# Irrigation Water
# Compliance Monitoring Programme
# Annual Report
# 2018-2019

## Technical Report 2019-83

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# Executive summary

This report for the period July 2018 to June 2019 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the environmental and consent compliance performance of irrigation consent holders across the Taranaki region. The assessment covers resource consents held for pasture irrigation, horticultural and golf course irrigation. This is the 16th Annual Report issued by the Council to report on compliance monitoring programmes for consents authorising the abstraction of freshwater for irrigation purposes in Taranaki.

At 30 June 2019, a total of 69 resource consents to take and use freshwater for irrigation purposes were registered in the Council's database. Of these, 51 were for pasture irrigation, 8 for horticultural activities and 10 for recreational purposes (golf clubs). Fifty-eight of these consents authorised the abstraction of surface water (84%) while 11 (16%) allow for abstraction from a groundwater source.

A total of 56 irrigation consents were exercised during the 2018-2019 monitoring year, with most commencing irrigation in November or December and concluding for most in March. Rainfall recorded at the Council's monitoring locations over the summer irrigation period ranged between 58% and 111% of historical mean values. A particularly dry October, along with warm coastal winds, caused soils to dry out faster than normal which resulted in high irrigation water demand. Total usage during the 2018-2019 irrigation season, with a total water use across all exercised irrigation consents was 6,906 ML. This was slightly less than that used during the preceding 2017-2018 monitoring year, when 58 irrigation consents were exercised, and a total usage of 7,204 ML.

The Council's monitoring of irrigation water permits comprises a range of various components, including liaison with consent holders, site inspections, the collection as assessment of abstraction data, residual flow monitoring, water quality analysis, data review and compliance assessments. The specific range of monitoring carried out for each consent is dictated by the water source, weather and flow conditions, and system design.

The Council carried out compliance monitoring inspections at 64 sites during the 2018-2019 irrigation season, with 100% of all of the active consents being visited. The inspections included visual checks of the intake structures, screens, staff gauges, pumping infrastructure, downloading of data and, in some cases, stream flow measurements. Compliance with residual flow conditions for surface water abstractions was assessed by the Council on 79 separate occasions, across 27 waterways.

Consent holder performance for the year was assessed based on compliance with their authorised abstraction rates/volumes, maintenance of minimum residual flows, provision of abstraction records and all other general conditions of their consent(s).

The Council was required to enter a total of five incidents over the course of the 2018-2019 period in relation to irrigation consents. These incidents were reported to Council and staff implemented appropriate responses as they were identified, which included the issuing of three abatement notices.

During the 2018-2019 year, 89% of exercised irrigation consents in Taranaki achieved a high level of environmental performance and compliance with their consents, 4% achieved a good level of performance, while 7% are required to improve their compliance performance.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the irrigation water consent holders over the last several years, this report shows that consent holder performance has improved significantly in the year under review, continuing the improvement in compliance seen over recent years.

This report includes recommendations for the 2019-2020 year.

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# 1 Introduction

## 1.1 Compliance monitoring programme reports and the Resource Management Act 1991

### 1.1.1 Introduction

This report is for the period July 2017 to June 2018 by the Taranaki Regional Council (the Council) describing the monitoring programmes for resource consents authorising the abstraction of freshwater for irrigation purposes in Taranaki. The report covers the data collected for compliance monitoring for resource consents for pasture irrigation, horticultural and golf courses.

### 1.1.2 Structure of this report

**Section 1** of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consents held for water takes across various catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the irrigation activities conducted in each catchment.

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

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

**Section 4** presents recommendations to be implemented in the 2019-2020 monitoring year.

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

### 1.1.3 The Resource Management Act 1991 and monitoring

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

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

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

including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

### 1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the consent holders, this report also assigns a rating as to each Company's environmental and administrative performance during the period under review.

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

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

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

#### Environmental Performance

**High:** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

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

For example:

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

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

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

### Administrative performance

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

**Good:** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

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

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

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.[1]

## 1.1.5 Regional freshwater allocation

At 30 June 2019, there were a total of 69 resource consents to take and use freshwater for irrigation purposes. Fifty-one consents were for pasture irrigation, eight for irrigation associated with horticultural activities and ten for recreational purposes (e.g. golf course watering) (Figure 1).

Surface water is the predominant source of water for irrigation, accounting for 58 of the 69 consented water abstractions (84%). The remaining 11 consents (16%) authorise abstractions from groundwater (Figure 2).

The relatively low yields from Taranaki's aquifers are rarely sufficient to supply an entire irrigation system, and hence groundwater usage as a primary source of irrigation water is uncommon across the region. Typically, groundwater abstractions are used to supplement surface water irrigation supply.

The breakdown of freshwater allocation in the region indicates that pasture irrigation represents 27% of the total consented water abstraction in Taranaki. Other types of irrigation (horticultural and recreational) account for approximately 9%, with other uses[2] accounting for the majority (64%) of the total water allocation across the region (Figure 3).

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[1] The Council has used these compliance grading criteria for 15 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

[2] Includes: Aquaculture, Building Construction/Drainage/Flood Control, Chemical Processing/Manufacturing, Dairy Farm, Dairy Processing/Manufacturing, Dry Stock Farm, Hydrocarbon Exploration/Servicing Facilities, Landfills, Local Authorities, Meat and By-Product Processing, Petrochemical Processing, Piggery Farms, Poultry Farms, Power Generation – HydroPower Generation & Thermal, Quarries, Recreation/Tourism/Cultural, Road/Bridge Construction or Maintenance, Sewage Treatment, Swimming Pools, Timber Treatment or Sawmills, Water Supply or Treatment.

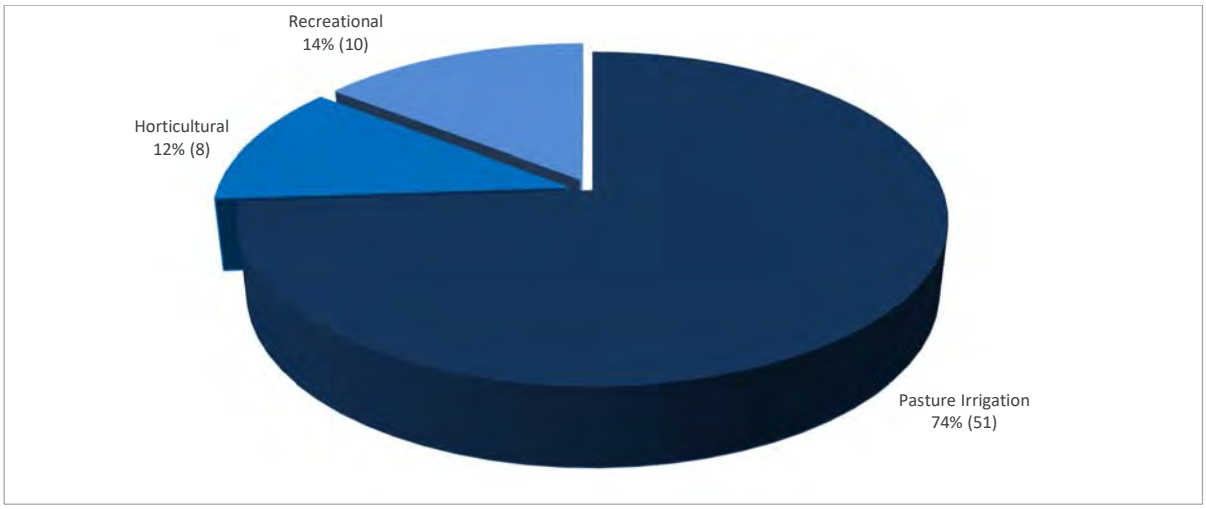


Figure 1 Percentage of water irrigation allocation per activity in the Taranaki region

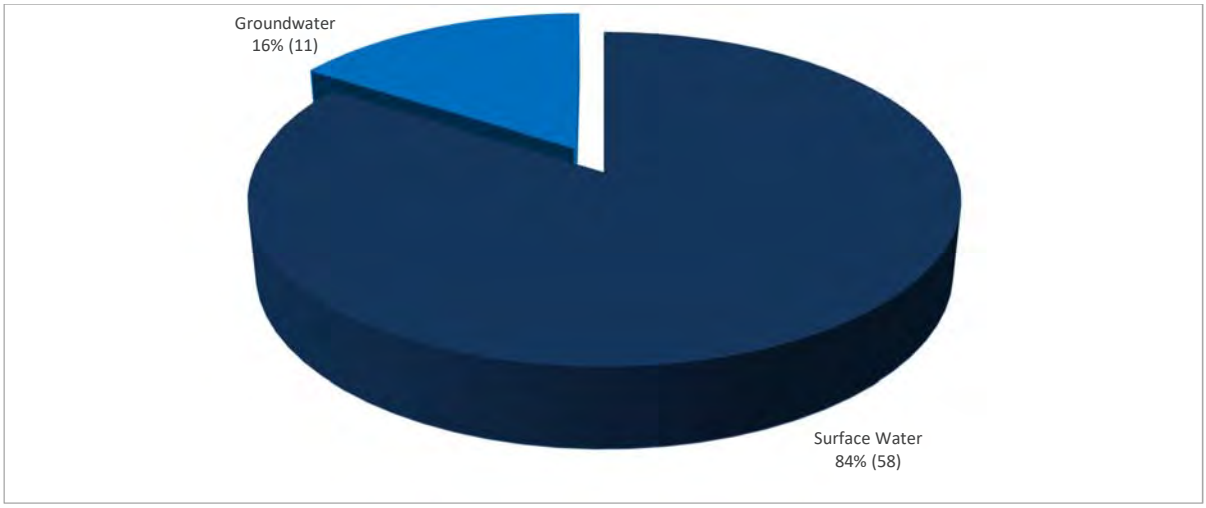


Figure 2 Source of water for irrigation in Taranaki during the 2018-2019 period

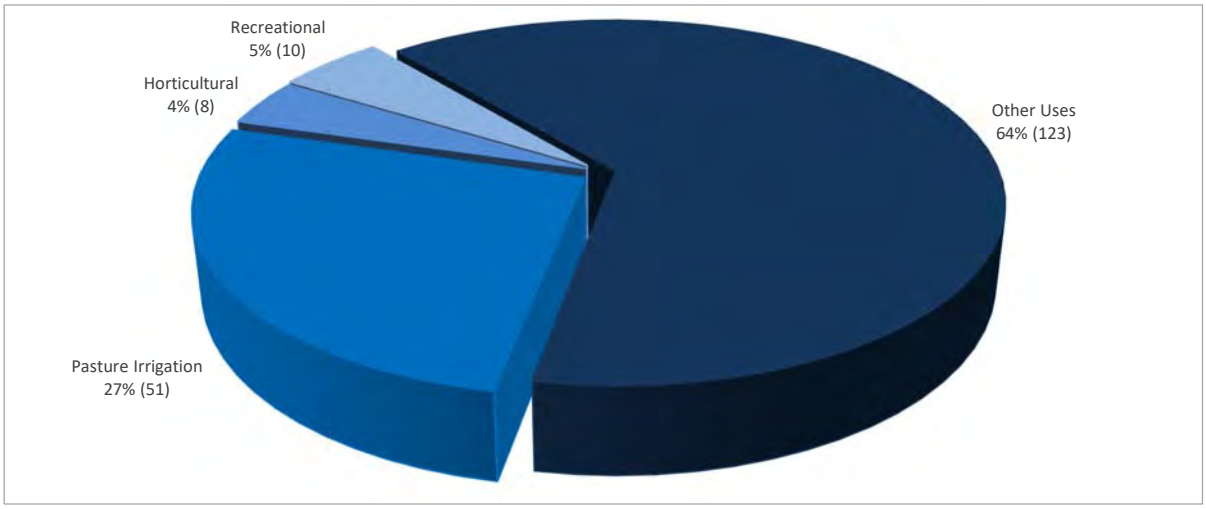


Figure 3 Total consented water abstractions – distributed by activity 2018-2019

### 1.1.6 Irrigation zones

A regional study commissioned for the Council in 2002 (Rout, 2003) identified eight irrigation zones based mainly based on climate. The zones were characterised by different parameters in terms of system management and financial return. Each zone, and the location of all current irrigation consents are illustrated in Figure 4.

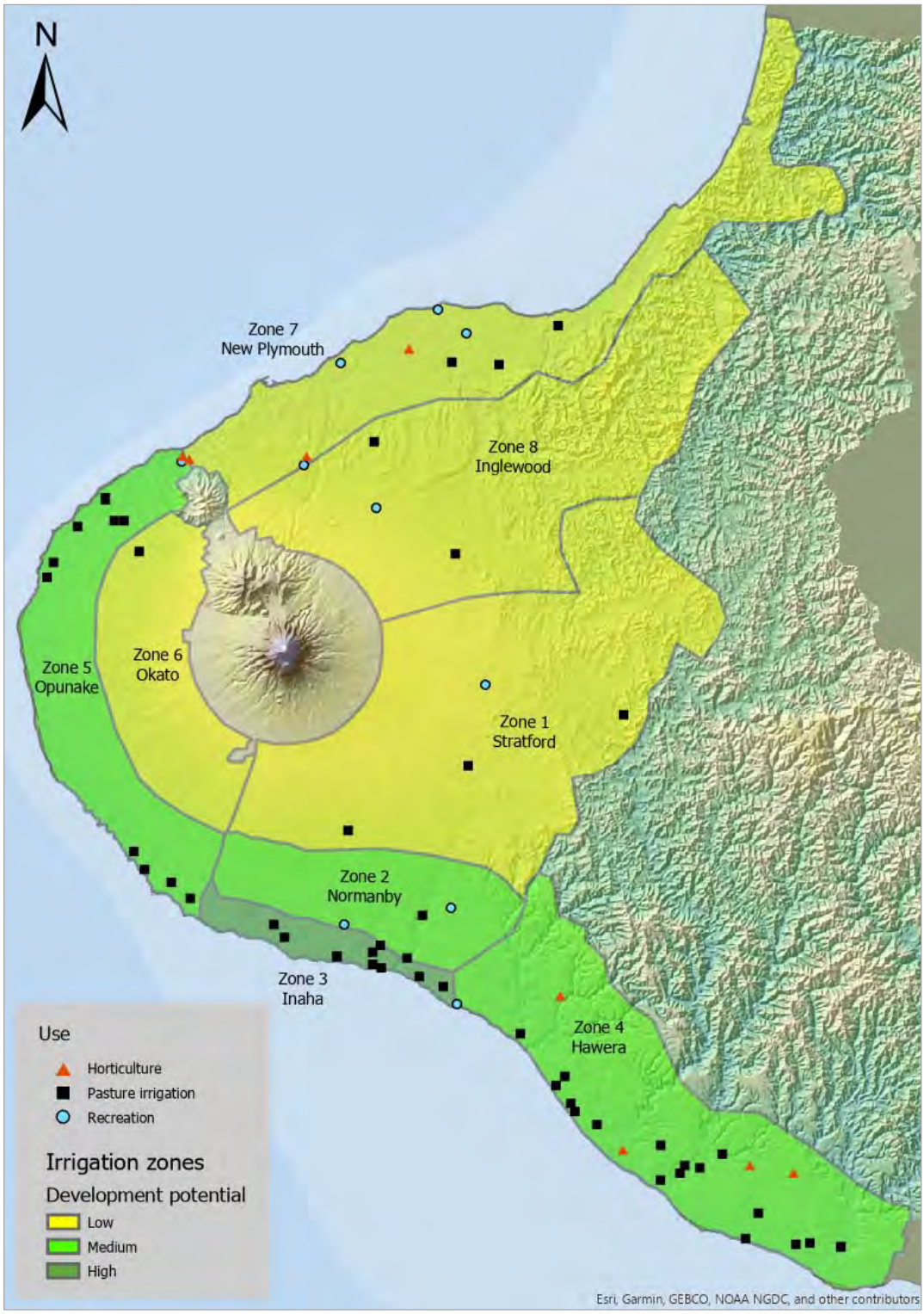


Figure 4 Pasture irrigation zones and locations of consented irrigation in Taranaki

The modelling exercise identified zones with the most potential for pasture irrigation requirements were Normanby (*Zone 2*), Inaha (*Zone 3*), Hawera (*Zone 4*) and Opunake (*Zone 5*). As illustrated in Figure 4 the vast majority of pasture irrigation in Taranaki does take place within Zones 2, 3, 4 and 5, which represents a 10 km wide belt of coastal land stretching from Oakura to Waitotara. The remainder or irrigators are generally located inland, between Inglewood and Eltham.

### 1.1.7 Irrigation systems

In general there are two types of irrigation methods; surface and pressurised. The majority of irrigation systems currently in operation in the province fall in to the pressurised category. Pressurised systems can be further differentiated based on the method of operation and equipment used. A summary of the systems encountered in the region is given below.

#### K-line and long-lateral types – Impact sprinklers mounted on moveable laterals (Photo 1)

These are the most common systems found in the region, as they are a low cost option and are relatively easy to operate. They can easily be adapted to fit in with existing farm layouts and are especially suitable for windy conditions. However, these systems are labour intensive, as they need to be moved manually on a regular basis.

Photo 1 Mosaic of pictures depicting k-line long lateral type irrigation

#### Centre pivot type – spray mounted on a movable lateral (Photo 2)

Centre pivot type systems are automatically controlled, so have a low labour input. They are low maintenance and have versatility in application rates and are desirable on steep, rocky or uneven soils. However, they are a high capital cost option and can be expensive to run due to electricity costs.

#### Travelling irrigators-spray nozzles mounted on fixed or rotating boom *(rotary boom, fixed boom, gun irrigator, effluent irrigator)* (Photo 3)

Travelling irrigators are a low capital cost option, and are simple to operate. They can cover a large irrigation area and there is some control over the application rate. However, these systems do not perform well in windy conditions, and tend to apply uneven amounts of water, especially at the end of a run.

The predominant irrigation system used in Taranaki is the K-line, accounting for 49% of all systems in use. Fourteen percent of irrigation consent holders operate solely with centre pivots, 9% operate travelling irrigators, while 19% operate more than one type of system on their farm. The remaining 9% of consent holders are yet to install irrigation infrastructure.

Appendix II lists the type of system operated by each consent holder.

Photo 2 Mosaic of pictures depicting centre pivots

Photo 3 Picture depicting travelling irrigator system

### 1.1.8 Environmental effects of exercising water permits

Environmental effects of water abstraction can include a loss of aquatic habitat and biodiversity, and impacts on cultural, recreational and aesthetic values of waterbodies. In an effort to reduce such impacts, the Council encourages the efficient use of water through technical irrigation system design, and maintenance and management practices that help with the achievement of high irrigation efficiencies.

#### Surface water bodies

Expected periods of peak irrigation water demand normally coincide with periods of low flows in rivers and streams. During these periods, the Council closely monitors river flows and the exercising of water permits.

The majority of surface water permits for irrigation require the abstraction to cease when the flow in the river providing water for irrigation reaches, or falls below, a specified level (minimum/residual flow). Policy 6.1.5 of the Regional Freshwater Plan for Taranaki states that at least two-thirds of habitat within a river or stream is to be retained at mean annual low flow (MALF) levels. This figure has been derived for protection of habitat requirements for brown trout, and is considered conservative for native species.

For many smaller waterways, two-thirds habitat roughly equates to two-thirds MALF, however, the cut-off flow level on many irrigation abstraction consents is in practice generally set at MALF. It is the responsibility of the consent holder to ensure compliance with consent conditions at all times.

In certain coastal streams, and under certain flow conditions, tidal movements can result in the migration of saline water upstream from the coastal margin. The abstraction and application of saline or brackish water to land can have adverse effects on pumping and irrigation equipment, crops and soils.

### Groundwater abstractions

The abstraction of groundwater for use in irrigation supply has the potential to lower groundwater levels in the vicinity of the pumping bore. The potential effects of any groundwater abstraction are assessed by the Council during the processing of a resource consent application for a groundwater take. The potential impact of any new take on existing groundwater users and ecological receptors form a major component of this assessment.

Groundwater levels in coastal bores should generally be maintained above mean sea level to avoid the risk of sea water intrusion into the freshwater aquifers. Increased salinity in previously fresh groundwater can result in significant adverse ecological effects, adversely impact on existing groundwater users and potential future use.

Fortunately in Taranaki, the risk of saltwater intrusion is low due to the limited number of high yielding coastal bores. The Council does however monitor water indicators at five coastal sites as part of irrigation monitoring programmes, in order to assess any changes in groundwater composition as a result of abstraction.

### Nutrient loading

Irrigated pasture typically supports higher stock numbers compared with non-irrigated pasture and consequently a higher nutrient (nitrate) loading per hectare. This is particularly the case in areas where the underlying soils are free-draining. Irrigation schemes in Zones 2, 3 and 4 occur in areas where groundwater is known to be at risk of nitrate contamination given the drainage characteristics of soils in those zones (TRC 1998, 2005). Careful management of irrigation water and fertiliser application regimes is therefore required to minimise the risk of groundwater and surface water contamination.

## 1.2 Climatological data and irrigation requirements

The Council provides live on-site data on soil moisture, rainfall and temperature via its website. Eight sites along the coastline provide climatological information about the most intensively developed irrigation zones.

Irrigation in Taranaki dairy farms usually occurs over a three to six month period depending on location and climatic conditions. Irrigation for the 2018-2019 season commenced in October for the majority of consent holders, which was due to the lower than normal rainfall in winter and into spring. Strong coastal winds were also prevalent, which meant soil moisture levels were drier than normal for that time of year. The irrigation season was effectively over for most of the consent holders by the end of February. As shown in Table 1, the rainfall sites along the southern and coastal belt received between 71% and 11% of normal for the period 1 October 2018 to 31 March 2019. Rainfall gradients across the region are illustrated in Figure 5.

Rainfall has a direct impact not only on river and stream flows but also on the amount of water recharging the region's aquifers, which also contribute baseflow to surface water systems. Rainfall recharge is critical to maintain groundwater levels and thus the potential to supply water in the zones where there is more pressure on surface water resources.

Accurate interpretation of climatological data is important for the planning, scheduling and operation of efficient irrigation systems. Precipitation and evapotranspiration data are fundamental to carrying out reliable water budget calculations and calculations of crop (pasture) water requirements. Crop water requirements can be defined as the depth of water need to offset the loss of water through evapotranspiration. In other words, for any period of time, the net irrigation requirement is the amount of water which is not effectively provided for by rainfall.

The calculated amounts of irrigation water to be efficiently applied to pasture, should also account for the water that is lost while transporting it from its source to the pasture root zone. Some of the losses that need

to be estimated are those which occur due to leakage from pipelines and evaporation from droplets sprayed through the air. To compensate for these losses, additional water must be pumped than that is required to be stored in the pasture root zone. Therefore, the gross irrigation requirement is the total amount that must be pumped which takes into consideration the irrigation efficiency.

The third variable that should be accounted for when planning and operating irrigation systems is soil moisture. Some of the water that is required by the pasture may already be held in the soil, so it is critical to quantify it. There is no extra value in applying more water than the soil can hold, this only results in unnecessary costs and wastage. The only reliable way of knowing how much irrigated water can be stored in the soil at the time of irrigation is by measuring soil moisture.

Table 1 Total rainfall from 1 October 2018 to 31 March 2019 versus historical values

| Site | Total rainfall 1 October 2018 to 31 March 2019 (mm) | Mean rainfall October to March (mm) | October 2018 to March 2019 rainfall as a proportion of mean values |
|---|---|---|---|
| North Egmont | 1,840 | 3,200 | 58 % |
| Dawson Falls | 1,628 | 2,435 | 67 % |
| Kahui Hut | 1,636 | 2,230 | 73 % |
| Hillsborough | 575 | 726 | 79 % |
| Brooklands Zoo | 466 | 686 | 68 % |
| Mangati | 483 | 567 | 85 % |
| Motunui | 442 | 588 | 75 % |
| Egmont Village | 764 | 1,108 | 69 % |
| Everett Park | 676 | 954 | 71 % |
| Inglewood | 755 | 1,097 | 69 % |
| Stratford | 559 | 819 | 68 % |
| Mangaehu | 510 | 700 | 73 % |
| Kotare | 769 | 1,001 | 77 % |
| Kaka Rd (Uruti) | 738 | 1,077 | 69 % |
| Pohokura Saddle | 681 | 899 | 76 % |
| Stony (Okato) | 654 | 839 | 78 % |
| Kapoaiaia (Cape Egmont) | 425 | 598 | 71 % |
| Taungatara (Te Kiri) | 625 | 639 | 98 % |
| Kaupokonui (Manaia) | 429 | 501 | 86 % |
| Duffys (Whareroa) | 529 | 477 | 111 % |
| Patea | 481 | 469 | 102 % |
| Charlies | 646 | 731 | 88 % |
| Moana Trig | 571 | 736 | 78 % |
| Rimunui Stn (Waitotara) | 449 | 610 | 74 % |
| Ngutuwera | 487 | 580 | 84 % |

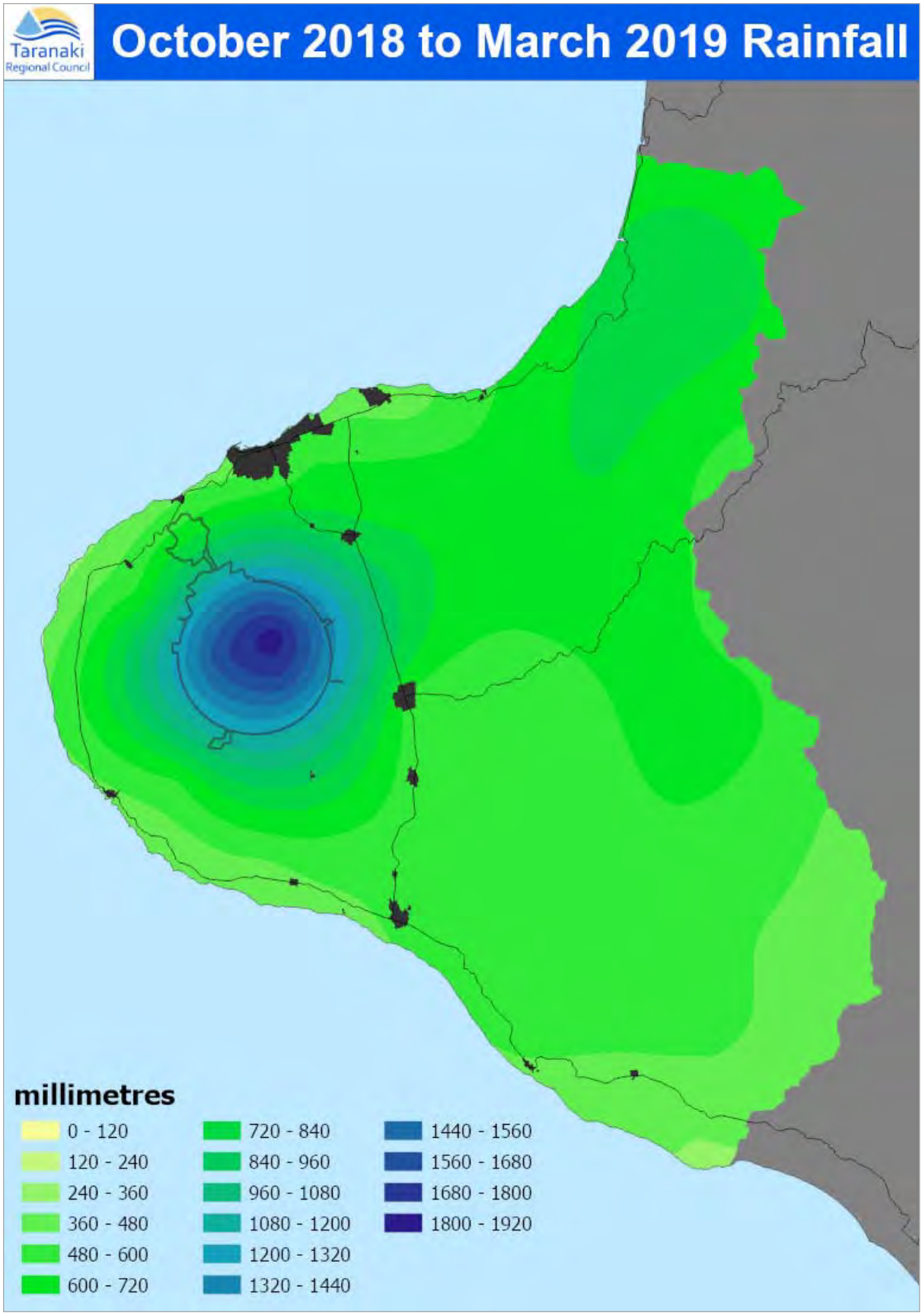


Figure 5 Distribution map of the total rainfall recorded from 1 October 2018 to 31 March 2019

By measuring the soil moisture the irrigator can be more certain that:

- only the amount of water required by the plant is applied;
- leaching of nutrients is minimised;
- pasture growth and quality is maximised;
- the environmental impacts of irrigation are minimised; and
- costs are reduced.

In order to maximise the efficient use of water taken, the Council strongly urges irrigators to monitor and plan irrigation with the factors outlined above in mind. Precision irrigation will also assist irrigators in achieving greater economic benefits from water taken.

### 1.2.1 Droughts in Taranaki

Droughts are a normal, recurrent feature of climate. This phenomenon occurs almost everywhere though it features vary from region to region. Defining drought is difficult as it depends on need, physical differences in regions, and varying disciplinary perspectives. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in damage to crops and resultant loss of yields.

Climate change scenarios suggest that Taranaki may experience more severe weather extremes in the form of dry spells, as well as heavy rainfall events. The most severe droughts in Taranaki have been in 1969-1970, 1977-1978, 2007-2008 and 2017-2018. Changes in drought risk for the Taranaki region indicate a slight increase in the southern coast of the region. Developing climatology assessments of drought for a region provides a greater understanding of its characteristics and the probability of recurrence at various levels of severity. Information of this type is extremely beneficial in the development of response and mitigation strategies and preparedness plans.

## 1.3 Monitoring programme

### 1.3.1 Introduction

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

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

Every year the Council undertakes monitoring programmes for all pasture irrigation water permits. The programmes list all of the work that the Council could undertake during the forthcoming monitoring period and the cost of the activities to the consent holder. Because irrigation is climate dependent, the level of monitoring varies from year to year, as do associated costs. Increased monitoring is generally required during drier years. Automated monitoring systems can reduce ongoing monitoring costs for consent holders.

The 2018-2019 monitoring programmes for irrigation water permits comprised a range of various components, including liaison with consent holders, site inspections, water take data collection, residual flow monitoring, water quality analysis, data review and compliance assessments. The specific range of monitoring carried out in relation to each consent is dictated by the water source, weather and flow conditions and system design. Irrigation began as early as October for the majority of famers, due to low rainfall and strong winds drying out the soils. Many farmers were required to turn off their systems in

December as river levels dropped below their consented cut-off points. Rainfall started to fall regularly from mid-January 2019, allowing river levels to rise, which then meant farmers could start to irrigate if there was any benefit to do so. Irrigation was over, for the most, by the end of March.

A summary of the various monitoring programme components are set out in Sections 1.3.2 to 1.3.6.

### 1.3.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

### 1.3.3 Site inspections

The 2018-2019 pasture irrigation monitoring programme provided for an annual inspection of each pasture irrigation abstraction site to assess/evaluate compliance with consent conditions. Council staff were able to visit 100% of the active consents during the 2018-2019 monitoring period. Additionally, activities comprising of golf clubs, horticultural irrigation schemes and stock and dairy shed takes were also subject to a planned inspection visit.

Site inspections are focused on assessing the overall set-up of the intake structures, a visual inspection and assessment of screenings, fences, staff gauges, flowmeters, datalogger devices and planting of riparian vegetation, in line with consent conditions.

The annual inspections occur between May and July each year, once the irrigation season has ended. The timing of inspections means that a full seasons irrigation records can be downloaded from the datalogging devices during inspections, resulting in time and cost efficiencies. It also means however that most irrigation systems have been decommissioned for the season or undergoing maintenance, so it is sometimes difficult for staff to assess compliance with all consent conditions, particularly those relating to application efficiency and water loss across the operable system. Note, consent holders that breached their consent conditions in the previous monitoring period, will also receive a mid-season inspection to ensure compliance is continuing.

Monitoring programmes for surface water abstraction include checking compliance with the residual flow conditions of the consent. Residual flow conditions set minimum environmental flows to be maintained during pumping in the waterways downstream from the abstraction point. Compliance with the residual flow conditions is assessed through hydrological flow gaugings which are carried out during low flow conditions in summer. The results of residual flow monitoring are summarised in Section 2.2.

### 1.3.4 Measuring and reporting of water takes

A special condition of all irrigation water abstractions is the requirement for the consent holder to measure and record abstraction data. The information collected contributes to the sustainable management of the resource and allows for assessment of compliance with consent conditions. The information is also useful for

consent holders in managing inputs to their operations, identifying potential energy savings, operational issues and making water use efficiency gains[3].

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (the Regulations) place further legislative requirement on holders of consents for water abstraction greater than 5 L/s, unless the taking of water is for non-consumptive purposes.

The regulations require:

- all water permits allowing the taking of 5L/s or more to collect and report records to a set minimum requirement[4];
- measurement at the point of where the water is taken from the river, lake or groundwater system (unless otherwise approved by the Council to be in another location);
- continuous records of daily volumes to be collected using an appropriate flowmeter with the data transferred to the Council on at least an annual basis;
- the flowmeter to meet an accuracy standard ($^{+}/_{-}$ 5%), and should be properly installed and calibrated independently every five years; and
- the consent holder is to be responsible for recording and transferring the data to the Council.

All abstractions captured under the Regulations were required to be complaint by 10 November 2016. The Council retains the authority to apply more stringent requirements on consent holders over and above those set out in the Regulations through the setting of consent conditions.

The rates and volumes of water abstraction are measured using a flowmeter. If a flowmeter is installed outside of the manufacturer's specifications, large errors may occur. The error produced by a valve installed immediately upstream of the flowmeter can be as much as 50%. Errors produced by sharp bends upstream of the flowmeter can amount to 20% of the measured flow. Photo 4 shows an example of a good installation of a flowmeter, with appropriate lengths of straight pipe either side of the meter. Photo 5 shows an example of a poor installation, with an elbow in the pipework immediately downstream of the flowmeter.

Poorly installed flowmeters are unlikely to pass the verification test required by a resource consent and/or the Regulations. In these instances the consent holder will be required to undertake works to allow for the successful verification of the flowmeter.

Resource consents issued by the Council generally stipulate the range and frequency of data that a consent holder must record in relation to their water take. Specific requirements have become more stringent as monitoring requirements and expectations have evolved. In addition to the requirements set out in consent conditions, all takes captured under the Regulations are required to meet the data recording and submission requirements set out therein. This includes a minimum requirement to measure and record the daily volume of water taken or weekly where an exception is granted under section 9 of the Regulations. Records are required to cover the entire water year (1 July to 30 June) and must be provided to the Council by 31 July of each year.

[3] Sustainable Water Programme of Action, Ministry for the Environment.
[4] Refer to the document Resource Management (Measuring and reporting of Water Takes) Regulations 2010. REF 2010/267.

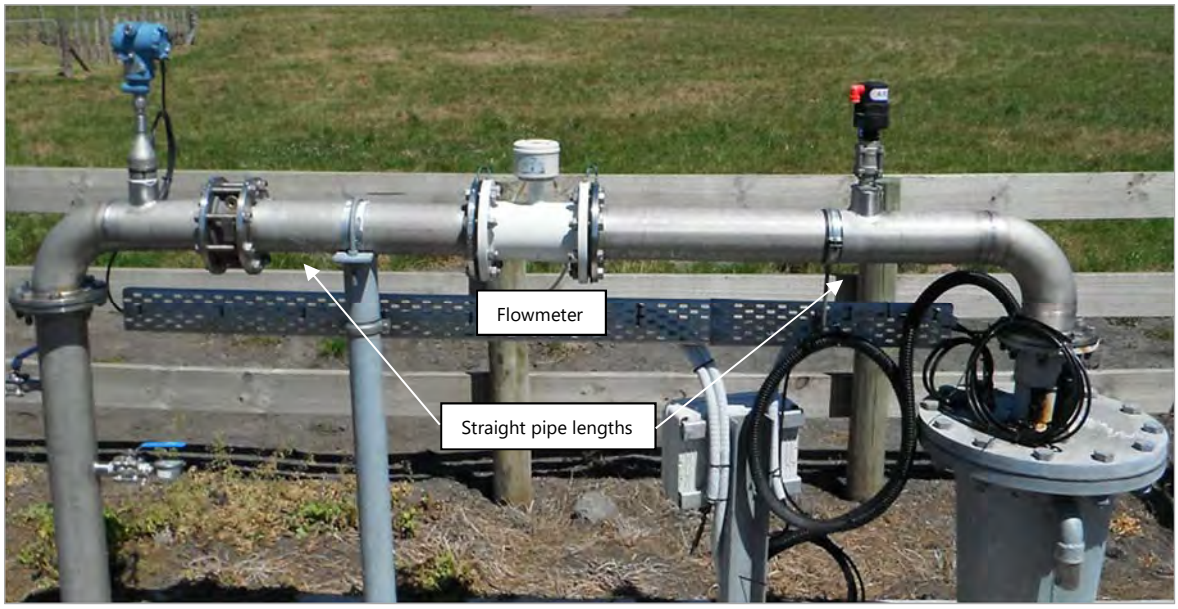


Photo 4 An example of a good flowmeter installation


Photo 5 An example of a poor flowmeter installation

The Council receives a mixture of manual and electronic records of water use data each year. The majority of consent holders use a datalogger to electronically store all take data being measured by the flowmeter. Data stored on a datalogger is downloaded in the field by Council staff during end of year inspection visits, or earlier if deemed necessary. Some datalogging systems also utilise telemetry to transmit data to the Council in near real-time. Telemetered systems have clear benefits for both consent compliance and water use assessment by consent holders.

### 1.3.5 Residual flow monitoring

Compliance with consent conditions requires water to only be taken when there is water available above the minimum flow limit set out in the consent. If flows drop below this level, then irrigation is to cease until there is adequate water to allow for irrigation to recommence. To determine compliance with these consent conditions the Council undertakes stream flow measurements by indirect and direct methods at control points usually upstream and/or downstream of abstraction points. These methods involve the measurements of velocity and cross-sectional areas which are used together to determine the flow rate at the time of the assessment.

### 1.3.6 Data review and compliance assessment

A major component of the monitoring programme is the assessment of water take data for consent compliance purposes. Compliance with abstraction rate and volume is assessed for all consent holders that exercised their consent. Compliance with abstraction rate and/or volume limits stipulated in the applicable resource consent was determined by assessment of remotely recorded data, or by calculating from records submitted by the consent holder. Data transferred to the Council by telemetered systems is electronically assessed on receipt, with pre-set automated alarms activated in the event of any consent limit exceedances.

# 2 Results

## 2.1 Site inspections

The Council carried out annual compliance monitoring inspections at all sites where irrigation consents were exercised during 2018-2019 irrigation season. This represented 64 separate sites, of which 56 were actively used, compared to 62 inspections carried out for the 2017-2018 irrigation season. The increased number of year on year inspections was due to inspecting officers visiting all sites that had previously exercised their consent and had infrastructure in place to exercise, when compared to the preceding 2017-2018 year.

Generally inspections found takes being well managed and operated within relevant consent conditions. One non-compliance was identified during inspection visits. In this instance a flowmeter, which had been operating on its internal battery only had gone flat, hence data had stopped being recorded.

## 2.2 Residual flow compliance

During the period under review, compliance with residual flow conditions for surface water abstraction sites was assessed 79 times in 27 waterways. This is slightly higher than 2017-2018 (62 gaugings), due to low rainfall and long periods of low flows during the period under review.

Stream gaugings were generally targeted to coincide with the periods of low surface water flows. Of the 79 gaugings carried out, flows were measured below residual flow limits on 15 occasions. However, in these instances, the irrigators had already ceased taking water, as they had been using the Council's website to monitor the river flows via the environmental data page.

## 2.3 Water usage and compliance assessment

A total of 56 irrigation consents were exercised during the 2018-2019 monitoring year, with most commencing irrigation in November or December and concluded for most in March. Total water use across all exercised irrigation consents of 6,906 ML. This was slightly less than that used during the preceding 2017-2018 monitoring year, when 58 irrigation consents were exercised, and a total usage of 7,204 ML.

The highest water usage for the season was by Spenceview Farms, abstracting 821,555 $m^3$. This consent took an average of 88 L/s, with irrigation occurring from November to early April. The second highest water user was Roger Dickie Family Trust with 792,196 $m^3$. Both Spenceview Farms and Roger Dickie Family Trust use large volumes of water, as they operate centre pivots to irrigate large areas of their farmland. Both consent holders operated within the conditions of their respective consents for the duration of the monitoring period. The average usage across all irrigation takes for the 2018-2019 year was 104,631 $m^3$.

The majority of the consent holders who exercised their consents during the 2018-2019 period and were required to submit records, either by their consent conditions or the Regulations, did so within the required timeframe. Written notifications and telephone calls received advising the non-exercising of consents were also taken as provision of records. There was one consent holder who had a problem with their flowmeter, which is discussed further in later sections of this report.

Knowing the actual water usage is an important aspect of any consent monitoring programme, not only to enable the assessment of consent compliance, but also to assist the Council in their overall management of the water resource and determining water allocation limits. The data collected also allows the consent holder to make robust assessments of their water use and resultant benefits.

Appendix III lists each consent holder's 2018-2019 water usage for comparison against their maximum authorised take volume over the monitoring period. The average annual consented take volume across all irrigation consents is 989,946 $m^3$. In contrast to this figure, the actual average annual usage for the 2018-2019 season was 104,631 $m^3$. Actual usage figures are significantly less than the volume allocated through

consents given that consents are only exercised for a small portion of the year, as demand only spikes during dry periods. Also, the majority of the consent holders tend to not irrigate on a continual basis, but generally irrigate at night to minimise evaporation losses and capitalise on reduced electricity supply costs. Peak irrigation does generally coincide with periods of reduced flow in the region's rivers and streams, which means there is a reduced volume of water available for abstraction.

All data collected is assessed for compliance against respective consent conditions. Following the assessment of the 2018-2019 data, four incidents were lodged in relation to irrigation consent non-compliances. Details relating to each non-compliance and the follow-up actions undertaken by the Council, are presented in Section 2.5.

## 2.4 Groundwater quality results

During the period under review, groundwater samples were obtained from a total of seven coastal sites to assess salinity levels in aquifers being pumped. The results indicate groundwater salinities in the range expected in coastal areas and measured values during the 2018-2019 monitoring period show little deviation from historical mean values at each site.

The results of the sampling carried out are presented below in Table 2. Historical means for each analyte are presented in brackets for comparison.

Table 2 Groundwater quality results

| Consent | Site code | Sample date | Chloride ($g/m^3$) | Conductivity (mS/m) | pH | Sodium ($g/m^3$) | Number of samples on record |
|---|---|---|---|---|---|---|---|
| 0714-2 | GND1150 | 02/04/2019 | 27 (28.3) | 31.5 (27.9) | 7.6 (7.5) | 32.0 (30.1) | 6 |
| 5950-1 | GND1203 | 29/01/2019 | 33.0 (33.6) | 37.1 (32.6) | 8.2 (8.6) | 63.0 (60.7) | 7 |
| | GND1711 | 29/01/2019 | 40.0 (n/a) | 34.7 (n/a) | 8.7 (n/a) | 59.0 (n/a) | 1 |
| 6026-1 | GND1233 | 02/04/2019 | 65.0 (54.1) | 57.6 (49.3) | 7.7 (7.8) | 44.0 (41.0) | 6 |
| 9561-1 | GND2108 | 25/01/2019 | 44.0 (44.3) | 44.5 (40.8) | 8.2 (8.1) | 26.0 (25.6) | 4 |
| | GND2109 | 25/01/2019 | 33.0 (37.9) | 37.3 (36.3) | 8.2 (8.1) | 27.0 (25.8) | 4 |
| 9608-1 | GND2354 | 25/01/2019 | 72.0 (90.2) | 77.5 (75.3) | 9.0 (8.7) | 180.0 (187.4) | 5 |

## 2.5 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the consent holders. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

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

Compliance with consent conditions was assessed for all irrigation consents exercised 2018-2019 period. Of the 56 consent holders who exercised their irrigation consents during the monitoring year, five (9%) had incidents recorded against them, which required further investigation by the Council.

Following investigation of all registered incidents, three consent holders were found to have a statutory defence, or the breaches were sufficiently minor to not warrant further action from the Council, over and above a formal warning regarding their future conduct. Five incidents resulted in enforcement action being brought by the Council, which included the issuing of three abatement notices. This equates to a non-compliance rate across all active irrigation consents of 9% during the 2018-2019 monitoring year, which is lower than the 2017-2018 monitoring year, in which 13% of exercised consents were subject to some form of enforcement action.

A summary of each incident identified during the 2018-2019 year, and the Council's response, is presented in Table 3.

Table 3 Consents found to be in breach and the incidents registered

| Date | Consent Holder (Consent number) | Details | Compliant (Y/N) | Enforcement Action Taken? | Outcome |
|---|---|---|---|---|---|
| 01/07/2019 | Go 2 Milk Limited (0721-3) | The bore label was not present, measuring and recording equipment was not installed, and abstraction records were not able to be supplied. | N | Abatement notice | An abatement notice was issued requiring them to undertake works to ensure consent compliance. |
| 09/07/2019 | The Tom Lance Trust (3312-3) | Abstraction volume had been breached on several occasions between 29 July 2018 and 19 February 2019. Also no ground water level monitoring equipment was installed as required. | N | 14 day letter and abatement notice | An abatement notice was issued requiring them to comply with their consent conditions at all times. |
| 11/07/2019 | EO & CP Lander (1223-3) | Abstraction rate breaches in February and March 2019 due to the flowmeter being re-conditioned but not reset correctly. However, the flowmeter had been reset by end of year inspection and was operating correctly. | N | 14 day letter | Letter of explanation received and Council accepted. |
| 22/07/2019 | IHC New Zealand Inc (NORTH TARANAKI) (0880-3) | During routine monitoring it was found that the flow meter battery was flat, and no data was available after 26 April 2019. | N | None | Flowmeter battery was still under warranty, so battery was replaced. |
| 23/07/2019 | Kaitake Golf Club Inc (0124-5) | Abstraction volume breaches on a number of occasions during the monitoring year. | N | 14 day letter and abatement notice | An abatement notice was issued requiring them to comply with their consent conditions at all times. |

# 3 Discussion

## 3.1 Discussion of site performance

Given that this report jointly covers 69 different irrigation water take consents at numerous locations across the region, a discussion of system performance at each location is impractical. However overall, the examination of the data supplied to the Council for the 2018-2019 monitoring year revealed that five of the 56 consent holders (9%) who exercised their consents breached one or more conditions of their resource consent. Four of these breaches related to exceedances of an abstraction rate and/or volume limit, and one for a faulty flowmeter battery.

Discussed below are some of the key points and issues arising from the monitoring of irrigation water takes during the 2018-2019 monitoring year. Also discussed are some components of irrigation system monitoring, data collection and transfer that could assist consent holders in improving compliance performance and optimisation of their water usage.

The primary means of measuring water abstraction data is the flowmeter. In order to comply with monitoring requirements set out in consent conditions, and the requirements set out in relation to meter accuracy in the Regulations, it is critical that flowmeters are installed as per manufacturer's specifications. Consent holders must ensure the meter is operable at all times, even when no water is being taken. Consent holders should not tamper with the operation of the meter, or attempt to access internals of the meter, without advising the Council and engaging a suitably qualified technician. Further information regarding preferred meter specification and operation can be obtained by contacting the Council.

To ensure data being collected by a flowmeter is accurate; the accuracy of the meter needs to be confirmed by a verification test. A meter is deemed to be recording accurately (verified) when reading within $^{+}/_{-}$ 5% of a calibrated reference meter. The regulations required all takes over 5 L/s to be verified by 10 November 2016. Resource consents being issued by the Council generally require flowmeters to be verified before the consent is first exercised. The correct installation of a good quality flowmeter will typically ensure a meter is able to pass a verification test. While 100% of active consents that required their meters to be verified in Taranaki have been verified, the Council has had to pursue enforcement action in a small number of instances to ensure compliance. Consent holders should be reminded that verification is required every five years, and plans should be put in place well in advance of re-verification dates to avoid any compliance issues.

The Council received a small number of calls from consent holders at the conclusion of the monitoring period advising of operational issues with measurement and recording equipment that had occurred during the year. In some cases, Council staff were only advised of these issues verbally while attending sites for end of year inspections. Consent holders are reminded that they need to contact the Council as soon as they discover any operational issues with any monitoring equipment or operational issues that impact their ability to comply with their consent (e.g. burst pipework). The majority of irrigation consents stipulate a requirement to notify the Council of such issues in any case, and failure to do so may result in enforcement action being taken.

As discussed previously in this report, the majority of irrigation consent holder's record water take data on dataloggers. Data from these loggers is subsequently downloaded by Council staff at the conclusion of the monitoring year, at which point it is assessed for compliance. During the investigation and follow-up of non-compliances identified at the conclusion of the 2018-2019 monitoring year, a number of consent holders identified as non-compliant were interested in what technologies were available to enable them to view water use data in real-time and which allowed them to be notified of any impending consent exceedances. Such systems are widely available, using telemetry to transmit data electronically via the cell phone or radio network. This data can be accessed by the consent holder and automated alarms can be set up to notify

them of any breaches of authorised abstraction rate of volume. The Council promotes the installation of telemetry systems as a means of improving consent compliance and allowing water users to better monitor their water usage and improve water use efficiency.

Irrigation consent holders are also urged to investigate the use of soil moisture monitoring equipment to assist in the efficient planning and scheduling of irrigation. By monitoring soil moisture conditions, irrigators can optimise the usage of their irrigation systems to only apply water to pasture when it is required and to cease irrigation when the optimum volume of water has been applied. This has obvious benefits in terms of maximising pasture production but can also save irrigators money by avoiding the application of water when it is not required. Soil moisture monitoring can be undertaken with handheld sensors, or with dedicated in-situ systems. The complexity and cost of each available system vary and consent holders are urged to contact the Council for further information.

## 3.2 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 4.

Table 4 Individual performance for all irrigation consent holders

| Consent | Consent Holder | Environmental compliance achieved? | Administration compliance achieved? |
|---|---|---|---|
| **0017-3.1** | Manaia Golf Club | High | High |
| **0124-5** | Kaitake Golf Club Inc | Improvement required | High |
| **0132-3** | Hawera Golf Club Inc | High | High |
| **0189-4** | AI & KJ Williams | n/a | n/a |
| **0270-3** | Westown Golf Club Inc | High | High |
| **0278-4** | NRGE Farms Ltd/Oceanview Trust | n/a | n/a |
| **0464-3** | Oakura Farms Ltd | n/a | n/a |
| **0647-3** | IG Cassie | High | High |
| **0714-2** | GD & HM McCallum | High | High |
| **0721-3** | Go 2 Milk Ltd | Improvement required | Improvement required |
| **0880-3** | IHC New Zealand Inc (NORTH TARANAKI) | Good | High |
| **1223-3** | EO & CP Lander | Improvement required | High |
| **1721-3** | Manukorihi Golf Club Inc | High | High |
| **1877-3** | Te Ngutu Golf Club Incorporated | High | High |
| **1879-3** | Wairau Nurseries | n/a | n/a |
| **2138-3** | Riverside Farms Taranaki Ltd | High | High |
| **3171-3** | Taranaki Greenhouses Ltd | High | High |
| **3312-3** | The Tom Lance Trust | Improvement required | Good |

| Consent | Consent Holder | Environmental compliance achieved? | Administration compliance achieved? |
|---|---|---|---|
| **4450-2** | Waitara Golf Club Inc | High | High |
| **4494-2** | CT & JM McDonald | High | High |
| **4783-2** | Larsen Trusts Partnership | n/a | n/a |
| **4993-2** | J & EG Sanderson | High | High |
| **4994-2** | J & EG Sanderson | High | High |
| **5128-2** | Coastal Country Farms Ltd | n/a | n/a |
| **5568-1** | Cornwall Park Farms Ltd | n/a | n/a |
| **5570-2** | Kaihihi Trust | High | High |
| **5571-1** | Jimian Ltd | n/a | n/a |
| **5623-2** | WD & SC Morrison | High | High |
| **5636-1** | Waiwira Trust | High | High |
| **5773-1** | Goodin FJ & Sons Ltd | High | High |
| **5778-1** | Mara Trust | High | High |
| **5781-2** | Waikaikai Farms Ltd | High | High |
| **5791-1** | AL & LA Campbell | High | High |
| **5797-1** | Pihama Farms Ltd | High | High |
| **5807-2** | Dickie Roger Family Trust | Good | High |
| **5827-2** | Walker & McLean Partnership | High | High |
| **5829-1** | RM & MC Julian Family Trust | High | High |
| **5840-2** | Gibbs G Trust | High | High |
| **5863-2** | Geary AR Trust (A R Geary) | High | High |
| **5876-1** | GA & RJ Dorn | High | High |
| **5878-2** | Woollaston Family Trust Partnership | High | High |
| **5879-1** | BR & RG Harvey Family Trust | High | High |
| **5887-1** | Croftwest Trust | High | High |
| **5896-2** | Kohi Investments Ltd | High | High |
| **5898-2** | David Pease Family Trust | High | High |
| **5950-2** | WD & SC Morrison | High | High |
| **6026-1** | JR & DM Baker | High | High |
| **6159-1** | Pinehill Land Company Ltd | n/a | n/a |
| **6292-1** | New Plymouth Golf Club Inc | High | High |

| Consent | Consent Holder | Environmental compliance achieved? | Administration compliance achieved? |
|---|---|---|---|
| **6429-1** | Leatherleaf Ltd | High | High |
| **6430-1** | Fonic Farms Ltd | High | High |
| **6628-1** | Hamblyn Family Trusts | High | High |
| **7270-1** | Ian Mantey Family Trust & Sally Mantey Family Trust | n/a | n/a |
| **7346-1** | Spenceview Farms | High | High |
| **7372-1** | Pukeone Partnership | High | High |
| **7527-1** | Pukeone Partnership | High | High |
| **7528-1** | Kereone Farms Ltd | High | High |
| **7626-1** | NW & DM King | High | High |
| **7768-1** | Carter AJ Ltd | n/a | n/a |
| **7781-1** | D Krumm | High | High |
| **7866-1** | Stratford Golf Club Inc | n/a | n/a |
| **7895-1** | Ohawe Farm Ltd | High | High |
| **7981-1** | Taranaki Community Rugby Trust | n/a | n/a |
| **9561-1** | Kereone Farms Ltd | High | High |
| **9577-1** | MJ Washer Trusts Partnership | High | High |
| **9597-1** | Nilock & Camole | High | High |
| **9608-1** | D Wilson | High | High |
| **10135-1.1** | Luttrell Trust Partnership | High | High |
| **10369-1** | Inglewood Golf Club Inc | High | High |

n/a = consent not exercised during the period under review so no rating assigned

During the year, 89% of exercised irrigation consents in Taranaki achieved a high environmental performance and compliance rating as defined in Section 1.1.4. A further 7% are required to show improvement.

Ninety-six percent of consent holders who exercised their consents during the 2018-2019 year achieved a high level rating for their administrative performance and compliance.

## 3.3 Recommendations from the 2017-2018 Annual Report

In the 2017-2018 Annual Report, it was recommended:

1. THAT in the first instance, monitoring and reporting of consented irrigation activities for the 2018-2019 year continue at the same level as in 2017-2018.
2. THAT should there be issues with environmental or administrative performance in 2018-2019, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

3. THAT the monitoring and the downloading of abstraction data occurs mid-season for those that had water takes breaches during the 2016-2017 and 2017-2018 seasons.
4. THAT the Council encourages consent holders that do not supply good quality records to install a datalogger and transfer data electronically to the Council database via telemetry.

Recommendation 1, 2 and 3 were implemented during the period under review, while the Council continues to work with consent holders in regards to recommendation 4.

## 3.4 Alterations to monitoring programmes for 2019-2020

In designing and implementing the monitoring programmes in the region, the Council has taken into account:

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

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for that for 2019-2020 that monitoring of irrigation consents continues at the same levels as during the 2018-2019 year.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2019-2020.

# 4 Recommendations

1. THAT in the first instance, monitoring and reporting of consented irrigation activities for the 2019-2020 year continue at the same level as in 2018-2019.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the monitoring and the downloading of abstraction data occurs mid-season for those that had water takes breaches during the 2017-2018 and 2018-2019 seasons.
4. THAT the Council encourages consent holders that do not supply good quality records to install a datalogger and transfer data electronically to the Council database via telemetry.

# Glossary of common terms and abbreviations

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

| | |
|---|---|
| Conductivity | Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m. |
| Cumec | A volumetric measure of flow- 1 cubic metre per second (1 $m^3s^{-1}$). |
| $g/m^3$ | Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures. |
| Incident | An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred. |
| Intervention | Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring. |
| Investigation | Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident. |
| Incident Register | The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan. |
| L/s | Litres per second. |
| mS/m | Millisiemens per metre. |
| pH | A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5. |
| Resource consent | Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15). |
| RMA | *Resource Management Act 1991* and including all subsequent amendments. |

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# Appendix I

# Example surface water abstraction permit for irrigation

# Water Permit

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

| | |
|---|---|
| Name of Consent Holder: | RM & MC Julian Family Trust<br>[Trustees: Richard Mark & Michelle Catherine Julian]<br>3645 Main South Road<br>RD 32<br>State Highway 45<br>Opunake 4682 |
| Decision Date | 27 March 2019 |
| Commencement Date | 17 April 2019 |

## Conditions of Consent

| | |
|---|---|
| Consent Granted: | To take and use water from the Taungatara Stream for pasture irrigation purposes |
| Expiry Date: | 1 June 2036 |
| Review Date(s): | June 2021, June 2024, June 2027, June 2030, June 2033 |
| Site Location: | 3645 Main South Road, Opunake |
| Grid Reference (NZTM) | 1676510E-5629360N |
| Catchment: | Taungatara |

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

## General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

## Special conditions

1. The rate of taking shall not exceed 50 litres per second, and the volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 4,200 cubic metres.

   *Note: at 50 L/s the daily limit of 4,200m³ would be taken in 23.3 hours.*

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking (or a nearby site in accordance with Regulation 10 of the *Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.* The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5% at intervals not exceeding 15 minutes.

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

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

   (a) has been installed and/or maintained in accordance with the manufacturer's specifications; and/or

   (b) has been tested and shown to be operating to an accuracy of ± 5%.

   The documentation shall be provided:

   (i) within 30 days of the installation of a water meter or datalogger;

   (ii) at other times when reasonable notice is given and the Chief Executive, Taranaki Regional Council has reasonable evidence that the equipment may not be functioning as required by this consent; and

   (iii) no less frequently than once every five years.

4. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person and a maintenance report provided to the Chief Executive, Taranaki Regional Council within 30 days of the work occurring.

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

6. From 1 September 2019 the consent holder shall determine the flow in the Taungatara Stream immediately downstream of the take site at intervals not exceeding 15 minutes. For flows less than 1000 L/s the flow shall also be determined, at 15 minute intervals, to an accuracy of +10%.

   *Note: The installation required by condition 6 will be installed by the Taranaki Regional Council and costs charged to the consent holder.*

7. The records of stream flow and water taken shall:

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

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

   (c) from 1 September 2019 be transmitted to the Taranaki Regional Council's computer system within 2 hours of being recorded.

8. No taking shall occur when the flow in the Taungatara Stream immediately downstream of the intake point is less than 496 L/s litres per second.

9. At all times the consent holder shall take all practicable steps to take and use water efficiently and generally prevent or minimise any adverse effects on the environment including as minimum, by ensuring that:
   (a) the minimum amount of water necessary for the purpose is taken;
   (b) as far as practicable, soil water does not exceed field capacity;
   (c) there is no surface ponding or runoff; and
   (d) equipment does not leak.

10. From 1 September 2019 all water shall be taken and used in accordance with an *Irrigation Management Plan* ('IMP') prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The IMP shall detail methods and techniques that will be used to ensure compliance with condition 9 including, as a minimum, details of:
    (a) The specific area(s) to be irrigated and the method of irrigation;
    (b) Crop water requirements, evapotranspiration and available water holding capacity of the soil(s) over the irrigated area;
    (c) How irrigation will be scheduled to maximise the benefits of rainfall and minimise subsurface drainage and minimise loss through evaporation;
    (d) How available soil water will be determined;
    (e) How water is to be applied as uniformly as practicable over the irrigated area, and the uniformity of application demonstrated; and
    (f) A leak detection programme.

11. The Irrigation Management Plan ('IMP') prepared and submitted to the Chief Executive, Taranaki Regional Council in accordance condition 10 shall also be provided to Fish and Game New Zealand and Te Korowai o Ngāruahine Trust at the same time.

    *Advice note: Any comments made by Fish and Game New Zealand and Te Korowai o Ngāruahine Trust within 15 working days of receiving a plan will be taken into account by the Chief Executive, Taranaki Regional Council when determining if the plan meets the requirements of this consent.*

12. Before 1 September 2019 the intake shall be screened to avoid fish (including juveniles) entering the intake or being trapped against the screen, by ensuring that gaps in the screen are no bigger than 1.5 mm and the intake velocity is not greater than 0.12 metres per second.

13. The consent holder shall maintain the fencing and riparian planting specified in the Riparian Management Plan for the property.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review within 12 months of a Regional Plan becoming operative that includes objectives or polices relating to the allocation of water. The purpose of this review is to ensure that the conditions of the consent which set the environmental flows (allocation limit and minimum flow) are consistent with those objectives and policies.

15. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2021 and at 3 yearly intervals thereafter for the purposes of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 27 March 2019

For and on behalf of
Taranaki Regional Council

_____

A D McLay
**Director - Resource Management**

# Appendix II

# Active irrigation consents in Taranaki
# July 2018 to June 2019

# Irrigation Water Takes

## Surface water takes

| Consent | Consent Holder | Usage | Irrigation system |
|---|---|---|---|
| **0017-3** | Manaia Golf Club | Recreational | K – line |
| **0124-5** | Kaitake Golf Club Inc | Recreational | K – line |
| **0132-3** | Hawera Golf Club Inc | Recreational | K – line |
| **0189-4** | AI & KJ Williams | Pasture Irrigation | Travelling irrigator |
| **0270-3** | Westown Golf Club Inc | Recreational | K – line |
| **0278-4** | NRGE Farms Limited/Oceanview Trust | Pasture Irrigation | K – line and flood irrigation |
| **0464-3** | Oakura Farms Limited | Horticultural | n/a |
| **0647-3** | IG Cassie | Horticultural | K – line |
| **0880-3** | IHC New Zealand Inc (NORTH TARANAKI) | Horticultural | K – line |
| **1223-3** | EO & CP Lander | Horticultural | K – line |
| **1721-3.1** | Manukorihi Golf Club Inc | Recreational | K – line |
| **1877-3** | Te Ngutu Golf Club Incorporated | Recreational | K – line |
| **1879-3** | Wairau Nurseries | Horticultural | n/a |
| **2138-3** | Riverside Farms Taranaki Ltd | Pasture Irrigation | K – line |
| **4450-2.1** | Waitara Golf Club Inc | Recreational | K – line |
| **4494-3** | CT & JM McDonald | Pasture Irrigation | K – line |
| **4783-3** | Larsen Trusts Partnership | Pasture Irrigation | K – line and travelling irrigator |
| **4993-2** | J & EG Sanderson | Pasture Irrigation | K – line |
| **4994-2** | J & EG Sanderson | Pasture Irrigation | K – line |
| **5128-2** | Coastal Country Farms Limited | Pasture Irrigation | K – line and travelling irrigator |
| **5568-2** | Cornwall Park Farms Limited | Pasture Irrigation | Travelling irrigator |
| **5570-2** | Kaihihi Trust | Pasture Irrigation | K – line |
| **5571-2** | Jimian Limited | Pasture Irrigation | K – line |
| **5623-2** | WD & SC Morrison | Pasture Irrigation | Centre pivot and K - line |
| **5636-2** | Waiwira Trust | Pasture Irrigation | Centre pivot and K - line |
| **5773-1.2** | Goodin FJ & Sons Limited | Pasture Irrigation | K – line |
| **5778-1** | Mara Trust | Pasture Irrigation | K – line |
| **5781-2.1** | Waikaikai Farms Limited | Pasture Irrigation | K – line |
| **5791-1** | AL & LA Campbell | Pasture Irrigation | K – line |
| **5797-1** | Pihama Farms Limited | Pasture Irrigation | K – line |
| **5807-2** | Dickie Roger Family Trust | Pasture Irrigation | Centre pivot and K – line |
| **5827-2** | Walker & McLean Partnership | Pasture Irrigation | Centre pivot |
| **5829-1.1** | Julian RM & MC Family Trust | Pasture Irrigation | K – line and travelling irrigator |

| Consent | Consent Holder | Usage | Irrigation system |
|---|---|---|---|
| **5840-2** | Gibbs G Trust | Pasture Irrigation | Centre pivot |
| **5863-2.1** | Geary AR Trust (A R Geary) | Pasture Irrigation | Centre pivot and K – line |
| **5876-1** | GA & RJ Dorn | Pasture Irrigation | K – line |
| **5878-2.1** | Woollaston Family Trust Partnership | Pasture Irrigation | Travelling irrigator |
| **5887-1** | Croftwest Trust | Pasture Irrigation | K – line |
| **5896-2** | Kohi Investments Limited | Pasture Irrigation | K – line |
| **5898-2** | David Pease Family Trust | Pasture Irrigation | K – line |
| **6159-1** | Pinehill Land Company Limited | Pasture Irrigation | K – line & travelling irrigator |
| **6292-1** | New Plymouth Golf Club Inc | Recreational | K – line |
| **6429-1** | Leatherleaf Limited | Pasture Irrigation | Centre pivot |
| **6430-1** | Fonic Farms Limited | Pasture Irrigation | Centre pivot and K – line |
| **6628-1.1** | Hamblyn Family Trusts | Pasture Irrigation | K – line |
| **7270-1** | Ian Mantey Family Trust & Sally Mantey Family Trust | Pasture Irrigation | Travelling irrigator |
| **7346-1.1** | Spenceview Farms | Pasture Irrigation | Centre pivot |
| **7372-1** | Pukeone Partnership | Pasture Irrigation | Centre pivot |
| **7527-1.1** | Pukeone Partnership | Pasture Irrigation | Centre pivot |
| **7528-1.1** | Kereone Farms Limited | Pasture Irrigation | Centre pivot |
| **7626-1** | NW & DM King | Pasture Irrigation | K – line |
| **7768-1** | Carter AJ Limited | Pasture Irrigation | Travelling irrigator |
| **7781-1** | D Krumm | Pasture Irrigation | Travelling irrigator |
| **7895-1** | Ohawe Farm Limited | Pasture Irrigation | K – line |
| **7981-1** | Taranaki Community Rugby Trust | Pasture Irrigation | n/a |
| **9577-1.1** | MJ Washer Trusts Partnership | Pasture Irrigation | K – line and travelling irrigator |
| **9597-1** | Nilock & Camole | Pasture Irrigation | Centre pivot |
| **10135-1.1** | Luttrell Trust Partnership | Pasture Irrigation | K – line |

## Groundwater takes

| Consent | Consent Holder | Usage | Irrigation system |
|---|---|---|---|
| **0714-2** | GD & HM McCallum | Pasture Irrigation | K – line and travelling irrigator |
| **0721-3** | Go 2 Milk Limited | Horticultural | n/a |
| **3171-3** | Taranaki Greenhouses Limited | Horticultural | K – line |
| **3312-3.1** | The Tom Lance Trust | Horticultural | K – line |
| **5879-1** | BR & RG Harvey Family Trust | Pasture Irrigation | n/a |
| **5950-2.1** | WD & SC Morrison | Pasture Irrigation | Centre pivot and K - line |
| **6026-1** | JR & DM Baker | Pasture Irrigation | K – line |
| **7866-1** | Stratford Golf Club Inc | Recreational | n/a |
| **9561-1** | Kereone Farms Limited | Pasture Irrigation | Centre pivot |
| **9608-1.2** | D Wilson | Pasture Irrigation | Centre pivot |
| **10369-1** | Inglewood Golf Club Inc | Recreational | K – line |

n/a - consent holder does not have any system in place.

# Appendix III

# Water take consent usage for 2018-2019

## Water take consent usage for 2018-2019

| Consent | Consent holder | Consented allowable annual usage ($m^3$/annum) | Actual water usage from 1 July 2018 to 30 June 2019 ($m^3$/annum) | Percentage of consented volume used |
|---|---|---|---|---|
| **0017-3.1** | Manaia Golf Club | 36,500 | 7,177 | 20 % |
| **0124-5** | Kaitake Golf Club Inc | 47,450 | 14,979 | 32 % |
| **0132-3** | Hawera Golf Club Inc | 91,250 | n/a[1] | n/a |
| **0189-4** | AI & KJ Williams | 365,000 | 0 | 0 % |
| **0270-3** | Westown Golf Club Inc | 131,400 | 4,700 | 4 % |
| **0278-4** | NRGE Farms Limited/Oceanview Trust | 4,320,432 | 0 | 0 % |
| **0464-3** | Oakura Farms Limited | 36,500 | 0 | 0 % |
| **0647-3** | IG Cassie | 30,660 | 1,461 | 5 % |
| **0714-2** | GD & HM McCallum | 182,500 | 9,186 | 5 % |
| **0721-3** | Go 2 Milk Limited | 30,660 | n/a[2] | 0 % |
| **0880-3** | IHC New Zealand Inc (NORTH TARANAKI) | 32,120 | 3,992 | 12 % |
| **1223-3** | EO & CP Lander | 108,405 | 7,533 | 7 % |
| **1721-3** | Manukorihi Golf Club Inc | 69,350 | 11,610 | 17 % |
| **1877-3** | Te Ngutu Golf Club Incorporated | 73,000 | 7,205 | 10 % |
| **1879-3** | Wairau Nurseries | 33,215 | 0 | 0 % |
| **2138-3** | Riverside Farms Taranaki Ltd | 756,864 | 19,273 | 3 % |
| **3171-3** | Taranaki Greenhouses Limited | 22,630 | 8,120 | 36 % |
| **3312-3** | The Tom Lance Trust | 29,200 | 15,732 | 54 % |
| **4450-2** | Waitara Golf Club Inc | 18,250 | 8,543 | 47 % |
| **4494-2** | CT & JM McDonald | 788,400 | 62,465 | 8 % |
| **4783-2** | Larsen Trusts Partnership | 1,169,825 | 0 | 0 % |
| **4993-2** | J & EG Sanderson | 1,022,000 | 11,845 | 1 % |
| **4994-2** | J & EG Sanderson | 1,186,250 | 126,206 | 11 % |
| **5128-2** | Coastal Country Farms Limited | 851,545 | 0 | 0 % |
| **5568-1** | Cornwall Park Farms Limited | 286,525 | 0 | 0 % |
| **5570-2** | Kaihihi Trust | 547,500 | 18,120 | 3 % |
| **5571-1** | Jimian Limited | 1,261,440 | 0 | 0 % |
| **5623-2** | WD & SC Morrison | 3,547,800 | 168,560 | 5 % |
| **5636-1** | Waiwira Trust | 2,584,930 | 554,231 | 21 % |

[1] Consent was exercised but not required to submit records by the consent or the Regulations

[2] Consent was exercised, but no records kept.

| Consent | Consent holder | Consented allowable annual usage ($m^3$/annum) | Actual water usage from 1 July 2018 to 30 June 2019 ($m^3$/annum) | Percentage of consented volume used |
|---|---|---|---|---|
| **5773-1** | Goodin FJ & Sons Limited | 630,720 | 116,496 | 18 % |
| **5778-1** | Mara Trust | 630,720 | 57,778 | 9 % |
| **5781-2** | Waikaikai Farms Limited | 2,269,205 | 113,665 | 5 % |
| **5791-1** | AL & LA Campbell | 958,125 | 111,040 | 12 % |
| **5797-1** | Pihama Farms Limited | 1,314,000 | n/a[3] | n/a |
| **5807-2** | Dickie Roger Family Trust | 6,679,500 | 792,196 | 12 % |
| **5827-2** | Walker & McLean Partnership | 821,250 | 116,717 | 14 % |
| **5829-1** | RM & MC Julian Family Trust | 1,533,000 | 64,619 | 4 % |
| **5840-2** | Gibbs G Trust | 821,250 | 52,709 | 6 % |
| **5863-2** | Geary AR Trust (A R Geary) | 1,144,640 | 284,156 | 25 % |
| **5876-1** | GA & RJ Dorn | 1,350,500 | 53,578 | 4 % |
| **5878-2** | Woollaston Family Trust Partnership | 474,500 | 10,969 | 2 % |
| **5879-1** | BR & RG Harvey Family Trust | 630,720 | 9,600 | 2 % |
| **5887-1** | Croftwest Trust | 547,500 | 32,688 | 6 % |
| **5896-2** | Kohi Investments Limited | 1,460,000 | 165,679 | 11 % |
| **5898-2** | David Pease Family Trust | 946,080 | 83,775 | 9 % |
| **5950-2** | WD & SC Morrison | 313,900 | 76,409 | 24 % |
| **6026-1** | JR & DM Baker | 189,070 | 741 | >1 % |
| **6159-1** | Pinehill Land Company Limited | 237,250 | 0 | 0 % |
| **6292-1** | New Plymouth Golf Club Inc | 292,000 | 48,285 | 17 % |
| **6429-1** | Leatherleaf Limited | 912,500 | 134,892 | 15 % |
| **6430-1** | Fonic Farms Limited | 1,741,050 | 206,638 | 12 % |
| **6628-1** | Hamblyn Family Trusts | 765,770 | 72,832 | 10 % |
| **7270-1** | Ian Mantey Family Trust & Sally Mantey Family Trust | 378,140 | 0 | 0 % |
| **7346-1** | Spenceview Farms | 3,815,856 | 821,555 | 22 % |
| **7372-1** | Pukeone Partnership | 1,261,440 | 261,623 | 21 % |
| **7527-1** | Pukeone Partnership | 5,545,080 | 757,059 | 14 % |
| **7528-1** | Kereone Farms Limited | 3,416,400 | 617,240 | 18 % |
| **7626-1** | NW & DM King | 725,328 | 91,110 | 13 % |
| **7768-1** | Carter AJ Limited | 126,144 | 0 | 0 % |
| **7781-1** | D Krumm | 105,120 | n/a[1] | n/a |

[3] At the time of the inspection, the pump shed had lost power, so datalogger was flat. Data will be retrieved from logger at next inspection.

| Consent | Consent holder | Consented allowable annual usage ($m^3$/annum) | Actual water usage from 1 July 2018 to 30 June 2019 ($m^3$/annum) | Percentage of consented volume used |
|---|---|---|---|---|
| **7866-1** | Stratford Golf Club Inc | 25,550 | 0 | 0 % |
| **7895-1** | Ohawe Farm Limited | 1,259,250 | 54,040 | 4 % |
| **7981-1** | Taranaki Community Rugby Trust | 838,858 | 0 | 0 % |
| **9561-1** | Kereone Farms Limited | 682,550 | 126,870 | 19 % |
| **9577-1** | MJ Washer Trusts Partnership | 127,750 | 11,681 | 9 % |
| **9597-1** | Nilock & Camole | 647,875 | 59,024 | 9 % |
| **9608-1** | D Wilson | 946,080 | 232,848 | 25 % |
| **10135-1.1** | Luttrell Trust Partnership | 2,043,533 | 203,665 | 10 % |
| **10369-1** | Inglewood Golf Club Inc | 36,500 | 2,527 | 7 % |

# Appendix IV

# Report on consented water permits for farm and general water supply purposes

# Report on water permits for farm and general water supply

## Introduction

This report is for water takes for general farm and water supply purposes that have been granted by the Council [water takes in excess of the permitted 1.5 litres per second or 50 cubic metres per day entitlement per property according to the Regional Fresh Water Plan for Taranaki, Rule 15]. This report discusses the consents active to 30 June 2019 and any compliance issues related to them.

These water takes are different to that for water irrigation, as these are used for general farm use and water supply and are used throughout the year unlike irrigation consents that are used for a small portion of the year. These consents generally have different consent conditions attached to them, compared to those for irrigation water, as the takes are generally of a minor nature and generally fall outside the Measurement and Reporting of Water Takes Regulations 2010.

## Current water take consents

At 30 June 2019, there were a total of 34 current water take consents for general farm and water supply purposes. Of these seven were from surface water and 27 were from groundwater sources (Table **1**).

Table 1 Total consents granted for dairy farm and water supply purposes to 30 June 2019

| Consent | Consent holder | Source |
|---|---|---|
| 0865-3 | Kathdan Trust Limited | Surface Water |
| 1190-3 | Pungarehu Farmers Group Water Scheme | Surface Water |
| 5413-2 | MJ Fahy | Groundwater |
| 5990-2 | ID & JA Armstrong | Surface Water |
| 6133-1 | DJ & ME McKenzie | Groundwater |
| 6372-1 | Naplin Trust | Groundwater |
| 6380-1 | Caiseal Trust Partnership | Groundwater |
| 6451-2 | Nukumaru Water Scheme Society Inc | Groundwater |
| 6903-1 | Awatea Hawkes Bay Trust | Groundwater |
| 7132-1 | Aorere Farms Partnership | Groundwater |
| 7272-1 | Belmont Dairies Limited | Groundwater |
| 7304-1 | Gwerder Brothers | Groundwater |
| 7497-1 | Te Rua O te Moko 2B Ahuwhenua Trust | Surface Water |
| 7540-1 | AJ & DI Dravitzki Trusts Partnership | Groundwater |
| 7569-1 | Stoney River Dairy Limited | Groundwater |
| 7608-1 | Go 2 Milk Limited | Groundwater |
| 7711-1 | Pariroa Marae (The Trustees) | Groundwater |
| 7783-1 | Norwood Farm Partnership | Groundwater |
| 7969-1 | AB Middleton | Surface Water |
| 9747-1 | DP & JH Roper Family Trust Partnership | Groundwater |
| 9900-1 | Kaipi Holdings Limited | Groundwater |
| 9910-1 | PKW Farms LP | Groundwater |
| 9947-1 | Ngatoro Poultry Limited | Groundwater |
| 10029-1 | Hernly Farms Limited | Groundwater |
| 10112-1 | Construction Mechanics (1993) Limited | Groundwater |
| 10113-1.2 | Lupton Trust | Groundwater |
| 10120-1.1 | SC & MJ O'Neill Family Trust | Groundwater |
| 10199-1 | R Oldfield | Groundwater |
| 10421-1 | Medley Partnership | Surface Water |
| 10449-1 | Joblin Partners Limited | Groundwater |
| 10484-1 | PKW Farms LP | Groundwater |
| 10542-1 | Zenith Farms Family Trust | Surface Water |
| 10728-1 | Turangareere Trust | Groundwater |

| Consent | Consent holder | Source |
|---|---|---|
| 10746-1 | Hernly Farm Limited | Groundwater |

## Results and discussion

During the year under review, the Council inspected all water take consents that have a compliance monitoring programme. This meant that some consents were not monitored due to the small nature of the takes, as it was deemed unnecessary, and/or there were no enforceable consent conditions to monitor on the systems.

Of the consents that were inspected, they were checked to ensure that they were compliant with their resource consent conditions, which may include the presence of a flowmeter, a tamperproof flowmeter, adequately screened intakes, bores labelled and cased, pump sheds fenced off, water bodies fenced off, riparian margins planted.

If the consents were required to keep records, the records were either downloaded at the time of the annual inspection, if a datalogger was present, or the records were to be sent to the Council by 31 July. Table 2 lists the consents annual allowable usage and actual water usage for 2018-2019 season.

Table 2 Consents allowable annual water take and 2018-2019 actual annual usage

| Consent | Consent holder | Consented allowable annual usage ($m^3$/annum) | Actual water usage from 1 July 2018 to 30 June 2019 ($m^3$/annum) |
|---|---|---|---|
| 0865-3 | Kathdan Trust Limited | 394,200 | 127,134 |
| 1190-3.2 | Pungarehu Farmers Group Water Scheme | 125,143 | 127,456 |
| 5413-2 | MJ Fahy | 71,540 | n/a |
| 5990-2 | ID & JA Armstrong | 43,800 | 7,864 |
| 6133-1 | DJ & ME McKenzie | 1,825 | n/a |
| 6372-1 | Naplin Trust | 18,250 | n/a |
| 6380-1 | Caiseal Trust Partnership | 36,500 | 7,910 |
| 6903-1 | Awatea Hawkes Bay Trust | 91,250 | 9,716 |
| 7132-1 | Aorere Farms Partnership | 65,700 | 26,396 |
| 7272-1 | Belmont Dairies Limited | 94,535 | 47,908 |
| 7304-1 | Gwerder Brothers | 78,214 | 35,136 |
| 7497-1 | Te Rua O te Moko 2B Ahuwhenua Trust | 28,470 | 5,265 |
| 7540-1 | AJ & DI Dravitzki Trusts Partnership | 18,250 | n/a |
| 7569-1 | Stoney River Dairy Limited | 78,840 | Not setup |
| 7608-1 | Go 2 Milk Limited | 9,125 | n/a |
| 7711-1 | Pariroa Marae (The Trustees) | 18,250 | 901 |
| 7783-1 | Norwood Farm Partnership | 51,100 | 34,994 |
| 7969-1 | AB Middleton | 51,100 | n/a |
| 9747-1 | DP & JH Roper Family Trust Partnership | 36,500 | 21,990 |
| 9900-1 | Kaipi Holdings Limited | 220,752 | 78,922 |
| 9910-1 | PKW Farms LP | 40,150 | 20,368 |
| 9947-1 | Ngatoro Poultry Limited | 127,020 | 25,142 |
| 10029-1 | Hernly Farms Limited | 126,144 | Not operational |
| 10112-1 | Construction Mechanics (1993) Limited | 47,450 | No records |
| 10113-1.2 | Lupton Trust | 45,625 | 1,893 |
| 10120-1.1 | SC & MJ O'Neill Family Trust | 43,800 | n/a |
| 10199-1 | ClearAz Taranaki Spring Water | 2,008 | 736 |
| 10421-1 | Medley Partnership | 78,840 | Not setup |
| 10449-1 | Joblin Partners Limited | 54,750 | 53,968 |
| 10484-1 | PKW Farms LP | 50,057 | No records |
| 10542-1 | Zenith Farms Family Trust | 58,400 | n/a |
| 10728-1 | Turangareere Trust | 49,275 | Not setup |

| | | | |
|---|---|---|---|
| 10746-1 | Hernly Farm Limited | 60,955 | 19,287 |

n/a – not applicable (no requirement to provided records)

Thirty-two of the consents had an end of year site inspection, with five of these being found to be non-compliant with their consent conditions, which resulted in incidents being lodged. A summary of each incident identified during the 2018-2019 year, and the Council's response, is presented in Table 3.

Table 3 Consent non-compliances found during 2018-2019

| Date | Consent Holder (Consent number) | Details | Compliant (Y/N) | Enforcement Action Taken? | Outcome |
|---|---|---|---|---|---|
| 08/07/2019 | Hernly Farm Limited (10746-1) | New groundwater bore, had no dip tube installed, was not labelled and was not recording groundwater level | N | None | On further investigation, it was found that groundwater level data was being recorded and that their consultant had the data. As all conditions were met, the enforcement was closed. |
| 10/07/2019 | PKW Farms LP (10484-1) | No records. This was self-notified by consent holder, as datalogger damaged and data irretrievable due to a lightning strike | N | None | Council accepted consent holders reason. |
| 19/07/2019 | Construction Mechanics (1993) Limited (10112-1) | The data logger was not operational and no data was available for the year | N | 14 day letter and Abatement Notice | An abatement notice was issued requiring them to comply with their consent conditions. Re-inspection found that the abatement notice was being complied with. Significant works have been undertaken to the system to ensure compliance continues. |
| 23/07/2019 | Pungarehu Farmers Group Water Scheme (1190-3.2) | Volume breaches | N | Abatement Notice | An abatement notice was issued requiring them to comply with their consent conditions at all times. |
| 07/08/2019 | Gwerder Brothers (7304-1) | Flow meter not operating correctly. Missing data throughout the year | N | None | A new flowmeter was installed and verified within given timeframes. |

## Summary

Of the 32 sites inspected, there was a 16 % non-compliance rate, with one of these being for the breaching their abstraction volume, three for in-operable flowmeter or datalogger and one for unlabelled groundwater well and having no dip tube present. Council will continue to work with all consent holders to ensure they comply their consent conditions in future seasons.

The biggest water user for the 2018-2019 season was Pungarehu Farmers Group Water Scheme with 127,456 $m^3$. The average annual water use across all consents was 34,217 $m^3$.

The Council will continue to monitor these water takes and any new consents that may be granted in the future, as although they are relatively minor in size, it is still important to manage the resources and assess if there are any adverse environmental effects arising from the exercising of these consents.