the information contained in the application for this consent titled "Inghams Enterprises (NZ) PTY Limited, Discharged of wastewater to land and water from the Te Aroha Poultry Processing Plant, Resource consent applications forms and Assessment of Environmental Effects, August 2016", received by Council 5 September 2016, wrcdoc#9055668. If there is any inconsistency between the application and any consent condition, then the consent condition shall prevail.
2	<p>The consent holder shall give priority to the discharge of treated wastewater to land authorised by this consent, over the discharge of treated wastewater directly to the Waiheka Stream authorised by AUTH1327282.02. In particular, the wastewater shall not be discharged to the Waiheka Stream unless land disposal of the wastewater is not practicable, and shall only occur as a contingency discharge. Reasons that are acceptable to the Council for a contingency discharge are:</p> <ul style="list-style-type: none"> <li>(i) The soil is saturated and pugging or ponding or runoff of wastewater to surface water is likely to occur; or</li> <li>(ii) Operational improvements on the irrigation farm, including resowing or ripping, which affects a substantial proportion of the irrigation areas and which</li> </ul>

	<p>significantly restricts the ability of the consent holder to irrigate the wastewater; or</p> <p>(iii) Unavoidable equipment failure which prevents irrigation; or</p> <p>(iv) The Waiheka Stream flow exceeds 525 L/s.</p> <p>The wastewater may be discharged to the Waiheka Stream during other circumstances with the prior written approval of the Waikato Regional Council.</p> <p>For the purpose of this consent circumstances in which contingency 2(i) shall be deemed to be met include, but are not limited to:</p> <p>(a) Days where there has been more than 25mm rain within the 24 hour preceding period at the consent holder's rain station.</p> <p>(b) Days during the months of June to August inclusive.</p> <p>For the purposes of this consent condition, a flow of 525 L/s in the Waiheka Stream at the discharge point is equivalent to a flow of 2,750 L/s at the Mellon Road flow gauge. However this condition does not restrict in any way the consent holder installing a flow gauge on the Waiheka Stream (subject to any resource consents that may be required for the flow gauge structure), should the consent holder prefer a more direct method to measure the stream flow.</p>
3	The maximum volume of treated wastewater and biomass applied to the irrigation area shall not exceed 4000 cubic metres per day.
4	<p>The nitrogen loading rate to land in any irrigation season, from application of treated wastewater, biomass, dairy farm effluent, and any other waste material containing nitrogen, shall not exceed a total of 150 kilograms of nitrogen per hectare per year (kgN/ha/yr).</p> <p>Compliance with the nitrogen loads limit shall be assessed on a per paddock basis. The wastewater shall be spread as evenly as practicable in each paddock.</p> <p>Advice Note: This consent does not authorise, and this condition does not limit, the application of nitrogen based fertiliser to the irrigation area. The application of fertiliser must be in accordance with the rules in the relevant regional plan.</p>
5	<p>The wastewater hydraulic application rates shall not exceed the following:</p> <p>a) A maximum of 10 millimetres per hour; and</p> <p>b) A maximum of 30 millimetres per day, and shall be reduced as required to minimise the potential for soil saturation or run-off.</p>
6	Stock shall not be present on any paddock which has been irrigated with wastewater until at least 7 days after the irrigation event, and for at least 14 days after irrigation with biomass.
7	<p>The rotation period for wastewater irrigation on any paddock shall not be less than 14 days. The rotation period may be reduced with written approval from Council if it is required during adverse weather conditions, or during a period of dry weather to prevent hydrophobicity of the soil.</p>
8	<p>Irrigation shall not be carried out within:</p> <p>(a) 10 metres of any surface water body.</p> <p>(b) 50 metres of any property boundary or public road. The distance to a property boundary may be reduced with the written agreement of the property owner or occupier.</p> <p>(c) 50 metres of any groundwater abstraction bore.</p> <p>(d) 150 metres of any residential dwelling when irrigating treated wastewater, unless the written agreement of the occupier has been obtained.</p> <p>(e) 300 metres of any residential dwelling when irrigating combined biosolids and treated wastewater, unless the written agreement of the occupier has been obtained.</p>

	<p>(f) 300 metres of schools, marae, community halls, or residential zones.</p> <p>The distances referred to above are the distances that the irrigated material falls on the ground, and not the position of the irrigator.</p>
8	There shall be no significant ponding of wastewater on the irrigated area. For the purpose of this consent, significant ponding is deemed to occur if wastewater remains on an area of more than 10 square metres, 24 hours after being irrigated.
10	Irrigation of wastewater shall be with equipment such that aerosols and spray drift are minimised, and there shall be no detectable spray drift beyond the boundaries of the property.
11	<p>There shall be no overland flow of wastewater to any neighbouring property, flowing watercourse, drainage ditch, or permanent pond.</p> <p>Where there has been an irrigation incident where contamination of a drain or waterway has occurred, the consent holder shall:</p> <ol style="list-style-type: none"> <li>a) Advise the Waikato Regional Council as soon as practicable, but no later than 24 hours of the incident;</li> <li>b) Record details of the date and time of the incident;</li> <li>c) Record details of where the spill went, potentially affected persons and whether they have been contacted;</li> <li>d) Record any remedial work that is going to be undertaken;</li> <li>e) Record any actions to be undertaken to prevent a reoccurrence; and</li> <li>f) Provide a written report including the above details and records to the Waikato Regional Council within 5 working days of the incident.</li> </ol>
12	There shall be no odour as a result of the activities authorised by this resource consent that causes an objectionable or offensive effect beyond the boundary of the site.
13	<p>Should an emission of odour occur that has an objectionable or offensive effect, the consent holder shall provide a written report to the Waikato Regional Council within five days of being notified by the Waikato Regional Council. The report shall specify:</p> <ol style="list-style-type: none"> <li>(a) The cause or likely cause of the event and any factors that influenced its severity.</li> <li>(b) The nature and timing of any measures implemented by the consent holder to avoid, remedy or mitigate any adverse effects.</li> <li>(c) The action to be taken in future to prevent recurrence of similar events.</li> </ol>
14	<p>The wastewater shall be UV treated or treated in an equivalent disinfection unit prior to irrigation, such that the concentration of <i>E coli</i> in the irrigated wastewater shall not exceed 500 cfu per 100 mLs as a 95<sup>th</sup> percentile in any year. It is acknowledged that biomass or pond solids cannot be UV disinfected.</p> <p>Note: chemical (for example chlorine) disinfection shall not be used unless an effects assessment has been provided to the Waikato Regional Council, which approves the chemical disinfection method in writing prior to use. In providing approval, the Waikato Regional Council shall assess equivalence with UV disinfection in terms of <i>E coli</i> reduction in concentration, and environmental effects from chemical residuals.</p>
15	<p>The consent holder shall maintain the soil's natural infiltration capacity and structure. In particular, the irrigation of wastewater or biomass or other materials shall not result in an exchangeable sodium percentage (ESP) of the soil to exceed 10%. If the ESP exceeds 10%,</p>

	<p>action to remedy the elevated ESP shall be undertaken within one month of the consent holder becoming aware of the elevated ESP.</p> <p>Note: Action by the consent holder to remedy elevated ESP is likely to commence at a lower ESP, as set out in the Irrigation Management Plan, and as a guide is likely to commence at approximately 3-5% ESP.</p>
16	<p>Where there is evidence of pugging or ponding as a result of the application of treated wastewater or biomass, the Council may, with written notice, direct irrigation to cease. Approval to recommence irrigation will not be given until the soil has recovered to an infiltration capacity of at least 5 mm/hour. Evidence of the soil infiltration capacity recovery may be by visual assessment unless Council directs in writing that infiltration testing is required.</p> <p>The visual assessment must be undertaken by a person with the qualifications and/or expertise in soil science or soil infiltration rates, and that person shall provide a written report to Council confirming (or not) that the soil infiltration rate at least is 5 mm/hour.</p>
17	<p>Wastewater stored prior to irrigation shall be aerated, if necessary, to ensure that dissolved oxygen levels are maintained above 1.0 gram per cubic metre and that there are no objectionable odours when the stored wastewater is irrigated.</p>
18	<p>The consent holder shall implement best practicable options to minimise phosphorus losses via overland runoff from the irrigation area. Mitigation options shall include but not be limited to:</p> <ol style="list-style-type: none"> <li>a) Livestock shall be excluded from all perennial streams and riparian management areas;</li> <li>b) Riparian fencing to exclude livestock shall be a minimum of 3 metres from the edge of the waterway;</li> <li>c) Riparian management;</li> <li>d) Sediment detention bunds, where appropriate;</li> <li>e) Sedimentation catchpits off farm races, where appropriate.</li> </ol> <p>A report on proposed actions to minimise phosphorus losses, with location maps for all riparian areas, detention bunds and catchpits, shall be provided to Council within 6 months of commencement of this consent, and shall be implemented within 18 months. The mitigation measures shall be maintained over the term of the consent.</p>
	<p><b>Monitoring</b></p>
19	<p>The consent holder shall characterise the irrigated wastewater as follows:</p> <p><u>Daily:</u> Volume irrigated, in cubic metres per day;</p> <p><u>Weekly:</u> Total nitrogen, total phosphorus and electrical conductivity;</p> <p><u>Monthly:</u> pH, sodium, chloride, ammoniacal-nitrogen, E coli, 5-day carbonaceous Biochemical Oxygen Demand.</p> <p>Wastewater sampling frequency and tests may be amended after four years with the written approval of the Waikato Regional Council.</p>
20	<p>The irrigated topsoil shall be sampled annually within the active irrigation area and tested for saturated hydraulic conductivity, pH, Olsen P, potassium, calcium, magnesium, sodium, cation exchange capacity, exchangeable sodium percentage, and available nitrogen (kg/ha). Representative soil core samples shall be taken from the soil to make 10 composite samples, of at least 4 composite samples from Waitoa Gley, 2 composites from Te Puninga Loam, 2 composites from Kereone Loam, 1 composite from Waihou-Waitoa soil, and 1 composite from Waihou-Te Puninga soil (if the respective soil types have been irrigated within the annual monitoring period). The general location of the soils types is set out in Schedule 4.</p>

	<p>All soils test subsamples shall be collected at a core depth of 0-15 cm. The sampling shall occur in the months of June to August, and shall be collected using standard soil sampling procedures and in appropriate laboratory supplied containers or sample bags. The locations from which samples are collected shall have their GPS coordinates recorded and any subsequent annual sampling shall also be collected from these general locations.</p> <p>The saturated hydraulic conductivity tests shall be carried out on at least 10 sites within the active irrigation area with at least 4 tests of Waitoa Gley areas, 2 tests of Te Puninga Loam areas, 2 test of Kereone Loam, 1 test of Waihou-Waitoa mixture and 1 test of Waihou-Te Puninga mixture (if the respective soil types form part of the area irrigated with wastewater, within the annual monitoring period).</p>
21	<p>Groundwater effects monitoring shall be undertaken to assess the effects of the wastewater irrigation on groundwater. To this end, “Lyndhurst” bores 1 to 7, and “Inghams” bores 1 to 5 shall be sampled quarterly each year, generally in January, April, July, and October, and tested for depth to groundwater, pH, electrical conductivity, sodium, nitrate-N, total Kjeldahl nitrogen, dissolved reactive phosphorus, sulphate, chloride and <i>E coli</i>.</p> <p>In addition the consent holder shall install additional groundwater monitoring bores in the new irrigation areas prior to commencement of irrigation, in accordance with the following:</p> <ul style="list-style-type: none"> <li>(a) There shall be at least one control site upstream of the active irrigation area (per 100 ha of active irrigation area);</li> <li>(b) At least one bore per 25 hectares of active irrigation area in suitable locations to account for the groundwater flow that would intercept the active irrigated area, including: <ul style="list-style-type: none"> <li>i. At least two bores in Lot 2 DP 473506 (being in general, that land between the Waipuna Stream and Seddon Road);</li> <li>ii. At least 2 bores in Section 3 SO432231 (being in general, land to the south of Waiheka Rd and east of Chudleigh Road);</li> <li>iii. At least 4 bores in the area which includes Lot 2 DP3172888, Lot 3 DP7322, PT Lot 4 DP7322 and Waiheka 4B Block (being in general, land to the east of Seddon Road and north of Waiheka Road);</li> </ul> </li> <li>(c) The locations of the bores shall be agreed with the Waikato Regional Council prior to installation.</li> </ul> <p>The additional monitoring bores shall be sampled/tested as per monitoring regime for the 12 existing bores listed above.</p> <p>In addition, the consent holder shall monitor the neighbouring bore located at 392 Ngarua Road, by sampling twice yearly to correspond with the early summer low and winter high water table, generally in December and July, and tested for pH, electrical conductivity, nitrate-N, sodium, chloride and <i>E coli</i>. Access to the property shall at all times be with the permission of the property owner and/or occupier, and bore monitoring shall cease if requested by the property owner and/or occupier.</p>
22	<p>The consent holder shall take grab samples from the Waiheka Stream at upstream location URA, downstream location DRC, and if irrigation has commenced on land east of Seddon Road or Chudleigh Road the tributary of the Piraunui at locations PT1 and PT2, to determine any changes in water quality as a result of the irrigation. The sampling shall occur at least four times each season, between the months of October to May, and each sampling round shall be at least four weeks since the previous sampling round. The samples shall be tested for conductivity, sodium, ammoniacal-N, nitrate-N and total phosphorus.</p>

	<p>In addition at least four quarterly samples shall be taken from PT1 and PT2 before commencement of irrigation.</p> <p>Sampling locations URA, DRC, PT1 and PT2 are shown in Schedules 2 and 3 of this consent.</p>
23	<p>The consent holder shall take four grab samples each year, one in each three month period throughout the year, from the following subsurface drain outlets, if those outlets have a discharge to surface water in that 3-month period, and test for electrical conductivity, nitrate-N, ammoniacal-N, dissolved reactive phosphorus and sodium. The subsurface drain outlets are:</p> <ul style="list-style-type: none"> <li>(a) Novaflow 1: (as identified in Schedule 2 of this consent).</li> <li>(b) Novaflow 3: (as identified in Schedule 2 of this consent).</li> </ul>
24	<p>All sample analyses shall be undertaken in accordance with the methods detailed in the most recent edition of the "Standard Methods for the Examination of Water and Wastewater" by A.P.H.A. and A.W.W.A. and W.P.C.F. or any other method approved in advance by the Waikato Regional Council.</p>
<b>Irrigation Management Plan</b>	
25	<p>The consent holder shall provide to the Waikato Regional Council for certification an Irrigation Management Plan which details the procedures that will be implemented to operate in accordance with conditions of this resource consent. This plan shall be lodged with Waikato Regional Council within six months following the granting of this consent and shall be reviewed and updated as a minimum every three years thereafter. Any changes to the plan shall be confirmed in writing by the consent holder following consultation with the Waikato Regional Council. The plan shall address but not be limited to:</p> <ul style="list-style-type: none"> <li>a) A comprehensive description of the disposal area, disposal methods and equipment;</li> <li>b) On-site responsibilities, including operation and maintenance of the transfer pipeline to the site, and record-keeping;</li> <li>c) Management responses to wind speed and direction, or rainfall on the site;</li> <li>d) Contingency measures in place to deal with unusual events including spills;</li> <li>e) Routine inspections and monitoring by the consent holder, including farm drains;</li> <li>f) Hydraulic application rates (particularly in relation to rain), rotation periods and nutrient loadings;</li> <li>g) Procedures and precautions to prevent emission of offensive odours, or spraydrift beyond the boundary;</li> <li>h) Circumstances in which irrigation will be initiated and in which irrigation will cease.</li> <li>i) Description of progressive remediation measures to be taken by the consent holder when the soil ESP exceeds 5%, in terms of tonnes of lime or gypsum or equivalent material to be added per hectare, for each of the major soil types found on the farms.</li> </ul> <p>Certification means that the Council review the IMP for its approval in a technical capacity that it meets all the requirements set out in the conditions of this resource consent. Except where the Council provides notice in writing that it refuses to certify the IMP, then should certification not be provided within 20 working days, the Consent Holder shall regard the relevant IMP as being deemed to have been certified.</p> <p>Subject to any other conditions of this consent the IMP shall be implemented and all activities shall be undertaken in accordance with the latest revision of the IMP</p>
26	<p>Where liquid effluents or biomass irrigation occurs on land crossed by high-voltage transmission lines, the consent holder shall ensure that the spray discharge will not directly</p>

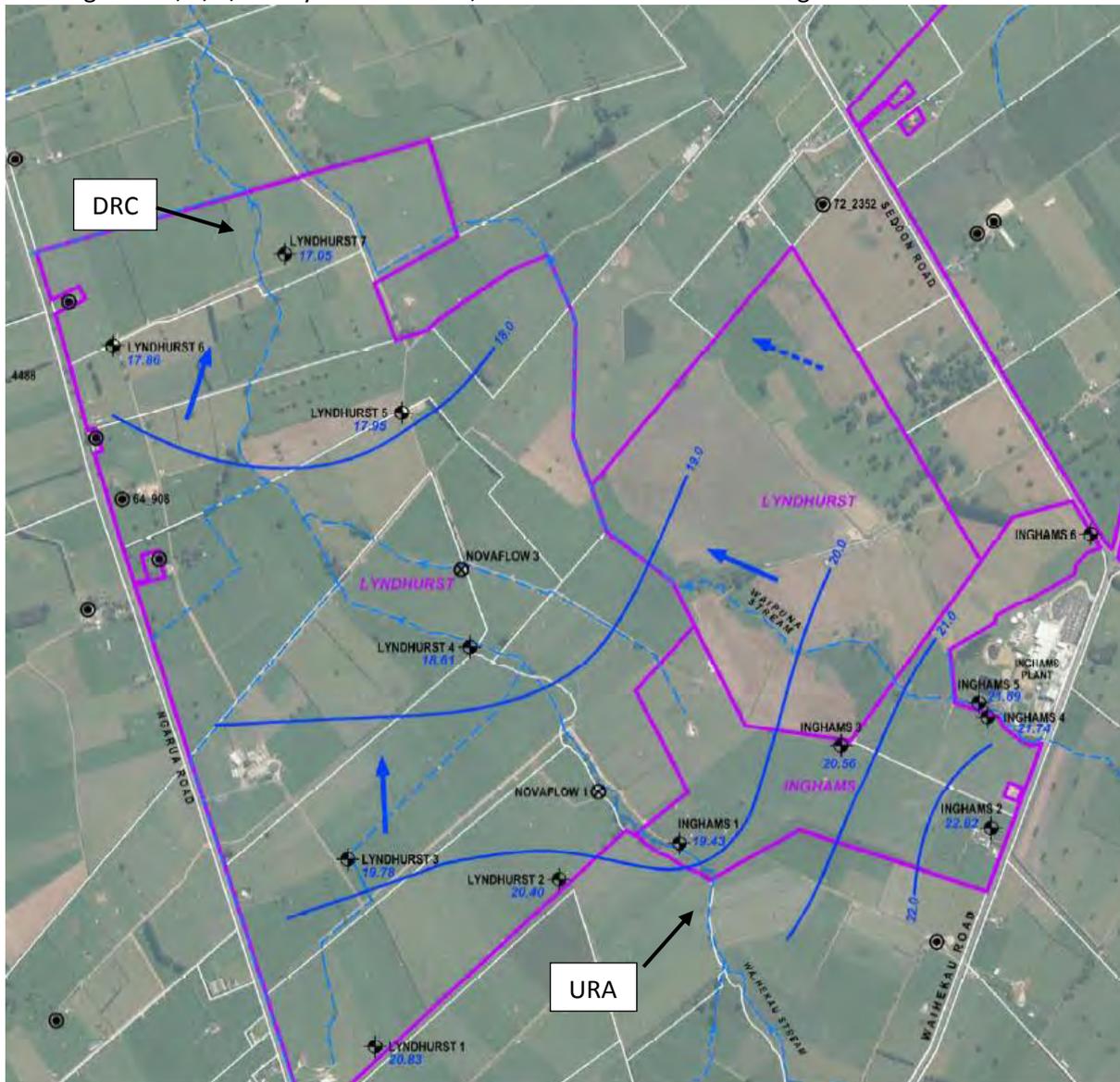
	<p>contact the transmission lines or support structures, and shall take all practicable measures to avoid or minimise spray or spray drift onto (electricity) support structures or electricity distribution lines. To this end:</p> <ol style="list-style-type: none"> <li>a) All equipment and/or mobile plant on site shall maintain a clearance distance of at least 4 metres from the transmission line conductors at all times in accordance with Section 5.2.1 of the NZ Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001).</li> <li>b) In addition to (a), for truck or tractor spreading application, a 4 metre clearance distance shall be maintained between any mobile plant and the footing of any tower and pole base.</li> <li>c) For travelling irrigator or pod application methods, equipment shall be located and operated so that a 10 metre buffer distance (no spray zone) is maintained at all times. The buffer distance shall apply 5 metres either side of the centre line drawn directly underneath the transmission lines.</li> </ol> <p><b>Advice Note 1:</b> <i>Any conductive fence (even wooden fences can be conductive when wet) close to a National Grid support structure (pole or tower) or running basically parallel to a transmission line may need to be earthed and/or insulated to manage the potential for electrical hazards.</i></p> <p><b>Advice Note 2:</b> <i>Please refer to NZECP 34:2001 for further details about safe distances of mobile plant from conductors.</i></p>
27	<p>The consent holder shall maintain and keep a complaints register for complaints received by the consent holder about all aspects of operations at the site. The register shall record:</p> <ol style="list-style-type: none"> <li>a) The date, time and duration of the incident that has resulted in a complaint.</li> <li>b) The location of the complainant when the incident was detected.</li> <li>c) The possible cause of the incident.</li> <li>d) Any corrective action undertaken by the consent holder in response to the complaint.</li> </ol>
28	<p>The complaints register shall be available to the Waikato Regional Council at all reasonable times. Complaints received by the consent holder which may indicate non-compliance with the conditions of this resource consent shall be forwarded to the Waikato Regional Council within 5 days of the complaint being received. The complaint information provided to the Waikato Regional Council shall include all information recorded in accordance with condition 27 above. Details of all other complaints shall be forwarded to the Waikato Regional Council on a monthly basis.</p>
	<p><b>Reporting</b></p>
29	<p>All monitoring results as required under this consent shall be forwarded to the Waikato Regional Council at monthly intervals.</p>
30	<p>The consent holder shall maintain a map of the irrigated farms that identifies individual paddocks and soil types, and shall keep records of the dates of irrigation of the Ingham's Te Aroha plant wastewater or biosolids onto each paddock. The records shall include daily rainfall, flowmeter readings, pump hours, paddocks irrigated, number of hours irrigated, number of runs, irrigator speed setting, total number of tanker loads per paddock per day, and volume of biosolids applied per paddock per day. These records shall be made available to the Waikato Regional Council staff or agents at all reasonable times and shall be forwarded to the Waikato Regional Council by 1st September each year, in accordance with Condition 31.</p>
31	<p>The consent holder shall forward to the Waikato Regional Council by 1<sup>st</sup> September each year an Annual Report which shall provide:</p> <ol style="list-style-type: none"> <li>a) Annual loads (kg/ha/yr) of nitrogen, phosphorus, potassium, and sodium applied to</li> </ol>

	<p>any irrigated paddocks.</p> <p>b) Annual volume of effluent applied to any irrigated paddocks, including application rates in mm/day.</p> <p>c) Details of any incident or equipment failure which caused a breach of any condition in this consent, and improvements to prevent any similar event occurring in the future.</p> <p>d) Details of any complaints regarding irrigation, and action taken in response.</p> <p>e) Results of the groundwater and soil testing.</p> <p>f) Comparison of annual nutrient application with that anticipated by the nutrient budget for that year that was provided to the Waikato Regional Council in accordance with condition 32, and the reasons for any variance with the anticipated budget.</p> <p>The annual monitoring period shall be from 1 July to 30 June the following year.</p> <p>In addition the consent holder shall provide a copy of the Annual Report to Ngati Haua Iwi Trust by 1<sup>st</sup> September.</p>
32	<p>The Consent Holder shall provide to Waikato Regional Council by 31 July each year an anticipated nutrient management budget for each farm (that is, for the whole farm) in which there is wastewater irrigation for the following year. The nutrient management budget shall be based on the outputs of either Overseer or any other nutrient management planning tool that meets the following criteria:</p> <p>a) Be a Crown Research Institute, University or Industry developed model that has successfully completed commercial trials commensurate with climatic, terrain and soil conditions expected to be encountered in the Waikato region.</p> <p>b) Be able to predict annual, seasonal or crop nutrient losses at either a paddock or total crop area scale with a margin of error no more than 30%.</p> <p>c) Have been calibrated against current versions of Overseer, or versions that are no more than 3 years old, and any departures from those models when using identical data sets documented and explained.</p> <p>d) Have product maintenance and support currently available as of the date of use or guaranteed for a period of one year.</p>
33	<p>The nutrient management budget required by condition 32 shall as a minimum record the following information for at least nitrogen (N) and phosphorus (P) (in units of kilograms of N and P per hectare per year):</p> <p>a) Inputs from wastewater or biomass irrigation, fertiliser, and any nutrient source.</p> <p>b) Outputs in product.</p> <p>c) Results of soil testing.</p>
34	<p>The Waikato Regional Council may in September 2019, and thereafter in September every third year (for instance, 2021, 2023, 2025), serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this consent at the consent holder's expense, for the following purposes:</p> <p>a) if necessary and appropriate, to require the consent holder to adopt the best practicable option to remove or reduce adverse effects on the surrounding environment (including soil, groundwater and surface water); and/or</p> <p>b) to review the adequacy of monitoring undertaken by the consent holder; and/or</p> <p>c) to take into account any National Environmental Standard, National Policy Statement, or Waikato Regional Plan (including changes) which have become operational or effective since the granting of this consent.</p>

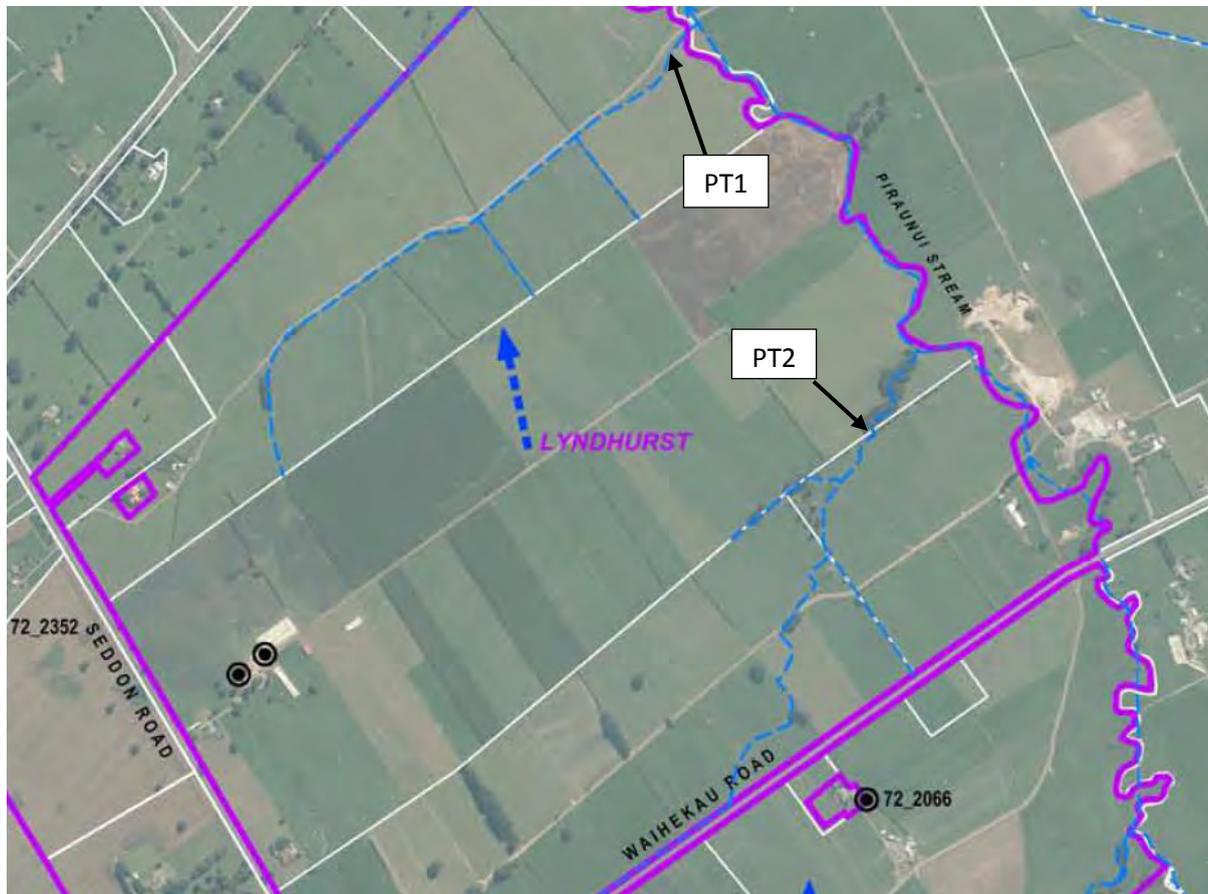
35	The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the resource Management Act 1991.
	END



Schedule 2: Location of Novaflow 1 and 3 outlets to the Waihekeau Stream; groundwater monitoring bores Inghams 1, 2, 3, and Lyndhurst 1 to 7; Waihekeau Stream monitoring locations URA and DRC.



Schedule 3: Location of PT1 and PT2 (see condition 23) – surface water monitoring locations for wastewater irrigation effects.



## Appendix 2: AUTH1327282.02 Discharge treated wastewater to the Waiheka Stream

### Consent conditions

**Term: 25 years**

#### Definitions

For the purposes of this consent, the following definitions apply.

<b>Term</b>	<b>Definition</b>
Certified (or Certification)	In relation to a Management Plan or Monitoring Plan: means that the Council has certified that the Management Plan or Monitoring Plan contains all information specified in the relevant condition(s) and that the Management Plan or Monitoring Plan meets all the requirements set out in the conditions of the resource consent.
Council or WRC	Waikato Regional Council
IPENZ	Institute of Professional Engineers New Zealand
Reasonable Mixing Zone	For the purposes of this consent, the reasonable mixing zone extends 30 metres downstream from the most down-gradient part of the rocky filter on the bank of the Waiheka Stream.
Treated wastewater	Treated wastewater is that final discharge after treatment from the consent holder's poultry processing wastewater treatment plant.
Year, yearly, annual, annually	Shall all be the period of the dairy season being from 1 July of one year to 30 June inclusive of the following year

- 1 Except as specifically provided for by other conditions of this consent, all activities to which this consent relates shall be undertaken generally in accordance with the information contained in the application for this consent titled "Inghams Enterprises (NZ) PTY Limited, Discharged of wastewater to land and water from the Te Aroha Poultry Processing Plant, Resource consent applications forms and Assessment of Environmental Effects, August 2016" ("AEE"), received by Council 5 September 2016, wrdoc#9055668. If there is any inconsistency between the application and any consent condition, then the consent condition shall prevail.
- 2 The consent holder shall give priority to the discharge of treated wastewater to land authorised by consent AUTH1327282.01, over the discharge of treated wastewater directly to the Waiheka Stream authorised by this consent. In particular, the wastewater shall not be discharged to the Waiheka Stream unless land disposal of the wastewater is not practicable, and shall only occur as a contingency discharge. Reasons that are acceptable to the Council for a contingency discharge are:
  - (i) The soil is saturated and pugging or ponding or runoff of wastewater to surface water is likely to occur; or
  - (ii) Operational improvements on the irrigation farm, including resowing or ripping, which affects a substantial proportion of the irrigation areas and which significantly restricts the ability of the consent holder to irrigate the wastewater; or
  - (iii) Unavoidable equipment failure which prevents irrigation; or
  - (iv) The Waiheka Stream flow exceeds 525 L/s.

The wastewater may be discharged to the Waiheka Stream during other circumstances with the prior written approval of the Waikato Regional Council.

For the purpose of this consent circumstances in which contingency 2(i) shall be deemed to be met include, but are not limited to:

- (a) Days where there has been more than 25mm rain within the 24 hour preceding period at the consent holder's rain station.
- (b) Days during the months of June to August inclusive.

For the purposes of this consent condition, a flow of 525 L/s in the Waiheka Stream at the discharge point is equivalent to a flow of 2,750 L/s at the Mellon Road flow gauge. However this condition does not restrict in any way the consent holder installing a flow gauge on the Waiheka Stream (subject to any resource consents that may be required for the flow gauge structure), should the consent holder prefer a more direct method to measure the stream flow.

(Note: the conversion of Mellon Road flow to Waiheka Stream flow is based on the Pattle Delamore Partners report dated 8 May 2015, titled "Waiheka Stream Synthetic flow record", Method 1, wrdoc#6204897.)

- 3 The maximum discharge rate of the wastewater to the stream shall not exceed 47 litres per second, and the maximum daily volume shall not exceed 4000 cubic metres.
- 4 The treated poultry processing wastewater discharged to the Waiheka Stream shall comply with the following:
  - (i) The pH of the wastewater shall not fall outside the range of 6 to 8.5 pH units.
  - (ii) The wastewater shall not contain floatable fat or oils or material could produce oil or grease films, scums, foams in the Waiheka Stream.
  - (iii) The average 5-day carbonaceous biochemical oxygen demand (cBOD<sub>5</sub>) concentration shall not exceed 7.5 grams per cubic metre, expressed as a running average for the last 20 samples, nor exceed 30 grams per cubic metre at any time.

- (iv) The average suspended solids concentration shall not exceed 15 grams per cubic metre, expressed as a running average for the last 20 samples, nor exceed 50 grams per cubic metre at any time.
- (v) The average ammoniacal-nitrogen concentration shall not exceed 2.7 grams per cubic metre, expressed as a running average for the last 20 samples, nor exceed 11.2 grams per cubic metre at any time.
- (vi) The average nitrate-nitrogen concentration shall not exceed 12 grams per cubic metre, expressed as a running average for the last 20 samples, nor exceed 30 grams per cubic metre at any time.
- (vii) The dissolved oxygen concentration shall not be less than 6.0 grams per cubic metre.

Note: the limits set out in this condition are intended to prevent toxicity effects in the Waiheka Stream, and are not intended to imply that the consent holder may decrease the effluent quality of the wastewater treatment plant, as it existed in practice prior to granting of this consent, and as set out in Table 9 of the AEE (August 2016).

- 5 The annual mass of total nitrogen discharged to the Waiheka Stream, as determined by weekly sampling (when there is a discharge to the Waiheka Stream in that week), shall not exceed 5000 kilograms in any year, and shall not exceed 3000 kilograms in any year as a 7-year rolling average.

In terms of compliance with the 7-year rolling average, the rolling average shall be based on the 7 previous full years TN discharge loads, including those which may have occurred when consent 108880 was active. The consent holder may elect to not include the years 2017/18, 2018/19, 2019/20, 2020/21 and 2021/22 within the 7-year rolling average calculation, if in these years the consent holder is upgrading (including commissioning) its wastewater treatment plant to achieve a higher quality of treated effluent.

- 6 The annual mass of total phosphorus discharged to the Waiheka Stream, as determined by weekly sampling, shall not exceed 800 kg in any year, and shall not exceed 500 kg as a 7-year rolling average.

In terms of compliance with the 7-year rolling average, the rolling average shall be based on the 7 previous full years discharge loads, including those which may have occurred when consent 108880 was active. The consent holder may elect to not include the years 2017/18, 2018/19, 2019/20, 2020/21 and 2021/22 within the 7-year rolling average calculation, if in these years the consent holder is upgrading (including commissioning) its wastewater treatment plant to achieve a higher quality of treated effluent.

*Advice Note: The consent holder may achieve compliance with conditions 5 and/or 6 by offsetting some of its total nitrogen and / or total phosphorus discharged to the Waiheka Stream via offset mitigation works approved by Council via the process set out in conditions 36 and 37.*

- 7 The annual mass of carbonaceous BOD<sub>5</sub> discharged to the Waiheka Stream, as determined by weekly sampling, shall not exceed 2000 kg in any year, until 30 June 2028. From 1 July 2028 the annual mass of carbonaceous BOD<sub>5</sub> shall not exceed 1150 kg in any year.
- 8 The wastewater shall be UV treated or treated in an equivalent disinfection unit prior to discharge to the Waiheka Stream, such that the concentration of *E. coli* in the discharged wastewater shall not exceed 500 cfu per 100 mls as a 95<sup>th</sup> percentile in any year.

Note: chemical (for example chlorine) disinfection shall not be used unless an effects assessment has been provided to the Waikato Regional Council, which approves the chemical disinfection method in writing prior to use. In providing approval, the Waikato Regional Council shall assess

equivalence with UV disinfection in terms of *E coli* reduction in concentration, and environmental effects from chemical residuals.

- 9 The wastewater shall discharge through a rock filter prior to contact with the Waiheka Stream.

The consent holder shall be responsible for taking any necessary action, including seeking any necessary resource consents, and other approvals to avoid remedy or mitigate any river side erosion which may arise as a result of the presence of the rock filter.

- 10 A wastewater storage pond shall form part of the Consent Holder's wastewater treatment plant to ensure that, at any time, there is sufficient capacity to store at least 48 hours site production of final treated wastewater, in order to minimise the need to discharge to the stream. The wastewater storage pond shall be utilised whenever possible to minimise the numbers of days each year that wastewater needs to be discharged to the Waiheka Stream.
- 11 For the purposes of this consent, the reasonable mixing zone shall extend 30 metres downstream from the most down-gradient part of the rock filter on the bank of the Waiheka Stream.
- 12 Beyond the reasonable mixing zone, the discharge shall not cause the Waiheka Stream temperature to increase by more than 3 degrees Celsius above ambient stream temperature, and shall not cause the stream temperature to exceed 25 degrees Celsius at any time.
- 13 Beyond the reasonable mixing zone, the treated wastewater discharge shall not produce the following effects:
- i. Conspicuous oil or grease film, scums, foams or floatable or suspended materials in the Waiheka Stream.
  - ii. Raise the turbidity of the Waiheka Stream by more than 10 NTU, if the turbidity of the Waiheka Stream as measured no less than 5 metres above the wastewater discharge, is less than 10 NTU; or
  - iii. More than double the turbidity of the Waiheka Stream, if the turbidity of the Waiheka Stream, as measured no less than 5 meters above the wastewater discharge, is greater than 10 NTU.
  - iv. Conspicuously change the colour of Waiheka Stream.
- 14 Notwithstanding the stated limits in conditions of this consent, the consent holder shall operate the wastewater treatment system with the objective of achieving the highest final effluent quality that can reasonably and practicably be achieved, having regard to the capabilities of the treatment system, financial implications, the current state of technical knowledge and best wastewater management practice. For the purposes of assessing compliance against this condition, the effluent quality shall, when assessed over a period of at least four years, in consistent with that set out in Table 9 of the AEE (August 2016).

For the avoidance of doubt, nothing in this condition requires the consent holder to achieve lower limits than those specified in conditions 3 to 8, 12, 13 and 18 of this consent, within the time period applicable for those individual conditions.

- 15 There shall be no odour as a result of the activities authorised by this resource consent that causes an objectionable or offensive effect beyond the boundary of the site.
- 16 Should an emission of odour occur that has an objectionable or offensive effect, the consent holder shall provide a written report to the Waikato Regional Council within five days of being notified by the Waikato Regional Council. The report shall specify:
- (a) The cause or likely cause of the event and any factors that influenced its severity.

- (b) The nature and timing of any measures implemented by the consent holder to avoid, remedy or mitigate any adverse effects.
  - (c) The action to be taken in future to prevent recurrence of similar events.
- 17 The waste treatment plant and stream discharge shall be operated, maintained and managed by appropriately experienced personnel in accordance with the Environmental Management Plan (EMP, see condition 24).
- 18 Wastewater stored prior to irrigation shall be aerated, if necessary, to ensure that dissolved oxygen levels are maintained above 1.0 gram per cubic metre and that there are no objectionable odours when the stored wastewater is irrigated.

### **Monitoring**

- 19 The wastewater shall be sampled daily and tested for conductivity, BOD<sub>5</sub>, suspended solids and ammoniacal-nitrogen concentrations. In addition the wastewater shall be sampled weekly and tested for pH, total kjeldahl nitrogen, nitrate-nitrogen, dissolved reactive phosphorus, total phosphorus and *E coli*. The results of the above testing shall be forwarded to the Waikato Regional Council at monthly intervals.
- 20 The daily discharge volume and flow rate shall be recorded, and records forwarded to the Waikato Regional Council at monthly intervals.
- 20A. The consent holder shall carry out monthly sampling of the Waiheke Stream upstream and downstream of the outfall for turbidity and temperature to demonstrate compliance with condition 12 and condition 13(ii) and (iii) of this consent. The results of this testing shall be forwarded to the Waikato Regional Council at monthly intervals.
- 21 The consent holder shall carry out an annual survey of the Waiheke Stream, following a minimum 2-week period of discharge and preferably in October-November to investigate the biological condition of the stream. Macroinvertebrate Community Index (MCI and QMCI), EPT (excluding Hydroptilidae) taxa richness and %EPT abundance, and abundance of aquatic plants, and percent substrate cover of algal slimes and periphyton shall be investigated. Biological surveys shall be carried out at sites URA, DRB, DRC, DRD and a representative point between DRB and DRC (approximately 700 metres downstream of the discharge point) as shown in Attachment 1 attached to this consent. The timing, sampling locations and frequency of the stream surveys may be varied with the written approval of the Waikato Regional Council.

At least one week prior to undertaking the survey, the consent holder shall provide the survey methodology and proposed timing to Council for approval. The stream survey shall not be carried out if the flow in the Waiheke Stream is in excess of 1000 litres per second without the written approval of the Waikato Regional Council.

The stream survey shall include a diurnal dissolved oxygen and pH record, with recordings made at least hourly over the 24 hour period.

The stream survey report shall include identification of any trends evident, compared to previous years, including Excel spreadsheets of macroinvertebrate taxa counts.

The consent holder shall liaise with Fonterra Waitoa and Wallace Corporation Ltd, Waitoa on a '*best endeavours*' basis to seek to align the timing of the river surveys as closely as possible.

- 22 When discharging to the Waiheke Stream, the consent holder shall carry out regular, and at a minimum monthly, inspections of the outlet discharge to ensure that the rock filter is intact, and that there are no visible scums, fats and discoloration in the Waiheke Stream as a result of the discharge, outside of the reasonable mixing zone. Records shall be kept of these inspections, and provided monthly to the Waikato Regional Council.
- 23 All sample analyses shall be undertaken in accordance with the methods detailed in the most recent edition of the "Standard Methods for the Examination of Water and Wastewater" by A.P.H.A. and A.W.W.A. and W.P.C.F. or any other method approved in advance by the Waikato Regional Council.

### **Management Plan**

- 24 The consent holder shall provide the Waikato Regional Council with an Environmental Management Plan (EMP) for the site which details site activities, wastewater treatment plant, staff responsibilities, monitoring, reporting, complaint procedures, emergency procedures and has the following objectives:
- (i) To ensure that the consent holder complies with the conditions of this consent;
  - (ii) To manage the impacts of site construction/expansion in a responsible and pro-active manner;
  - (iii) To ensure continuous environmental improvement through identification and management of all activities on site with the potential to affect the environment;
  - (iv) To ensure responsible environmental management.
  - (v) Provide details of spill prevention measures, in the event of a spill of wastewater, or hazardous material into the wastewater system.

The EMP shall be reviewed at least every two years and updated if necessary.

### **Complaints register**

- 25 The consent holder shall maintain and keep a complaints register for complaints received by the consent holder about all aspects of operations at the site. The register shall record:
- a) The date, time and duration of the incident that has resulted in a complaint.
  - b) The location of the complainant when the incident was detected.
  - c) The possible cause of the incident.
  - d) Any corrective action undertaken by the consent holder in response to the complaint.
- 26 The complaints register shall be available to the Waikato Regional Council at all reasonable times. Complaints received by the consent holder which may indicate non-compliance with the conditions of this resource consent shall be forwarded to the Waikato Regional Council within 5 days of the complaint being received. The complaint information provided to the Waikato Regional Council shall include all information recording in condition 25 above. Details of all other complaints shall be forwarded to the Waikato Regional Council on a monthly basis.

### **Reporting**

- 27 All monitoring results as required under this consent shall be forwarded to the Waikato Regional Council at monthly intervals.
- 28 The consent holder shall forward to the Waikato Regional Council by 1<sup>st</sup> September each year an Annual Report which shall provide:
- (i) a summary of the monitoring data provided under conditions 3 to 8, 12, 13 and 18 of this consent, and identification of any trends evident, compared to previous years;

- (ii) Summary of other monitoring records and/or tests undertaken to ensure compliance with conditions of this consent;
- (iii) Summary of maintenance and operational improvements to the wastewater treatment plant to ensure compliance with the conditions of this consent.
- (iv) Details of any incident or equipment failure which caused a breach of any condition in this consent, and improvements to prevent any similar event occurring in the future.
- (v) Details of any complaints regarding the wastewater discharge to the Waiheke Stream, and action taken in response.
- (vi) Records of the days on which wastewater was discharged to the Waiheke Stream, and comment on compliance with condition 2 of this consent.
- (vii) Details of the financial contributions made in the monitoring year in accordance with condition 35.
- (viii) Details of any environmental enhancement works and / or any offset mitigation works undertaken during the year in accordance with conditions 36 and 37.

The annual monitoring period shall be from 1 July to 30 June the following year.

In addition the consent holder shall provide a copy of the Annual Report to Ngati Haua Iwi Trust by 1<sup>st</sup> September.

- 29 The consent holder shall notify the Waikato Regional Council as soon as practicable, and as a minimum requirement within 48 hours of the consent holder becoming aware of any event which has resulted in the limits specified in conditions of this resource consent being exceeded, or any accidental discharge, plant breakdown or other circumstance which is likely to result in the limits being exceeded. The consent holder shall, within 10 working days of the incident occurring, provide a written report to the Waikato Regional Council, identifying the non-compliance, possible causes and steps to ensure future compliance.

#### **Wastewater Pond lining**

- 30 Any wastewater pond, tank, lagoon or other treatment facility (hereby all defined as pond for conditions 30 to 32) which is installed after the date of grant of this consent, shall be lined to achieve a permeability of no more than  $1 \times 10^{-9}$  m/s, and in accordance with best practice for lining wastewater storage or treatment facilities.

Note: Best practice for conditions 30 to 32 is deemed to be IPENZ Practice Note 21 (Farm Dairy Effluent Pond design and Construction, Version 2, 2013) or any upgrade to that Practice Note.

- 31 In the event that an existing pond is emptied or is renovated for any purpose, then that pond shall be lined to achieve a permeability of no more than  $1 \times 10^{-9}$  m/s, and in accordance with best practice for lining storage or treatment facilities.

Note: A pond that is emptied for the purposes of desludging is not included in this condition, and does not need to be re-lined to achieve the stated permeability.

- 32 Where any pond has been lined in accordance with conditions 30 or 31, no wastewater shall be placed in the pond until the liner has been certified by a member of IPENZ that it meets the design requirements and has been constructed in accordance with best practice.

#### **Section 128 RMA Review**

- 33 The Waikato Regional Council may in September 2019, and thereafter in September every third, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this consent at the consent holder's expense, for the following purposes:
- a) if necessary and appropriate, to require the consent holder to adopt the best practicable option to remove or reduce adverse effects on the surrounding environment; and/or
  - b) to review the adequacy of monitoring undertaken by the consent holder; and/or
  - c) to take into account any National Environmental Standard, National Policy Statement, or Waikato Regional Plan (including changes) which have become operational or effective since the granting of this consent.
  - d) where conditions 36 and 37 of this consent are utilized and following the receipt of any written opinion under condition 37B.
  - e) where the long term average quality of the treated wastewater is materially different to that anticipated under condition 14.
- 34 The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act 1991.

### **Compensation**

- 35 The consent holder shall contribute \$45,000 to environmental enhancement works in the Firth of Thames catchment in each consecutive three year period that this consent is operative beginning 1 January 2018.
- (i) The purpose of these works shall be to mitigate or offset the effect of the ongoing discharge of nutrients to surface water from the Ingham's wastewater treatment plant.
  - (ii) For the avoidance of doubt, the works are not required to directly reduce surface water nutrient loading in the catchment by any specified amount.
  - (iii) Environmental Enhancement works may include, but are not necessarily limited to: retirement of pastoral farmland, riparian planting, wetland development or enhancement, aquatic habitat improvement or public amenity improvements related to surface water.
  - (iv) An Environmental Enhancement Plan specifying the works to be undertaken in each three year period shall be provided to the Council by 31 December 2017, and at three yearly intervals thereafter for Council's approval, acting in a technical certification capacity. Each three yearly Environmental Enhancement Plan shall be developed following consultation with Ngati Haua Iwi Trust, the Department of Conservation and Fish and Game New Zealand.
  - (v) The consent holder may amend the Environmental Enhancement Plan at any time during a three yearly work cycle by submitting an updated Environmental Enhancement Plan to the Council for approval acting in a technical certification capacity.

### **Offset mitigation**

36. The purpose of offset mitigation under conditions 36 and 37 is to provide an opportunity to the consent holder, as the wastewater volumes increase, to implement offset mitigation in full or in part, to achieve the annual nutrient loading limits set out in conditions 5 and 6, instead of

upgrading the wastewater treatment plant. Offset mitigation shall not be used to prevent the requirements of condition 14 being satisfied.

The consent holder may, at its discretion, discharge contaminant loads in excess of those authorised by conditions 5 and/or 6, provided that it fully offsets any increases in contaminant loads above those authorised in conditions 5 and/or 6 by implementing offset mitigation works in the Firth of Thames catchment. The consent holder shall demonstrate to Council's satisfaction that the qualifying works are in accordance with the process set out in condition 37 and the general principles below:

- (i) Qualifying Works do not include environmental enhancement works undertaken to achieve compliance with condition 35.
- (ii) Qualifying Works may include but are not necessarily limited to: retirement of pastoral farmland, riparian planting and fencing and edge of field mitigations including detention bunds and wetlands.
- (iii) The quantum of Total Nitrogen and / or Total Phosphorus offset by the Qualifying Works shall be calculated based on the best available science at the time that the works are first provided to Council under condition 37 for approval.
- (iv) Qualifying Works must be in place and ready to fulfil their purpose at the start of the first compliance year on which they are anticipated to be relied to achieve compliance with condition 5 or 6.
- (v) Qualifying works shall be "like for like", in that offset mitigation for nitrogen shall only apply to condition 5, and offset mitigation for phosphorus shall only apply to condition 6.

37. To be Qualifying Works for the purposes of condition 36, prior to the start of the compliance year:

- A. The Council must have been provided written notice from the consent holder which sets out:
  - a) Which offset mitigation works will be Qualifying Works for the following compliance year and the quantum of Total Nitrogen and Total Phosphorus those works will offset.
  - b) That those Qualifying Works will be ready to fulfil their intended purpose at the start of the compliance year.
  - c) A proposed management plan to ensure any Qualifying Works will remain effective for the duration of the compliance year.
  - d) A Report by a suitably qualified expert that assesses the quantum of Total Nitrogen and/or Total Phosphorus loading into the Firth of Thames catchment the Qualifying Works would reduce if they are in place and managed in accordance with the management plan referred to in (c) for the full compliance year having regard to:
    - i. Uncertainties, including margins of error in any methodology used; and/or
    - ii. Predicted delays or lag times
  - e) Comments (if any) received from Fish and Game on the Report, following reasonable consultation. For the purposes of this condition "reasonable consultation" means providing the Report in draft to Fish and Game and allowing at least one month for a response.
  - f) For any comments received from Fish and Game that have not been accepted into the Qualifying Works, written advice explaining reasons for not accepting those comments.
- B. Following a compliance year in which Qualifying Works have been in place, the Qualifying Works must be audited by a suitably qualified expert and the Consent Holder shall

provide to Council that expert's written opinion on whether the Qualifying Works have met the criteria contained in conditions 36 and 37.

END