South Taranaki Water Supplies Monitoring Programme Annual Report 2017-2018

Technical Report 2018-52

ISSN: 1178-1467 (Online)
Document: 2032386 (Word)
Document: 2109326 (Pdf)

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October 2018

Executive summary

The South Taranaki District Council (STDC) operates a total of 11 water treatment plants (WTP's) throughout the district. STDC holds 34 resource consents which include 317 conditions setting out the requirements that must be satisfied. STDC holds 15 consents to take water, ten consents to discharge to both land and water, and nine consents to construct and maintain in-stream structures.

This report for the period July 2017 to June 2018 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the environmental performance of STDC during the period under review, and the results and environmental effects of their activities.

During the monitoring period, STDC demonstrated an overall high level of environmental performance.

During the 2017-2018 monitoring period the Council's monitoring programme included nine inspections, the collection of six water samples for physicochemical analysis, three biomonitoring surveys of receiving water, and two fish surveys. Abstraction, stream flow and discharge data, provided by the consent holder, 7was analysed and reviewed.

Chemical sampling of discharges and receiving waters, macroinvertebrate surveys and fish surveys, all indicated that the water supply schemes were not causing any adverse environmental effects.

During the monitoring period, STDC demonstrated an overall high level of environmental performance and a good level of administrative performance. There were some minor issues in regards to the transmission of bore abstraction data and stream flow data during the period under review.

For reference, in the 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% of the consents, a good level of environmental performance and compliance was achieved.

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

During the monitoring period no incidents were recorded in relation to activities covered by this report.

This report includes recommendation for the 2018-2019 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is the Annual Report for the period July 2017 to June 2018 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents for 11 water treatment plants (WTP's) in the South Taranaki District.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consents held by South Taranaki District Council (STDC), that relate to water supply schemes and WTP's that they operate.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Company's use of water, land and air, and is the 20th annual report by the Council for the water supply industry in the South Taranaki District.

1.1.2 Structure of this report

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

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at each of STDC's site's.

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 2018-2019 monitoring year.

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

1.1.3 The Resource Management Act 1991 and monitoring

The *Resource Management Act 1991* (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 STDC, this report also assigns a rating as to STDC'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 organisation's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

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

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

Environmental Performance

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

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

For example:

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

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or in response to unauthorised incident reports. Cumulative adverse effects of a persistent minor non-

compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

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

Administrative performance

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

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

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

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

For reference, in the 2017-2018 year, consent holders were found to achieve a high level of environmental performance and compliance for 76% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 20% of the consents, a good level of environmental performance and compliance was achieved.

1.2 Process description

Details of the processes and resource consents of each WTP and supply scheme are given in Table 1.

Table 1 South Taranaki water supplies resource consents and processes

Water Supply Scheme	Consent No	Description	Expiry Date	Next Review Date	Process
Eltham WTP	0989-3	To discharge reservoir contents from the Eltham Water Supply Reservoir onto land adjacent to the Waingongoro River	1 June 2029	June 2023	Raw water is abstracted from a pool (no weir) and piped to the treatment plant. Polyaluminium chloride (PACl) is added and the water passed through a clarifier and sand filters. The water is pH buffered (sodium bicarbonate) and chlorinated. Backwash from the filters is discharged via one of two settling ponds to a drain which flows to an unnamed tributary of the Waingongoro River.
	1811-4.0	To discharge filter backwash from the Eltham WTP via a settling pond into an unnamed tributary of the Waingongoro River	1 June 2035	June 2023	
	0213-3	To take and use water from the Waingongoro River for municipal water supply purposes	Expired- Section 124 protection	-	
Hawera WTP	0146-2	To take and use water from the Kapuni Stream for municipal water supply purposes	1 June 2020	-	Raw water is abstracted from the Kapuni Stream and pumped to the WTP. It passes through grit tanks and a flocculant is added before it goes into a flocculation tank. It then is pumped through strainers before going through the membrane filters. The water is then pH adjusted using caustic soda, chlorinated, and fluoride added before going to the site reservoirs. Membrane backwash water is discharged via two settling ponds to the Kapuni Stream. The discharge water is de-chlorinated and pH adjusted before it goes to the ponds.
	0933-3	To discharge up to 227 cubic metres/day of settling pond supernatant from a water treatment plant into the Kapuni Stream	1 June 2023	-	
	7002-1	To take and use up to 4,320 m^3/day of groundwater at a maximum rate of 50 l/s as a combined total from up to three water bores in a bore field at the Kapuni reservoir site for municipal, rural, industrial, and recreational supply purposes	1 June 2023	-	
	7413-1	To erect, use and maintain a water intake structure on the bed of the Kapuni Stream, including temporary damming and diversion during construction	1 June 2023	-	
	7446-1	To discharge membrane backwash water and cleaning wastewater from the Kapuni WTP into the Kapuni Stream	1 June 2023	-	
	7447-1	To install, use and maintain an outfall structure on the bank of the Kapuni Stream for the Kapuni WTP	1 June 2023	-	

Water Supply Scheme	Consent No	Description	Expiry Date	Next Review Date	Process
	9473-1	To construct, place and use a water intake structure on the bed of the Waiaua River for water abstraction purposes	1 June 2030	June 2018	
Inaha WTP	1185-3.1	To take water from the Mangatoki Stream in the Waingongoro catchment for Inaha rural water supply purposes	1 June 2023	June 2018	Raw water is abstracted from two intake structures (weirs) on the Mangatoki Stream and a single intake (no weir) on the Waingongoro River. Water is gravity fed and pumped to a settling pond and then to the treatment plant. PACL is added and the water is passed through two sand filters. The water is pH buffered (sodium bicarbonate) and chlorinated. Filter backwash is discharged to a small settling pond, then to an unnamed tributary of the Mangatoki Stream via a natural pond.
	1186-3	To take water from the Waingongoro River for Inaha rural water supply purposes	1 June 2023	June 2018	
	3927-3.0	To discharge backwash wastewater from the Inaha Rural WTP into an unnamed tributary of the Mangatoki Stream	1 June 2035	June 2023	
	3928-3.0	To discharge uncontaminated overflow water from the Inaha Rural Water Supply Treatment Plant via a settlement pond into an unnamed tributary of the Mangatoki Stream	1 June 2035	June 2023	
	5365-2.0	To dam water and use a low level intake weir in the Mangatoki Stream for Inaha rural water supply scheme purposes	1 June 2035	June 2023	
	4102-2	To maintain an existing low-level weir and fish pass across the Mangatoki Stream in the Waingongoro catchment	1 June 2023	-	
Opunake WTP	0232-4	To take and use water from the Waiaua River for Opunake town water supply purposes	1 June 2030	June 2018	Water is abstracted via submerged intake structure and is pumped to the adjacent treatment plant where it is membrane filtered and chlorinated.
	5574-2	To discharge water treatment residuals, and pond drainage water from the Opunake WP into the Waiaua River	1 June 2030	June 2018	
Patea groundwater supply	3388-3.1	To take and use groundwater from three bores (known as Bore 1, Bore 4 and Bore 5) for Patea Township water supply purposes	1 June 2028	June 2022	Groundwater is pumped from bores 1, 2 and 4 and then sent to reticulation. There is an option to chlorinate the water if necessary.

Water Supply Scheme	Consent No	Description	Expiry Date	Next Review Date	Process
Rahotu WTP	3696-3	To take and use water from the Pungaereere Stream for the Rahotu community water supply	1 June 2031	June 2019	Raw water is pumped from a pool in the Pungaereere Stream (no weir) to the adjacent treatment plant. Water is treated by clarification and membrane filtration.
	6038-1	To discharge filter backwash water and settling tank waste from the Rahotu WTP into the Pungaereere Stream	1 June 2019	-	
Wai-inu Beach Supply	3770-3	To take and use groundwater for Wai-inu Beach water supply purposes	1 June 2028	June 2023	Groundwater is pumped from a bore, chlorinated and then pumped to a reservoir for distribution.
Waimate West WTP	0129-3.2	To discharge treated wash water from the Waimate Water Supply Scheme into an unnamed tributary of Kelly's Creek	1 June 2023	-	Raw water is diverted from the Otakeho and Mangawhero Streams to the Mangawhero-iti Stream. Water is then abstracted from the Mangawhero-iti Stream (all takes are via weirs) and gravity fed to the WTP. When sufficient water can be abstracted from the other two streams in the scheme, water from the Mangawhero Stream is avoided due to its turbidity. PACL and flocculant are added and the water passes through a clarifier and sand filters. The water is pH buffered (soda ash) and chlorinated (chlorine gas). On average the clarifier is bled every six hours and each of the four filters are backwashed once per day. Clarifier bleed and filter backwash are discharged via one of two settling ponds to an unnamed tributary of the Mangawhero-iti Stream. A groundwater bore is currently being commissioned to top up supply during low flow periods.
	0634-3	To take water from the Mangawhero-iti Stream for the Waimate West water supply	1 June 2023	June 2018	
	0635-3	To take water from the Mangawhero Stream for the purpose of adding to the flow of the Mangawhero-iti Stream and providing water for the Waimate West water supply	1 June 2023	June 2018	
	10370-1.0	To take and use groundwater for Waimate West water supply purposes	1 June 2035	June 2020	
	3911-2	To take water from the Otakeho Stream for the Pope and Waimate West water supply schemes	Expired-Section 124 protection	-	
	4446-2	To discharge treated backwash water from the Pope Rural WTP into an unnamed tributary of the Mangawhero Stream in the Kaupokonui catchment	1 June 2023	-	
	4826-3.0	To dam water and use a weir and water intake structure on the bed of the Otakeho Stream	1 June 2035	June 2023	

Water Supply Scheme	Consent No	Description	Expiry Date	Next Review Date	Process
	5451-2.0	To dam water and use a water intake structure on the bed of the Mangawhero-iti Stream for water abstraction purposes	1 June 2035	June 2023	
	5452-2.0	To dam water and use a weir, a water intake structure and a swing bridge on/over the bed of the Mangawhero Stream for water abstraction	1 June 2035	June 2023	
Waverley groundwater supply	3313-3	To take and use groundwater from the "Fookes Street" bore (GND0244), the "Chester Street" bore (GND0059) and the "Swinbourne Street" bore (GND2242) for municipal water supply purposes at Waverley	1 June 2022	-	Groundwater is pumped from two bores, which tap a confined aquifer in the Whenuakura formation, to a reservoir for distribution. The water passes through a sand trap prior to being pumped to a reservoir for distribution. There is no treatment.
Waverley Beach	9563-1	To take and use groundwater for Waverley Beach water supply purposes	1 June 2028	June 2022	Groundwater is pumped from a bore to a reservoir for distribution. It is not chlorinated.

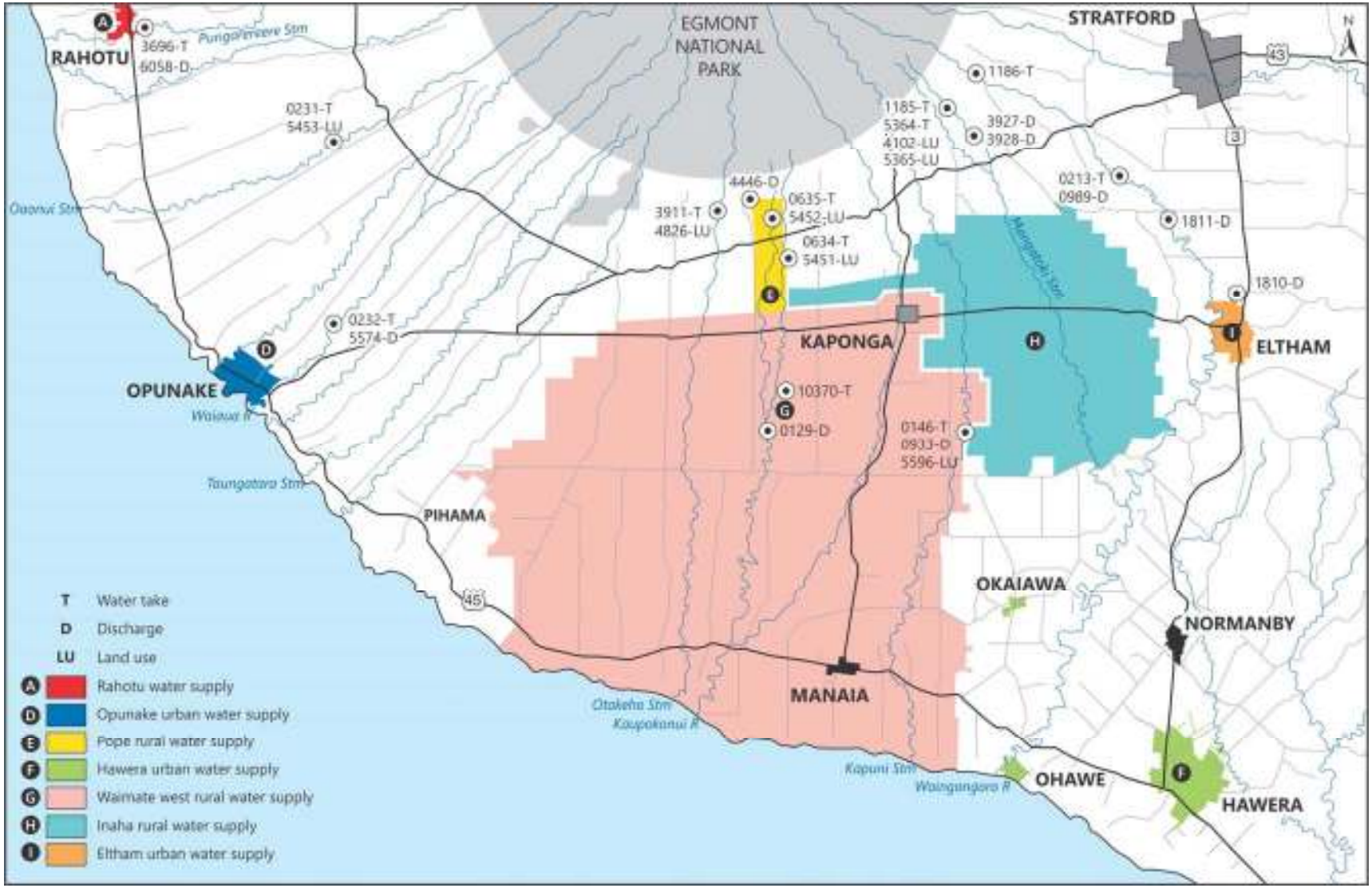

Figure 1 Location of STDC central and western resource consents

Figure 2 Location of STDC's southern consents

1.3 Resource consents

STDC holds various resource consents including water abstraction permits, discharge permits and land use consents for various water supply plants and structures they operate. These resource consents are listed in Table 1 and their locations are shown in Figures 1 and 2. Copies of all resource consents held in relation to water supply plants and structures in the South Taranaki District are included in Appendix I.

1.3.1 Abstraction consents

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14.

STDC holds 15 consents to abstract water. These consents were granted by the Council under Section 87 of the RMA and each contains special conditions STDC must comply with.

These consents generally have consent conditions that:

- specify abstraction rates and/or daily volumes;
- set out requirements for the measurement of abstraction rates and/or volumes;
- specify data reporting requirements;
- set out conservation and leak detection reporting requirements; and
- set out lapse and review provisions.

Other requirements specific to individual consents include:

- in-stream flow recording (Mangawhero-iti – Waimate West WTP);
- minimum residual flow limits (Mangawhero-iti – Waimate West WTP);
- financial contributions (Mangawhero-iti – Waimate West WTP).

1.3.2 Land use consents (structures)

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

There are a total of nine land use consents covered by this report that permit the installation of water abstraction or discharge structures.

These consents were granted by the Council under Section 87 of the RMA and each contains special conditions that the consent holder must comply with.

These consents generally have consent conditions that:

- require notification prior to works;
- require the adoption of best practice;
- require provision of fish passage;
- require minimisation of effects in receiving waters;
- limit time frames for any works undertaken; and
- set out lapse and review provisions.

1.3.3 Discharge consents

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. STDC hold ten discharge consents.

These consents generally have consent conditions that:

- require the adoption of the best practical option;
- set limits on contaminants in the discharge;
- limit effects in receiving waters; and
- set out lapse and review provisions.

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

1.4 Monitoring programme

1.4.1 Introduction

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

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

The 2016-2017 monitoring programme for STDC's water supply schemes consisted of eight primary components.

1.4.2 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;
- in discussion over monitoring requirements;
- preparation for any reviews;
- renewals;
- new consents;
- advice on the Council's environmental management strategies and content of regional plans and;
- consultation on associated matters.

1.4.3 Site inspections

A total of nine inspections undertaken. The inspections focussed on intake structures, fish passage, abstraction metering, abstraction rates and plant discharges.

1.4.4 Chemical sampling

The Council undertook audit sampling of discharges and receiving water samples were also collected in relation to discharges from the Kapuni WTP.

1.4.5 Biomonitoring

Macroinvertebrate surveys were undertaken in relation to the Hawera and, Waimate West and Opunake WTP's to determine effects upon the stream communities due to the discharge of filter backwash and/or abstractions.

Two fish surveys were undertaken in relation to the Hawera and Waimate West WTP's.

1.4.6 Hydrological surveys

Hydrological surveys were undertaken in order to check flows and maintain ratings curves.

1.4.7 Review of discharge quality data

STDC provided discharge sampling data to the Council throughout the monitoring year. This was reviewed by Council staff to ensure contaminant concentrations complied with consent conditions.

1.4.8 Review of abstraction data

STDC provided abstraction data to the Council throughout the monitoring year. This was reviewed by Council staff to ensure abstraction volumes and rates complied with consent conditions.

1.4.9 Review of reports required by consents

Water conservation and leak detection reports are required by consents held STDC. These are reviewed to ensure that the consent holder is minimising water usage.

2 Results

2.1 Inspections

Annual inspections generally focussed on instream structures, discharges, and water abstraction measurement equipment.

Eltham WTP (30 Jan 2018)

The south backwash pond was dry whilst the north pond was discharging at less that 0.5 L/s. The discharge was clean and no issues were noted in the receiving water. The plants inflow meter was reading 178 m^3/hour (49.4 L/s) which was in compliance and matched the telemetered data. The intake screen was inspected and no issues were noted. The settling pond below the intake was not in use and was dry.

Inaha WTP (30 Jan 2018)

Both Mangatoki intake weirs were inspected and the fish passes were working well. The discharge ponds were inspected and it was found that the western pond was in use and discharging. The discharge was clear and occurring at about 0.5 L/s. The Mangatoki inflow meter was checked and it was found to be at 106 m^3 /hr (28.3 L /s) which was in compliance and matched the telemetered data. The Waingongoro flow meter was reading 96 m^3/hr (26.6 L/s), which was in compliance and matched the telemetered data.

Waimate West WTP (30 Jan 2018)

The Mangawhero and Mangawhero-iti weirs were in good order and there was good flow in the fish passes. The Otakeho weir was also working well. Discussions were held about the consent requirement for accurate real time river flow measurement. STDC had managed to get a transducer in place andit was agreed that Council would install a staff gauge and undertake flow gaugings. The Otakeho abtraction flow meter was inspected and it was found that the intake was 297 m^3/hr (82.5 L/s) which was in compliance and matched the telemetered data.
The discharge ponds were undergoing works to enable backwash fluids to be recycled into the raw water line.The Mangawhero-iti abstraction meter was inspected and found that the abstraction rate was 420 m^3 /hr (116 L/s) which was in compliance and matched the telemetered data.

It was noted that the new goundwater supply bore had been installed, however commsioning works had not been completed.

Opunake WTP (30 Jan 218)

The intake structure and discharge were inspected The intake structure was in good condition and back wash discharges were soaking to land. The flow meter read 70 m^3/hr (19.44 L/s) and this matched the telemetered data and was compliant with consent conditions.

Hawera WTP (27 March 2018)

The Kapuni Stream was running at moderate swift flow, clear and uncoloured. The Kapuni Stream abstraction rate was well within consent conditions and it was noted that the supply bore was not in service at the time. Samples were taken from the backwash discharge and the Kapuni Stream either side of the discharge. The backwash discharge had a free available chlorine residual level of <0.01 mg/L. The intake structure was also inspected. The intake and fish pass appeared to be in good condition. Debris from the last fresh was programmed to be removed.

Wai-inu Beach WTP (27 March 2018)

The bore and chemical dosing shed were inspected. The pump was not operating and the reservoir tanks were full at the time . No issues were noted.

Waverley Beach Water Supply (27 March 2018)

The existing bore (permitted use) and plant were inspected and found to be compliant with Regional Freshwater Plan (RFWP) rules. The oprations log was inspecteed and no issues were noted.

Waverley Water Supply (27 March 2018)

The Swinbourne Street bore was in service although not abstracting at the time of inspection as the reservoir was near full. The Fookes Street and Chester Street bores were not in service. No issues were noted in regard to bore construction and integrity.

Patea Water Supply (27 March 2018)

Patea water supply bore four was running and abstracting 20m^3/hr (5.5 L/s) which was well within consent conditions. Bores one and five were not in service. All flows are being metered at the point of abstraction. A chlorine dosing plant was onsite and operating at the time.

2.2 Results of discharge monitoring

2.2.1 Kapuni WTP

Discharge and receiving water samples were taken at the Kapuni WTP (Figure 3) on two occasions and the results are presented in Tables 2 and 3 below.

Figure 3 Aerial photo showing locations of the Kapuni WTP, and relevant sampling sites

Table 2 Kapuni WTP sample results 27 March 2018

Parameter	Unit	Upstream (KPN000300)	Pond discharge (STW002080)	Downstream (KPN000301)	Consent limits for discharge
Free available chlorine	g/m^3	-	<0.01	-	<0.1
Conductivity @ 20°C	mS/m	14.4	14.1	14.2	-
Sodium	g/m^3	16.8	20.5	16.3	-
pH	pH	7.6	7.8	7.6	6-9
Suspended solids	g/m^3		6		20
Temperature	Deg C	16.6	18.0	16.6	-
Turbidity	NTU	0.70	-	0.66	-

Table 3 Kapuni WTP sample results 24 May 2018

Parameter	Unit	Upstream (KPN000300)	Discharge	Downstream (KPN000301)	Consent limits for discharge
Free available chlorine	g/m3	-	<0.01	-	<0.1
Conductivity @ 20°C	mS/m	9.9	13.3	9.9	-
Sodium	g/m3	11.2	25.0	16.2	-
pH	pH	7.5	7.6	7.5	6-9
Suspended solids	g/m3	-	5	-	20
Turbidity	NTU	2.4		2.5	-
Temperature	Deg C	9.7	10.4	10.1	-

All results were in compliance with consent conditions in regard to suspended solids, pH and free available chlorine.

While the consent does not limit sodium, it is of particular interest due to the use of chemicals such as sodium hypochlorite, sodium hydroxide and sodium bisulphate in the WTP process. Ballance Agri-Nutrients and Vector both have discharges to the Kapuni Stream, upstream of the WTP discharge, which have limits placed on them for sodium. The WTP discharge will continue to be regularly monitored for sodium to establish whether it is making a significant contribution to sodium loadings in the Kapuni Stream.

2.3 Discharge data review

STDC now monitors all of its discharges on a monthly basis, both visually for effects on the receiving environment) and for concentrations of contaminants in the discharge. This data was accessed and reviewed and it was found that the results indicated that they were complying with consent conditions in regards to environmental effects and discharge limits.

Table 4 STDC's discharge self-monitoring summary

Site	No of samples taken	Free available chlorine % compliance	pH % compliance	Suspended solids % compliance
Eltham WTP	15	100	100	100
Inaha WTP	15	100	100	100
Kapuni WTP	15	100	100	100
Rahotu WTP	15	100	100	100
Waimate West WTP	15	100	100	100
Consent limits	-	0.1 g/m^3	6-9	20 g/m^3

2.4 Results of biomonitoring

2.4.1 Macroinvertebrate surveys

The Council's 'kick-sampling' technique was used to collect streambed macroinvertebrates and assess the impact of two WTPs in the period under review. These WTPs were the Waimate West WTP (Mangawhero-iti Stream) and the Hawera WTP (Kapuni Stream).

This has provided data to assess any potential impacts the consented water abstraction and or backwash discharges may have had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and SQMCI$_S$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The SQMCI$_S$ takes into account taxa abundances as well as sensitivity to pollution. Significant differences in either the taxa richness, MCI or the SQMCI$_S$ between sites may indicate the degree of adverse effects (if any) caused by water abstractions.

A copy of each report from the surveys is given in Appendix II and a summary of each report is given below.

2.4.1.1 Kapuni Stream macroinvertebrate survey (Hawera WTP)

5 March 2018

This survey was the eighth to follow full commissioning of the Hawera Water WTP. The discharge point is now located just upstream of the Skeet Road bridge, and the sampling sites were consequently changed, to enable monitoring of this new location. Site 1 has an extensive historical dataset, as a result of monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites, located upstream. This dataset can also be used as a reference for site 2 (KPN000301), until a suitable data record has been established here. It should be noted however, that the monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites is done so using slightly different methodology, which has the potential to produce lower taxa richness and higher MCI scores.

During the 2016 late summer macroinvertebrate survey, it was noted that the stream appeared to have been severely impacted by a recent flood event, with large volumes of substrate moving down the catchment. This was again apparent in the current survey, but to a lesser degree. There was fine silt tied up in the substrate, although only at site 2, possibly related to the backwater discharge, but more likely related to an erosion event in the National Park. The results of this survey indicate that the community at site 2, downstream of the discharge point, was in good health, and similar to that recorded upstream at site 1,

upstream of the discharge point. There is no evidence to suggest that the discharge of filter backwash and settling tank sediment had resulted in an impact on the macroinvertebrate communities of the Kapuni Stream. This is illustrated by the MCI score recorded downstream of the discharge being higher than the median score for the upstream site.

The macroinvertebrate communities of the Kapuni Stream contained significant proportions of 'sensitive' taxa at both sites and the communities were dominated by 'sensitive' taxa. Taxonomic richness (number of taxa) was moderate at both the control site 1 and at site 2, downstream of the discharge, with only three differences in the presence/absence of taxa between sites. Both sites recorded an above average MCI score, reflecting the shorter period of receding flow that preceded this survey (12 days). The minimal change in MCI and $SQMCI_S$ scores from site 1 to site 2 was not an unexpected result considering the flow conditions that preceded this survey, and the influence of substrate mobilisation and fine silt. These results are not an indication of any impacts from the Hawera water treatment plant.

2.4.1.2 Waimate West WTP macroinvertebrate survey (Mangawhero-iti Stream)

30 October 2017

A spring macroinvertebrate survey was performed at four sites in the Mangawhero-iti Stream in relation to consented water abstraction by the Waimate West water supply scheme. Samples were processed to provide taxa richness, MCI and $SQMCI_S$ scores. Taxa richnesses were moderate at sites 1, 2 and 4, and high at site 3. Sites 2 and 4 recorded the lowest taxa richnesses to date. MCI scores and $SQMCI_S$ scores were high at all sites, with sites 1 and 4 recording their highest MCI scores to date and site 1 recording the highest $SQMCI_S$ score to date. There was a general trend of decreasing macroinvertebrate community health in a downstream direction, consistent with typical patterns in Taranaki ringplain rivers and streams. Overall, there was no evidence that water abstraction from the Mangawhero-iti Stream by the Waimate West WTP had significantly affected the freshwater macroinvertebrate communities of the Mangawhero-iti Stream.

2 March 2018

A summer macroinvertebrate survey was performed at four sites in the Managwheroiti Stream in relation to consented water abstraction by the Waimate West water supply scheme. Samples were processed to provide taxa richness, MCI and $SQMCI_S$ scores. Taxa richnesses were moderate at sites 1, 2 and 4, and moderately high at site 3. These richnesses were similar to those recorded in the preceding survey. MCI scores and $SQMCI_S$ scores were high at all sites, with site 4 recording the highest MCI score to date and site 1 recording a score equal to the highest $SQMCI_S$ score to date. Only the MCI score at sites 1 and 3 were significantly different from the preceding survey, with a decrease to close to the site's median score. Overall, there was no evidence that water abstraction from the Mangawhero-iti Stream by the Waimate West WTP had significantly affected the freshwater macroinvertebrate community of the Mangawhero-iti Stream.

2.4.1.3 Waiaua Stream (Opunake WTP)

16 January 2018

Taxonomic richnesses were moderate to moderately low, being slightly lower than normal for the 'control' site but typical for the two 'impact' sites. The macroinvertebrate communities were in 'good' to 'very good' health with no significant differences among sites except for a decrease in $SQMCI_s$ score between sites 2 and 3.

This summer macroinvertebrate survey (the fourth since sampling commenced in 1998) indicated that abstraction of water for the Opunake water supply and discharges of treated backwash from the WTP had not had any recent detrimental effects on the macroinvertebrate communities of the mid-reaches of the Waiaua River. No significant changes in the macroinvertebrate communities were found between the upstream 'control' site and the sites downstream of the abstraction point and backwash discharge.

2.4.2 Fish surveys

During the period under review the Council undertook fish surveys in the Kapuni and Otakeho Streams. A copy of each report from the surveys is included in Appendix II and a summary of each report is given below.

2.4.2.1 Kapuni – electric fishing survey

A four site fish survey was undertaken in the Kapuni Stream on 24 April 2018, in order to determine whether the water intake structure on the bed of the Kapuni Stream effectively provided for fish passage. The fish communities were surveyed using the electric fishing technique, with all fish identified where possible, counted, and lengths estimated. It should be noted that fish migration in the Kapuni Stream may be impeded by other structures, although the railway weir, located approximately 900 m downstream of the STDC weir, was remediated in late 2014.

There are three primary aspects to monitoring fish communities in order to determine whether passage is provided for at a structure:

- Is there evidence of fish accrual below the structure?
- Is there a significant difference in species richness when comparing upstream and downstream communities?
- Is the size structure of the upstream communities indicative of an actively recruiting population?

Four fish species were recorded during this survey, being longfin and shortfin eel, redfin bully and brown trout. Redfin bully were the most abundant species recorded, and they were also present at three of the four sites. However, overall abundances were low, reflecting the high flow conditions that affected the effectiveness of the survey.

Three of the four species recorded were recorded upstream of the intake weir, although only two were migratory (longfin eel and redfin bully). Although koaro were recorded in the previous survey, they are generally more abundant closer to the national park, and as such were not recorded in the current survey. In addition, although the highest fish abundance was recorded downstream of the weir, this is considered to be a reflection of habitat variation, rather than fish accrual. This is because there was no difference in abundance at the site immediately downstream of the weir and the site 1.6 km downstream. This is consistent with that concluded in the previous (2014) survey. Juvenile koaro and small eels were recorded upstream of the weir in the previous survey. This, coupled with the presence of redfin bully upstream of the weir in the current survey, indicates that these species are actively recruiting.

Overall, due to the low numbers of fish recorded in the current survey, these results can only be used to provide an indication as to whether the weir presents a barrier to fish passage. The results of the current and previous survey do not indicate that the weir presents a barrier. It is worth considering employing the spotlighting technique in subsequent surveys, especially if those sites surveyed in 2014 are to be resurveyed. However, this will need to be done with consideration of flow conditions at the time.

The current survey frequency, being a four site survey completed every three years, is considered adequate, and it is recommended that this level of monitoring continue.

2.4.2.2 Otakeho Stream- electric fishing survey

On 21 March 2018, an electric fishing survey was undertaken at two sites in the Otakeho Stream, upstream and downstream of an STDC water intake weir. The purpose of the survey was to assess compliance with the fish passage condition of the consent held for this structure. STDC holds this consent.

From the results of this survey, there is no indication that the weir presents a restriction to the passage of fish. Three species were recorded in the current survey, the most abundant being koaro (*Galaxias*

brevipinnis). Two other species were also recorded (brown trout and longfin eel), but not at densities that enabled any conclusions. The current survey found that koaro density downstream of the weir was within the range of that recorded upstream. This follows the two previous surveys which both recorded a higher density upstream than downstream. These results indicate that the upgrade to the fish pass has resolved the possible restriction of fish passage suggested by pre-2012 surveys.

In 2012, a visual assessment of the weir found that the new fish pass was carrying too much water, and that passage would be optimised if flows down the pass were reduced. The previous (2016) survey found that the fish pass contained little to no flow, due to gravels aggregating at the inlet to the fish pass and effectively blocking it off. The current survey found flows down the pass to be adequate and close to optimum.

With regard to whether the weir meets the special condition of consent 4826, there is no evidence to indicate that the weir presents a restriction to the passage of fish. However, it is important that the consent holder continues to regularly inspect the weir, especially after large floods, to ensure optimum flows are maintained down the fish pass.

2.5 Abstraction data review

Data is collected from STDC and tabulated and archived in the Council's database. Below (Table 5) is a summary of data that shows the level of compliance with daily volumes, abstraction rates and data supply.

Table 5 Summary of abstraction data compliance

Plant	Source	Records on time?	Daily volume limit m^3	Compliance with daily volumes	Abstraction rate limit L/s	Compliance with abstraction rates	Completeness of data
Eltham	Waingongoro	Yes	5,520	100%	64	100%	100%
Hawera	Kapuni	Yes	10,757	100%	124.5	100%	100%
	Kapuni bore	Yes	4,320	100%	50	100%	100%
Inaha	Mangatoki	Yes	2,504	100%	29	100%	100%
	Waingongoro	Yes	2,592	100%	30	100%	100%
Opunake	Waiaua	Yes	2,200	100%	25.5	100%	100%
Patea	Bore 1	Yes	300*	100%	4.7	100%	100%
	Bore 4	Yes	N/A	N/A	10	100%	100%
	Bore 5	Yes	N/A	N/A	10	100%	100%
	Combined	Yes	1,125	100%	N/A	N/A	100%
Rahotu	Pungaereere	Yes	180	100%	3.0	100%	100%
Wai-inu	Wai-inu bore	Yes	346	100%	4.0	100%	100%
Waimate West	Mangawhero-iti	Yes	N/A	N/A	121	99%	100%
	Otakeho	Yes	N/A	N/A	85	100%	100%
	Mangawhero	Yes	N/A	N/A	70	99%	100%
Waverley	Chester St bore	Yes	400	100%	7.0	100%	100%
	Fookes St bore	Yes	500	100%	7.2	100%	100%
	Swinbourne St bore	Yes	890	100%	10.3	100%	100%
	Combined Take	Yes	900	99%	14.2	100%	100%
Waverley	Bore 2	NE	NE	NE	NE	NE	NE

Key: NE= consent not exercised N/A= no limit set in consent

2.6 Residual flow and ground water level data

Stream flow and groundwater level data was also collected and reviewed for compliance with consent conditions. The results are summarised in Table 6.

Table 6 Groundwater level and residual stream flow compliance summary

Plant	Source	Type of data	Records on time	Residual flow/level limit on consent?	Compliance with limits	Completeness of data
Patea	Brannigan's Bore	Groundwater level	Yes	48 mbgl*	Yes	100%
Waimate West	Mangawhero-iti Stream	Stream flow	Yes	32 L/s	99%	100%
Waverley	Chester St bore	Groundwater level	Yes	No	N/A	100%
	Fookes St bore	Groundwater level	Yes	No	N/A	100%
	Swinbourne St bore	Groundwater level	Yes	No	100%	100%
Waimate West	Mangawhero-iti	Stream flow	Yes	32 L/s	99%	100%

*Metres below ground level

3 Investigations, interventions, and enforcements

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

The Council operates and maintains a register of all complaints or reported and discovered excursions from acceptable limits and practices, including non-compliance with consents, which may damage the environment. The incident register includes events where the organisation concerned has itself notified the Council. The register contains details of any investigation and corrective action taken.

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

In the 2017-2018 period, the Council was not required to record incidents, in association with STDC's conditions in resource consents or provisions in Regional Plans.

4 Discussion

4.1 Discussion of site performance

Older resource consents require that records of daily volumes of water abstracted are to be provided. Some of the newer consents require 15 minute abstraction rates to be telemetered. STDC has been very proactive in having all abstraction data for all consents telemetered to Council's database regardless of whether consent conditions require it or not. During the monitoring period a greater than 99% compliance was attained in regards to abstraction data.

Stream level recording the Otakeho Stream was installed as per consent conditions however, due to ongoing issues with flood damage, the full year of data required by consent conditions was not collected by July 1 2017. STDC continues to monitor the stream levels at Otakeho to support their consent application. It is envisaged that the new consent will require permanent stream flow monitoring.

The new groundwater bore at the Waimate West WTP has been installed and certification/installation documents have been supplied. Data transmission and bore labelling requirements have yet to be fulfilled, however it noted that consent has not been exercised in terms of water production. These outstanding matters were in the process of being addressed at the time of the preparation of this report.

Intake structures were inspected and found to be in good condition and no issues with fish passage were noted.

Reports required by consents 0146-2, 0232-4, 0634-3, 1185-3, 1186-3 and 3696-3 on efficient water use, leak detection and repair were submitted to the Council. All water abstraction records for the period were provided in timely manner.

Overall the performance of STDC's sites was good.

4.2 Environmental effects of exercise of consents

Filter backwash discharge sampling was conducted at the Kapuni, Waimate West and Opunake WTPs. The results indicated that the discharges were not likely to be causing any adverse environmental effects.

Macroinvertebrate surveys found no evidence of adverse effects in regards to abstraction or discharges associated with the Kapuni, Mangawhero-iti and Waiaua Streams.

Fish surveys indicated that at the sites surveyed, that fish passage was adequate.

Overall the STDC demonstrated a high level of environmental performance.

4.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 7-46.

4.3.1 Eltham WTP

Table 7 Summary of performance for Consent 0213-3 (Eltham WTP)

Purpose: ***To take and use water from the Waingongoro River for municipal water supply purposes***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction volume and rate	Review of abstraction data provided	100% compliance
2. Recording of abstraction data and provision of records to Council	Data received - 100% complete	Yes
3. Consent to be exercised in accordance with application	Inspection and liaison with consent holder	Yes
4. Quantification of reticulation system losses and reporting	Report received 1 March 2001	Yes
5. Investigation and report on blocking of intake	Report received 18 January 2002	Yes
6. Review of SC1 in 2002 to assess water conservation measures	Liaison with consent holders	N/A
7. Mitigation by riparian planting	Completed	Yes
8. Review provision	No further provision for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

Table 8 Summary of performance for Consent 0989-3 (Eltham WTP)

Purpose: ***To discharge water from the Eltham water supply reservoir onto land adjacent to the Waingongoro River***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse effects	No discharge during period under review	N/A
2. Notification of discharge two days prior	No discharge during period under review	N/A
3. Volume of discharge not to exceed 5,000 m^3 once per year	No discharge during period under review	N/A

Purpose: *To discharge water from the Eltham water supply reservoir onto land adjacent to the Waingongoro River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Discharge only when flows in Waingongoro > 1,050 L/s	No discharge during period under review	N/A
5. Discharge across land, no direct discharge	No discharge during period under review	N/A
6. Consent holder to reduce volume of sediment and silt in the discharge	No discharge during period under review	N/A
7. Suspended solids in discharge not to exceed 100 g/m^3	No discharge during period under review	N/A
8. Discharge not to have effects on receiving water	No discharge during period under review	N/A
9. Review provision	Next review option June 2023	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

Table 9 Summary of performance for Consent 1810-3 (Eltham WTP)

Purpose: *To discharge overflow and reservoir drainage water from the Eltham water supply reservoir*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Approval required prior to emptying reservoir	No discharge during period under review	N/A
2. Periods when consent exercised minimised	No discharge during period under review	N/A
3. Minimise discharge of sediments when emptying reservoir	No discharge during period under review	N/A
4. Discharge not to cause certain effects in the receiving waters	No discharge during period under review	N/A
5. Limits on chlorine and suspended solids in the discharge	No discharge during period under review	N/A
6. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

Table 10 Summary of performance for Consent 1811-3 (Eltham WTP)

Purpose: *To discharge filter backwash from the Eltham WTP*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Proper and efficient maintenance of the settlement pond system	Inspection	Yes
2. Discharge not to cause certain effects in the receiving waters below the established mixing zone	Inspection	Yes
3. Limits on chlorine and suspended solids in the discharge	Sampling and review of consent holder data	Yes
4. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.2 Hawera WTP

Table 11 Summary of performance for Consent 0146-2 (Hawera WTP)

Purpose: *To take and use water from the Kapuni Stream for municipal water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction volume and rate	Review of abstraction data provided	100%
2. Recording of abstraction data and provision of records to Council	Data received - 100% complete	Yes
3. Consent to be exercised in accordance with application documentation. Report on efficiency measures every two years	Report received	Yes
4. Reporting of events when abstraction is greater than 124.5 L/s	Data review	Yes
5. Mitigation by riparian planting	Total amount has been paid to the Taranaki Tree Trust	Yes
6. Preparation and maintenance of management plan for Kapuni Stream in conjunction with other users (within three months of granting)	Liaison with consent holder – Plan prepared in 2003 and updated in 2006	Yes
7. Annual leak detection and repair report	Report received	Yes

Purpose: *To take and use water from the Kapuni Stream for municipal water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Point of abstraction	Inspection	Yes
9. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 12 Summary of performance for Consent 0933-3 (Hawera WTP)

Purpose: *To discharge up to 227 m^3 /day of settling pond supernatant from a water treatment plant into the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspections and liaison with consent holder	Yes
2. Exercise of consent in accordance with application documentation	Inspections and liaison with consent holder	Yes
3. Notification prior to exercise	Notification received	N/A
4. Permanent solution for treatment of wastes at time of upgrade in 2008	Backwash settling pond operating	Yes
5. Proper and efficient maintenance and operation of settlement system	Inspections and liaison with consent holder	Yes
6. Discharge not to have adverse effects on receiving waters	Inspection, sampling and macroinvertebrate surveys	Yes
7. Limits on certain parameters in the discharge	Sampling and review of consent holder data	Yes
8. Lapse provision	Not applicable – consent exercised	N/A
9. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 13 Summary of performance for Consent 7002-1 (Hawera WTP)

Purpose: *To take and use groundwater for municipal, rural, industrial, and recreational supply purposes (Hawera)*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent to be in accordance with application	Inspections of site and records	Yes

Purpose: *To take and use groundwater for municipal, rural, industrial, and recreational supply purposes (Hawera)*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
2. Notify the Council in writing at least seven days prior to exercise of consent	Notification received	Yes
3. Provide Council with results of pump testing prior to exercise of consent	Received	Yes
4. Abstraction not to exceed 4,320 m^3/day	Review of abstraction data provided	100%
5. Abstraction not to cause a more than 10% drop in static water level by interference	Not assessed	N/A
6. Maintain records of the abstraction from each bore	Data received - 100% complete	Yes
7. Install device to record abstraction	Inspection and data received by Council	Yes
8. Consent holder to meet monitoring costs	Liaison with consent holder	Yes
9. Lapse provision	Not applicable – consent exercised	N/A
10. Review provision	Next review option June 2023	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 14 Summary of performance for Consent 7413-1 (Hawera WTP)

Purpose: *To erect, use and maintain a water intake structure on the bed of the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent to be in accordance with application	Inspection	Yes
2. Disturbance of riverbed between 1 November and 30 April only	N/A	N/A
3. Notification prior to works and maintenance	No maintenance during monitoring period	N/A
4. Area and volume of disturbance minimised	No maintenance during monitoring period	N/A
5. Minimise sediment entering stream	No maintenance during monitoring period	N/A
6. Structure removed and area reinstated when no longer required	Structure in use	N/A

Purpose: *To erect, use and maintain a water intake structure on the bed of the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Consent holder to monitor and maintain fish pass	Inspection	Yes
8. Procedure if archaeological remains discovered during construction	None found	N/A
9. Lapse provision	Not applicable – consent exercised	N/A
10. Review provision	Next review option June 2023	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 15 Summary of performance for Consent 7446-1 (Hawera WTP)

Purpose: *To discharge membrane backwash water and cleaning wastewater into the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to minimise adverse effects	Inspection and liaison with consent holder	Yes
2. No adverse effects on receiving waters	Inspection, sampling, biomonitoring	Yes
3. Allowable increase in turbidity below mixing zone	Sampling	Yes
4. Levels of contaminants in discharge	Sampling and review of consent holder data	Yes
5. Lapse provision	Not applicable	N/A
6. Review provision	No further review options	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 16 Summary of performance for Consent 7447-1 (Hawera WTP)

Purpose: *To install, use and maintain an outfall structure on the bank of the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent to be in accordance with application	Inspections	Yes
2. Disturbance of riverbed between 1 November and 30 April only	N/A	N/A

Purpose: *To install, use and maintain an outfall structure on the bank of the Kapuni Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
3. Notification prior to works and maintenance	N/A	N/A
4. Area and volume of disturbance minimised	N/A	N/A
5. Minimise sediment entering stream	N/A	N/A
6. Structure removed and area reinstated when no longer required	Structure in use	N/A
7. Procedure if archaeological remains discovered during construction	None found	N/A
8. Lapse provision	Consent exercised	N/A
9. Review provision	Next review option June 2023	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.3 Inaha WTP

Table 17 Summary of performance for Consent 1185-3 (Inaha WTP)

Purpose: *To take water from the Mangatoki Stream in the Waingongoro catchment for Inaha rural water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspection and liaison with consent holder	Yes
2. Combined take not to exceed 29 L/s, or 2,504 m^3/day	Review of abstraction records	100% (volume) 100% (rate)
3. Gravity take preferential	Inspection and liaison with consent holder	Yes
4. Install and maintain water meter and data logger	Inspection and liaison with consent holder	Yes
5. Certification of water meter	NES verification	Yes
6. Notification of equipment failure	No notification received	N/A
7. Intake structure maintained, and removed if no longer required	Inspection	Yes
8. Water meter and data logger accessible to Council staff	Inspection	Yes
9. Suitable format of water records	Review of abstraction records	Yes

Purpose: *To take water from the Mangatoki Stream in the Waingongoro catchment for Inaha rural water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
10. Water records to be transmitted in 'real time' to Council	Data received - 100% complete	Yes
11. Intake structure to be screened	Inspection	Yes
12. Intake structure not to block fish passage	Inspection	Yes
13. Leak detection and repair programme with annual report	Report received	Yes
14. Review provision	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 18 Summary of performance for Consent 1186-3 (Inaha WTP)

Purpose: *To take water from the Waingongoro River for Inaha rural water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspection and liaison with consent holder	Yes
2. Exercise in accordance with application	Inspection and liaison with consent holder	Yes
3. Maximum abstraction 2,592 m^3/day at 30 L/s	Review of abstraction data	100% (volume) 100 % (rate)
4. Measure and record abstraction rate and provide to Council	Data received - 100% complete	Yes
5. Maintain intake structure and remove when no longer required	Inspection and liaison with consent holder	Yes
6. Intake screened to avoid fish entrainment	Inspection	Yes
7. Intake structure shall not obstruct fish passage	Inspection	Yes
8. Report annually on efficient water use, leak detection and repair	Report received	Yes
9. Lapse provision	Not applicable – consent exercised	N/A
10. Review provision	No further option for review.	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 19 Summary of performance for Consent 3927-2 - to 15 August 2017 (Inaha WTP)

Purpose: ***To discharge backwash wastes from the Inaha WTP into an unnamed tributary of the Mangatoki Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Proper and efficient maintenance of the settlement pond system	Not assessed before consent expiry	N/A
2. Discharge not to cause certain effects in the receiving waters	Not assessed before consent expiry	N/A
3. Limits on chlorine and suspended solids in the discharge	Consent holder sample data reviewed	Yes
4. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 20 Summary of performance for Consent 3927-3 -from 15 August 2017 (Inaha WTP)

Purpose: ***To discharge backwash wastewater from the Inaha Rural Water Supply Treatment Plant into an unnamed tributary of the Mangatoki Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspection	N/A
2. Discharge not to cause certain effects in the receiving waters	Inspection	N/A
3. Limits on chlorine and suspended solids in the discharge	Consent holder sample data reviewed	Yes
4. Review provision	Next review option June 2023	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 21 Summary of performance for Consent 3928-2 -to 15 August 2017 (Inaha WTP)

Purpose: ***To discharge uncontaminated overflow water from the Inaha rural WTP***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Proper and efficient maintenance of the settlement pond system	Not assessed before consent expiry	N/A
2. Discharge not to cause certain effects in the receiving waters	Not assessed before consent expiry	N/A
3. Review provision	Next review option June 2023	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

Table 22 Summary of performance for Consent 3928-3 -from 15 August 2017 (Inaha WTP)

Purpose: ***To discharge uncontaminated overflow water from the Inaha Rural WTP via a settlement pond into an unnamed tributary of the Mangatoki Stream***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adopt best practice	Inspection	Yes
2. Discharge not to cause certain effects in the receiving waters	Inspection/ Sampling/data review	Yes
3. Review provision	Next review option June 2023	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 23 Summary of performance for Consent 4102-2 (Inaha WTP)

Purpose: ***To construct a low-level weir and fish pass across the Mangatoki Stream to improve water intake efficiencies***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	No maintenance during period under review	N/A
2. Exercise of consent in accordance with application documentation	No maintenance during period under review	N/A
3. Notification of Council prior to exercise of consent	No maintenance during period under review	N/A
4. Notification of Council prior to major maintenance works	No maintenance during period under review	N/A

Purpose: *To construct a low-level weir and fish pass across the Mangatoki Stream to improve water intake efficiencies*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Adoption of best practicable option during maintenance works	No maintenance during period under review	N/A
6. River bed disturbance to be minimised during maintenance	No maintenance during period under review	N/A
7. No maintenance works between 1 May to 31 October	No maintenance during period under review	N/A
8. Structure to be properly maintained	Inspection	Yes
9. Structure not to impede fish passage	Inspection	Yes
10. Structure to be removed and area reinstated when no longer required	Structure in use	N/A
11. Lapse provision	Not applicable - consent exercised	N/A
12. Review provision	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 24 Summary of performance for Consent 5365-1 (Inaha WTP)

Purpose: *To erect, place and maintain a low level intake weir in the Mangatoki Stream for Inaha rural water supply scheme purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification of Council prior to construction and maintenance works	No maintenance during period under review	N/A
2. Adoption of best practicable option to minimise adverse effects	No maintenance during period under review	N/A
3. No obstruction of fish passage	Inspection	Yes
4. Construction and maintenance to be in accordance with application	No maintenance during period under review	N/A
5. Maintain and operate safe structure	Inspection	Yes
6. Structure to be removed when no longer required and area reinstated	Structure in use	N/A

Purpose: *To erect, place and maintain a low level intake weir in the Mangatoki Stream for Inaha rural water supply scheme purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.4 Opunake WTP

Table 25 Summary of performance for Consent 0232-4 (Opunake WTP)

Purpose: *To take and use water from the Waiaua River for Opunake town water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Rate of take not to exceed 2,200 m^3/day or 25.5 L/s	Review of abstraction data	100%
2. Take water through 'new' intake except during maintenance works	Inspection and liaison with consent holder	Yes
3. Rate of take through old intake up to 3,650 m^3/day or 42.2 L/s	No take through old intake	N/A
4. Notify Council if take occurs through old intake	No take through old intake occurred	N/A
5. Installation and maintenance of water meter and data logger	Inspection	Yes
6. Water meter certification	Meter NES verified	Yes
7. Notify Council of equipment failure	No equipment failure noted	N/A
8. Water meter and data logger accessible to Council staff	Inspection	Yes
9. Suitable format of records	Review of abstraction data	Yes
10. Data to be transmitted to Council in real time from 1 December 2013	Data received - 100% complete	Yes
11. Best practicable option to prevent or minimise adverse effects	Inspection and liaison with consent holder	Yes
12. Annual report on leak detection and water use efficiency	Report received	Yes
13. Lapse provision	Consent exercised	N/A
14. Review provision	Review in June 2018 not required. No further option for review	N/A

Purpose: *To take and use water from the Waiaua River for Opunake town water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 26 Summary of performance for Consent 5574-2 (Opunake WTP)

Purpose: *To discharge water treatment residuals and pond drainage water from the Opunake WTP into the Waiaua River*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse effects	Yes	Yes
2. Discharge not to exceed 120 m^3/day	Not assessed	Not assessed
3. Not to give rise to effects in receiving waters	Inspection	Yes
4. Limits on contaminants in discharge	Review of consent holder data	Yes
5. Lapse provision	Consent exercised	N/A
6. Review provision	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 27 Summary of performance for Consent 9473-1 (Opunake WTP)

Purpose: *To construct, place and use a water intake structure on the bed of the Waiaua River for water abstraction purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Intake specifications	Inspection during construction	Yes
2. Notification prior to works	Notification received	Yes
3. Minimise river bed disturbance	Inspection during construction	Yes
4. Minimise sediment discharge to river	Inspection during construction	Yes
5. Ensure screen does not entrap fauna	Inspection	Yes
6. No obstruction of fish passage	Inspection	Yes
7. Financial payment	Payment received	Yes

Purpose: *To construct, place and use a water intake structure on the bed of the Waiaua River for water abstraction purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Procedures for archaeological finds	Nothing found	N/A
9. Remove structure when no longer required	Structure being used	N/A
10. Lapse condition	Consent exercised	N/A
11. Reviews June 2018 and June 2024	Next review option in June 2024	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.5 Patea WTP

Table 28 Summary of performance for Consent 3388-3 (Patea Bores)

Purpose: *To take and use groundwater from three bores (known as Bore 1, Bore 2 and Bore 4) for Patea Township water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Total daily extraction not to exceed 1,125 m^3	Review of data	100%
2. Each bore not to exceed certain abstraction rates	Review of data	100%
3. Bore 1 not to exceed 300 m^3/day	Review of data	100%
4. Install flow meters	Inspection	Yes
5. Install data logger	Data received -100% complete	Yes
6. Inform Council of any equipment malfunction	Programme supervision	N/A
7. Provide access to equipment	Inspection	Yes
8. Adopt best practical option	Inspection	Yes
9. Measure level in Brannigan's bore	Groundwater level recorder installed	Yes
10. Consultations with Brannigan's bore owner if levels meet certain criteria	Liaison with consent holder – not necessary	N/A
11. Restrict use or provide water to Brannigan's bore owner if levels meet certain criteria	Liaison with consent holder – not necessary	Yes
12. Not to cause saltwater intrusion	Not assessed	N/A
13. Review provision	No further options for review prior to expiry	N/A

Purpose: *To take and use groundwater from three bores (known as Bore 1, Bore 2 and Bore 4) for Patea Township water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.6 Pope WTP

Table 29 Summary of performance for Consent 4446-2 (Pope WTP)

Purpose: *To discharge treated backwash water from the Pope rural WTP*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	No longer exercise	N/A
2. Exercise in accordance with application	No longer exercised	N/A
3. Maximum discharge of 6 m^3/day at 5 L/s	No longer exercised	N/A
4. Limits not to be exceeded in the discharge	No longer exercised	N/A
5. Efficient operation	No longer exercised	N/A
6. No effects on receiving water	No longer exercised	N/A
7. Lapse provision	No longer exercised	N/A
8. Review provision	Next option for review June 2026	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

4.3.7 Rahotu WTP

Table 30 Summary of performance for Consent 3696-3 (Rahotu WTP)

Purpose: *To take and use water from the Pungaereere Stream for the Rahotu community water supply scheme*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction volume and rate	Review abstraction data provided to Council	100%
2. Installation and maintenance of water meter and data logger	Inspection	Yes
3. Water meter certification	Meter verified	Yes

Purpose: *To take and use water from the Pungaereere Stream for the Rahotu community water supply scheme*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Notify Council of equipment failure	No equipment failure during period under review	Yes
5. Water meter and data logger accessible to Council staff	Inspection	Yes
6. Suitable format of records	Review of abstraction data	Yes
7. Data to be transmitted to Council in real time from 1 February 2014	Data received - 100% complete	Yes
8. Best practicable option to prevent or minimise adverse effects	Inspection and liaison with consent holder	Yes
9. Annual report on leak detection and water use efficiency	Report received	Yes
10. Lapse provision	Consent exercised	Yes
11. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 31 Summary of performance for Consent 6038-1 (Rahotu WTP)

Purpose: *To discharge filter backwash water and settling tank waste from the Rahotu WTP into the Pungaereere Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Discharge not to cause certain effects in the receiving waters below the established mixing zone	Review of consent holder data	Yes
2. Limits on chlorine and pH in discharge	Sampling and review of consent holder data	Yes
3. Review provision	No further provision for review before expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.8 Wai-inu Beach water supply

Table 32 Summary of performance for Consent 3770-3 (Wai-inu WTP)

Purpose: ***To take and use groundwater for Wai-inu Beach for water supply purposes***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction volume and rate	Review of abstraction data provided to Council	100%
2. Installation and maintenance of water meter and data logger	Logger and meter installed - data received	Yes
3. Water meter certification	Received	Yes
4. Notify Council of equipment failure	No equipment failure during monitoring period	Yes
5. Water meter and data logger accessible to Council staff	Inspection	Yes
6. Water records to be provided by 31 July each year	Data received - 100% complete	Yes
7. Best practicable option to prevent or minimise adverse effects	Inspection and liaison with consent holder	Yes
8. Lapse provision	Not applicable – consent exercised	N/A
9. Review provision	Review not required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.9 Waimate West WTP

Table 33 Summary of performance for Consent 0129-3 (Waimate West WTP)

Purpose: ***To discharge treated wash water from the Waimate water supply scheme into an unnamed tributary of Kelly's Creek***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Adoption of best practicable option	Inspection and liaison with consent holder	Yes
2. Exercise in accordance with application	Inspection and liaison with consent holder	Yes
3. Maximum discharge rate 750 m^3/day	Not assessed	N/A
4. Installation and maintenance of erosion protection structure during commissioning of plant.	Not required as commissioning discharges did not occur	Not required

Purpose: *To discharge treated wash water from the Waimate water supply scheme into an unnamed tributary of Kelly's Creek*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
5. Limits on discharge not to be exceeded	Review of consent holder data	N/A
6. Efficient operation of settling ponds	Inspection and data review	Yes
7. No effects on receiving water	Inspection and review of consent holder data	Yes
8. Lapse provision	Not applicable- consent exercised	N/A
9. Review provision	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 34 Summary of performance for Consent 0634-3 (Waimate West WTP)

Purpose: *To take water from the Mangawhero-iti Stream for the Waimate West water supply*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Max rate of abstraction 121 L/s	Review of abstraction data provided	99%
2. Limit on abstraction unless water is taken from Otakeho Stream at 85 L/s unless unable to achieve 85 L/s	Review of abstraction data provided	Yes
3. Installation of water meter and data logger and records of volumes abstracted	Inspections and abstraction data	Yes
4. Notification of installation of water meter and data logger	Received	Yes
5. Notification of equipment failure	No problems during monitoring period	Yes
6. Water meter and data logger accessible to Council	Inspections	Yes
7. Records of water taken in suitable format	Review of abstraction data provided	Yes
8. Flow in Mangawhero-iti Stream downstream of intake to be maintained above 32 L/s	Data provided	99%
9. Flow of Mangawhero-iti Stream recorded when less than 500 L/s	Data provided	Yes
10. Measurements to be transmitted to Council in 'real time'	Data received - 100% complete	Yes
11. Staff gauge to be installed	Installed by Council	Yes

Purpose: *To take water from the Mangawhero-iti Stream for the Waimate West water supply*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
12. Sufficient stream flow measurements undertaken to maintain a 'rating curve'	Gauging undertaken by Council	Yes
13. Best practicable option to prevent or minimise adverse environmental effects	Inspections, data review	Yes
14. Annual report due 1 September	Report received	Yes
15. Five annual payments of $30,600 due 2011 to 2015	Payments all received no more required	N/A
16. Review of consent conditions	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 35 Summary of performance for Consent 0635-3 (Waimate West WTP)

Purpose: *To take water from the Mangawhero Stream to add to the flow of the Mangawhero-iti Stream for water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Max rate of take 70 L/s	Review of abstraction data provided	99%
2. Scope of use	Review of abstraction data provided	Yes
3. Installation of water meter and data logger and records of volumes abstracted	Inspections and abstraction data	Yes
4. Notification of installation of water meter and data logger	Received	Yes
5. Notification of equipment failure	N/A	N/A
6. Water meter and data logger accessible to Council	Inspections	Yes
7. Records of water taken in suitable format	Review of abstraction data provided	Yes
8. Measurements to be transmitted to Council in 'real time'	Data received - 100% complete	Yes
9. Best practicable option to prevent or minimise adverse environmental effects	Inspections, data review	Yes
10. Review provision	No further option for review	N/A

Purpose: *To take water from the Mangawhero Stream to add to the flow of the Mangawhero-iti Stream for water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 36 Summary of performance for Consent 3911-2 (Waimate West WTP)

Purpose: *To take water from the Otakeho Stream for the Pope and Waimate West water supply schemes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction rate	Review of abstraction data provided	99%
2. Installation of water meter and data logger and records of volumes abstracted	Inspections and abstraction data	Yes
3. Notification of installation of water meter and data logger	Received	Yes
4. Notification of equipment failure	N/A	Yes
5. Water meter and data logger accessible to Council	Inspections	Yes
6. Records of water taken in suitable format	Review of abstraction data provided	Yes
7. Best practicable option to prevent or minimise adverse environmental effects	Inspections, data review	Yes
8. Measurements to be transmitted to Council in 'real time'	Data received - 100% complete	Yes
9. Flows of less than 500 L/s recorded for one year prior to June 2017	Data received	No - data incomplete
10. Review provision	Review in June 2018 not required. No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **Improvement required**

Table 37 Summary of performance for Consent 4826-2 (Waimate West WTP)

Purpose: *To place, use and maintain a water intake structure and associated structures on the bed of the Otakeho Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification of Council prior to construction and maintenance works	No maintenance during period under review	N/A
2. Structure to be constructed in accordance with application	Construction completed	N/A
3. Adoption of best practicable option to minimise adverse effects on water quality	No maintenance during period under review	N/A
4. Minimise disturbance during construction and maintenance	No maintenance during period under review	N/A
5. Maintenance works to only occur between 1 April and 30 November	No maintenance during period under review	N/A
6. No obstruction of fish passage	Inspection and triennial fish surveys	Yes
7. Council Biologist to be present during construction of the fish pass	Biologist present	Yes
8. Structure to be removed when no longer required and area reinstated. Council to be notified prior to removal	Structure in use	N/A
9. Review provision	No further options for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 38 Summary of performance for Consent 5451-1 (Waimate West WTP)

Purpose: *To erect, place, use and maintain a water intake structure on the bed of the Mangawhero-iti Stream for water abstraction purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification of Council prior to construction and maintenance works	No maintenance during period under review	N/A
2. Structure to be constructed in accordance with application documents	Construction completed	N/A
3. Adoption of best practicable option to minimise adverse effects on water quality	No maintenance during period under review	N/A

Purpose: *To erect, place, use and maintain a water intake structure on the bed of the Mangawhero-iti Stream for water abstraction purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Minimise disturbance during construction and maintenance and reinstate disturbed areas	No maintenance during period under review	N/A
5. Maintenance works to only occur between 1 April and 30 November	No maintenance during period under review	N/A
6. No obstruction of fish passage	Inspection and triennial fish survey	Yes
7. Monitoring programme to determine fish passage	Inspection and triennial fish survey	Yes
8. Structure to be removed when no longer required and area reinstated	Structure in use	N/A
9. Review provision	No further options for review prior to expiry	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 39 Summary of performance for Consent 5452-1 (Waimate West WTP)

Purpose: *To erect, place, use and maintain a water intake structure on the bed of the Mangawhero Stream for water abstraction*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notification of Council prior to construction and maintenance works	No maintenance during period under review	N/A
2. Structure to be constructed in accordance with application	Construction completed	N/A
3. Adoption of best practicable option to minimise adverse effects on water quality	No maintenance during period under review	N/A
4. Minimise disturbance during construction and maintenance and reinstate disturbed areas	No maintenance during period under review	N/A
5. No obstruction of fish passage	Inspection and triennial fish survey	Yes
6. Monitoring programme to determine fish passage	Inspection and triennial fish survey	Yes
7. Structure to be removed when no longer required and area reinstated	Structure in use	N/A

Purpose: *To erect, place, use and maintain a water intake structure on the bed of the Mangawhero Stream for water abstraction*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
8. Review provision	No further options for review prior to expiry	Yes
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

Table 40 Summary of performance for Consent 10370-1 (Waimate West WTP)

Purpose: *To take and use groundwater for Waimate West water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limits abstraction to 432 m^3 per 24 hour period	Data review	Not exercised
2. Bore to be labelled	Inspection	No
3. The bore shall include a conduit (or 'dip tube')	Inspection	Yes
4. Installation of flow recording equipment	Inspection	Yes
5. Data to be transmitted in correct format	Inspection and data review	No-some data recorded, no transmission as yet
6. Documentation of installation of flow recording equipment to be supplied	Document review	Yes
7. Notification of equipment failure	Document review	Yes
8. Equipment to be accessible to Council staff	Inspection	Yes
9. Undertake measures to minimise water take	Document and data review	Yes
10. Bore constructed to prevent entry of surface water	Inspection	Yes
11. Review condition	Next review option June 2020	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**Good**

4.3.10 Waverley water supply

Table 41 Summary of performance for Consent 3313-3 (Waverley bores)

Purpose: ***To take and use groundwater from the Fookes, Chester and Swinbourne Street bores for Waverley municipal supply purposes***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Combined take not to exceed 14.2 L/s or 900 m^3/day	Review of abstraction data	100%
2. Daily maximum volume and abstraction limits for each bore	Review of abstraction data	100%
3. Bores to have permanent labelling	Inspections	Yes
4. Water meter and data logger installed and maintained on each bore	Inspections	Yes
5. Install and maintain level recording equipment on each bore	Inspection	Yes
6. Record water level in each bore	Inspection and data review	Yes
7. Recording of abstraction and level data	Data received	Yes
8. Notice of installation of water measuring equipment	Notification received	Yes
9. Notification of non-operational measuring equipment	Review of notifications received	N/A
10. Best practicable option to prevent or minimise adverse effects	Inspections, review or data	Yes
11. No intrusion of salt water	Not assessed	N/A
12. Access to well provided for water measurement purposes	Inspections	Yes
13. Review of consent	No further option for review	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

4.3.11 Waverley Beach water supply

Table 42 Summary of performance for Consent 9563-1 (Waverley Beach supply)

Purpose: *To take and use groundwater for Waverley Beach water supply purposes*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on abstraction rate	Not exercised	N/A
2. No intrusion of salt water	Consent not exercised	N/A
3. Bores to have permanent labels	Consent not exercised	N/A
4. Installation and maintenance of water meter and data logger	Consent not exercised	N/A
5. Water meter certification	Consent not exercised	N/A
6. Installation of water level monitoring devices	Consent not exercised	N/A
7. Water level certification	Consent not exercised	N/A
8. Water meter and data logger accessible to Council staff	Consent not exercised	N/A
9. Notify Council of equipment failure	Consent not exercised	N/A
10. Water records to be provided by 31 July each year	Consent not exercised	N/A
11. Best practicable option to prevent or minimise adverse effects	Consent not exercised	N/A
12. Lapse provision	Consent not exercised	N/A
13. Review provision	No review option this period	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**N/A**
Overall assessment of administrative performance in respect of this consent		**N/A**

During the monitoring period, STDC demonstrated an overall high level of environmental performance and a good level of administrative performance.

4.4 Recommendations from the 2016-2017 Annual Report

In the 2016-2017 Annual Report, it was recommended:

1. THAT for 2017-2018 the level of monitoring for the STDC Water Supplies remains similar to that of 2016-2017.
2. THAT the option for a review of resource consents 0232-4, 5574-2, 9473-1, 0634-3, 0635-3, 1185-3, and 1186-3 in June 2018, not be pursued based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports.

These recommendations were implemented.

4.5 Alterations to monitoring programmes for 2018-2019

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account the extent of information made available by previous authorities, its relevance under the RMA, its obligations to monitor discharges and effects under the RMA, and report to the regional community. The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki discharging to the environment.

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 2018-2019.

It is proposed that for 2018-2019 the level of monitoring for the South Taranaki Water Supplies remain similar to that of 2017-2018.

4.6 Exercise of optional review of consent

Consent 0696-3 provides for an optional review of the consent conditions in June 2019. Condition 11 of the consent provides for a review 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.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued.

5 Recommendations

1. THAT for 2018-2019 the level of monitoring for the STDC Water Supplies remains similar to that of 2017-2018.
2. THAT should there be issues with environmental or administrative performance in the 2018-2019 period, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the option for a review of resource consent 3696-6 in June 2019, not be pursued, on the grounds that the current 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.

Glossary of common terms and abbreviations

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

Biomonitoring	Assessing the health of the environment using aquatic organisms.
COD	Chemical oxygen demand. A measure of the oxygen required to oxidise all matter in a sample by chemical reaction.
Condy	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/m.
DRP	Dissolved reactive phosphorus.
Fresh	Elevated flow in a stream, such as after heavy rainfall.
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.
L/s	Litres per second.
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
SQMCI	Semi quantitative macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity *and abundance* of the taxa present to organic pollution in stony habitats.
mS/m	Millisiemens per metre.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
NH_4	Ammonium, normally expressed in terms of the mass of nitrogen (N).
NH_3	Unionised ammonia, normally expressed in terms of the mass of nitrogen (N).
NWMR	National Water Metering Regulations 2010.
NNN	Nitrate-Nitrite Nitrogen.
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
PACL	Poly aluminium chloride – a flocculant used in water treatment
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.
Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.

For further information on analytical methods, contact a Science Services Manager.

Bibliography and references

Taranaki Regional Council (2017): *South Taranaki Water Supplies Monitoring Programme Annual Report 2016-2017*. Technical Report 2017-16

Taranaki Regional Council (2016): *South Taranaki Water Supplies Monitoring Programme Annual Report 2015-2016*. Technical Report 2016-103

Taranaki Regional Council (2015): *South Taranaki Water Supplies Monitoring Programme Annual Report 2014-2015*. Technical Report 2015-69

Taranaki Regional Council (2014): *South Taranaki Water Supplies Monitoring Programme Annual Report 2013-2014*. Technical Report 2014-121

Taranaki Regional Council (2013): *South Taranaki Water Supplies Monitoring Programme Annual Report 2012-2013*. Technical Report 2013-65

Taranaki Regional Council (2013): *South Taranaki Water Supplies Monitoring Programme Annual Report 2012-2013*. Technical Report 2013-65

Taranaki Regional Council (2012): *South Taranaki Water Supplies Monitoring Programme Annual Report 2011-2012*. Technical Report 2012-78

Taranaki Regional Council (2011): *South Taranaki Water Supplies Monitoring Programme Annual Report 2010-2011*. Technical Report 2011-42

Taranaki Regional Council (2010): *South Taranaki Water Supplies Monitoring Programme Annual Report 2009-2010*. Technical Report 2010-53

Taranaki Regional Council (2010): *South Taranaki Water Supplies Monitoring Programme Annual Report 2008-2009*. Technical Report 2009-84

Taranaki Regional Council (2008): *South Taranaki District Water Supply Plants Monitoring Programme Biennial Report 2006-2008*. Technical Report 2008-85

Taranaki Regional Council (2006): *South Taranaki District Water Supply Plants and Structures Monitoring Programme Annual Report 2005-2006*. Technical Report 2006-22

Taranaki Regional Council (2005): *South Taranaki District Water Supply Plants and Structures Monitoring Programme Annual Report 2004-2005*. Technical Report 2005-54

Taranaki Regional Council (2004): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 2003-2004*. Technical Report 2004-09

Taranaki Regional Council (2003): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 2002-2003*. Technical Report 2003-69

Taranaki Regional Council (2002): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 2001-2002*. Technical Report 2002-64

Taranaki Regional Council (2001): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 2000-2001*. Technical Report 2001-65

Taranaki Regional Council (2000): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 1999-2000*. Technical Report 2000-80

Taranaki Regional Council (1999): *South Taranaki District Council Water Supply Plants and Structures Monitoring Programme Annual Report 1998-99*.Technical Report 99-51

Taranaki Regional Council (1997): *Hawera Water Treatment Plant Annual Report 1996-97*. Technical Report 97-43

Taranaki Regional Council (1996): *Hawera Water Treatment Plant Annual Report 1995-96*. Technical Report 96-40

Taranaki Regional Council (1995): *Hawera Water Treatment Plant Annual Report 1994-95*. Technical Report 95-24

Taranaki Regional Council (1994): *Hawera Water Treatment Plant Annual Report 1993-94*. Technical Report 94-47

Taranaki Regional Council (1993): *Hawera Water Treatment Plant Annual Report 1992-93*. Technical Report 93-19

Taranaki Regional Council (1992): *Hawera Water Treatment Plant Annual Report 1991-92*. Technical Report 92-24

Appendix I

Resource consents held by STDC

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

Eltham WTP (STDC)

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	5 November 2012
Commencement Date:	5 November 2012

Conditions of Consent

Consent Granted:	To discharge reservoir contents from the Eltham Water Supply Reservoir onto land adjacent to the Waingongoro River at or about (NZTM) 1708817E-5639437N
Expiry Date:	1 June 2029
Review Date(s):	June 2017, June 2023
Site Location:	Finnerty Road Ngaere Eltham
Legal Description:	Lot 1 DP 11209 Blk V Ngaere SD (Discharge source & site)
Catchment:	Waingongoro

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

General condition

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any adverse effects on the environment from the exercise of this consent including, but not limited to, ensuring the discharge occurs over a period in excess of 4 days.

2. The consent holder shall notify the Council of the intention to discharge at least 2 working days prior to discharge occurring. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.

3. The volume of the discharge shall not exceed 5000 cubic metres and shall occur no more frequently than once every calendar year.

4. The discharge shall only commence when flows in the Waingongoro River at Eltham road are greater than 1050 litres per second.

5. All reservoir contents shall be directed over land before entering the Waingongoro River. There shall be no direct discharge to the Waingongoro River.

6. The consent holder shall, as far as practicable, reduce the volume of sediment and silt in the discharge before entering the Waingongoro River, including the off-site disposal of settled solids from the bottom of the reservoir.

7. The maximum concentration of the suspended solid contained in the discharge shall not exceed 100 gm^{-3}.

8. After allowing for reasonable mixing, within a mixing zone extending 100 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

    a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
    b) any conspicuous change in the colour or visual clarity;
    c) any emission of objectionable odour;
    d) the rendering of fresh water unsuitable for consumption by farm animals;
    e) any significant adverse effects on aquatic life.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2017 and/or June 2023, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 5 November 2012

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 Hawera 4640
Decision Date:	28 June 2017
Commencement Date:	28 June 2017

Conditions of Consent

Consent Granted:	To discharge filter backwash from the Eltham Water Treatment Plant via a settling pond into an unnamed tributary of the Waingongoro River
Expiry Date:	1 June 2035
Review Date(s):	June 2023, June 2029
Site Location:	Eltham Water Treatment Plant, 225B Finnerty Road, Ngaere
Grid Reference (NZTM)	1709710E-5638778N
Catchment:	Waingongoro

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

General condition

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

Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.

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

Constituent	**Standard**
Suspended solids	Concentration not greater than 20 gm^{-3}
Free available chlorine	Concentration no greater than 0.1 gm^{-3}
pH	Within the range 6.0 to 9.0

3. After allowing for a mixing zone of 25 metres downstream of the discharge point, the discharge shall not give rise to any of the following effects in the unnamed tributary of the Waingongoro River;

   (a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   (b) any conspicuous change in the colour or visual clarity;
   (c) any emission of objectionable odour;
   (d) the rendering of fresh water unsuitable for consumption by farm animals; and
   (e) any significant adverse effects on aquatic life.

4. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2023 and/ or June 2029, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 28 June 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA
Consent Granted Date:	15 December 1999

Conditions of Consent

Consent Granted:	To take and use water from the Waingongoro River for municipal water supply purposes at or about GR: Q20:188-014
Expiry Date:	1 June 2018
Review Date(s):	June 2002, June 2006, June 2012
Site Location:	Finnerty Road, Ngaere, Eltham
Legal Description:	Pt 31 Lot 2 DP 2918 Blk V Ngaere SD
Catchment:	Waingongoro

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

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. THAT the consent allows the abstraction of:

a) 4020 cubic metres/day [47 litres/second] on an unrestricted basis; and
b) 1500 cubic metres/day [17 litres/second] on a restricted basis as per condition 6.

2. THAT the consent holder shall install and maintain, to the satisfaction of the General Manager, Taranaki Regional Council, a measuring device capable of recording daily rates of abstraction and shall make such records available to the General Manager, Taranaki Regional Council, upon request.

3. THAT the exercise of this consent shall be undertaken in general accordance with the information supplied in support of application 534, particularly regarding the promotion of the efficiency of use of the water, and the installation of a telemetry system at the water treatment plant.

4. THAT the consent holder shall quantify the reticulation system losses by 31 December 2000 and report the results to the General Manger, Taranaki Regional Council, by 28 February 2001.

5. THAT the consent holder shall investigate and report on the blocking of the intake, and options for addressing this; the report to be received by the General Manager, Taranaki Regional Council, not later than 10 months from the date the consent is granted.

6. THAT the Taranaki Regional Council by the agreement of the consent holder, shall review condition 1(b), pursuant to section 128 of the Resource Management Act 1991, by giving notice of review during the month of June 2002, for the purpose of assessing the success of consent holder 5437 in implementing water conservation measures in reducing plant water use and to demonstrate a need for the water.

7. THAT by the agreement of the consent holder, the consent holder shall mitigate the effects of the abstraction by donating $10,000 [goods and services tax exclusive] to the Taranaki Tree Trust by 31 January 2000, for the purpose of providing riparian management in the Waingongoro catchment, in the reach above the Climie Stream, and in the Climie Stream catchment.

8. THAT the Taranaki Regional Council may review, according to section 128 of the Resource Management Act 1991, any or all of the conditions of this consent by giving notice of review during June 2002 and/or June 2006 and/or June 2012, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 December 1999

For and on behalf of
Taranaki Regional Council

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General Manager

Hawera WTP (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Change To Conditions Date:	28 October 2008 [Granted: 7 June 2000]

Conditions of Consent

Consent Granted:	To take and use water from the Kapuni Stream for municipal water supply purposes at or about (NZTM) 1701447E-5630678N
Expiry Date:	1 June 2020
Review Date(s):	June 2011
Site Location:	Kapuni Stream, Palmer Road, Kapuni
Legal Description:	Adjacent to Lot 1 DP 10570 & Lot 3 DP 10570 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. That the consent allows the abstraction of:

a) 10756.8 cubic metres/day [124.5 litres/second] on an unrestricted basis; and
b) 1343.2 cubic metres/day [15.5 litres/second] on a restricted basis as per condition 4.

2. The consent holder shall install and maintain, to the satisfaction of the Chief Executive, Taranaki Regional Council, a measuring device(s) capable of recording daily rates of abstraction and shall make such records available to the Chief Executive, Taranaki Regional Council, on a monthly basis.

Condition 3 [changed]

3. The exercise of this consent shall be undertaken in general accordance with the information supplied in support of applications 533 and 6128, particularly regarding the promotion of the efficiency of use of the water and reporting on efficiency measures every two years from the commencement of this consent.

Conditions 4 to 7 [unchanged]

4. That the water available under condition 1(b) shall only be used for those times where peak demand exceeds 124.5 litres/second. On each occasion that condition 1(b) is exercised, the consent holder shall, within seven days of the reduction of demand below 124.5 litres/second, provide a written report to the Chief Executive, Taranaki Regional Council, detailing the volumes of water abstracted, the time period during which the abstraction exceeded 124.5 litres/second, and the conservation measures adopted during that time.

5. That, by the agreement of the consent holder, the consent holder shall mitigate the effects of the abstraction by donating a minimum amount of $3,150 and a maximum of $12,000 per annum [GST exclusive and inflation adjusted], with a total contribution not to exceed $63,000 [GST exclusive and inflation adjusted] to the Taranaki Tree Trust, for the purpose of providing riparian management in the Kapuni Stream and its tributaries, preferably above Skeet Road.

6. The consent holder shall prepare and subsequently update and maintain a management plan for the Kapuni Stream between GR's: Q20:116-928 and Q20: 110-913, in conjunction with the other users, including but not restricted to the Natural Gas Corporation of New Zealand Limited and Petrochem Limited, to manage the abstraction of water from and discharge of contaminants to the Kapuni Stream. The management plan shall be submitted to the Chief Executive, Taranaki Regional Council, for approval within three months of the granting of the consent.

7. The consent holder shall undertake a leak detection and repair programme throughout the term of the consent within Hawera, Normanby, Okaiawa and Ohawe Beach townships and report on this programme annually to the Chief Executive, Taranaki Regional Council.

Condition 8 [new]

8. The point of abstraction shall remain at its current location [at or about GR: Q20:115-925 NZMSG] until the new intake to be constructed pursuant to resource consent 7413-1 is commissioned. At that time the point of abstraction shall be at the new intake [at or about 1701447E-5630678N NZTM].

Condition 9 [changed, previously condition 8]

9. The Taranaki Regional Council may review, according to section 128 of the Resource Management Act 1991, any or all of the conditions of this consent by giving notice of review during June 2011, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time, and for the purpose of assessing the implementation of the leak detection and repair programme specified in condition 7.

Signed at Stratford on 28 October 2008

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4800
Change To Conditions Date:	1 February 2007 [Granted: 26 January 2006]

Conditions of Consent

Consent Granted:	To discharge up to 227 cubic metres/day of settling pond supernatant from a water treatment plant into the Kapuni Stream at or about GR: Q20:112-916
Expiry Date:	1 June 2023
Review Date(s):	June 2008, June 2011, June 2017
Site Location:	Palmer Road, Kapuni
Legal Description:	Lot 2 DP 3675 Lot 2 DP 10737 Lot 2 DP 15107 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

Conditions 1 to 3 – unchanged

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 4516. In the case of any contradiction between the documentation submitted in support of application 4516 and the conditions of this consent, the conditions of this consent shall prevail.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

Condition 4 – changed

4. The consent holder shall address the issue of a permanent solution for water treatment residuals with the construction of a new water treatment plant, planned for 2010.

Condition 5 to 9 – unchanged

5. The consent holder shall properly and efficiently maintain and operate the settlement facility to the general satisfaction of the Chief Executive, Taranaki Regional Council.

6. After allowing for a mixing zone of 25 metres downstream of the discharge, the discharge shall not give rise to any of the following effects in the Kapuni Stream:

i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
ii) any conspicuous change in the colour or visual clarity;
iii) any emission of objectionable odour;
iv) the rendering of fresh water unsuitable for consumption by farm animals; and
v) any significant adverse effects on aquatic life.

7. The discharge quality shall not exceed the following limits at all times:

Component	**Concentration**
suspended solids	20 g/m^3
free available chlorine	0.1 g/m^3
pH	6.5 - 8.5

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

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2008 and/or June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 1 February 2007

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4800
Consent Granted Date:	2 November 2006

Conditions of Consent

Consent Granted:	To take and use up to 4,320 m^3/day of groundwater at a maximum rate of 50 l/s as a combined total from up to three water bores in a bore field at the Kapuni reservoir site for municipal, rural, industrial, and recreational supply purposes at or about GR: Q20:111-909
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Kapuni reservoir site, off 1054 Skeet Road, Kapuni
Legal Description:	Lot 2 DP 6410 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of application 4419 and shall ensure the efficient and effective use of water. In the case of any contradiction between the documentation submitted in support of application 4419 and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

3. Prior to the exercise of this consent, the consent holder shall provide a report to Chief Executive, Taranaki Regional Council, detailing the results of pump testing (72-hour constant discharge at 50 l/s and recovery tests) of the bores used for water supply to show (1) that the abstraction is sustainable, and (2) the effects of the abstraction on flows in the Kapuni Stream.

4. The volume of groundwater abstracted shall not exceed 4,320 cubic metres per day at a rate not exceeding 50 litres per second as a combined total from the bores in the bore field.

5. The abstraction shall not cause more than a 10% lowering of the static water level by interference in any adjacent registered water bore located beyond the boundary of the bore field.

6. The consent holder shall maintain daily records of the abstraction from each bore including date, abstraction rate and daily volume, and pumping hours, and make these records available to the Chief Executive, Taranaki Regional Council, no later than 31 July of each year, or upon request.

7. Prior to the exercise of this consent the consent holder shall install groundwater monitoring piezometers between the Kapuni Stream and the boundary of the bore field for the purposes of monitoring groundwater levels.

8. The consent holder shall install and maintain a measuring device approved by the Chief Executive, Taranaki Regional Council, on each bore for the purposes of accurately recording the abstraction of water.

9. This consent shall be subject to monitoring by the Taranaki Regional Council and the consent holder shall meet all reasonable costs associated with the monitoring.

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

11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 2 November 2006

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Change To Conditions Date:	10 February 2009 [Granted: 2 November 2006]

Conditions of Consent

Consent Granted:	To take and use up to 4,320 m^3/day of groundwater at a maximum rate of 50 l/s as a combined total from up to three water bores in a bore field at the Kapuni reservoir site for municipal, rural, industrial, and recreational supply purposes at or about (NZTM) 1701067E-5629178N
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Kapuni reservoir site, off 1054 Skeet Road, Kapuni
Legal Description:	Lot 2 DP 6410 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

Condition 1 to 6 [unchanged]

1. The exercise of this consent shall be undertaken in general accordance with the documentation submitted in support of application 4419 and shall ensure the efficient and effective use of water. In the case of any contradiction between the documentation submitted in support of application 4419 and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

3. Prior to the exercise of this consent, the consent holder shall provide a report to Chief Executive, Taranaki Regional Council, detailing the results of pump testing (72-hour constant discharge at 50 l/s and recovery tests) of the bores used for water supply to show (1) that the abstraction is sustainable, and (2) the effects of the abstraction on flows in the Kapuni Stream.

4. The volume of groundwater abstracted shall not exceed 4,320 cubic metres per day at a rate not exceeding 50 litres per second as a combined total from the bores in the bore field.

5. The abstraction shall not cause more than a 10% lowering of the static water level by interference in any adjacent registered water bore located beyond the boundary of the bore field.

6. The consent holder shall maintain daily records of the abstraction from each bore including date, abstraction rate and daily volume, and pumping hours, and make these records available to the Chief Executive, Taranaki Regional Council, no later than 31 July of each year, or upon request.

Condition 7 [previously condition 8]

7. The consent holder shall install and maintain a measuring device approved by the Chief Executive, Taranaki Regional Council, on each bore for the purposes of accurately recording the abstraction of water.

Condition 8 [previously condition 9]

8. This consent shall be subject to monitoring by the Taranaki Regional Council and the consent holder shall meet all reasonable costs associated with the monitoring.

Condition 9 [previously condition 10]

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

Condition 10 [previously condition 11]

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 February 2009

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Consent Granted Date:	5 February 2009

Conditions of Consent

Consent Granted:	To erect, use and maintain a water intake structure on the bed of the Kapuni Stream, including temporary damming and diversion during construction at or about (NZTM) 1701447E-5630678N
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Kapuni Stream, Palmer Road, Kapuni
Legal Description:	Lot 1 DP 10570 Lot 1 DP 3675 Lot 3 DP 10570 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The exercise of this consent shall be undertaken in accordance with the documentation submitted in support of application 6131, in particular Drawing No. 80066/19. If there is any conflict between the documentation submitted in support of application 6131 and the conditions of this consent, the conditions of this consent shall prevail.

2. Any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

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

5. The consent holder shall take all reasonable steps to:

a. minimise the amount of sediment discharged to the stream;
b. minimise the amount of sediment that becomes suspended in the stream; and
c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki Region,* by the Taranaki Regional Council, will achieve compliance with this condition.

6. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

7. The consent holder shall monitor and maintain the fish pass, to ensure it performs as designed and allows for the effective passage of fish.

8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

9. This consent shall lapse on 31 March 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 5 February 2009

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Consent Granted Date:	13 March 2009

Conditions of Consent

Consent Granted:	To discharge membrane backwash water and cleaning wastewater from the Kapuni Water Treatment Plant into the Kapuni Stream at or about (NZTM) 1700804E-5628910N
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Skeet Road, Kapuni
Legal Description:	Lot 1 DP 18183 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

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

2. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
b) any conspicuous change in the colour or visual clarity;
c) any emission of objectionable odour;
d) the rendering of fresh water unsuitable for consumption by farm animals;
e) any significant adverse effects on aquatic life.

3. After allowing for reasonable mixing, within a mixing zone extending 25 metres downstream of the of the discharge point, the discharge shall not give rise to an increase in the turbidity of the Kapuni Stream of more than 50%, as determined using NTU [nephelometric turbidity units].

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

Constituent	Standard
free available chlorine	Concentration not greater than 0.1 gm^{-3}
pH	Within the range 6.5 to 8.5
suspended solids	Concentration not greater than 20 gm^{-3}

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

5. This consent shall lapse on 31 March 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

6. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 13 March 2009

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Consent Granted Date:	20 February 2009

Conditions of Consent

Consent Granted:	To install, use and maintain an outfall structure on the bank of the Kapuni Stream for the Kapuni Water Treatment Plant at or about (NZTM) 1700804E-5628910N
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Skeet Road, Kapuni
Legal Description:	Lot 1 DP 18183 Blk XVI Kaupokonui SD
Catchment:	Kapuni

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The exercise of this consent shall be undertaken in accordance with the documentation submitted in support of application 6202, in particular Drawing No. 0652C010. If there is any conflict between the documentation submitted in support of application 6202 and the conditions of this consent, the conditions of this consent shall prevail.

2. Any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April, except where this requirement is waived in writing by the Chief Executive, Taranaki Regional Council.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

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

5. The consent holder shall take all reasonable steps to:

a. minimise the amount of sediment discharged to the stream;
b. minimise the amount of sediment that becomes suspended in the stream; and
c. mitigate the effects of any sediment in the stream.

Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki Region,* by the Taranaki Regional Council, will achieve compliance with this condition.

6. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

7. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

8. This consent shall lapse on 31 March 2014, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 20 February 2009

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	21 February 2013
Commencement Date:	21 February 2013

Conditions of Consent

Consent Granted:	To construct, place and use a water intake structure on the bed of the Waiaua River for water abstraction purposes
Expiry Date:	1 June 2030
Review Date(s):	June 2018, June 2024
Site Location:	Opunake Water Treatment Plant, 470 Ihaia Road, Opunake
Legal Description:	Sec 4 Blk X Opunake SD (Site of structure)
Grid Reference (NZTM)	1678013E-5635411N
Catchment:	Waiaua

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

General condition

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

Special conditions

1. The water intake structure shall:

   a) have a 0.75 mm slot size wedge wire screen;
   b) be 300 mm in diameter;
   c) 1500 mm in length; and
   d) the bottom of the screen to sit a nominal 225 mm above the existing riverbed.

2. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of the initial installation and again at least 48 hours prior to and upon completion of any subsequent maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable only if the consent holder does not have access to email.

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

4. The consent holder shall take all reasonable steps to:

   a. minimise the amount of sediment discharged to the river;
   b. minimise the amount of sediment that becomes suspended in the river; and
   c. mitigate the effects of any sediment in the river.

   Undertaking work in accordance with *Guidelines for Earthworks in the Taranaki Region,* by the Taranaki Regional Council, will achieve compliance with this condition.

5. The consent holder shall ensure that the water intake structure is appropriately screened to avoid the entrapment of freshwater fauna. The maximum screen slot velocity shall be no more than 0.15 m/s at design capacity.

6. The water intake structure shall not obstruct fish passage.

7. To mitigate the adverse environmental effects of this consent the consent holder shall make a single payment of $20,000 (excluding GST) to the Taranaki Regional Council as a financial contribution for the purpose of providing riparian planting and management in the Waiaua Stream catchment. The payment shall be made before 1 September 2013.

8. In the event that any archaeological remains are discovered as a result of works authorised by this consent, the works shall cease immediately at the affected site and tangata whenua and the Chief Executive, Taranaki Regional Council, shall be notified within one working day. Works may recommence at the affected area when advised to do so by the Chief Executive, Taranaki Regional Council. Such advice shall be given after the Chief Executive has considered: tangata whenua interest and values, the consent holder's interests, the interests of the public generally, and any archaeological or scientific evidence. The New Zealand Police, Coroner, and Historic Places Trust shall also be contacted as appropriate, and the work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

9. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

10. This consent shall lapse on 31 March 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2018 and/or June 2024, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 21 February 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Inaha WTP (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Chief Executive Private Bag 902 HAWERA 4800
Consent Granted Date:	29 August 2006

Conditions of Consent

Consent Granted:	To take water from the Mangatoki Stream in the Waingongoro catchment for Inaha rural water supply purposes at or about GR: Q20:107-039
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2018
Site Location:	Inaha Water Supply, Upper Palmer Road, Mahoe
Legal Description:	Sec 24 Blk VII Kaupokonui SD
Catchment:	Waingongoro
Tributary:	Mangatoki

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3449. In the case of any contradiction between the documentation submitted in support of application 3449 and the conditions of this consent, the conditions of this consent shall prevail.

3. The volume of water abstracted shall not exceed 1,122 cubic metres/day at a rate not exceeding 13 litres/second.

4. The consent holder shall install and operate a measuring device capable of accurately recording daily rates of abstraction and shall measure, record and make such records available to the Chief Executive, Taranaki Regional Council, upon request.

5. The intake structure shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council. Once the abstraction licensed by this consent is no longer required, the consent holder shall remove the intake structure to the satisfaction of the Chief Executive, Taranaki Regional Council.

6. The intake structures shall be screened to avoid the entrainment of fish.

7. The intake structure shall be maintained and operated so that the passage of fish is not obstructed.

8. The consent holder shall promote the efficient use of water and undertake a leak detection and repair programme throughout the term of the consent for the Inaha Water Supply Scheme and report on this programme annually for the duration of this consent.

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

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2018, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 29 August 2006

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640	
Decision Date (Change):	29 May 2014	
Commencement Date (Change):	29 May 2014	(Granted: 29 August 2006)

Conditions of Consent

Consent Granted:	To take water from the Mangatoki Stream in the Waingongoro catchment for Inaha rural water supply purposes
Expiry Date:	01 June 2023
Review Date(s):	June 2018
Site Location:	Inaha water supply, 1551 Upper Palmer Road, Mahoe
Legal Description:	Sec 24 Blk VII Kaupokonui SD Lot 2 DP 421857 Blk VIII Kaupokonui SD (Site of take)
Grid Reference (NZTM)	1700531E-5642453N and 1700921E-5641908N
Catchment:	Waingongoro
Tributary:	Mangatoki

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

General condition

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

    i) the administration, monitoring and supervision of this consent; and
    ii) charges authorised by regulations.

Special conditions

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

2. The combined rate of taking shall not exceed 29 litres per second, and the volume taken in any 24 hour period ending at midnight (New Zealand Standard Time) shall not exceed 2504 cubic metres.

3. The consent holder shall use the gravity take preferentially over the pumped take. The pumped take may be used exclusively only when the gravity take is not operational due to maintenance, capital works or flood damage.

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

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

5. 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.

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

7. The intake structures shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council. Once the abstraction licensed by this consent is no longer required, the consent holder shall remove the intake structure to the satisfaction of the Chief Executive, Taranaki Regional Council.

8. The water meter and 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 Council officers can readily verify that it is accurately recording the required information.

9. The records of water taken shall:

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

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

10. That measurements made in accordance with condition 4 be transmitted to Taranaki Regional Councils computer system to maintain "real time" records of the water taken, with a delay of no more than 2 hours.

11. The intake structures shall be screened to avoid the entrainment of fish.

12. The intake structure shall be maintained and operated so that the passage of fish is not obstructed.

13. The consent holder shall promote the efficient use of water and undertake a leak detection and repair programme through out the term of the consent for the Inaha Water Supply Scheme and report on this programme annually for the duration of this consent.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2018 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 29 May 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Chief Executive Private Bag 902 HAWERA 4800
Consent Granted Date:	29 August 2006

Conditions of Consent

Consent Granted:	To take water from the Waingongoro River for Inaha rural water supply purposes at or about GR: Q20:104-070
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2018
Site Location:	Inaha Water Supply, Upper Palmer Road, Mahoe
Legal Description:	Sec 15 Blk VIII Kaupokonui SD
Catchment:	Waingongoro

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3450. In the case of any contradiction between the documentation submitted in support of application 3450 and the conditions of this consent, the conditions of this consent shall prevail.

3. The volume of water abstracted shall not exceed 2,592 cubic metres/day at a rate not exceeding 30 litres/second.

4. The consent holder shall install and operate a measuring device capable of accurately recording daily rates of abstraction and shall measure, record and make such records available to the Chief Executive, Taranaki Regional Council, upon request.

5. The intake structure shall be maintained to the satisfaction of the Chief Executive, Taranaki Regional Council. Once the abstraction licensed by this consent is no longer required, the consent holder shall remove the intake structure to the satisfaction of the Chief Executive, Taranaki Regional Council.

6. All intake structures shall be screened to avoid the entrainment of fish.

7. The intake structure shall be maintained and operated so that the passage of fish is not obstructed.

8. The consent holder shall promote the efficient use of water and undertake a leak detection and repair programme throughout the term of the consent for the Inaha Water Supply Scheme and report on this programme annually for the duration of this consent.

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

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2018, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 29 August 2006

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

TRK993927

DISCHARGE PERMIT

Pursuant to the RESOURCE MANAGEMENT ACT 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	SOUTH TARANAKI DISTRICT COUNCIL PRIVATE BAG 902 HAWERA
Renewal Granted Date:	4 June 1999

CONDITIONS OF CONSENT

Consent Granted:	TO DISCHARGE UP TO 228 CUBIC METRES/DAY OF BACKWASH WASTES FROM THE INAHA RURAL WATER SUPPLY TREATMENT PLANT INTO AN UNNAMED TRIBUTARY OF THE MANGATOKI STREAM IN THE WAINGONGORO CATCHMENT AT OR ABOUT GR: Q20:110-030
Expiry Date:	1 June 2017
Review Date[s]:	June 2005 and June 2011
Site Location:	INAHA WATER TREATMENT PLANT, PALMER ROAD, MAHOE
Legal Description:	PT SEC 3 BLK VIII KAUPOKONUI SD

Catchment:	WAINGONGORO	350.000
Tributary:	MANGATOKI UNNAMED TRIBUTARY	350.010

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

TRK993927

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. THAT the consent holder shall properly and efficiently maintain and operate the settlement pond system.

2. THAT after allowing for a mixing zone of 25 metres downstream of the discharge, the discharge shall not give rise to any of the following effects in the tributary of the Mangatoki Stream:

   i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   ii) any conspicuous change in the colour or visual clarity;
   iii) any emission of objectionable odour;
   iv) the rendering of fresh water unsuitable for consumption by farm animals; and
   v) any significant adverse effects on aquatic life.

3. THAT the discharge quality shall not exceed the following limits at all times:

suspended solids	20	gm^{-3}
free available chlorine	0.1	gm^{-3}

4. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2005 and/or June 2011, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 4 June 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

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DIRECTOR—RESOURCE MANAGEMENT

TRK993928

DISCHARGE PERMIT

Pursuant to the RESOURCE MANAGEMENT ACT 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	SOUTH TARANAKI DISTRICT COUNCIL PRIVATE BAG 902 HAWERA
Renewal Granted Date:	4 June 1999

CONDITIONS OF CONSENT

Consent Granted:	TO DISCHARGE UP TO 3,060 CUBIC METRES/DAY OF UNCONTAMINATED OVERFLOW WATER FROM THE INAHA RURAL WATER SUPPLY TREATMENT PLANT VIA A SETTLEMENT POND INTO AN UNNAMED TRIBUTARY OF THE MANGATOKI STREAM AND THEN INTO THE MANGATOKI STREAM IN THE WAINGONGORO CATCHMENT AT OR ABOUT GR: Q20:110-030 and Q20:109-036
Expiry Date:	1 June 2017
Review Date[s]:	June 2005 and June 2011
Site Location:	INAHA WATER TREATMENT PLANT, PALMER ROAD, MAHOE
Legal Description:	PT SEC 3 BLK VIII KAUPOKONUI SD

Catchment:	WAINGONGORO	350.000
Tributary:	MANGATOKI UNNAMED TRIBUTARY	350.010

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

TRK993928

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. THAT the consent holder shall properly and efficiently maintain and operate the settlement pond system.

2. THAT after allowing for a mixing zone of 25 metres downstream of the discharge, the discharge shall not give rise to any of the following effects in the receiving waters:

   i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   ii) any conspicuous change in the colour or visual clarity;
   iii) any emission of objectionable odour;
   iv) the rendering of fresh water unsuitable for consumption by farm animals; and
   v) any significant adverse effects on aquatic life.

3. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2005 and/or June 2011, for the purpose of ensuring that the conditions adequately deal with the environmental effects arising from the exercise of this consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 4 June 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

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DIRECTOR—RESOURCE MANAGEMENT

Land Use Consent

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA
Consent Granted Date:	15 June 2005

Conditions of Consent

Consent Granted:	To maintain an existing low-level weir and fish pass across the Mangatoki Stream in the Waingongoro catchment at or about GR: Q20:105-042
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Inaha Intake Site, Palmer Road, Mahoe, Stratford
Legal Description:	Sec 24 Blk VII Kaupokonui SD
Catchment:	Waingongoro
Tributary:	Mangatoki

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3451. In the case of any contradiction between the documentation submitted in support of application 3451 and the conditions of this consent, the conditions of this consent shall prevail.

3. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least seven days prior to the exercise of this consent.

4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, at least 48 hours prior to any maintenance works of the structure[s] or fish pass licensed by this consent which would involve disturbance of, or deposition to, the streambed or discharges to water.

5. The consent holder, during any maintenance works, shall adopt the best practicable option to avoid or minimise the discharge of silt or other contaminants into water or onto the streambed and to avoid or minimise the disturbance of the streambed and any adverse effects on water quality.

6. The consent holder, during any maintenance, shall ensure that the area and volume of river bed disturbance shall, so far as practicable, be minimised and any areas which are disturbed shall, so far as practicable, be reinstated.

7. No maintenance work shall be conducted during the period 1 May to 31 October unless waived in writing by the Chief Executive, Taranaki Regional Council.

8. The structure[s] authorised by this consent shall be maintained to ensure the conditions of this consent are met.

9. The structure[s] authorised by this consent shall be constructed and maintained so as not to restrict the passage of native fish and trout, to the satisfaction of the Chief Executive, Taranaki Regional Council.

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

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

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 June 2005

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Opunake WTP (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	30 July 2013
Commencement Date:	20 August 2013

Conditions of Consent

Consent Granted:	To take and use water from the Waiaua River for Opunake town water supply purposes
Expiry Date:	1 June 2030
Review Date(s):	June 2018, June 2024
Site Location:	Opunake Water Supply Intake, Ihaia Road, Opunake
Legal Description:	Sec 4 Blk X Opunake SD (Site of take & use)
Grid Reference (NZTM)	1678013E-5635411N
Catchment:	Waiaua

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 to section 36 of the Resource Management Act 1991.

Special conditions

1. Except as provided for in conditions 2 and 3 below, the rate of taking shall not exceed 2200 cubic metres per day or 25.5 litres per second.

2. The taking shall occur through the 'new' intake authorised by consent 9473-1 (NZTM 1678013E-5635411N), except that taking may instead temporarily occur through the 'old' intake (NZTM 1678426E-5635847N):

   (a) prior to the new intake and associated treatment plant being commissioned; and

   (b) at other times if the new intake is unable to be used.

3. When taking occurs through the old intake the rate of taking may be up to 3650 cubic metres per day and 42.2 litres per second if that rate necessary to mitigate the effects of high sediment load.

4. If taking occurs through the old intake the consent holder shall advise the Chief Executive, Taranaki Regional Council as soon as practicable. Advice shall be made by emailing worknotification@trc.govt.co.nz with appropriate details including the dates that taking occurred.

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

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

6. 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.

7. 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.

8. The water meter and datalogger shall be accessible to Taranaki Regional Council officer's at all reasonable times for inspection and/or data retrieval.

9. The records of water taken shall:

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

10. From a date no later than 1 December 2013, the measurements made in accordance with condition 5 of this consent, in a format to be advised by the Chief Executive, Taranaki Regional Council shall be transmitted to the Taranaki Regional Council's computer system to maintain a 'real time' record of the water taken.

11. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

12. The consent holder shall, on an annual basis, provide a report detailing:

    - the work done to detect and minimise leaks;
    - water use efficiency and conservation measures undertaken; and
    - water use benchmarking data for the region and how the area supplied by this consent supplied compare.

    The report(s) shall be provided to the Chief Executive, Taranaki Regional Council before 31 August each year and cover the previous 1 July to 30 June period.

13. This consent shall lapse on 30 September 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2018 and/or June 2024, for the purposes of:

    (a) discontinuing or amending the authorisation to take via the old intake; and/or
    (b) 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 30 July 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	30 July 2013
Commencement Date:	30 July 2013

Conditions of Consent

Consent Granted:	To discharge water treatment residuals, and pond drainage water from the Opunake Water Treatment Plant into the Waiaua River
Expiry Date:	1 June 2030
Review Date(s):	June 2018, June 2024
Site Location:	Opunake Water Treatment Plant, Ihaia Road, Opunake
Legal Description:	Sec 4 Blk X Opunake SD (Discharge source & site)
Grid Reference (NZTM)	1677645E-5635245N
Catchment:	Waiaua

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

General condition

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

Special conditions

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

2. The discharge shall not exceed 120 cubic metres per day.

3. After allowing for reasonable mixing, within a mixing zone extending 10 metres downstream of the discharge point, the discharge shall not, either by itself or in combination with other discharges, give rise to any or all of the following effects in the receiving water:

   a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
   b) any conspicuous change in the colour or visual clarity;
   c) any emission of objectionable odour;
   d) the rendering of fresh water unsuitable for consumption by farm animals;
   e) any significant adverse effects on aquatic life.

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

Constituent	Standard
free available chlorine	Concentration not greater than 0.1 gm^{-3}
pH	Within the range 6.5 to 8.5
suspended solids	Concentration not greater than 50 gm^{-3}

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

5. This consent shall lapse on 30 September 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

6. 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 2018 and/or June 2024, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time

Signed at Stratford on 30 July 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Patea WTP (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Chief Executive Private Bag 902 Hawera 4640
Decision Date (Change):	29 October 2014
Commencement Date (Change):	29 October 2014 (Granted Date: 30 May 2012)

Conditions of Consent

Consent Granted:	To take and use groundwater from three bores (known as Bore 1, Bore 4 and Bore 5) for Patea Township water supply purposes
Expiry Date:	01 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Egmont St & Taranaki Rd, Patea
Legal Description:	Lot 1 DP 5899 (Bore 4) Lot 1 DP 411166 (Bores 1 & 5) Patea Dist Blk VI Carlyle SD
Grid Reference (NZTM)	1725370E - 5599180N (Bore 1) 1725010E - 5600000N (Bore 4) 1725360E - 5599180N (Bore 5)
Catchment:	Patea Unnamed Catchment 12

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

General condition

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

Special conditions

1. The total volume of groundwater taken from the three bores combined shall not exceed 1,125 cubic metres per day.

2. Subject to condition 3, the rate of take from each bore shall not exceed the maximum rate shown in the table below:

Bore #	Maximum rate
1	4.7 litres per second
4	10 litres per second
5	10 litres per second

3. The volume taken from Bore 1 shall not exceed 300 cubic metres per day unless either Bore 4 or Bore 5 is unable to be operated because of breakdown or is shut down for essential maintenance.

4. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger on each bore. The water meters and dataloggers shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%.

   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.

5. Within 30 days of the installation of a water meter or datalogger, and at other times when reasonable notice is given, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that:

   a. water measuring or recording equipment required by the conditions of this consent has been installed and/or maintained in accordance with the manufacturer's specifications; and/or
   b. water measuring or recording equipment required by the conditions of this consent has been tested and shown to be operating to an accuracy of ± 5%.

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

7. The water meter and datalogger shall be accessible to Taranaki Regional Council officer's at all reasonable times for inspection and/or data retrieval.

8. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.

9. The consent holder shall measure and record the water level in the Brannigan bore (GND0076, located at grid reference 1725550E-5599498N) to an accuracy of ± 0.05 metres and at intervals not exceeding 15 minutes.

10. An accessible groundwater level indicator shall be installed on the Brannigan bore which shows when groundwater levels have reached 48 metres below ground level (mbgl). Should groundwater reach this level then consultation between the owner of the Brannigan bore and the consent holder shall occur and, if the bore owner requires it, the measures in condition 11 shall be implemented.

11. That the consent holder shall immediately restrict the exercise of this consent and/or provide a suitable unchlorinated alternative water supply for the Brannigan bore owner should the exercise of this consent restrict the use of the Brannigan bore.

12. The taking shall not cause the intrusion of salt water into any freshwater aquifer.

13. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022, for the purposes of:

    a. ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or

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

Signed at Stratford on 29 October 2014

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Rahotu WTP (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	15 August 2013
Commencement Date:	15 August 2013

Conditions of Consent

Consent Granted:	To take and use water from the Pungaereere Stream for the Rahotu community water supply
Expiry Date:	1 June 2031
Review Date(s):	June 2019, June 2025
Site Location:	State Highway 45, Rahotu
Legal Description:	Lot 1 DP 15882 (Site of take & use)
Grid Reference (NZTM)	1669415E-5645831N
Catchment:	Pungaereere

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 180 cubic metres per day or 3 litres per second.

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

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

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

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

   The documentation shall be provided:

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

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

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

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

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

6. The records of water taken shall:

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

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

7. From a date no later than 1 February 2014, the measurements made in accordance with condition 2 of this consent, in a format to be advised by the Chief Executive, Taranaki Regional Council shall be transmitted to the Taranaki Regional Council's computer system to maintain a 'real time' record of the water taken.

8. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

9. The consent holder shall, on an annual basis, provide a report detailing:

    - the work done to detect and minimise leaks;
    - water use efficiency and conservation measures undertaken; and
    - water use benchmarking data for the region and how the area supplied by this consent supplied compare.

    The report(s) shall be provided to the Chief Executive, Taranaki Regional Council before 31 August each year and cover the previous 1 July to 30 June period.

10. This consent shall lapse on 30 September 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

11. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2019 and/or June 2025, 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 15 August 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA
Consent Granted Date:	2 September 2002

Conditions of Consent

Consent Granted:	To discharge filter backwash water and settling tank waste from the Rahotu Water Treatment Plant into the Pungaereere Stream at or about GR: P20:794-075
Expiry Date:	1 June 2019
Review Date(s):	June 2007, June 2013
Site Location:	State Highway 45, Rahotu
Legal Description:	Lot 1 DP 15882 Blk I Opunake SD
Catchment:	Pungaereere

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council (hereinafter the Chief Executive), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. That after allowing for reasonable mixing, within a mixing zone extending 50 metres below the discharge point, the discharge shall not give rise to any of the following effects in the Pungaereere Stream:

(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
(b) any conspicuous change in the colour or visual clarity;
(c) any emission of objectionable odour;
(d) the rendering of fresh water unsuitable for consumption by farm animals;
(e) any significant adverse effects on aquatic life, habitats, or ecology.

2. That the discharge quality shall not exceed the following limits at all times:

pH	6.5-8.5
Free available chlorine	0.1 gm^{-3}

3. 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 2007 and/or June 2013, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 2 September 2002

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Wai-inu Beach water supply (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	7 May 2012
Commencement Date:	7 May 2012

Conditions of Consent

Consent Granted:	To take and use groundwater for Waiinu Beach water supply purposes at or about (NZTM) 1748362E-5586586N
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Nukumaru Domain Reserve, Waiinu Road, Waiinu Beach
Legal Description:	Pt Sec 150 Waitotara Dist Blk XIV Wairoa SD (Site of take & use)
Catchment:	Waitotara

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

General condition

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

Special conditions

1. The volume of water taken shall not exceed 4 litres per second (346 m^3/day).

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter at the site of taking. The water meter shall be tamper-proof and shall measure and record the volume of water taken to an accuracy of ± 5%.

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

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

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

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

   The documentation shall be provided:

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

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

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

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

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

6. The consent holder shall maintain a record of the water taken by recording the meter reading and the date of the reading at monthly intervals. This record shall be provided to the Chief Executive, Taranaki Regional Council, no later than 31 July of each year, or earlier upon request.

7. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

8. This consent shall lapse on 30 June 2017, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

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

   (a) ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or

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

Signed at Stratford on 7 May 2012

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Waimate WTP (STDC)

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date (Change):	15 May 2013
Commencement Date (Change):	15 May 2013 (Granted: 12 June 2006)

Conditions of Consent

Consent Granted:	To discharge treated washwater from the Waimate Water Supply Scheme into an unnamed tributary of Kellys Creek
Expiry Date:	1 June 2023
Review Date(s):	June 2017
Site Location:	Waimate Water Treatment Plant, Rowan Road, Manaia
Legal Description:	Pt Sec 79 Blk X Kaupokonui SD (Discharge source & site)
Grid Reference (NZTM)	1695477E-5636870N
Catchment:	Kaupokonui
Tributary:	Mangawhero Kellys Creek

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of applications 3445 and 7390. In the case of any contradiction between the documentation submitted in support of applications 3445 and 7390 and the conditions of this consent, the conditions of this consent shall prevail.

3. The discharge shall not exceed 750 m^3 per day, except in the following situations:

   a) During plant start-up where the discharge shall not exceed 7,500 m^3 per day for a one-off period of up to 10 days;
   b) During clarifier drain-down where the discharge shall not exceed 1500 m^3 per day, twice annually, for a maximum 24 hour period; and
   c) During sludge pond dewatering where the discharge shall not exceed 1000 m^3 per day, once annually, for up to 14 days.

4. The consent holder shall install and continually maintain an erosion protection structure generally in accordance with the plan prepared by CH2M Beca - Drawing No. W-DKC-0012, to ensure that the exercise of this consent does not cause any erosion or scour of the streambed.

5. The discharge quality shall not exceed the following limits at all times:

Component	**Concentration**
free available chlorine	<0.1g/m^3
suspended solids	20 g/m^3
pH	6.5-8.5

6. The consent holder shall properly and efficiently maintain and operate the settling ponds so as to meet the conditions of this consent.

7. After allowing for reasonable mixing, being a mixing zone extending seven times width of the unnamed tributary of Kellys Creek at the point of discharge, any discharge of contaminants shall not give rise to any of the following effects in the unnamed tributary of Kellys Creek:

    a) any conspicuous change in the colour or visual clarity;
    b) any emission of objectionable odour;
    c) the rendering of fresh water unsuitable for consumption by farm animals;
    d) any significant adverse effects on aquatic life.

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

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 May 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 Hawera 4640
Decision Date (Change):	24 November 2015
Commencement Date (Change):	24 November 2015 (Granted Date: 12 June 2006)

Conditions of Consent

Consent Granted:	To discharge treated washwater from the Waimate Water Supply Scheme into an unnamed tributary of Kellys Creek
Expiry Date:	1 June 2023
Review Date(s):	June 2017
Site Location:	Waimate Water Treatment Plant, 791 Rowan Road, Manaia
Legal Description:	Pt Secs 78, 79 & 81 Blk X Pt Secs 1 & 2 Pt Stream Bed Blks VI & X Kaupokonui SD (Discharge source & site)
Grid Reference (NZTM)	1695480E-5636870N
Catchment:	Kaupokonui
Tributary:	Mangawhero Kellys Creek

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

   i) the administration, monitoring and supervision of this consent; and
   ii) charges authorised by regulations.

Special conditions

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

2. For a period not exceeding 40 days commencing in November or December 2015 this consent also authorises a discharge of water and contaminants from developing and testing of bores (GND5211 and GND1728). The consent holder shall advise the Chief Executive, Taranaki Regional Council of the date that this period is to commence by emailing worknotification@trc.govt.nz.

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

4. The discharge shall not exceed 750 m^3 per day, except in the following situations:

   a) During plant start-up where the discharge shall not exceed 7,500 m^3 per day for a one-off period of up to 10 days;
   b) During clarifier drain-down where the discharge shall not exceed 1500 m^3 per day, twice annually, for a maximum 24 hour period;
   c) During sludge pond dewatering where the discharge shall not exceed 1000 m^3 per day, once annually, for up to 14 days; and
   d) During the period described in condition 2, when the discharge rate shall not exceed 2478 m^3 per day.

5. The consent holder shall install and continually maintain an erosion protection structure generally in accordance with the plan prepared by CH2M Beca - Drawing No. W-DKC-0012, to ensure that the exercise of this consent does not cause any erosion or scour of the streambed.

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

Constituent	Standard
free available chlorine	Concentration no greater than 0.1 g/m^3
suspended solids	Concentration no greater than 20 g/m^3
pH	Within the range 6.5 to 8.5
iron	Concentration no greater than 2 g/m^3
manganese	Concentration no greater than 1.3 g/m^3
ammonia	Concentration no greater than 0.025 g/m^3

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

7. The consent holder shall properly and efficiently maintain and operate the settling ponds so as to meet the conditions of this consent.

8. After allowing for reasonable mixing, being a mixing zone extending seven times width of the unnamed tributary of Kellys Creek at the point of discharge, any discharge of contaminants shall not give rise to any of the following effects in the unnamed tributary of Kellys Creek:

   a) any conspicuous change in the colour or visual clarity;
   b) any emission of objectionable odour;
   c) the rendering of fresh water unsuitable for consumption by farm animals;
   d) any significant adverse effects on aquatic life.

9. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 24 November 2015

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	7 June 2011
Commencement Date:	7 June 2011

Conditions of Consent

Consent Granted:	To take water from the Mangawheroiti Stream for the Waimate West water supply at or about (NZTM) 1694422E-5637449N
Expiry Date:	1 June 2023
Review Date(s):	June 2018
Site Location:	Rowan Road, Kaponga
Legal Description:	Pt Sec 79 Blk X Kaupokonui SD
Catchment:	Kaupokonui
Tributary:	Mangawhero Mangawheroiti

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

Special conditions

1. The rate of taking shall not exceed 121 litres per second [including any water that is taken from the Mangawhero Stream, in accordance with consent 0635, and discharged to the Mangawheroiti Stream].

2. No water shall be taken pursuant to this consent unless water is being concurrently taken from the Otakeho Stream at 85 litres per second. If, for a temporary period, the Otakeho Stream intake and diversion can not supply 85 litres per second, for example during maintenance, the consent holder shall immediately advise the Chief Executive, Taranaki Regional Council and this condition shall not apply.

3. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and datalogger. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%. Records of the date, the time and the rate and volume of water taken at intervals not exceeding 15 minutes.

   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.

4. 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.

5. 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.

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

7. The records of water taken shall:

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

8. The taking of water authorised by this consent shall be managed to ensure that the flow in the Mangawheroiti Stream, immediately downstream of the intake, is not less than 32 litres per second.

9. When the flow in the Mangawheroiti Stream is less than 500 litres per second the consent holder shall measure and record the flow of the Mangawheroiti Stream that passes downstream the intake to an accuracy of ±10% at intervals not exceeding 30 minutes.

10. From a date no later than 30 June 2012, the measurements made in accordance with conditions 3 and 9 of this consent, in a format to be advised by the Chief Executive, Taranaki Regional Council, shall be transmitted to the Taranaki Regional Council's computer system to maintain a 'real time' record of the water taken and the flow past the intake, with a delay of no more than 2 hours.

11. The consent holder shall ensure that a staff gauge is installed and maintained to effectively display the water level at the weir to an accuracy of 0.005 m at all times when the flow is less than 500 litres per second.

12. If necessary to comply with condition 9, the consent holder shall ensure that sufficient stream flow measurements are undertaken to maintain a 'rating curve' that accurately translates the water level to stream flow over the weir.

    Note: Work required by special condition 12 may be undertaken by the Taranaki Regional Council and all reasonable costs recovered from the consent holder through the annual compliance monitoring programme that is in place for the activity.

13. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

14. The consent holder shall, on an annual basis, provide a report detailing:

    - the work done to detect and minimise leaks within each of the areas supplied;
    - water use efficiency and conservation measures undertaken and planned for all users of the Waimate Water Supply Scheme area; and
    - water use benchmarking data for the region compared to water use for the Waimate Water Supply Scheme.

    The report[s] shall be provided to the Chief Executive, Taranaki Regional Council before 1 September each year and cover the previous 1 July to 30 June period. The first report shall be provided by 1 September 2011.

15. The consent holder shall make five annual payments of $30,600 [GST exclusive] to the Taranaki Regional Council as a financial contribution in order to remedy or mitigate adverse effects on the environment. These payments shall be made no later than 1 September each year from 2011 to 2015.

16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2018, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 7 June 2011

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	7 June 2011
Commencement Date:	7 June 2011

Conditions of Consent

Consent Granted:	To take water from the Mangawhero Stream for the purpose of adding to the flow of the Mangawheroiti Stream and providing water for the Waimate West water supply at or about (NZTM) 1694040E-5640090N
Expiry Date:	1 June 2023
Review Date(s):	June 2018
Site Location:	Mangawhero Road, Kaponga
Legal Description:	Sec 11 Blk VI Kaupokonui SD
Catchment:	Kaupokonui
Tributary:	Mangawhero

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

General condition

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

Special conditions

1. The rate of taking shall not exceed 70 litres per second.

2. No water shall be taken pursuant to this consent unless water is concurrently being taken from the Otakeho and Mangawheroiti Streams, at 85 litres per second and 121 litres per second, respectively. If, for a temporary period, the Otakeho and Mangawheroiti Streams can not supply 85 litres per second and 121 litres per second respectively, for example during maintenance, the consent holder shall immediately advise the Chief Executive, Taranaki Regional Council and this condition shall not apply.

3. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and datalogger. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%. Records of the date, the time and the rate and volume of water taken at intervals not exceeding 15 minutes.

   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.

4. 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.

5. 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.

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

7. The records of water taken shall:

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

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

8. From a date no later than 30 June 2012, the measurements made in accordance with condition 3 of this consent, in a format to be advised by the Chief Executive, Taranaki Regional Council, shall be transmitted to the Taranaki Regional Council's computer system to maintain a 'real time' record of the water taken, with a delay of no more than 2 hours.

9. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2018, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 7 June 2011

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Chief Executive Private Bag 902 Hawera 4640
Decision Date:	27 February 2017
Commencement Date:	27 February 2017

Conditions of Consent

Consent Granted:	To take and use groundwater for Waimate West water supply purposes
Expiry Date:	1 June 2035
Review Date(s):	June 2020 and every three years thereafter
Site Location:	791 Rowan Road, Manaia
Grid Reference (NZTM)	1695555E-5636905N
Catchment:	Kaupokonui
Tributary:	Mangawhero Kellys Creek

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 volume of water taken in any 24 hour period ending at midnight shall not exceed 432 m^3.

2. All bores shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by the Taranaki Regional Council (GND2511).

3. The bore shall include a conduit (or 'dip tube') no less than 30 mm in diameter that provides unimpeded access for measuring the water level within the bore. The conduit shall have an easily removable cap that prevents contaminants entering it.

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

5. The records of water taken shall:

   a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;
   b) specifically record the water taken as 'zero' when no water is taken; and
   c) be transmitted to the Taranaki Regional Council's computer system within 2 hours of being recorded.

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

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

   the documentation shall be provided:

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

7. 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.

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

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 the minimum amount of water necessary for the purpose is taken.

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

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

Signed at Stratford on 27 February 2017

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	7 June 2011
Change To Conditions Date:	7 June 2011 [Granted: 22 November 2000]

Conditions of Consent

Consent Granted:	To take water from the Otakeho Stream for the Pope and Waimate West water supply schemes at or about (NZTM) 1691940E-5639453N
Expiry Date:	1 June 2018
Review Date(s):	June 2012
Site Location:	Mangawhero Road, Kaponga
Legal Description:	Sec 7 Blk VI Kaupokonui SD
Catchment:	Otakeho

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

General condition

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

Special conditions

1. The rate of taking shall not exceed 85 litres per second.

2. Before exercising this consent the consent holder shall install, and thereafter maintain a water meter and datalogger. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%. Records of the date, the time and the rate and volume of water taken at intervals not exceeding 15 minutes.

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

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

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

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

   The documentation shall be provided:

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

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

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

6. The records of water taken shall:

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

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

7. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of water, including, but not limited to, the efficient and conservative use of water.

8. From a date no later than 30 June 2012, the measurements made in accordance with condition 2 of this consent, in a format to be advised by the Chief Executive, Taranaki Regional Council, shall be transmitted to the Taranaki Regional Council's computer system to maintain a 'real time' record of the water taken, with a delay of no more than 2 hours.

9. The consent holder shall ensure that, before 1 June 2017, all flows of less than 500 litres per second past the intake structure, are measured and recorded to an accuracy ±10% at intervals not exceeding 30 minutes for a continuous period of at least 12 months.

10. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2012, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 7 June 2011

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Discharge Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4800
Consent Granted Date:	9 June 2006

Conditions of Consent

Consent Granted:	To discharge treated backwash water from the Pope Rural Water Supply Treatment Plant into an unnamed tributary of the Mangawhero Stream in the Kaupokonui catchment at or about GR: P20:032-003
Expiry Date:	1 June 2023
Review Date(s):	June 2011, June 2017
Site Location:	Upper Mangawhero Road, Kaponga
Legal Description:	Pt Lot 2 DP 7928 Blk VI Kaupokonui SD
Catchment:	Kaupokonui
Tributary:	Mangawhero 2

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

General conditions

a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

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

2. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of application 3452. In the case of any contradiction between the documentation submitted in support of application 3452 and the conditions of this consent, the conditions of this consent shall prevail.

3. The discharge shall not exceed 6 cubic metres per day, at a rate not exceeding 5 litres per second.

4. The discharge quality shall not exceed the following limits at all times:

Component	**Concentration**
free available chlorine	<0.1g/m^3
suspended solids	20 g/m^3
pH	6.5-8.5

5. The consent holder shall properly and efficiently maintain and operate the settling pond so as to meet the conditions of this consent.

6. After allowing for reasonable mixing, within a mixing zone extending 20 metres below the discharge point, the discharge shall not give rise to any of the following effects in the unnamed tributary of the Mangawhero Stream:

(a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
(b) any conspicuous change in the colour or visual clarity;
(c) any emission of objectionable odour;
(d) the rendering of fresh water unsuitable for consumption by farm animals;
(e) any significant adverse effects on aquatic life, habitats, or ecology.

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

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2011 and/or June 2017, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 June 2006

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Land Use Consent

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	10 December 2010
Change To Conditions Date:	10 December 2010 [Granted: 1 March 1999]

Conditions of Consent

Consent Granted:	To place, use and maintain a water intake structure and associated erosion protection structures, including upgrading the intake structure and constructing a new fish pass, on the bed of the Otakeho Stream at or about (NZTM) 1691980E-5639445N
Expiry Date:	1 June 2017
Review Date(s):	June 2011
Site Location:	Upper Mangawhero Road, Riverlea
Legal Description:	Section 7 Blk VI Kaupokonui SD [Site of structure]
Catchment:	Otakeho

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

General conditions

a) That on receipt of a requirement from the Chief Executive, Taranaki Regional Council [hereinafter the Chief Executive], the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

1. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the commencement and upon completion of any construction and/or maintenance works which would involve disturbance of or deposition to the riverbed or discharges to water. Notification shall include the consent number and a brief description of the activity consented and be emailed to worknotification@trc.govt.nz.

2. The structure[s] authorised by this consent shall be constructed in accordance with the documentation submitted in support of applications 95/185, 542, and 6622 [specifically Drawing No. 80357] and shall be maintained to ensure the conditions of this consent are met.

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

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

5. During any construction or maintenance the consent holder shall ensure that any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April except where this requirement is waived by the written approval of the Chief Executive, Taranaki Regional Council.

6. The structure[s] shall provide for the passage of fish to the satisfaction of the Chief Executive, Taranaki Regional Council as determined by a monitoring programme conducted by the Taranaki Regional Council at the consent holders expense.

7. A Taranaki Regional Council Freshwater Biologist shall be present during the placement and concreting of rocks in the fish pass.

8. Except with the written agreement of the Chief Executive, Taranaki Regional Council, the structure[s] authorised by this consent shall be removed and the area reinstated, if and when the structure is no longer required. A further resource consent may be required to authorise the removal of the structure, and the consent holder is advised to seek advice from the Council on this matter.

9. The Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001 and/or June 2005 and/or June 2011, for the purpose of ensuring that the conditions are adequate to deal with the any significant adverse effects arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 December 2010

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

TRK995451

LAND USE CONSENT

Pursuant to the RESOURCE MANAGEMENT ACT 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	SOUTH TARANAKI DISTRICT COUNCIL PRIVATE BAG 902 HAWERA
Consent Granted Date:	1 March 1999

CONDITIONS OF CONSENT

Consent Granted:	TO ERECT, PLACE, USE AND MAINTAIN A WATER INTAKE STRUCTURE AND ANCILLARY STRUCTURES ON AND OVER THE BED OF THE MANGAWHEROITI STREAM A TRIBUTARY OF THE MANGAWHERO STREAM IN THE KAUPOKONUI CATCHMENT FOR WATER ABSTRACTION PURPOSES AT OR ABOUT GR: P20:044-992
Expiry Date:	1 June 2017
Review Date[s]:	June 2001, June 2005 and June 2011
Site Location:	MANGAWHEROITI STREAM, ROWAN ROAD, KAPONGA
Legal Description:	SO 10908 PT SEC 79 BLK X KAUPOKONUI SD

Catchment:	KAUPOKONUI	355.000
Tributary:	MANGAWHERO	355.010
	MANGAWHROITI	355.014

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

TRK995451

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

i) the administration, monitoring and supervision of this consent; and
ii) charges authorised by regulations.

Special conditions

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

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

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

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

5. THAT during any construction or maintenance the consent holder shall ensure that any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April except where this requirement is waived by the written approval of the General Manager, Taranaki Regional Council.

6. THAT structure[s] which are the subject of this consent shall not obstruct fish passage.

7. THAT the consent holder shall develop and undertake a monitoring programme to determine the adequacy of fish passage as deemed necessary by the General Manager, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991. This monitoring information is to be forwarded to the General Manager, Taranaki Regional Council, upon request.

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

9. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001 and/or June 2005 and/or June 2011, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 1 March 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

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DIRECTOR—RESOURCE MANAGEMENT

TRK995452

LAND USE CONSENT

**Pursuant to the RESOURCE MANAGEMENT ACT 1991
a resource consent is hereby granted by the
Taranaki Regional Council**

Name of Consent Holder:	SOUTH TARANAKI DISTRICT COUNCIL PRIVATE BAG 902 HAWERA
Consent Granted Date:	1 March 1999

CONDITIONS OF CONSENT

Consent Granted:	TO ERECT, PLACE, USE AND MAINTAIN A WATER INTAKE STRUCTURE AND ASSOCIATED ANCILLARY STRUCTURES INCLUDING EROSION PROTECTION AND RIVER CONTROL WORKS UPSTREAM, AND A SWINGBRIDGE DOWNSTREAM, OF THE INTAKE STRUCTURE ON THE BED OF THE MANGAWHERO STREAM IN THE KAUPOKONUI CATCHMENT FOR WATER ABSTRACTION PURPOSES AT OR ABOUT GR: P20:041-016
Expiry Date:	1 June 2017
Review Date[s]:	June 2001, June 2005 and June 2011
Site Location:	MANGAWHERO STREAM, MANGAWHERO ROAD, KAPONGA
Legal Description:	SO370 SEC 11 BLK VI KAUPOKONUI SD

Catchment:	KAUPOKONUI	355.000
Tributary:	MANGAWHERO	355.010

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

TRK995452

General conditions

a) That on receipt of a requirement from the General Manager, Taranaki Regional Council (hereinafter the General Manager), the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.

b) That unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.

c) That the consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:

    i) the administration, monitoring and supervision of this consent; and
    ii) charges authorised by regulations.

Special conditions

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

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

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

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

5. THAT during any construction or maintenance the consent holder shall ensure that any disturbance of parts of the riverbed covered by water and/or any works which may result in downstream discolouration of water shall be undertaken only between 1 November and 30 April except where this requirement is waived by the written approval of the General Manager, Taranaki Regional Council.

6. THAT structure[s] which are the subject of this consent shall not obstruct fish passage.

7. THAT the consent holder shall develop and undertake a monitoring programme to determine the adequacy of fish passage as deemed necessary by the General Manager, Taranaki Regional Council, subject to section 35(2)(d) and section 36 of the Resource Management Act 1991. This monitoring information is to be forwarded to the General Manager, Taranaki Regional Council, upon request.

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

9. THAT the Taranaki Regional Council may review any or all of the conditions of this consent by giving notice of review during the month of June 2001 and/or June 2005 and/or June 2011, for the purpose of ensuring that the conditions are adequate to deal with any significant adverse effects on the environment arising from the exercise of this consent, which either were not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 1 March 1999

For and on behalf of
TARANAKI REGIONAL COUNCIL

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DIRECTOR—RESOURCE MANAGEMENT

Waverley water supply (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date (Change):	23 January 2013
Commencement Date (Change):	23 January 2013 (Granted: 23 September 2010)

Conditions of Consent

Consent Granted:	To take and use groundwater from the "Fookes Street" bore (GND0244) at or about (NZTM) 1739130E-5597816N, the "Chester Street" bore (GND0059) at or about (NZTM) 1740040E-5597843N and the "Swinbourne Street" bore (GND2242)) at or about (NZTM) 1739058E-5597248N for municipal water supply purposes at Waverley
Expiry Date:	1 June 2022
Review Date(s):	June 2016
Site Location:	Fookes Street, Chester Street & Swinbourne Street, Waverley
Legal Description:	Pt Sec 31 SO 34857 Waverley Tn Belt (Fookes Street) Sec 28 Waverley Tn Belt (Chester Street) Pt Sec 32 SO 34857 Waverley Tn Belt (Swinbourne Street)(Site of takes)
Catchment:	Whenuakura Wairoa

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 combined total volume of water taken from the 'Fookes Street' bore (GND0244), the 'Chester Street' bore (GND0059) and the 'Swinbourne Street' bore (GND2242) shall not exceed 900 cubic metres per day and the combined rate shall not exceed 14.2 litres per second.

2. The daily maximum take volume and abstraction rate from each individual bore shall not exceed the limits specified below:

Production bore ID	Maximum daily abstraction volume (cubic metres per day)	Maximum daily abstraction rate (litres per second)
Fookes Street (GND0244)	500	7.2
Chester Street (GND0059)	400	7.0
Swinbourne Street (GND2242)	890	10.3

3. The bores shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The label shall show the bore number assigned by the Taranaki Regional Council (GND0244 at Fookes Street, GND0059 at Chester Street and GND2242 at Swinbourne Street).

4. Prior to the exercise this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger on each bore. The water meters and dataloggers shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%.

   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 life-span.

5. Prior to the commencement of abstraction from the Swinbourne Street production bore, the consent holder shall in each bore, install and subsequently maintain equipment approved by the Taranaki Regional Council to measure and record the water level within each bore.

6. The consent shall, for each bore, maintain an abstraction record, including the date and time of abstraction, instantaneous rate and cumulative abstraction volume. The consent holder shall also maintain a record of water level in each bore, at intervals not exceeding 15 minutes, and include the date and time of measurement. All records shall be made available to the Chief Executive, Taranaki Regional Council in an approved format, by 31 July each year or earlier upon request.

7. Within 30 days of the installation of a water meter or datalogger, and upon request, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that:

   a. water measuring or recording equipment required by the conditions of this consent has been installed and/or maintained in accordance with the manufacturer's specifications; and

   b. water measuring or recording equipment required by the conditions of this consent has been tested and shown to be operating to an accuracy of ± 5%.

8. 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.

9. At all times the consent holder shall adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.

10. The taking shall not cause the intrusion of salt water into any freshwater aquifer.

11. The consent holder shall ensure that there is access into the well that enables the measurement of static and pumping water levels.

    Note: Compliance with this condition can be achieved with the existing wellhead configuration by allowing access to the well via the water level monitoring transducer installation tubing.

12. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 for the purposes of:

    (a) ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or

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

Signed at Stratford on 23 January 2013

For and on behalf of
Taranaki Regional Council

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Director-Resource Management

Waverley Beach water supply (STDC)

Water Permit

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

Name of Consent Holder:	South Taranaki District Council Private Bag 902 HAWERA 4640
Decision Date:	1 May 2013
Commencement Date:	1 May 2013

Conditions of Consent

Consent Granted:	To take and use water groundwater for Waverley Beach water supply purposes
Expiry Date:	1 June 2028
Review Date(s):	June 2016, June 2022
Site Location:	Waipipi Road, Waverley
Legal Description:	Pt Run 2 & 3 Blk XI Wairoa SD (Site of take)
Grid Reference (NZTM)	1739933E-5589679N
Catchment:	Unnamed Stream 3

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

General condition

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

Special conditions

1. The total volume of water taken from the 'bore 2' (GND2224) shall not exceed 80 cubic metres per day at a rate not exceeding 1.5 litres per second.

2. The taking shall not cause the intrusion of saltwater into any freshwater aquifer.

3. The bores within the supply network shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the well construction or associated building. The numbering on the label shall be the bore number assigned by Taranaki Regional Council as follows:

   Bore 1: GND1061
   Bore 2: GND2224

4. Prior to exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%.

   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.

5. Within 30 days of the installation of a water meter or datalogger, and at other times when reasonable notice is given, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that:

   a. water measuring or recording equipment required by the conditions of this consent has been installed and/or maintained in accordance with the manufacturer's specifications; and/or

   b. water measuring or recording equipment required by the conditions of this consent has been tested and shown to be operating to an accuracy of ± 5%.

6. Prior to exercising this consent the consent holder shall install water level monitoring devices in each bore (GND1061 and GND2224). The water level monitoring devices shall be accurate to ± 0.05 metres and record levels at intervals not exceeding 15 minutes.

7. Within 30 days of the installation of the water level monitoring devices, and at other times when reasonable notice is given, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that:

    a. water level monitoring devices required by the conditions of this consent have been installed and/or maintained in accordance with the manufacturer's specifications; and/or

    b. water level monitoring devices required by the conditions of this consent have been tested and shown to be operating to an accuracy of ± 0.05 metres.

8. The water meter and datalogger shall be accessible to Taranaki Regional Council officer's at all reasonable times for inspection and/or data retrieval.

9. 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.

10. The consent shall maintain an abstraction record, including the date and time of abstraction, instantaneous rate and cumulative abstraction volume. The consent holder shall also maintain a record of water level in each bore, at intervals not exceeding 15 minutes, and include the date and time of measurement. All records shall be made available to the Chief Executive, Taranaki Regional Council in an approved format, by 31 July each year or earlier upon request.

11. At all times the consent holder shall adopt the best practicable option (BPO) to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.

12. This consent shall lapse on 30 June 2018, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.

13. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2016 and/or June 2022 for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 1 May 2013

For and on behalf of
Taranaki Regional Council

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Chief Executive

Appendix II

Biomonitoring and fish survey reports

To	Job Manager, Scott Cowperthwaite
From	Environmental Scientist, Katie Blakemore
Report No	KB055
Document	2062468
Date	30 May 2018

Biomonitoring of the Mangawheroiti Stream in relation to the STDC Waimate West Water Supply, March 2018

Introduction

The South Taranaki District Council (STDC) owns and operates the Waimate West Water Supply Scheme (WWWSS), which involves the abstraction of water from three streams; the Mangawheroiti Stream, the Mangawhero Stream and the Otakeho Stream. This scheme provides water for dairy farms, industry, and domestic use. The main intake for the WWWSS is on the Mangawheroiti Stream. However, the flow in Mangawheroiti Stream is supplemented by water diverted into it from the Mangawhero Stream upstream of the intake.

Consent 0634-3 authorises the taking of water from the Mangawheroiti Stream for the water supply scheme. This consent contains a Special Condition (8) that requires STDC to ensure that a minimum flow of 32 litres per second (0.032 m^3/s) is provided at all times immediately downstream of the intake structure.

This biological survey was the second of two programmed for the 2017-2018 monitoring period, the inaugural survey having been performed in January 2012. The intention of these surveys is to monitor the health of the macroinvertebrate communities in the Mangawheroiti Stream in relation to any effects of water abstraction by the WWWSS.

Methods

This spring survey was undertaken on 2 March 2018 at four sites on the Mangawheroiti Stream; a control site upstream of the intake weir (site 1), a primary impact site approximately 40 metres downstream of the intake weir (site 2), a secondary impact site nearly three kilometres downstream of that intake (site 3) and a tertiary impact site approximately 8.3 kilometres downstream of the intake and 340 metres upstream of the confluence with the Mangawhero Stream (site 4) (Table 1, Figure 1).

The Council's standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from all sites. The 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative), of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark *et al*, 2001).

Table 1 Biomonitoring sites in the Mangawheroiti Stream in relation to the WWWSS

Site	Site code	GPS location	Location	Elevation (m asl)	Distance from NPk boundary (km)
1	MWI000170	E1694422 N5637468	Upstream of the intake weir	340	3.6
2	MWI000174	E1694425 N5637409	Approximately 40 metres downstream of the water intake	340	3.7
3	MWI000330	E1694186 N5635091	Approximately 3 km downstream of the water intake (580 metres upstream of Eltham Road bridge)	270	6.5
4	MWI000490	E1693732 N5631251	Approximately 8.3 km downstream of the water intake (340 metres upstream of confluence with the Mangawhero Stream)	180	11.9

Samples were preserved with Kahle's Fluid for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded based on the abundance categories in Table 2.

Table 2 Macroinvertebrate abundance categories

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

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa taken from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. More 'sensitive' communities inhabit less polluted waterways. A difference of 11 or more MCI units is considered significantly different (Stark 1998). A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985; Boothroyd and Stark, 2000) (Table 3).

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

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

A semi-quantitative MCI value (SQMCIs) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the SQMCIs is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

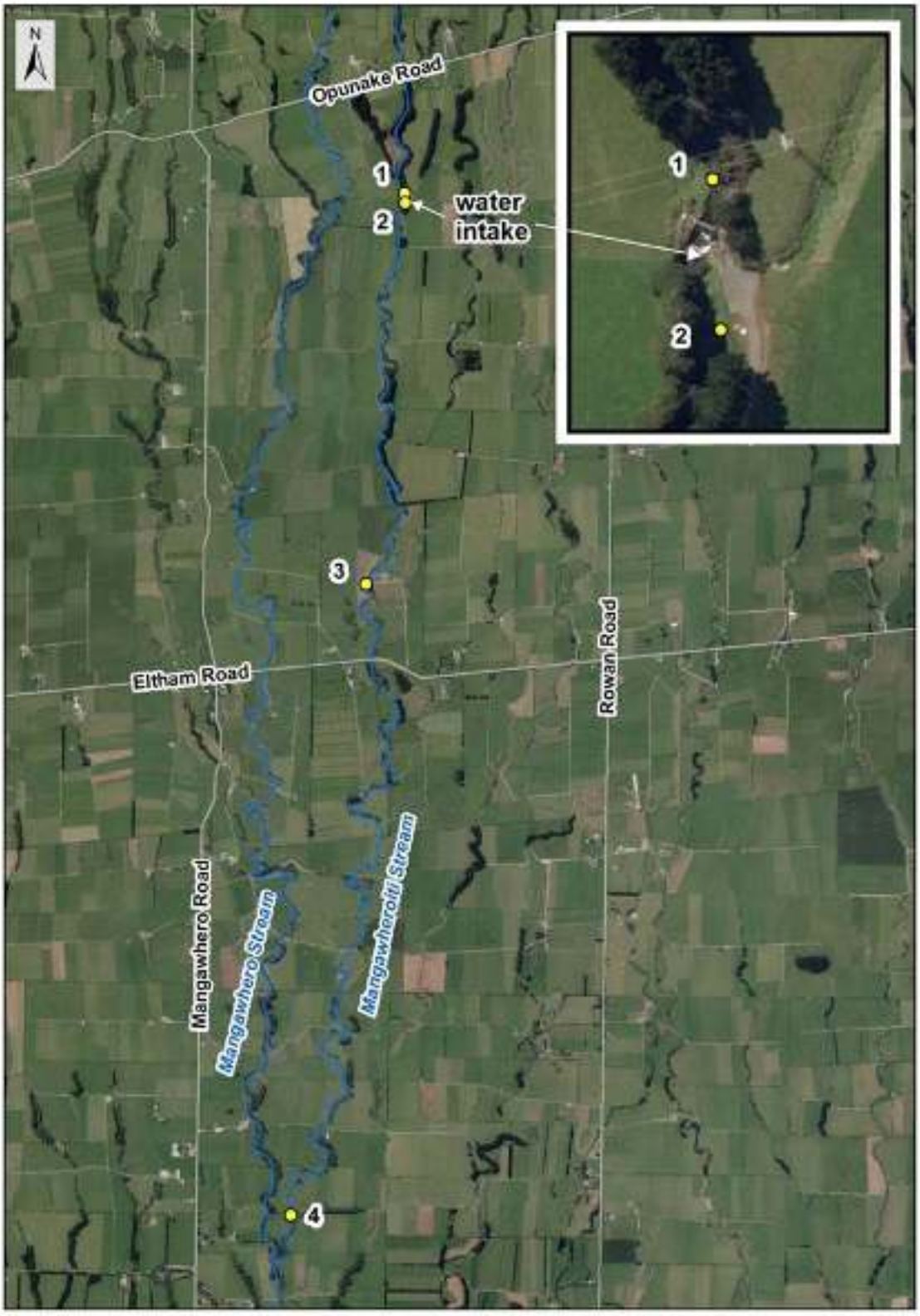

Figure 1 Biomonitoring sites in the Mangawheroiti Stream in relation to the WWWSS

Results

This survey followed a period of 9 days since a fresh in excess of 3x median flow and 19 days since a fresh in excess of 7x median flow. In the month prior to this survey, the flow in the Mangawheroiti Stream upstream of the intake weir ranged between 197 L/s and 2529 L/s. The residual flow at the time of the survey was approximately 107 L/s.

Water temperatures ranged between 15.2 °C and 17.8 °C. There was a low, swift, clear and uncoloured flown at all sites except site 4 which had steady flow. Substrate at all four sites comprised predominantly cobble, with varying amounts of boulder, fine and coarse gravels and sand also present. Site 1 also had a small amount of wood/root present.

Periphyton mats were slippery at site 2, and patchy at the remaining three sites. Filamentous periphyton was absent at site 2, and patchy at the remaining three site. Macrophytes were absent from all sites. Leaves and moss were patchy on the streambed at sites 1, 2 and 3, and leaves were patchy at site 4. Wood was patchy at sites 1 and 2 and absent at sites 3 and 4. The streambed was partially shaded at sites 2 and 4, and unshaded at sites 1 and 3.

Macroinvertebrate communities

A summary of macroinvertebrate community metrics recorded in previous surveys, together with the current survey results is presented in Table 4.

Table 4 Summary of previously recorded macroinvertebrate community metrics together with the current survey results

Site	Number of previous surveys	Numbers of taxa			MCI values			$SQMCI_s$ values		
		Median	Range	Current Survey	Median	Range	Current Survey	Median	Range	Current Survey
1	12	31	22 -38	22	128	119 -142	128	7.4	6.2 -7.9	7.9
2	12	33	21 -37	25	130	122 -131	128	7.4	7.0 -7.9	7.3
3	12	27	20 -45	27	114	105 -129	116	6.4	4.8 -8.0	7.1
4	12	24	18 -30	20	98	91 -107	111	4.6	3.7 -5.4	5.1

The macroinvertebrate fauna recorded in the current survey is presented in Table 5.

Table 5 Macroinvertebrate fauna recorded at four sites in the Mangawheroiti Stream in relation to the WWWSS water abstraction, 2 March 2018

Taxa List	Site Number	MCI score	1	2	3	4
	Site Code		MWI000170	MWI000174	MWI000330	MWI000490
	Sample Number		FWB18121	FWB18122	FWB18123	FWB18124
NEMERTEA	Nemertea	3	-	-	-	R
ANNELIDA (WORMS)	Oligochaeta	1	R	R	-	R
MOLLUSCA	*Potamopyrgus*	4	R	R	R	VA
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	C	R	A	A
	Coloburiscus	7	VA	VA	A	A
	Deleatidium	8	XA	VA	VA	A
	Nesameletus	9	VA	A	VA	R
	Zephlebia group	7	-	R	-	C
PLECOPTERA (STONEFLIES)	*Austroperla*	9	-	R	-	-
	Megaleptoperla	9	C	C	R	-
	Stenoperla	10	R	-	R	-
	Zelandoperla	8	C	R	-	-
COLEOPTERA (BEETLES)	Elmidae	6	A	A	A	C
	Hydraenidae	8	A	A	A	R
	Ptilodactylidae	8	-	-	-	R
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	C	A	C
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	R	R	A	A
	Costachorema	7	R	R	-	-
	Hydrobiosis	5	R	-	R	R
	Neurochorema	6	-	R	-	-
	Hydropsyche (Orthopsyche)	9	R	C	-	-
	Beraeoptera	8	C	A	VA	-
	Confluens	5	-	-	R	-
	Helicopsyche	10	-	-	C	-
	Hudsonema	6	-	-	R	-
	Olinga	9	R	R	-	-
	Oxyethira	2	-	-	C	-
	Pycnocentria	7	-	C	C	R
	Pycnocentrodes	5	C	C	VA	VA
	Triplectides	5	-	R	-	-
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	A	A	R
	Eriopterini	5	-	-	R	-
	Orthocladiinae	2	R	R	C	R
	Polypedilum	3	R	C	-	-
	Tanytarsini	3	-	-	R	-
	Muscidae	3	-	-	R	-
	Austrosimulium	3	-	-	R	C
	Tanyderidae	4	-	-	R	-
ACARINA (MITES)	Acarina	5	-	-	R	R
		No of taxa	22	25	27	20
		MCI	128	128	116	111
		SQMCIs	7.9	7.3	7.1	5.1
		EPT (taxa)	14	17	14	9
		%EPT (taxa)	64	68	52	45

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

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

Site 1 (upstream of intake weir)

A moderate macroinvertebrate community richness of 22 taxa was found at site 1 (the 'control' site) at the time of the survey. This was a substantial nine taxa fewer than the median number recorded for the site (median richness 31 taxa; Table 4) and two taxa fewer than the previous sample (taxa richness 24; Figure 2).

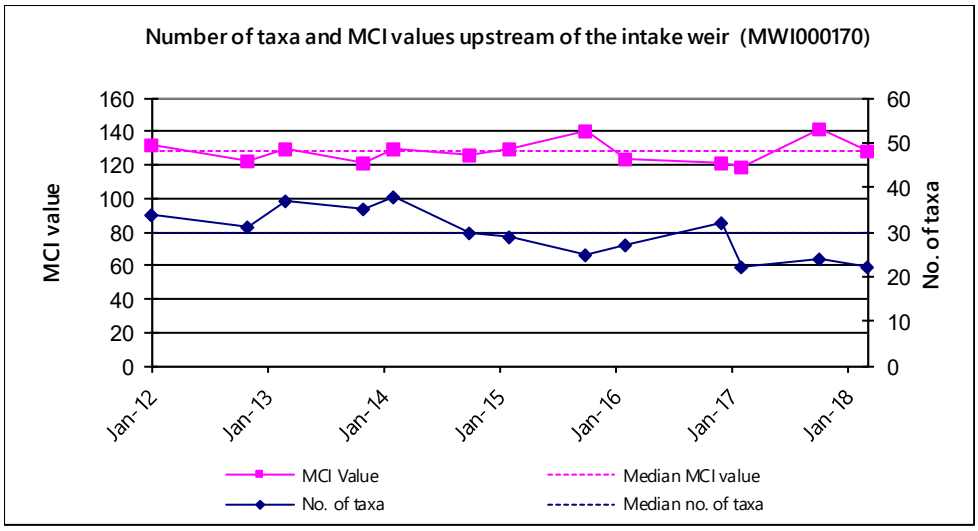

Figure 2 Number of taxa and MCI values upstream of the intake weir (MWI000170)

A MCI score of 128 units was recorded, categorising the site as having 'very good' macroinvertebrate community health. This score was equal to the median score for this site (median MCI score 128 units; Table 4) and significantly lower (Stark 1998) than the previously recorded result (MCI score 142 units; Figure 2). A $SQMCI_S$ score of 7.9 units was recorded, which is equal to the highest $SQMCI_S$ score recorded to date at this site (which was recorded in the preceding survey). The score is insignificantly higher than the median score for this site (median $SQMCI_S$ score 7.4 units; Table 4) and equal to the previously recorded result ($SQMCI_S$ score 7.9 units).

The macroinvertebrate community was characterised by five taxa, comprising the three 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*), and beetle (Hydraenidae)] and two 'moderately sensitive' taxa [mayfly (*Coloburiscus*) and beetle (Elmidae)] (Table 5).

Site 2 (40 m downstream of intake weir)

A moderate macroinvertebrate community richness of 25 taxa was recorded at this site (the 'primary impact' site) at the time of the survey. This was four taxa more than the previously recorded richness (taxa richness 21 taxa; Figure 3) but a substantial eight taxa fewer than the median for this site (median taxa richness 33 taxa; Table 4).

A MCI score of 128 units was recorded at this site, categorising the site as having 'very good' macroinvertebrate community health. This is an insignificant two units less than median for this site (median MCI score 130; Table 4) and the previous result (MCI score 130; Figure 3). A $SQMCI_S$ score of 7.3 units was recorded, slightly lower than the median $SQMCI_S$ score for this site (median $SQMCI_S$ 7.4 units; Table 4) and the previously recorded $SQMCI_S$ score ($SQMCI_S$ score 7.6 units).

The macroinvertebrate community was characterised by seven taxa, comprising the four 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*), beetle (Hydraenidae) and caddisfly (*Beraeoptera*)] and three 'moderately sensitive' taxa [mayfly (*Coloburiscus*), beetle (Elmidae) and cranefly (*Aphrophila*)] (Table 5).

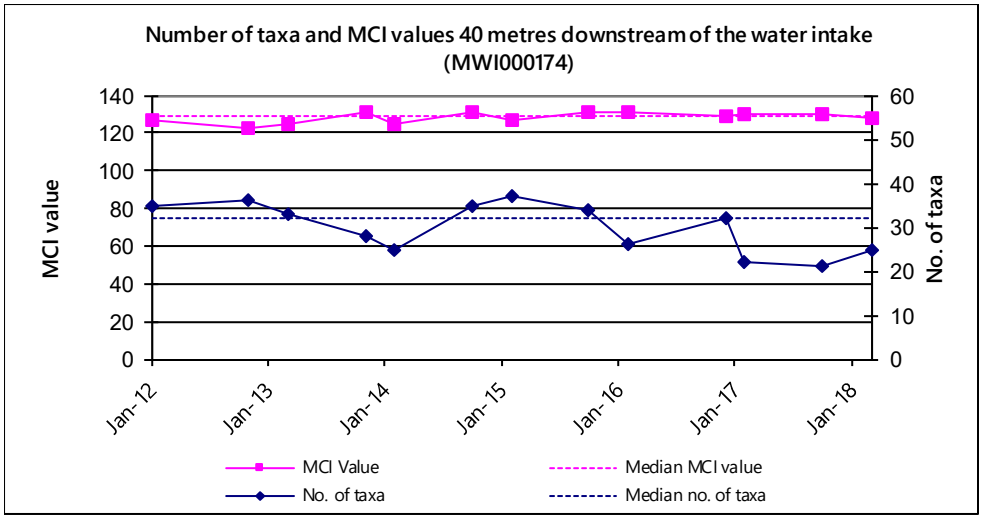

Figure 3 Number of taxa and MCI 40 meters downstream of the intake weir (MWI000174)

Site 3 (approximately 3 km downstream of intake weir)

A moderately high macroinvertebrate community richness of 27 taxa was recorded at this site (the 'secondary impact' site). This is equal to the median for this site (median taxa richness 27; Table 4) and four taxa less than the previously recorded richness (31 taxa; Figure 4).

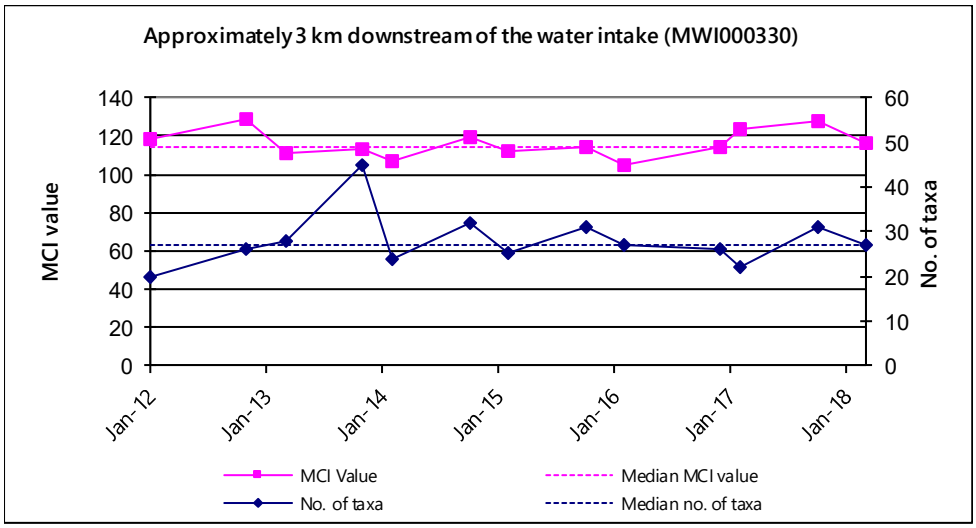

Figure 4 Number of taxa and MCI values approximately 3km downstream of intake weir (MWI000330)

A MCI score of 116 units was recorded, categorising the site having 'good' macroinvertebrate community health. This score is a non-significant two units higher than the median for this site (median MCI score 114 units; Table 4) and a significant (Stark 1998) 12 units lower than the previously recorded score for this site (MCI score 128 units; Figure 4). A $SQMCI_S$ score 7.1 units was recorded, which is not significantly different (Stark 1998) to the median score for this site (median $SQMCI_S$ score 6.4 units; Table 4) or the previously recorded score for this site ($SQMCI_S$ score 7.7 units).

The macroinvertebrate community was characterised by eleven taxa, comprising the four 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*), beetle (Hydraenidae) and caddisfly (*Beraeoptera*)], six 'moderately sensitive' taxa [mayflies (*Austroclima*) and (*Coloburiscus*), beetle (Elmidae), dobsonfly (*Archichauliodes*), caddisfly (*Pycnocentrodes*) and cranefly (*Aphrophila*)] and one 'tolerant' taxon [caddisfly (*Hydropsyche* – formerly *Aoteapsyche*)] (Table 5).

Site 4 (approximately 8 km downstream of intake weir)

A moderate macroinvertebrate community richness of 20 taxa was recorded at this site (the 'tertiary impact' site). This is four taxa fewer than the median for this site (median taxa richness 24 taxa; Table 4) and two taxa more than the previous result (18 taxa; Figure 5).

The MCI score of 111 units was recorded, categorising the site as having 'good' macroinvertebrate community health. This score is a significant (Stark 1998) 13 units higher than the median score for this site (median MCI 98 units; Table 4) and a non-significant four units higher than the previous survey result (107 units; Figure 5). This MCI score was the highest score recorded to date at this site. A $SQMCI_S$ score of 5.1 was recorded, slightly higher than both the median score for this site (median $SQWMCI_S$ score 4.6 units; Table 4) and slightly lower than the previously recorded result (5.2 units).

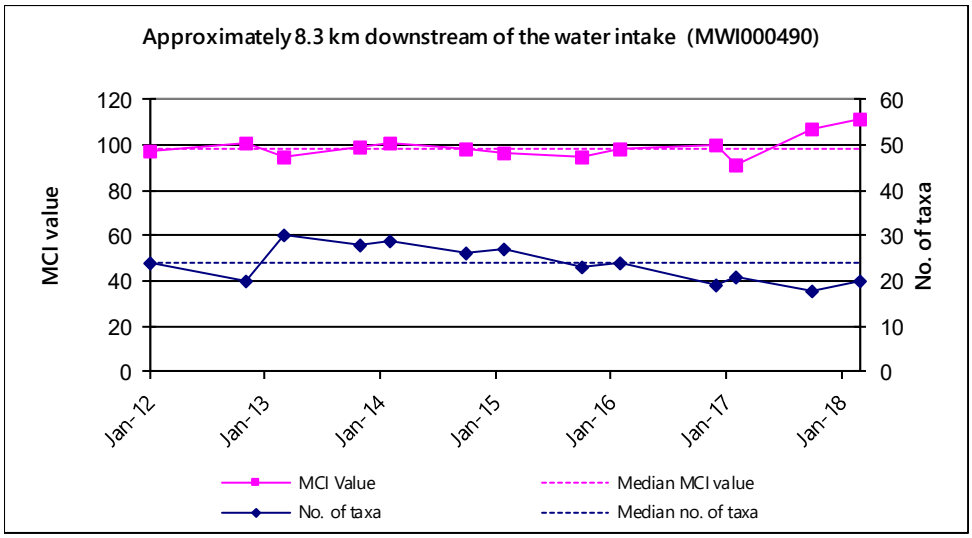

Figure 5 Number of taxa and MCI values approximately 8.3km downstream of the intake weir (MWI000490)

The macroinvertebrate community was characterised by six taxa, comprising the one 'highly sensitive' taxon [mayfly (*Deleatidium*)], three 'moderately sensitive' taxa [mayflies (*Austroclima*) and (*Coloburiscus*), and caddisfly (*Pycnocentrodes*)] and two 'tolerant' taxa [mud snail *(Potamopyrgus*) and caddisfly (*Hydropsyche* – formerly *Aoteapsyche*)] (Table 5).

Discussion and conclusions

The Council's 'kick-sampling' technique was used at four sites to collect streambed macroinvertebrates from the Mangawheroiti Stream in relation to the STDC WWWSS. This has provided data to assess any potential impacts the consented water abstraction may have had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and $SQMCI_S$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_S$ takes into account taxa abundances as well as sensitivity to pollution. Significant differences in either the taxa richness, MCI or the $SQMCI_S$ between sites may indicate the degree of adverse effects (if any) caused by water abstractions.

The abstraction of surface water particularly for extended periods of time may result in significant adverse effects on the macroinvertebrate communities living within a waterbody by potentially reducing flow velocities, wetted habitat area, and dissolved oxygen levels and increasing stream temperature, periphyton

abundance, macrophytes, pH, and deposited sediment. This March 2018 survey was undertaken to monitor whether the operation of the WWWSS was having an effect on the macroinvertebrate communities in the Mangawheroiti Stream downstream of the water take under summer conditions.

Taxa richnesses in this survey were moderate at sites 1, 2 and 4, and moderately high at site 3. Taxa richnesses at all sites were within the previously recorded range, although all richnesses were equal to or lower than the respective sites median score. This difference was substantial at sites 1 and 2. Richnesses were similar to those recorded in the preceding survey for all sites.

MCI scores at all sites were high. Site 4 recorded the highest MCI scores to date, surpassing the previous highest result (recorded in the preceding survey) by four units. This was the only site where the MCI score differed significantly from the median score. When compared to the preceding survey, all sites recorded similar scores except site 1 which decreased significantly (from the highest score recorded at this site to date). As in the preceding survey, and as is typical in the Taranaki ringplain, a general decrease in a downstream direction was observed. The scores at sites 1 and 2 were equal, and were significantly higher than at sites 3 and 4, which were similar.

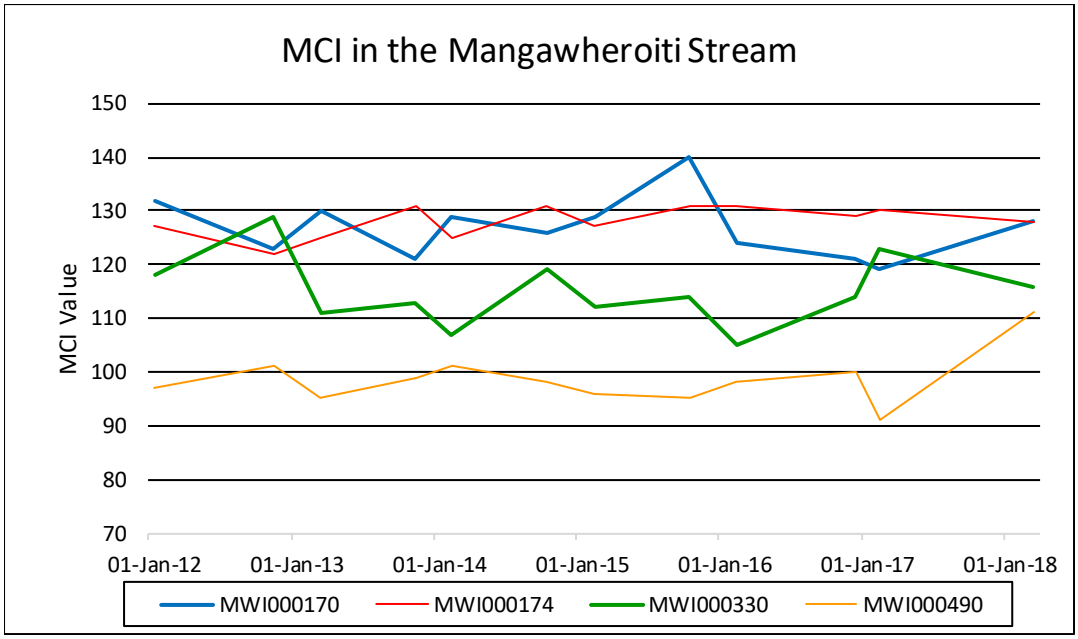

Figure 6 MCI scores at sites in the Mangawheroiti Stream sampled in relation to the WWWSS

$SQMCI_S$ scores were generally high, and were similar at sites 1-3, with a significantly lower score recorded at site 4. The scores at all sites were similar to those recorded in the preceding survey and to the respective sites median scores. The score at site 1 was equal to the previous survey and the highest score recorded to date at this site.

The high MCI and $SQMCI_S$ scores are a reflection of the high proportions of sensitive taxa recorded in this survey (77%, 80% 70% and 70% at sites 1-4 respectively). 'Sensitive' taxa are also numerically dominant at all sites.

Typically in Taranaki ringplain streams the health of macroinvertebrate communities decreases downstream because of the cumulative impacts of agricultural discharges. The decrease between sites 2 and 3 (approximately 3 km further downstream) is consistent with this. Overall, the results of this summer survey found no evidence that water abstraction from the Mangawheroiti Stream by WWWSS had had a significant effect on the freshwater macroinvertebrate communities downstream of the abstraction point. Macroinvertebrate indices decreased in a downstream direction which is most likely due to the negative effects of agricultural discharges on the macroinvertebrate stream communities.

Summary

A summer macroinvertebrate survey was performed at four sites in the Managwheroiti Stream in relation to consented water abstraction by the Waimate West water supply scheme. Samples were processed to provide taxa richness, MCI and $SQMCI_S$ scores. Taxa richnesses were moderate at sites 1, 2 and 4, and moderately high at site 3. These richnesses were similar to those recorded in the preceding survey. MCI scores and $SQMCI_S$ scores were high at all sites, with site 4 recording the highest MCI score to date and site 1 recording a score equal to the highest $SQMCI_S$ score to date. Only the MCI score at site 2 was significantly different from the preceding survey, with a decrease to close to the site's median score. There was a general trend of decreasing macroinvertebrate community health in a downstream direction, consistent with the cumulative impacts of agriculture. Overall, there was no evidence that water abstraction from the Managawheroiti Stream by the WWWSS had significantly affected the freshwater macroinvertebrate communities of the Mangawheroiti Stream.

References

Blakemore, KS, 2018: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, October 2017. TRC Internal Report KB033.

Fowles CR and Smith KL, 2012: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, November 2012. TRC Internal Report CF580.

Fowles CR and Jansma B, 2013: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, March 2013. TRC Internal Report CF582.

Fowles CR and Jansma B, 2013: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, November 2013. TRC Internal Report CF612.

Smith KL, 2012: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, January 2012. TRC Internal Report KS017.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. *Water and Soil Miscellaneous Publication No. 87.*

Stark JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded abundance data. *New Zealand Journal of Marine and Freshwater Research 32(1*): 55-66.

Stark JD, 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Institute, Nelson. Cawthron Report No. 472.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Stark JD and Maxted JR, 2004. Macroinvertebrate community indices for Auckland's soft-bottomed streams and applications to SOE reporting. Prepared for Auckland Regional Council. Cawthron Report No. 970. Cawthron Institute, Nelson. ARC Technical Publication 303. 59p.

Stark JD and Maxted JR, 2007. A biotic index for New Zealand's soft bottomed streams. New Zealand Journal of Marine and Freshwater Research 41 (1).

Stark JD and Maxted JR, 2007a. A user guide for the macroinvertebrate community index. Cawthron Institute, Nelson. Cawthron Report No. 1166.

Stark JD and Fowles CR, 2009. Relationships between MCI, site altitude, and distance from source Taranaki ring plain streams. Stark Environmental report No. 2009-01

Sutherland, DL, 2015: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, October 2014. TRC Internal Report DS022.

Sutherland, DL, 2015: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2015. TRC Internal Report DS023.

Thomas, B, 2014: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2014. TRC Internal Report BT035.

Thomas, B, 2016: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, October 2015. TRC Internal Report BT044.

Thomas, B, 2016: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, March 2016. TRC Internal Report BT055.

Thomas, B, 2017: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, December 2016. TRC Internal Report BT067.

Thomas B 2017: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2017. TRC Internal Report BT070.

Winterbourn MJ, Gregson KLD, Dolphin CH, 2006. Guide to the aquatic insects of New Zealand. [4th edition]. Bulletin of the Entomological Society of New Zealand 14, 108p.

To	Job Manager, Scott Cowperthwaite
From	Environmental Scientist, Katie Blakemore
Report No	KB033
Document	2020334
Date	08 Mar 2018

Biomonitoring of the Mangawheroiti Stream in relation to the STDC Waimate West Water Supply, October 2017

Introduction

The South Taranaki District Council (STDC) owns and operates the Waimate West Water Supply Scheme (WWWSS) which involves the abstraction of water from three streams; the Mangawheroiti Stream, the Mangawhero Stream and the Otakeho Stream. This scheme provides water for dairy farms, industry, and domestic use. The main intake for the WWWSS is on the Mangawheroiti Stream. However, the flow in Mangawheroiti Stream is supplemented by water diverted into it from the Mangawhero Stream upstream of the intake.

Consent 0634-3 authorises the taking of water from the Mangawheroiti Stream for the water supply scheme. This consent contains a Special Condition (8) that requires STDC to ensure that a minimum flow of 32 litres per second (0.032 m^3/s) is provided at all times immediately downstream of the intake structure.

This biological survey was the first of two programmed for the 2017-2018 monitoring period, the inaugural survey having been performed in January 2012. The intention of these surveys is to monitor the health of the macroinvertebrate communities in the Mangawheroiti Stream in relation to any effects of water abstraction by the WWWSS.

Methods

This spring survey was undertaken on 30 October 2017 at four sites on the Mangawheroiti Stream; a control site upstream of the intake weir (site 1), a primary impact site approximately 40 metres downstream of the intake weir (site 2), a secondary impact site nearly three kilometres downstream of that intake (site 3) and a tertiary impact site approximately 8.3 kilometres downstream of the intake and 340 metres upstream of the confluence with the Mangawhero Stream (site 4) (Table 1, Figure 1).

The Council's standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from all sites. The 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative), of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark *et al*, 2001).

Table 1 Biomonitoring sites in the Mangawheroiti Stream in relation to the WWWSS

Site	Site code	GPS location	Location	Elevation (m asl)	Distance from NPk boundary (km)
1	MWI000170	E1694422 N5637468	Upstream of the intake weir	340	3.6
2	MWI000174	E1694425 N5637409	Approximately 40 metres downstream of the water intake	340	3.7
3	MWI000330	E1694186 N5635091	Approximately 3 km downstream of the water intake (580 metres upstream of Eltham Road bridge)	270	6.5
4	MWI000490	E1693732 N5631251	Approximately 8.3 km downstream of the water intake (340 metres upstream of confluence with the Mangawhero Stream)	180	11.9

Samples were preserved with Kahle's Fluid for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded based on the abundance categories in Table 2.

Table 2 Macroinvertebrate abundance categories

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

Stark (1985) developed a scoring system for macroinvertebrate taxa according to their sensitivity to organic pollution in stony New Zealand streams. Highly 'sensitive' taxa were assigned the highest scores of 9 or 10, while the most 'tolerant' forms scored 1. Sensitivity scores for certain taxa have been modified in accordance with Taranaki experience. By averaging the scores obtained from a list of taxa taken from one site and multiplying by a scaling factor of 20, a Macroinvertebrate Community Index (MCI) value was obtained. The MCI is a measure of the overall sensitivity of macroinvertebrate communities to the effects of organic pollution. More 'sensitive' communities inhabit less polluted waterways. A difference of 11 or more MCI units is considered significantly different (Stark 1998). A gradation of biological water quality conditions based upon MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2013) from Stark's classification (Stark, 1985; Boothroyd and Stark, 2000) (Table 3).

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

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

A semi-quantitative MCI value (SQMCIs) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the SQMCIs is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

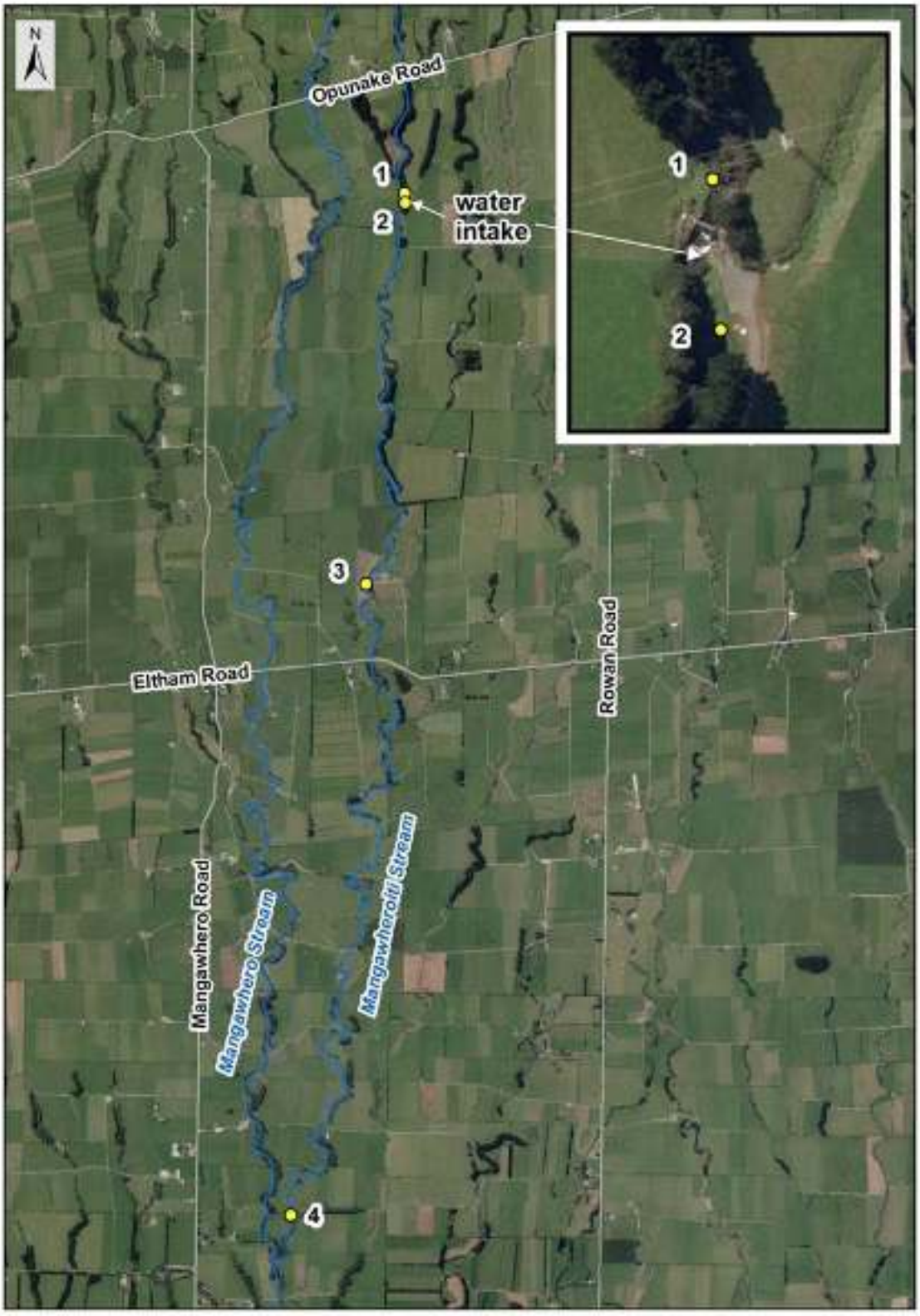

Figure 1 Biomonitoring sites in the Mangawheroiti Stream in relation to the WWWSS

Results

This survey followed a period of 19 days since a fresh in excess of 3x median flow and 22 days since a fresh in excess of 7x median flow. In the month prior to this survey, the flow in the Mangawheroiti Stream upstream of the intake weir ranged between 284 L/s and 3374 L/s. The residual flow at the time of the survey was approximately 168 L/s.

Water temperatures ranged between 11.5 °C and 15.1 °C. There was a moderate, swift, clear and uncoloured flown at all sites except site 3 which had steady flow. Substrate at all four sites comprised predominantly cobble, with varying amounts of boulder, fine and coarse gravels and sand also present.

Periphyton mats were slippery at site 1, and patchy at the remaining three sites. Filamentous periphyton and macrophytes were absent from all sites. Leaves and moss were patchy on the streambed at all four sites, while wood was patchy at sites 1 -3 and absent at site 4. The streambed was partially shaded at all sites except site 3 which was unshaded.

Macroinvertebrate communities

A summary of macroinvertebrate community metrics recorded in previous surveys, together with the current survey results is presented in Table 4.

Table 4 Summary of previously recorded macroinvertebrate community metrics together with the current survey results

Site	Number of previous surveys	Numbers of taxa			MCI values			$SQMCI_s$ values		
		Median	Range	Current Survey	Median	Range	Current Survey	Median	Range	Current Survey
1	11	31	22 -38	24	126	119 -140	142	7.3	6.2 -7.6	7.9
2	11	33	22 -37	21	129	122 -131	130	7.3	7.0 -7.9	7.6
3	11	26	20 -45	31	114	105 -129	128	6.4	4.8 -8.0	7.7
4	11	24	19 -30	18	98	91 -101	107	4.4	3.7 -5.4	5.2

The macroinvertebrate fauna recorded in the current survey is presented in Table 5.

Table 5 Macroinvertebrate fauna recorded at four sites in the Mangawheroiti Stream in relation to the WWWSS water abstraction, 30 October 2017

Taxa List	Site Number	MCI score	1	2	3	4
	Site Code		MWI000170	MWI000174	MWI000330	MWI000490
	Sample Number		FWB17368	FWB17369	FWB17370	FWB17371
ANNELIDA (WORMS)	Oligochaeta	1	-	-	-	R
	Lumbricidae	5	-	-	R	-
MOLLUSCA	*Potamopyrgus*	4	R	-	-	C
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	C	C	VA	C
	Coloburiscus	7	VA	VA	VA	C
	Deleatidium	8	XA	VA	XA	VA
	Ichthybotus	8	-	-	R	-
	Nesameletus	9	VA	A	VA	R
	Zephlebia group	7	R	C	A	-
PLECOPTERA (STONEFLIES)	*Acroperla*	5	R	C	C	-
	Austroperla	9	-	-	R	-
	Megaleptoperla	9	R	C	R	-
	Stenoperla	10	R	-	-	-
	Zelandobius	5	C	R	C	C
	Zelandoperla	8	C	C	C	-
COLEOPTERA (BEETLES)	Elmidae	6	C	C	A	R
	Hydraenidae	8	C	A	C	R
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	R	R	C	R
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	-	-	C	C
	Costachorema	7	-	-	-	R
	Hydrobiosis	5	R	R	R	R
	Hydrobiosella	9	R	-	-	-
	Hydropsyche (Orthopsyche)	9	C	R	-	-
	Plectrocnemia	8	-	-	R	-
	Psilochorema	6	-	-	R	-
	Beraeoptera	8	A	VA	VA	-
	Confluens	5	R	-	C	-
	Helicopsyche	10	C	R	VA	-
	Olinga	9	R	-	R	-
	Pycnocentria	7	-	-	C	-
	Pycnocentrodes	5	C	C	VA	A
	Triplectides	5	-	-	R	-
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	C	C	VA
	Eriopterini	5	R	-	R	-
	Maoridiamesa	3	-	-	C	VA
	Orthocladiinae	2	-	R	C	A
	Polypedilum	3	-	-	R	-
	Tanytarsini	3	-	-	-	R
	Empididae	3	-	R	-	-
	Austrosimulium	3	-	R	-	-
		No of taxa	24	21	31	18
		MCI	142	130	128	107
		SQMCIs	7.9	7.6	7.7	5.2
		EPT (taxa)	18	14	22	9
		%EPT (taxa)	75	67	71	50

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

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

Site 1 (upstream of intake weir)

A moderate macroinvertebrate community richness of 24 taxa was found at site 1 (the 'control' site) at the time of the survey which was seven taxa fewer than the median number recorded for the site (median richness 31 taxa; Table 4) and two taxa more than the previous sample (taxa richness 22; Figure 2).

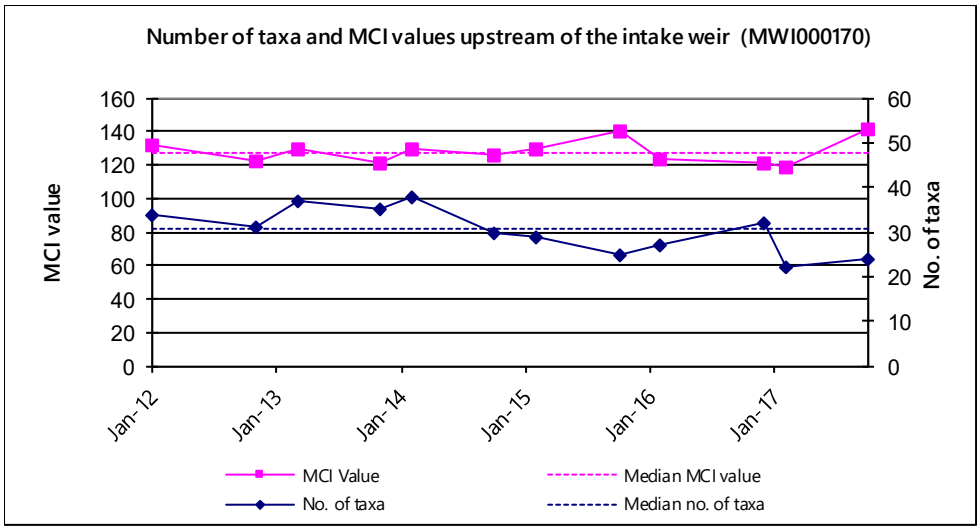

Figure 2 Number of taxa and MCI values upstream of the intake weir (MWI000170)

A MCI score of 142 units was recorded, categorising the site as having 'excellent' macroinvertebrate community health. This score was significantly higher (Stark 1998) than both the median score for this site (median MCI score 126 units; Table 4) and the previously recorded result (MCI score 119 units; Figure 2). This score is also the highest MCI score recorded at this site to date (Table 4). A $SQMCI_S$ score of 7.9 units was recorded, which is the highest $SQMCI_S$ score recorded to date at this site. The score is insignificantly higher than both the median score for this site (median $SQMCI_S$ score 7.3 units; Table 4) and the previously recorded result ($SQMCI_S$ score 7.2 units).

The macroinvertebrate community was characterised by three 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*), and caddisfly (*Beraeoptera*)] and one 'moderately sensitive' taxon [mayfly (*Coloburiscus*)] (Table 5).

Site 2 (40 m downstream of intake weir)

A moderate macroinvertebrate community richness of 21 taxa was recorded at this site (the 'primary impact' site) at the time of the survey. This was one taxon fewer than the previously recorded richness (taxa richness 22 taxa; Figure 3) and a substantial twelve taxa fewer than the median for this site (median taxa richness 33 taxa; Table 4).

A MCI score of 130 was recorded at this site, categorising the site as having 'very good' macroinvertebrate community health. This is an insignificant one unit higher than median for this site (median MCI score 129; Table 4) and is equal to the previous result (MCI score 130; Figure 3). Further, this is only one unit less than the highest recorded MCI score for this site (Table 4). A $SQMCI_S$ score of 7.6 units was recorded, slightly higher than the median $SQMCI_S$ score for this site (median $SQMCI_S$ 7.3 units; Table 4) and slightly lower than the previously recorded $SQMCI_S$ score ($SQMCI_S$ score 7.9 units).

The macroinvertebrate community was characterised by four 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*), beetle (Hydraenidae) and caddisfly (*Beraeoptera*)] and one 'moderately sensitive' taxon [mayfly (*Coloburiscus*)] (Table 5).

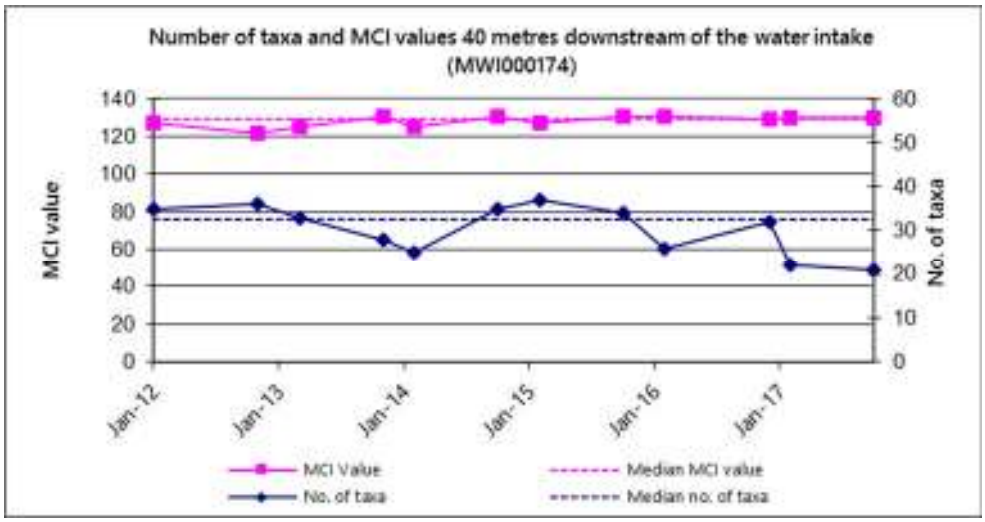

Figure 3 Number of taxa and MCI 40 meters downstream of the intake weir (MWI000174)

Site 3 (approximately 3 km downstream of intake weir)

A high macroinvertebrate community richness of 31 taxa was recorded at this site (the 'secondary impact' site). This is five taxa more than the median for this site (median taxa richness 26; Table 4) and a substantial nine taxa more than the previously recorded richness (22 taxa; Figure 4).

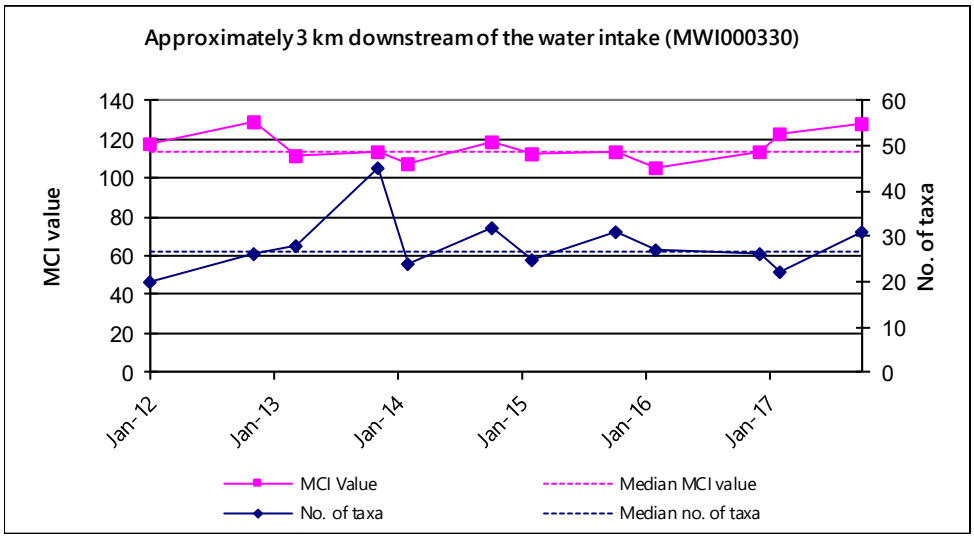

Figure 4 Number of taxa and MCI values approximately 3km downstream of intake weir (MWI000330)

A MCI score of 128 units was recorded, categorising the site having 'very good' macroinvertebrate community health. This score is a significant (Stark 1998) 14 units higher than the median for this site (median MCI score 114 units; Table 4) and a non-significant five units higher than the previously recorded score for this site (MCI score 123 units; Figure 4). This score is also only one unit less than the highest recorded MCI score for this site (Table 4). A $SQMCI_S$ score 7.7 units was recorded, significantly higher (Stark 1998) than the median score for this site (median $SQMCI_S$ score 6.4 units; Table 4) and the previously recorded score for this site ($SQMCI_S$ score 6.2 units).

The macroinvertebrate community was characterised by four 'highly sensitive' taxa [mayflies (*Deleatidium*) and (*Nesameletus*) and caddisflies (*Beraeoptera*) and (*Helicopsyche*)] and five 'moderately sensitive' taxa [mayflies (*Austroclima*), (*Coloburiscus*) and (*Zephlebia* group), beetle (Elmidae) and caddisfly (*Pycnocentrodes*)] (Table 5).

Site 4 (approximately 8 km downstream of intake weir)

A moderate macroinvertebrate community richness of 18 taxa was recorded at this site (the 'tertiary impact' site). This is six taxa fewer than the median for this site (median taxa richness 24 taxa; Table 4) and three taxa fewer than the previous result (21 taxa; Figure 5).

The MCI score of 107 units was recorded, categorising the site as having 'good' macroinvertebrate community health. This score is a non-significant nine units higher than the median score for this site (median MCI 98 units; Table 4) and a significant 16 units higher than the previous survey result (91 units; Figure 5). This MCI score was the highest score recorded to date at this site. A $SQMCI_S$ score of 5.2 was recorded, slightly higher than both the median score for this site (median $SQWMCI_S$ score 4.4 units; Table 4) and the previously recorded result (5.1 units).

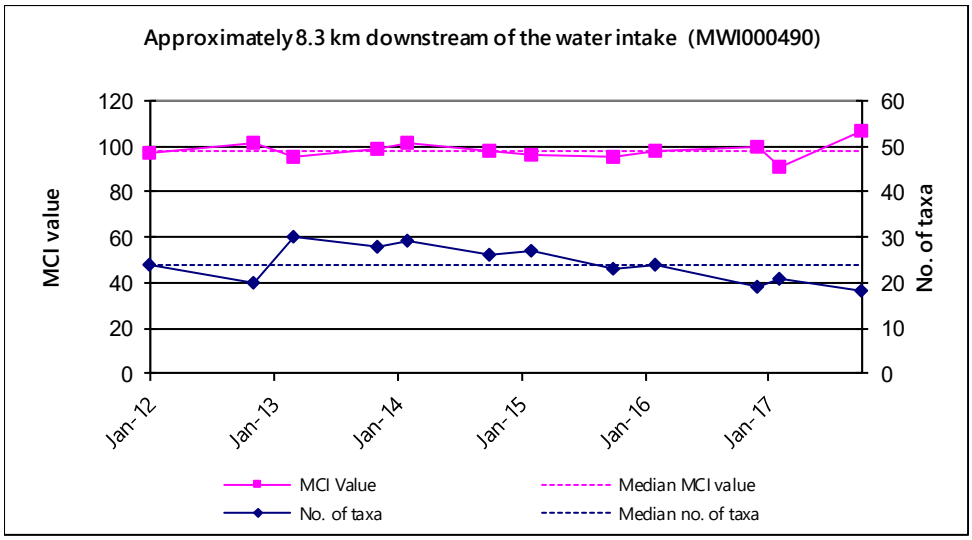

Figure 5 Number of taxa and MCI values approximately 8.3km downstream of the intake weir (MWI000490)

The macroinvertebrate community was characterised by one 'highly sensitive' taxon [mayfly (*Deleatidium*)], two 'moderately sensitive' taxa [caddisfly (*Pycnocentrodes*) and cranefly *(Aphrophila*)] and two 'tolerant' taxa [midge larvae (*Maoridiamesa*) and (Orthocladiinae)] (Table 5).

Discussion and conclusions

The Council's 'kick-sampling' technique was used at four sites to collect streambed macroinvertebrates from the Mangawheroiti Stream in relation to the STDC WWWSS. This has provided data to assess any potential impacts the consented water abstraction may have had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (richness), MCI, and $SQMCI_S$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_S$ takes into account taxa abundances as well as sensitivity to pollution. Significant differences in either the taxa richness, MCI or the $SQMCI_S$ between sites may indicate the degree of adverse effects (if any) caused by water abstractions.

The abstraction of surface water particularly for extended periods of time may result in significant adverse effects on the macroinvertebrate communities living within a waterbody by potentially reducing flow velocities, wetted habitat area, and dissolved oxygen levels and increasing stream temperature, periphyton abundance, macrophytes, pH, and deposited sediment. This October 2017 survey was undertaken to

monitor whether the operation of the WWWSS was having an effect on the macroinvertebrate communities in the Mangawheroiti Stream downstream of the water take under spring conditions.

Taxa richnesses in this survey were moderate at sites 1, 2 and 4, and high at site 3. At sites 2 and 4 the taxa richness was the lowest recorded to date, by one taxon, while at site 1 taxa richness was toward the lower end of the previously recorded range. At site 3 only two surveys have recorded higher taxa richnesses than the current survey. Taxa richnesses were similar to those recorded in the preceding survey for all sites except site 3, where the richness increased by 9 taxa.

MCI and $SQMCI_S$ scores at all sites were high. Sites 1 and 4 recorded their highest MCI scores to date, by two and six units respectively. Both sites showed a significant increase (Stark 1998) from the preceding survey, where both of these sites recorded their lowest MCI score to date (Figure 6). Sites 2 and 3 recorded MCI scores which were one unit less than the highest previously recorded score, and were the same as (site 2) or slightly higher (site 3) than the preceding result. The results of this survey show that the MCI score decreases in a downstream direction. A significant decrease in MCI score was recorded between sites 1 and 2, and again between sites 3 and 4.

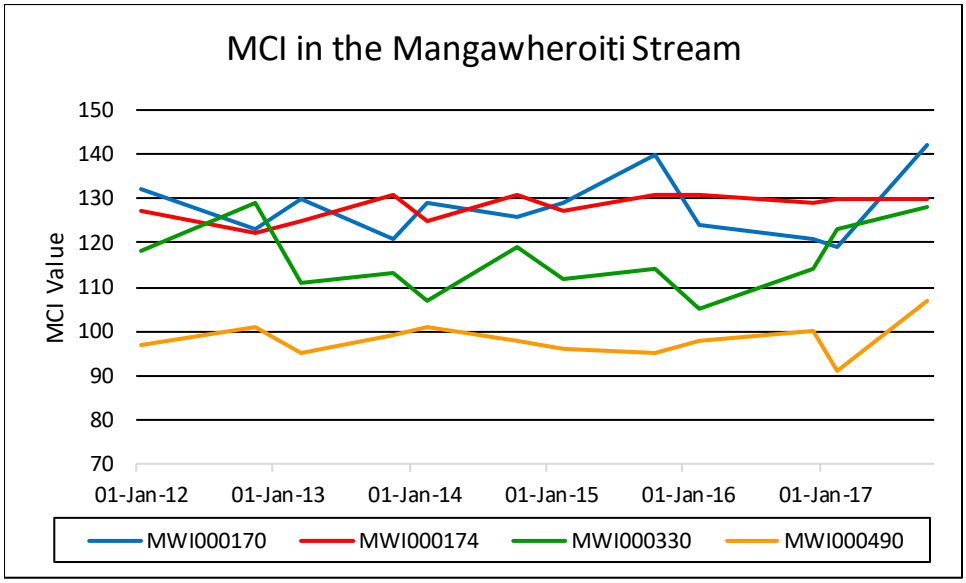

Figure 6 MCI scores at sites in the Mangawheroiti Stream sampled in relation to the WWWSS

$SQMCI_S$ scores were generally high, and were similar at sites 1-3, with a significantly lower score recorded at site 4. The scores at sites 1, 2 and 4 were similar to those recorded in the preceding survey, while site 3 showed a significant (Stark 1998) improvement. The score at site 1 was the highest score recorded to date at this site. The scores at sites 1 and 2 were similar to the respective sites median scores, while sites 3 and 4 recorded scores significantly higher than their respective medians.

The high MCI and $SQMCI_S$ scores are a reflection of the high proportions of sensitive taxa recorded in this survey (96%, 86% 87% and 67% at sites 1-4 respectively). 'Sensitive' taxa are also numerically dominant at all sites.

It is not uncommon to record high MCI scores in conjunction with low taxa richnesses, as is the case in this survey. This is because very good habitat and water quality conditions may favour taxa which are 'highly sensitive', allowing these taxa to outcompete more 'tolerant' taxa, thus excluding them from the macroinvertebrate community. As conditions change, more 'tolerant' taxa may be able to coexist, increasing the taxa richness but decreasing the MCI score. At the other end of the spectrum, only 'tolerant' taxa will survive, decreasing both taxa richness and MCI scores. This is known as a subsidy-stress response, and can be seen between sites 1 and 2. Subtle changes in the habitat, such as increased periphyton mats (from slippery to patchy), have resulted in an increase in tolerant taxa (from 4% to 14%). The three 'tolerant' taxa

recorded at site 2 are typically associated with periphyton, and all three are 'rare'. This results in a significant decrease in the MCI score, while the semi-quantitative $SQMCI_S$ score remains similar between the two sites. If these three taxa were absent at this site, the MCI score would be 142, equal to that at site 1.

Typically in Taranaki ring plain streams the health of macroinvertebrate communities decreases downstream because of the cumulative impacts of agricultural discharges. The decrease between sites 3 and 4 (approximately 5 km further downstream) is consistent with this.

Overall, the results of this spring survey found no evidence that water abstraction from the Mangawheroiti Stream by WWWSS had had a significant effect on the freshwater macroinvertebrate communities downstream of the abstraction point. Macroinvertebrate indices decreased in a downstream direction which is most likely due to the negative effects of agricultural discharges on the macroinvertebrate stream communities.

Summary

A spring macroinvertebrate survey was performed at four sites in the Managwheroiti Stream in relation to consented water abstraction by the Waimate West water supply scheme. Samples were processed to provide taxa richness, MCI and $SQMCI_S$ scores. Taxa richnesses were moderate at sites 1, 2 and 4, and high at site 3. Sites 2 and 4 recorded the lowest taxa richnesses to date. MCI scores and $SQMCI_S$ scores were high at all sites, with sites 1 and 4 recording their highest MCI scores to date and site 1 recording the highest $SQMCI_S$ score to date. There was a general trend of decreasing macroinvertebrate community health in a downstream direction, consistent with the cumulative impacts of agriculture. Overall, there was no evidence that water abstraction from the Managawheroiti Stream by the WWWSS had significantly affected the freshwater macroinvertebrate communities of the Mangawheroiti Stream.

References

Fowles CR and Smith KL, 2012: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, November 2012. TRC Internal Report CF580.

Fowles CR and Jansma B, 2013: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, March 2013. TRC Internal Report CF582.

Fowles CR and Jansma B, 2013: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, November 2013. TRC Internal Report CF612.

Smith KL, 2012: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, January 2012. TRC Internal Report KS017.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. *Water and Soil Miscellaneous Publication No. 87.*

Stark JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded abundance data. *New Zealand Journal of Marine and Freshwater Research 32(1)*: 55-66.

Stark JD, 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Institute, Nelson. Cawthron Report No. 472.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Stark JD and Maxted JR, 2004. Macroinvertebrate community indices for Auckland's soft-bottomed streams and applications to SOE reporting. Prepared for Auckland Regional Council. Cawthron Report No. 970. Cawthron Institute, Nelson. ARC Technical Publication 303. 59p.

Stark JD and Maxted JR, 2007. A biotic index for New Zealand's soft bottomed streams. New Zealand Journal of Marine and Freshwater Research 41 (1).

Stark JD and Maxted JR, 2007a. A user guide for the macroinvertebrate community index. Cawthron Institute, Nelson. Cawthron Report No. 1166.

Stark JD and Fowles CR, 2009. Relationships between MCI, site altitude, and distance from source Taranaki ring plain streams. Stark Environmental report No. 2009-01

Sutherland, DL, 2015: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, October 2014. TRC Internal Report DS022.

Sutherland, DL, 2015: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2015. TRC Internal Report DS023.

Thomas, B, 2014: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2014. TRC Internal Report BT035.

Thomas, B, 2016: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, October 2015. TRC Internal Report BT044.

Thomas, B, 2016: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, March 2016. TRC Internal Report BT055.

Thomas, B, 2017: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, December 2016. TRC Internal Report BT067.

Thomas B 2017: Biomonitoring of the Mangawheroiti Stream in relation to the Waimate West Water Supply Scheme, February 2017. TRC Internal Report BT070.

Winterbourn MJ, Gregson KLD, Dolphin CH, 2006. Guide to the aquatic insects of New Zealand. [4th edition]. Bulletin of the Entomological Society of New Zealand 14, 108p.

To	Job Manager, S Cowperthwaite
From	Environmental Scientist, B Jansma
Report No	BJ310
Doc No	2073422
Date	18 June 2018

Biomonitoring of the Kapuni Stream in relation to the Hawera Water Treatment Plant, March 2018

Introduction

This survey of two sites in the Kapuni Stream was conducted to determine if there had been adverse effects related to the discharge of filter backwash and settling tank sediment from the Hawera Water Treatment Plant. The survey fulfilled the biological monitoring requirements for this STDC consent monitoring programme in the 2017-2018 monitoring year. Results from surveys performed since the 2000-01 monitoring year are detailed in the references.

This survey was the ninth to follow commissioning of the Hawera Water Treatment Plant in 2009. The new discharge point is now located just upstream of the Skeet Road bridge, and the sampling sites have consequently been changed, to enable monitoring of this new location.

At the time of the initial survey, no discharge of filter backwash and settling tank sediment had yet occurred from this new discharge point, and therefore that survey acted as a baseline survey, with which future surveys can be compared. The current survey is the eighth survey undertaken since the plant became fully operational.

Methods

The standard '400 ml kick-sampling' technique was used to collect streambed macroinvertebrates from two established sites in the Kapuni Stream in relation to the Hawera Water Treatment Plant on 5 March 2018. This 'kick-sampling' technique is very similar to Protocol C1 (hard-bottomed, semi-quantitative) of the New Zealand Macroinvertebrate Working Group (NZMWG) protocols for macroinvertebrate samples in wadeable streams (Stark et al, 2001). The sites are described in Table 1 and Figure 1.

Samples were preserved with Kahle's Fluid for later sorting and identification under a stereomicroscope according to Taranaki Regional Council methodology using protocol P1 of NZMWG protocols for sampling macroinvertebrates in wadeable streams (Stark et al. 2001). Macroinvertebrate taxa found in each sample were recorded as:

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

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

Table 1 Biomonitoring sites in the Kapuni Stream in relation to the Hawera Water Treatment Plant

Site No.	Site Code	Location
1	KPN000300	Approximately 30 metres upstream of Skeet Rd, upstream of the Hawera water treatment plant discharge.
2	KPN000301	Approximately 30m downstream of Skeet Rd & 50m downstream of Hawera water treatment plant discharge

Figure 1 Aerial photo showing the location of the water treatment facility, and relevant sampling sites.

A semi-quantitative MCI value ($SQMCI_s$) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these products, and dividing by the sum of the loading factors (Stark, 1998 and 1999). The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the $SQMCI_s$ is not multiplied by a scaling factor of 20, so that its corresponding range of values is 20x lower.

Results and discussion

At the time of this mid-morning survey, there was a clear, uncoloured flow in the Kapuni Stream and the water temperature ranged from 17.1 to 17.4°C. The survey was performed during a moderate period of low flow, 12 days after a fresh in excess of three times median flow and 32 days after flows exceeded seven times median flow, resulting in the survey being undertaken during moderate flows. The bed of the stream at both sites comprised predominantly cobbles, coarse gravel and boulders, with some fine gravel and sand. It was noted during this survey that there was fine silt tied up in the substrate, although only at site 2 in the current survey. This is a repeat of that observed in previous surveys, with this silt also present at site 1

at times, suggesting an erosion event in the National Park. The current survey only noted it at site 2, and this may be due to the backwash discharge from the water treatment plant. Neither site supported much periphyton, with only a thin film of algae observed. Only site 2 had partial shading from riparian vegetation, with site 1 unshaded.

It was noted during the March 2013 that a backwash discharge was causing notable discolouration downstream (Photo 1). No such discharge was observed during the current survey.

Photo 1 The backwash discharge entering the Kapuni Stream from the left, 13 March 2013

Macroinvertebrate communities

Previous biological surveys in the Kapuni Stream have generally recorded macroinvertebrate communities that would be expected in clean, mid-catchment ringplain streams. The communities have had moderate to relatively good numbers of taxa and moderately high MCI values. The results of previous surveys are summarised in Table 2, together with current results and for site 1 are illustrated in Figure 2. The full results of the current survey are presented in Table 3.

Table 2 Numbers of taxa and MCI values recorded in previous surveys performed in the Kapuni Stream in relation to the Hawera WTP, together with current results

Site	Number of previous surveys	Numbers of taxa			MCI values		
		Median	Range	Current	Median	Range	Current
1	137	17	6-40	18	110	60-145	119
2	9	22	17-25	19	112	104-117	116

Site 1 - upstream of WTP discharge

This site has an extensive historical dataset, as a result of monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites, located upstream. This dataset extends as far back as October 1982 and can also be used as a reference for results at site 2 (KPN000301), until a suitable data record has been established there. It should be noted however, that the monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites is done so using slightly different methodology, which has the potential to produce lower taxa richness and higher MCI scores.

The macroinvertebrate community at site 1 (upstream of the water treatment plant) had a moderate richness of 18 taxa, which was similar to the median richness of all surveys conducted at this site to date (Table 2). Five 'highly sensitive' taxa were found, indicative of generally high preceding physicochemical water quality conditions and good physical habitat. The faunal community was characterised by one of these 'highly sensitive' taxa ((extremely abundant mayfly (*Deleatidium*)); two 'moderately sensitive' taxa (elmid beetles and *Aphrophila* cranefly) and one 'tolerant' taxon (*Hydropsyche* caddisfly).

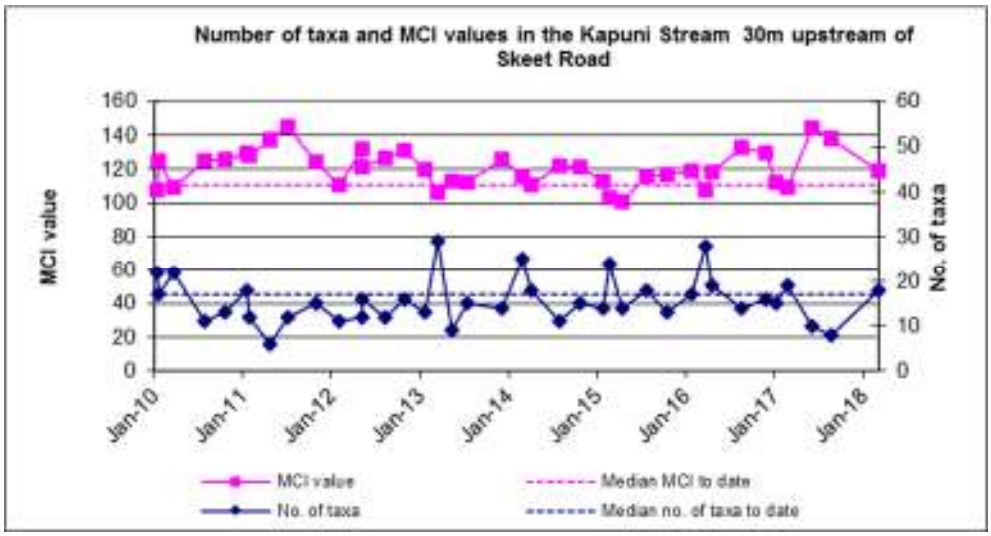

Figure 2 Numbers of taxa and MCI values in the Kapuni Stream upstream of Hawera WTP

The high proportion of 'sensitive' taxa (77% of taxa numbers) comprising this community was reflected in the MCI score of 119 units, which was nine units higher than the median, but less than that recorded in the most recent preceding surveys (Figure 2, Table 2). This result was also ten units higher than that recorded in the last water treatment plant survey, which is likely a reflection of the shorter period of flow recession that preceded the current survey. The current score is 20 units higher than the predicted score for this site (99 units), 19.1 km downstream of the National Park boundary (Stark and Fowles, 2009, Stark, 1998).

Table 3 Macroinvertebrate fauna of the Kapuni Stream in relation STDC Hawera WTP sampled on 5 March 2018

Taxa List	Site Number	MCI score	1	2
	Site Code		KPN000300	KPN000301
	Sample Number		FWB18139	FWB18140
NEMERTEA	Nemertea	3	R	R
MOLLUSCA	*Potamopyrgus*	4	-	R
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	C	R
	Coloburiscus	7	C	R
	Deleatidium	8	XA	XA
PLECOPTERA (STONEFLIES)	*Zelandoperla*	8	R	-
COLEOPTERA (BEETLES)	Elmidae	6	A	VA
	Hydraenidae	8	R	R
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	A
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	A	VA
	Costachorema	7	C	R
	Hydrobiosis	5	C	C
	Beraeoptera	8	R	C
	Olinga	9	C	C
	Pycnocentria	7	-	C
	Pycnocentrodes	5	R	VA
DIPTERA (TRUE FLIES)	*Aphrophila*	5	A	A
	Eriopterini	5	R	C
	Orthocladiinae	2	C	C
	Polypedilum	3	C	R
	No of taxa		18	19
	MCI		119	116
	SQMCIs		7.5	6.8
	EPT (taxa)		10	10
	%EPT (taxa)		56	53
'Tolerant' taxa	'Moderately sensitive' taxa		'Highly sensitive' taxa	

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

Site 2 - downstream of WTP

Taxa richness at site 2, 30m downstream of the water treatment plant discharge, was 19 taxa, similar to that recorded at site 1 (Table 2). The difference in community composition between sites was relatively insignificant as in all but one instance it was due to the presence/absence of taxa found only as rarities (less than 5 individuals per taxon) at the upstream site when they were absent/present downstream. Four 'highly sensitive' taxa were present, with the community characterised by the same taxa as those dominant at site 1 with the exception of two 'moderately sensitive' taxa (*Pycnocentria* and *Pycnocentrodes* caddisfly larvae) which increased in abundance (Table 3). Due to a similar proportion of 'sensitive' taxa in the community, the MCI score at site 2 (116 units) was only three units lower than the score recorded at site 1 upstream, which is not a statistically significant result (Stark, 1998). This score was higher than (but not significantly so) the median of past scores from KPN00300 but an improvement on that recorded at this site during the previous two surveys (Figure 3). When the nature of the changes is considered, it is not considered indicative of impacts from the water treatment plant discharge. Because of the proximity of KPN000300 to this site, the historical data for this site can be used for comparison at this site, which was only sampled for the tenth time in this survey.

Although there were two significant changes in individual taxon abundance recorded between sites, they were largely suggestive of an improvement in water quality, and therefore not of concern. The increased abundance of three 'moderately sensitive' taxa and one 'tolerant' taxon at site 2 was reflected in the $SQMCI_S$ score, which reduced by 0.7 unit, a statistically insignificant result (Table 3).

This is not an unexpected result considering the shorter period of flow recession that preceded this survey, and the fact that the catchment appears subject to significant substrate movement (including significant volumes of fine silt) during floods. It is also not an indication of any impacts from the Hawera water treatment plant.

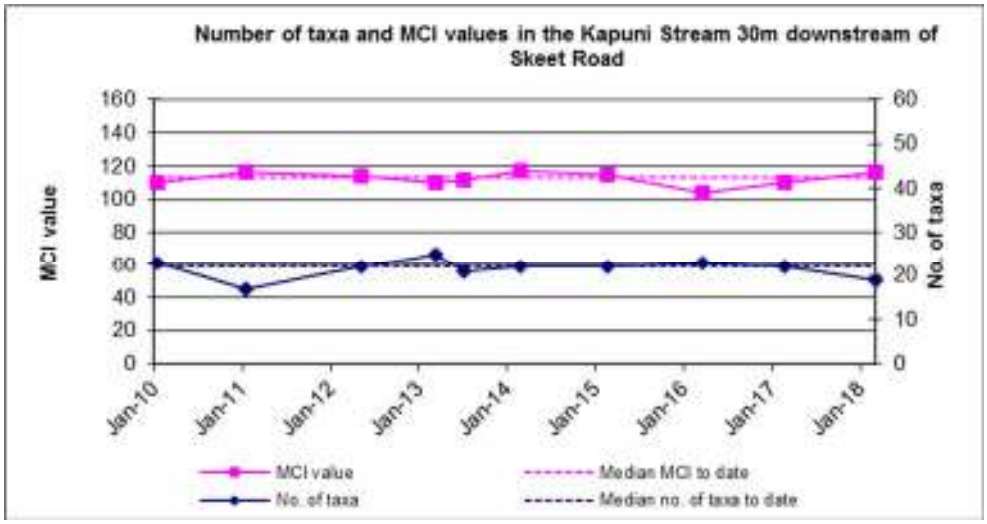

Figure 3 Numbers of taxa and MCI values in the Kapuni Stream downstream of Hawera WTP

Summary and conclusions

The Council's standard 'kick-sampling' technique was used on 5 March 2018 at two sites to collect streambed macroinvertebrates from the Kapuni Stream to determine if there had been any adverse effects on the macroinvertebrate community of the stream from Hawera water treatment plant backwash discharges. Samples were sorted and identified to provide number of taxa (richness) and MCI and $SQMCI_S$ scores for each site.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to

environmental conditions. The $SQMCI_S$ takes into account taxa abundance as well as sensitivity to pollution, and may reveal more subtle changes in communities, particularly if non-organic impacts are occurring. Significant differences in either the MCI or the $SQMCI_S$ between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

This survey was the eighth to follow full commissioning of the Hawera Water Treatment Plant. The discharge point is now located just upstream of the Skeet Road bridge, and the sampling sites were consequently changed, to enable monitoring of this new location. Site 1 has an extensive historical dataset, as a result of monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites, located upstream. This dataset can also be used as a reference for site 2 (KPN000301), until a suitable data record has been established here. It should be noted however, that the monitoring undertaken in relation to the Vector Kapuni and Ballance Agri-Nutrients Kapuni Ltd sites is done so using slightly different methodology, which has the potential to produce lower taxa richness and higher MCI scores.

During the 2016 late summer macroinvertebrate survey, it was noted that the stream appeared to have been severely impacted by a recent flood event, with large volumes of substrate moving down the catchment. This was again apparent in the current survey, but to a lesser degree. There was fine silt tied up in the substrate, although only at site 2, possibly related to the backwater discharge, but more likely related to an erosion event in the National Park. The results of this survey indicate that the community at site 2, downstream of the discharge point, was in good health, and similar to that recorded upstream at site 1, upstream of the discharge point. There is no evidence to suggest that the discharge of filter backwash and settling tank sediment had resulted in an impact on the macroinvertebrate communities of the Kapuni Stream. This is illustrated by the MCI score recorded downstream of the discharge being higher than the median score for the upstream site.

The macroinvertebrate communities of the Kapuni Stream contained significant proportions of 'sensitive' taxa at both sites and the communities were dominated by 'sensitive' taxa. Taxonomic richness (number of taxa) was moderate at both the control site 1 and at site 2, downstream of the discharge, with only three differences in the presence/absence of taxa between sites. Both sites recorded an above average MCI score, reflecting the shorter period of receding flow that preceded this survey (12 days). The minimal change in MCI and $SQMCI_S$ scores from site 1 to site 2 was not an unexpected result considering the flow conditions that preceded this survey, and the influence of substrate mobilisation and fine silt. These results are not an indication of any impacts from the Hawera water treatment plant.

References

Colgan BG, 2003: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, April 2003. TRC report BC009.

Dunning KJ, 2001: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, April 2001. TRC report KD68.

Dunning KJ, 2002: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, March 2002. TRC report KD118.

Fowles CR and Hope KJ, 2005: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, March 2005. TRC report CF386.

Fowles CR and Moore SC, 2004: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, March 2004. TRC report CF316.

Fowles CR and Jansma B, 2008: Biomonitoring of the Kapuni Stream in relation to the Hawera Water Treatment Plant, February 2008. TRC report CF454.

Hope K J, 2006: Biomonitoring of the Kapuni Stream, upstream and downstream of the Hawera Water Treatment Plant, February 2006. TRC report KH084.

Jansma B, 2009: Biomonitoring of the Kapuni Stream in relation to the Hawera Water Treatment Plant, January 2009. TRC report BJ076.

Jansma B, 2010: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, January 2010. TRC report BJ114.

Jansma B, 2011: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, January 2011. TRC report BJ147.

Jansma B, 2013: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, May 2012. TRC report BJ186.

Jansma B, 2013: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, March 2013. TRC Report BJ204.

Jansma B, 2015: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, February 2014. TRC Report BJ251.

Jansma B, 2015: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, February 2015. TRC Report BJ262.

Jansma B, 2016: Biomonitoring of the Kapuni Stream in relation to the Kapuni Water Treatment Plant, March 2016. TRC Report BJ273.

Jansma B, 2017: Biomonitoring of the Kapuni Stream in relation to the Hawera Water Treatment Plant, February 2017. TRC Report BJ294.

McWilliam H, 2000: Biomonitoring of the Kapuni Stream, in relation to the Hawera Water Treatment Plant, March 2000. TRC report HM216.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. *Water and Soil* Miscellaneous Publication No. 87.

Stark JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded abundance data. *New Zealand Journal of Marine and Freshwater Research 32(1*): 55-66.

Stark JD, 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Institute, Nelson. Cawthron Report No. 472.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Stark JD and Fowles CR, 2009: Relationships between MCI, site altitude, and distance from source for Taranaki ring plain stream. Prepared for Taranaki Regional Council. Stark Environmental Report No. 2009-01. 47p.

Taranaki Regional Council, 1999: Some statistics from the Taranaki Regional Council database (FWB) of freshwater macroinvertebrates surveys performed during the period from January 1980 to 31 December 1998. (State of the Environment Monitoring Reference Report). Technical Report 99-17

To	Scott Cowperthwaite, Job Manager
From	Darin Sutherland, Environmental Scientist
Document	2072904
Report	DS089
Date	19 June 2018

Biomonitoring of the Mangatoki Stream in relation to the STDC Inaha water supply scheme, January 2018

Introduction

STDC has ten water supply schemes monitored by the Taranaki Regional Council. Biological monitoring is conducted in relation to three of these schemes each year, one of which is the Hawera water supply scheme. Various aspects of the Inaha water supply scheme have been monitored on previous occasions in 1985 and 1986 (Moore, 1986), 1999 (Fowles, 1999) 2001 (Dunning, 2001), and 2007 (Fowles, 2007) while an unauthorised discharge incident was the subject of biomonitoring in 2005 (Hope, 2005).

The Inaha water scheme is supplied by two water abstractions from two weirs in the Mangatoki Stream (Figure 1). A settlement pond has been established beside the newest most downstream weir and has an overflow which discharges into a small unnamed tributary of the Mangatoki Stream. This tributary joins the Mangatoki Stream 100 m downstream of the weir. The backwash water discharges from the Inaha water treatment plant into another unnamed tributary of the Mangatoki Stream. This tributary enters the Mangatoki Stream approximately 300 m upstream of Opunake Road. During the 2000-01 monitoring year, five sites were surveyed in relation to the Inaha water takes and discharges. Two of these sites (sites 3 and 4, Figure 1) were established for the purposes of that survey following the construction of the new settlement pond and commencement of backwashing at the water treatment plant. The two previous surveys (February, 2007 and January 2012) and current survey focussed on the two sites (sites 4 and 5) either side of the Water Treatment Plant backwash discharge tributary, in which sites had been monitored in relation to the unauthorised discharge in 2005 (Hope, 2005).

Methods

The standard 'kick sampling' technique was used at two sites to collect streambed macroinvertebrates in the Mangatoki Stream upstream and downstream of the receiving waters of the unnamed tributary for the Inaha Water Supply Scheme filter backwash discharges (Table 1, Figure 1) on 16 January 2018.

Site number	Site code	Grid reference (NZTM)	Location	Altitude (masl)
4	MTK000067	E1701745 N5640951	Immediately u/s of tributary receiving Inaha WTP backwash discharge	400
5	MTK000070	E1701922 N5640933	Opunake Rd (d/s of tributary receiving backwash discharge)	400

Table 1 Biomonitoring sites in the Mangatoki Stream

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

streams (Stark et al, 2001). Samples were preserved with Kahle's Fluid for later stereomicroscopic sorting and identification according to documented Taranaki Regional Council methodology and macroinvertebrate taxa abundances scored based on the categories in Table 2.

Table 2 Macroinvertebrate abundance categories

Abundance category	Number of individuals
R (rare)	1-4
C (common)	5-19
A (abundant)	20-99
VA (very abundant)	100-499
XA (extremely abundant)	500+

Table 3 Macroinvertebrate health based on MCI ranges which has been adapted for Taranaki streams and rivers (TRC, 2015) from Stark's classification (Stark, 1985, Boothroyd and Stark, 2000, and Stark and Maxted, 2007)

TRC Grading	MCI	$SQMCI_s$
Excellent	>140	>7.00
Very Good	120-140	6.00-7.00
Good	100-119	5.00-5.99
Fair	80-99	4.00-4.99
Poor	60-79	3.00-3.99
Very Poor	<60	<3.00

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

A semi-quantitative MCI value, $SQMCI_S$ (Stark, 1999) has also been calculated for the taxa present at each site by multiplying each taxon score by a loading factor (related to its abundance), totalling these scores, and dividing by the sum of the loading factors. The loading factors were 1 for rare (R), 5 for common (C), 20 for abundant (A), 100 for very abundant (VA) and 500 for extremely abundant (XA). Unlike the MCI, the $SQMCI_s$ is not multiplied by a scaling factor of 20, therefore $SQMCI_s$ values range from 1 to 10, while MCI values range from 20 to 200. A difference of 0.83 units or more in $SQMCI_s$ values is considered significantly different (Stark 1998).

Figure 1 Biomonitoring sites in the Mangatoki Stream

Results

Site habitat characteristics and hydrology

This summer survey was performed under moderate flow conditions, ten days after a fresh in excess of 3 and 7 times median flow in the Waingongoro River at Eltham Road. The survey followed a relatively wet spring period with several freshes recorded over the preceding month. Water temperature was 14.8°C at site 4 and 15.2°C at site 5**.** Both sites had swift flow with uncoloured, clear water.

Substrate comprised predominantly cobble and boulder at site 4, and sand, gravels and cobbles gravel at site 5. Both sites had slippery algal mats and patchy leaves and site 4 had patchy moss and wood as well. Site 4 had overhanging vegetation completely shading the streambed while site 5 also had overhanging vegetation that partially shaded the streambed.

Macroinvertebrate communities

A summary of data obtained from previous surveys of the various river sites is presented in Table 4.

Table 4 Summary of the number of taxa, MCI and $SQMCI_s$ values from the current and past surveys in the Mangatoki Stream in relation to the Inaha Water Supply Scheme

Site No.	N	No of taxa			MCI value			SQMCIs value		
		Median	Range	Current survey	Median	Range	Current survey	Median	Range	Current survey
4	3	28	27-31	27	128	126-132	130	7.5	7.3-7.6	6.6
5	6	29	22-34	23	125	122-132	110	7.1	7.1-7.6	4.6

Table 5 Macroinvertebrate fauna of the Mangatoki Stream in relation to the Inaha Water Supply Scheme sampled on 16 January 2018

Taxa List	Site Number	MCI score	4	5
	Site Code		MTK000067	MTK000070
	Sample Number		FWB18011	FWB18012
ANNELIDA (WORMS)	Oligochaeta	1	A	VA
	Lumbricidae	5	-	R
MOLLUSCA	*Potamopyrgus*	4	-	C
EPHEMEROPTERA (MAYFLIES)	*Austroclima*	7	R	C
	Coloburiscus	7	VA	C
	Deleatidium	8	VA	VA
	Nesameletus	9	R	R
	Zephlebia group	7	C	C
PLECOPTERA (STONEFLIES)	*Austroperla*	9	C	-
	Megaleptoperla	9	R	-
	Zelandoperla	8	R	-
COLEOPTERA (BEETLES)	Elmidae	6	C	C
	Hydraenidae	8	R	R
	Ptilodactylidae	8	R	R
MEGALOPTERA (DOBSONFLIES)	*Archichauliodes*	7	C	C
TRICHOPTERA (CADDISFLIES)	*Hydropsyche (Aoteapsyche)*	4	R	R
	Hydrobiosis	5	C	R
	Hydrobiosella	9	R	-
	Hydropsyche (Orthopsyche)	9	A	-
	Plectrocnemia	8	R	-
	Psilochorema	6	C	C
	Beraeoptera	8	R	R
	Oeconesidae	5	-	R
	Olinga	9	R	-
DIPTERA (TRUE FLIES)	*Aphrophila*	5	C	R
	Eriopterini	5	R	R
	Hexatomini	5	R	-
	Orthocladiinae	2	C	C
	Polypedilum	3	A	A
	Austrosimulium	3	C	C
	Tanyderidae	4	-	A
		No of taxa	27	23
		MCI	130	110
		SQMCIs	6.6	4.6
		EPT (taxa)	16	10
		%EPT (taxa)	59	43
'Tolerant' taxa	'Moderately sensitive' taxa	'Highly sensitive' taxa		

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

Site 4 (upstream of receiving water tributary)

A high macroinvertebrate community richness of 27 taxa was found at site 4 ('control' site) at the time of the summer survey which was one taxon less than the historic median (Table 4) and the previous survey (28 taxa) on January 2012.

The MCI score of 130 units indicated a community of 'very good' biological health which was not significantly different (Stark, 1998) to the historical median MCI score (128 units) and to the previous survey (132 taxa). The $SQMCI_S$ score of 6.6 units was significantly lower than the median $SQMCI_S$ score of 7.5 units (Table 4) but was not significantly different to the previous survey (7.1 units).

The community was characterised by two 'tolerant' taxa [oligochaete worms and midge (*Polypedium*)], one 'moderately sensitive' taxon [mayfly (*Coloburiscus*)], and two 'highly sensitive' taxa [mayfly (*Deleatidium*) and caddisfly (*Hydropsyche-Orthopsyche*)] (Table 5).

Site 5 (downstream of receiving water tributary)

A high macroinvertebrate community richness of 23 taxa was found at site 5 ('impact' site) at the time of the summer survey which was six taxa less than the historic median (Table 4) and seven taxa less than the previous survey (30 taxa) on January 2012.

The MCI score of 110 units indicated a community of 'good' biological health which was significantly lower (Stark, 1998) than the historical median MCI score (128 units) and the previous survey (122 taxa). The score was also the lowest recorded at the site to date. The $SQMCI_S$ score of 4.6 units was also significantly lower than the median $SQMCI_S$ score of 7.1 units (Table 4) and the previous survey (7.1 units). The score was also the lowest recorded at the site to date.

The community was characterised by three 'tolerant' taxa [oligochaete worms and midges (*Polypedium* and Tanyderidae)], one 'moderately sensitive' taxon [mayfly (*Coloburiscus*)], and one 'highly sensitive' taxon [mayfly (*Deleatidium*)] (Table 5).

Discussion and conclusions

The Mangatoki Stream sites had high taxa richnesses with little variation between the two sites (four taxa). Taxa richnesses were slightly lower than historical medians, more so at the bottom site (six taxa) than the top site (one taxa), but the small number of surveys makes the historic medians somewhat unreliable.

MCI scores indicated that the macroinvertebrate communities present were in 'very good' health at the 'control' site and 'good' health at the 'impact' site. There was a significant downstream decrease in MCI score and the 'impact' site score was significantly below the historic median and the preceding survey. $SQMCI_S$ scores are generally more sensitive than MCI values as they take into account abundances as well as tolerance values when calculating the index. The $SQMCI_S$ scores were consistent with the MCI scores indicating a significant decline in the macroinvertebrate health at the 'impact' site. Furthermore, the 'impact' site $SQMCI_S$ score was relatively lower than the MCI score indicating a community of 'fair' health, probably as a result of the 'very abundant' highly tolerant oligochaete worms present at the site that have the lowest possible tolerance value.

The difference in health of the 'impact' site macroinvertebrate community can be partially explained by habitat differences. The 'impact' site had more fine sediment (5% silt and 20% sand) than the 'control' site (0% silt and 5% sand), had no woody debris, and was possibly less stable as indicated by the lack of moss which was present at the 'control' site. Discharges from the backwash of the water treatment plant may have had a negative impact but this is difficult to establish due to habitat variability and good health of the 'impact' site.

Overall, this January 2018 summer survey of two sites in the Mangatoki Stream in relation to the Inaha Water Supply filter backwash discharge indicated that the macroinvertebrate community at the 'impact' site was in poorer health compared with the upstream 'control' site, differences in habitat may account for differences between the two sites but discharges may also be having a negative effect.

Summary

The Council's standard 'kick-net' sampling technique was used to collect streambed macroinvertebrates from two sites in the Mangatoki Stream (upstream and downstream of the filter backwash discharge receiving water tributary) in order to assess whether the discharge had had any adverse effect on the macroinvertebrate communities of this stream. Samples were processed to provide number of taxa (richness), MCI and $SQMCI_S$ scores for each site.

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

Taxa richnesses at both sites were moderately high. The macroinvertebrate community in the upstream 'control' site was in very good health while the downstream 'impact' site was in 'good' health with a significant decrease in MCI and $SQMCI_S$ scores between sites. Furthermore, in contrast to the 'control' site, the 'impact' site also had significant decreases in health for both MCI and $SQMCI_S$ indices compared with the preceding survey and the historic median.

This summer survey in the Mangatoki Stream in relation to the Inaha Water Supply filter backwash discharge indicated that the macroinvertebrate community at the 'impact' site was in poorer health compared with the upstream 'control' site, differences in habitat may account for differences between the two sites but discharges may also be having a negative effect.

References

Dunning KJ, 2001: Biomonitoring of the Mangatoki Stream in relation to the STDC Inaha water supply scheme, February 2001. Report KD47.

Fowles CR, 1999: Biomonitoring of the Mangatoki Stream in relation to the STDC Inaha water supply scheme, February 1999. Report CF180.

Fowles CR, 2007: Biomonitoring of the Mangatoki Stream in relation to the STDC Inaha water supply scheme, February 2007. Report CF414.

Fowles CR, 2012: Biomonitoring of the Mangatoki Stream in relation to the STDC Inaha water supply scheme, January 2012. Report CF542.

Hope KJ, 2005: Biomonitoring of two unnamed tributaries of the Mangatoki Stream following an unauthorised discharge of aluminium sulphate from the Inaha WTP, September 2005. Report KH027.

Moore SC, 1986: Freshwater biological surveys of the Mangatoki Stream in the vicinity of an intake structure for the Inaha rural water supply scheme, on 2 December 1985 and 27 March 1986. Internal Report, SM6.

Stark JD, 1985: A macroinvertebrate community index of water quality for stony streams. Water and Soil Miscellaneous Publication No. 87.

Stark, JD, 1998: SQMCI: a biotic index for freshwater macroinvertebrate coded-abundance data. NZJE Mar FW Res 32: 55-66.

Stark, JD; 1999: An evaluation of Taranaki Regional Council's SQMCI biomonitoring index. Cawthron Report No 472. 32pp.

Stark JD, Boothroyd IKG, Harding JS, Maxted JR, Scarsbrook MR, 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

Stark JD and Fowles CR, 2009: Relationships between MCI, site altitude, and distance from source for Taranaki ringplain streams. Stark Environmental Report No. 2009-01 47p.

TRC, 2017: Some statistics from the Taranaki Regional Council database (FWB) of freshwater macroinvertebrate surveys performed during the period from January 1980 to 1 October 2017.

To	S Cowperthwaite, Job Manager
From	B Jansma, Environmental Scientist
Document	2074295
Report No.	BJ311
Date	20 June 2018

Fish survey in the Otakeho Stream, in relation to the STDC water intake weir, March 2018

Introduction

South Taranaki District Council (STDC) hold resource consents in relation to several water supply schemes. The monitoring programmes for the weirs used by these schemes include fish monitoring of a selection of the weirs each year. The Otakeho Stream was monitored in the 2017-2018 monitoring period.

The relevant consent relating to the Otakeho Stream weir is as follows:

4826 To place, use and maintain a water intake structure and associated erosion protection structures, including upgrading the intake structure and construction of a new fish pass, on the bed of the Otakeho stream

A special condition of this consent states that the structure[s] which are the subject of this consent shall provide for the passage of fish to the satisfaction of the Chief Executive of the Taranaki Regional Council. It is to assess compliance with this consent condition that the current survey was undertaken.

The weir in the Otakeho Stream is 2m high, and used for water supply purposes. A fish pass was installed on the weir in 1999, but was extensively damaged by floods. An attempt to replace this fish pass led to the weir and intake structure being potentially compromised. As a result, STDC replaced much of the entire structure and installed a new fish pass in early 2011 (Photo 1). As required by consent, a Regional Council Freshwater Biologist was onsite to ensure rock placement in the pass was appropriate (Photo 2).

Photo 1 The upgraded Otakeho Stream weir, 6 May 2011.

Photo 2 TRC biologist placing rocks in the steepest section of the new fish pass

The Taranaki Regional Council has previously conducted several fish surveys in the Otakeho Stream, both upstream and downstream of the weir. The results are held in the Council database ESAM, and discussed in various reports referenced below. The surveys employed one of two methods – night spotting and electric fishing. Both methods have their advantages and disadvantages for determining fish populations. When all results are compiled from both survey methods it can provide comprehensive fish community data.

Methods

In this survey two sites were sampled, one site upstream of the weir and one site downstream of the weir. The sites were surveyed using the electric fishing method, which involved the use of a standard backpack electric fishing machine. A handheld stop-net was used to capture fish in the sampled reach, which were then collected in a bucket to be identified, length estimated and counted. Any fish that were observed but evaded capture were identified where possible and their length estimated. Downstream, a reach of approximately 15 metres was surveyed, while upstream a 150 metre reach was surveyed. This equated to approximately 950 m^2 being surveyed upstream and 53 m^2 being surveyed downstream. There was significantly more area surveyed upstream, as this site is also a part of the Council's State of the Environment Monitoring Programme for Freshwater Fish, which follows a more extensive monitoring protocol (Joy et al, 2013). This protocol required 150 m of stream length to be surveyed, with results recorded for each 15 m reach.

Details of the sites surveyed are given in Table 1and the location of sites surveyed in relation to the weir and fish pass are shown in Figure 1.

Table 1 Location of sites surveyed for fish in relation to the STDC weir on the Otakeho Stream

Stream	Site No.	Site code	Description	Distance Inland from sea (km)
Otakeho Stream	1	OTK000177	Downstream of STDC weir	21.3
	2	OTK000173	Upstream of STDC weir	21.4

Results

The results of the survey conducted in the Otakeho Stream on 21 March 2018 are presented in Table 2. Included in this table is a summary of results from previous surveys.

Both sites had similar habitat, with substrate dominated by boulder, with some cobbles and gravels present also. The water was clear and swift, with little to no slow and deep areas. The area of erosion observed in the previous survey (true left bank, immediately upstream of the weir) was still active at the time of the current survey. In terms of instream fish cover, this was dominated by boulders, with only some undercut bank and overhanging vegetation.

Figure 1 Location of sites surveyed in the Otakeho Stream in relation to the Waimate West Water Supply weir and fish pass, 21 March 2018

Table 2 Fish species recorded in the Otakeho Stream upstream and downstream of the Otakeho Stream Weir

Species	Downstream of weir (OTK000177)				Upstream of weir (OTK000173)			
	Number	Length range (mm)	Number/m^2	Previous surveys	Number	Length range (mm)	Number/m^2	Previous surveys
Longfin eel *Anguilla dieffenbachii*	1	250	0.0190	✓	4	182-365	0.0042	✓
Shortfin eel Anguilla australis	-	-	-	✓	-	-	-	
Redfin Bully *Gobiomorphus huttoni*	-	-	-	✓	-	-	-	

Species	Downstream of weir (OTK000177)				Upstream of weir (OTK000173)			
	Number	Length range (mm)	Number/m^2	Previous surveys	Number	Length range (mm)	Number/m^2	Previous surveys
Brown trout *Salmo trutta*	1	240	0.0190	✓	-	-	-	✓
Koaro *Galaxias brevipinnis*	4	62-167	0.0762	✓	38	62-194	0.0401	✓
Shortjaw kokopu *Galaxias postvectis*	-	-	-		-	-	-	✓
Torrentfish *Cheimarrichthys fosteri*	-	-	-	✓	-	-	-	
UID trout	-	-	-		1	220	0.0011	
UID galaxiid	-	-	-		-		-	
UID eel	-	-	-		2	-	0.0021	
No. of species	3	-	0.1143	6	3	-	0.0475	4

Table 3 Fish densities recorded in each 15 m reach (A to J) surveyed upstream of the weir, 21 March 2018

Species	Number/m^2										
	A	B	C	D	E	F	G	H	I	J	Range
Koaro *Galaxias brevipinnis*	0.0432	0.0571	0.0444	0.0333	0.0266	0.0190	0.0177	0.0933	0.0667	0.0222	0.0177-0.0933
Longfin eel *Anguilla dieffenbachii*	-	-	0.0333	0.0111	-	-	-	-	-	-	0.0111-0.0333
UID trout	-	-	-	-	0.0088	-	-	-	-	-	0.008
UID eel	-	-	-	-	-	0.0095	-	-	-	0.0111	0.0095-0.011

The previous survey, undertaken at night using the spotlighting technique, observed koaro out of the main flow, or in areas of slower deeper flow. In contrast, the current survey recorded koaro primarily in areas of very swift turbulent flow. Not only does this reflect the difference in sampling methodology, but also reflects the different habitat used by koaro at night versus during the day.

Discussion

Moderate species richness was recorded during the current survey, with three species recorded in total. Although this is low compared with downstream sites, it is not unexpected, as the altitude of the sites surveyed would restrict the fish populations to non-migratory species or those that are good climbers. The majority of species previously recorded downstream of the weir were recorded at lower altitudes, and some species would be expected at the weir only infrequently e.g. shortfin eel, torrentfish and redfin bully.

Prior to the upgrade to the weir and fish pass, surveys showed that there was a higher density of species such as koaro and brown trout downstream of the weir, when compared with upstream. The surveys undertaken after the upgrade works were completed (2012 and 2016) recorded a higher density of koaro upstream than downstream, indicating that the upgrade to the fish pass had improved fish passage. The current survey has recorded a higher koaro density downstream of the weir, when compared with the average density upstream. However, it must be acknowledged that the area surveyed downstream of the weir was much smaller, and when the upstream results are assessed as 10 separate reaches (Table 3), then the downstream koaro density is within the range recorded upstream.

Trout and longfin eels were recorded both upstream and downstream of the weir, but in densities too low to enable any conclusions. These species are unlikely to be particularly abundant at this altitude due to the frequent and severe flood events influencing recruitment and survival.

In 2012, a visual assessment of the weir found that the new fish pass was carrying too much water (Photo 1), and that passage would be optimised if flows down the pass were reduced. During the previous survey, it was found that the fish pass contained little to no flow, due to gravels aggregating at the inlet to the fish pass and effectively blocking it off. During the current survey, flow down the fish pass was adequate, and no remedial works were required.

With regard to whether the weir meets the fish passage requirements of consent 4826, there is no evidence to indicate that the weir presents a restriction to the passage of fish. Provided maintenance continues to ensure flows are optimised down the fish pass, then compliance is likely to be maintained.

Summary

On 21 March 2018, an electric fishing survey was undertaken at two sites in the Otakeho Stream, upstream and downstream of an STDC water intake weir. The purpose of the survey was to assess compliance with the fish passage condition of the consent held for this structure. STDC holds this consent.

From the results of this survey, there is no indication that the weir presents a restriction to the passage of fish. Three species were recorded in the current survey, the most abundant being koaro (*Galaxias brevipinnis*). Two other species were also recorded (brown trout and longfin eel), but not at densities that enabled any conclusions. The current survey found that koaro density downstream of the weir was within the range of that recorded upstream. This is follows the two previous surveys which both recorded a higher density upstream than downstream. These results indicate that the upgrade to the fish pass has resolved the possible restriction of fish passage suggested by pre-2012 surveys.

In 2012, a visual assessment of the weir found that the new fish pass was carrying too much water, and that passage would be optimised if flows down the pass were reduced. The previous (2016) survey found that the fish pass contained little to no flow, due to gravels aggregating at the inlet to the fish pass and effectively blocking it off. The current survey found flows down the pass to be adequate and close to optimum.

With regard to whether the weir meets the special condition of consent 4826, there is no evidence to indicate that the weir presents a restriction to the passage of fish. However, it is important that the consent holder continues to regularly inspect the weir, especially after large floods, to ensure optimum flows are maintained down the fish pass.

References

Hope K, 2005: Fish surveys conducted in the Cold Stream and Otakeho Stream in relation to STDC water supply weirs, March 2005. Memorandum to Maureen O'Rourke, 10 May 2005.

Jansma B, 2010: Fish survey in the Otakeho Stream, in relation to the STDC water intake weir, 2009. Report No. BJ111

Jansma B, 2013: Fish survey in the Otakeho Stream, in relation to the STDC water intake weir, May 2012. Report No. BJ184

Jansma B, 2016: Fish survey in the Otakeho Stream, in relation to the STDC water intake weir, April 2016. Report No. BJ280.

Joy, M., David, B.O. & Lake, M. 2013: New Zealand Freshwater Fish Sampling Protocols: Part 1-wadeable rivers and streams. Massey University, Palmerston North.

McDowall R.M., 2000: The Reed Field Guide to New Zealand Freshwater Fishes. Reed books, Reed Publishing (New Zealand) Ltd. 224pp.

McWilliam H, 2000: Fish surveys in the Mangawhero Stream, Otakeho Stream and Oaonui Stream in relation to STDC weirs for water takes, May 2000. Memorandum to G Stevens, 3 May 2000.

Rhys FG, Barrier DJ and Caskey D, 2002: Survey methodology for Shortjawed Kokopu (*Galaxias postvectis*) – standardised spotlighting techniques. Department of Conservation, Wellington, New Zealand.

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Document	2085610
Report No	BJ314
Date	09 Jul 2018

Fish survey in the Kapuni Stream in relation to the STDC water intake weir and fish pass, April 2018

Introduction

South Taranaki District Council (STDC) hold resource consents in relation to several rural water supply schemes. The monitoring programmes for these schemes include fish monitoring of a selection of the weirs each year. The programme for the 2017-2018 monitoring period included monitoring of the Kapuni Stream weir and intake. The consent relating to this weir is as follows:

7413-1 To erect, use and maintain a water intake structure on the bed of the Kapuni Stream, including temporary damming and diversion during construction at or about (NZTM) 1701447E-5630678N

A special condition of resource consent 7413 requires the consent holder to monitor and maintain the fish pass, to ensure it performs as designed and allows for the effective passage of fish. The purpose of this fish survey is to satisfy this condition.

The Kapuni Stream weir was installed in 2009 and is a relatively unique design, being intended to take much of the river flow. The pass was designed intended to provide for both climbing and swimming species. During installation, rocks were placed in the concrete, to provide for variation in flow and rest areas. The shape of the pass was dished to provide some deep water for swimming fish to use. Photo 1 shows the pass during installation.
However, most of the largest rocks had been sheared off by high flows, resulting in the bed of the fish pass being smooth over large areas. There has been no change to this, with the fish pass appearing much the same during the 2018 survey. This loss of the larger rocks is only likely to affect swimming species, as the edge of the fish pass was still suitable for climbing species.

Photo 1 The STDC fish pass being installed September 2009

Photo 2 The Kapuni Stream fishpass in October 2009 (top) and January 2014 bottom

The degree of impact on swimming species will be assessed and hopefully determined through subsequent monitoring.

There has been annual fish monitoring undertaken in the Kapuni Stream in relation to the Kapuni production station and Ballance sites downstream, and the results to date are summarised in Stark, 2018. These surveys have recorded a population impacted by numerous barriers to fish passage, although over the years, these barriers have been steadily remediated. The most recent works, completed on March 2014, were on the weir located beneath the railway line, located approximately 900m downstream of the STDC weir.

Photo 3 The fishpass showing where the large rocks have been sheared off (24 April 2018)

Figure 1 Sites sampled in the Kapuni Catchment, in relation to the STDC water intake weir and fish pass

Methods

The current survey was performed at four sites in the Kapuni Stream catchment on 24 April 2018. Details of the sites surveyed in the current survey are presented in Table 1, and their locations are shown in Figure 1.

Although originally programmed to use the spotlighting method, the flow conditions at the time precluded this methodology, as the water was too deep and swift. Instead, the sites were surveyed using the electric fishing method, which employed a Kainga EFM machine. Those fish captured were identified and counted, where possible. Inevitably, some fish eluded capture, although some were identified before reaching cover. The length of each fish was estimated, following which they were released. The results of this survey are presented in Table 2 together with the results of previous surveys.

In addition, some observations were made regarding the habitat present at the sites surveyed.

Table 1 Location and description of fish monitoring sites in relation to the Hawera Water Treatment Plan weir and intake

Site	Site code	Site description	Grid reference	Distance to coast (km)	Approximate Altitude (m)
1	KPN000150	Kapuni Stream – Opunake Road	1699404-5640264	32.8	380
2	KPN000275	Kapuni Stream – 60m upstream of STDC weir	1701438-5630711	19.1	190
3	KPN000276	Kapuni Stream – 60m downstream of STDC weir	1701413-5630592	19.0	180
4	KON000293	Kapuni Stream – 1.6km downstream of STDC weir	1700872-5629404	17.5	160

Results and Discussion

The sites surveyed all included similar habitat, with the substrate comprising predominantly boulders and cobbles, with lesser proportions of gravels and sand. Sites 1 and 4 were partially shaded, while sites 2 and 3 were unshaded. Only sites 1 and 2 had any undercut bank while sites 2 and 4 had overhanging vegetation. Water clarity was good during this survey, with uncoloured and clear flow at all sites.

At the time of this survey, the recorded flow in the Kapuni Stream at Normanby Road was 1.57 cumecs, about 1.2 times median flow, or 4.5 times the mean annual low flow. Optimum flow conditions for fish surveys are usually during low flows, and as a result the current survey was somewhat impeded by the flow conditions.

The results for each site are summarised in Table 2.

Only one species was recorded at site 1, with only a slight improvement at sites 2, 3 and 4, with two species recorded. Only redfin bully were recorded both upstream and downstream of the weir, with shortfin eel recorded downstream of the weir, and longfin eel and brown trout recorded upstream of the weir. Freshwater crayfish were recorded at site 3 only, despite being recorded at all surveyed sites in the previous survey. The low species abundance was not surprising given the flow conditions at the time of the survey. It is likely more fish were present, but were inhabiting water that was unfishable due to water depth and speed. Furthermore, the altitude of the sites may have contributed to the low species abundance, as species abundance is highest at the coast, and decreases with altitude. For example, 89% of the torrentfish records in the National Freshwater Fish Database are from 180m above sea level or lower.

There are three primary aspects to monitoring fish communities in order to determine whether passage is provided for at a structure:

- Is there evidence of fish accrual below the structure?
- Is there a significant difference in species richness when comparing upstream and downstream communities?
- Is the size structure of the upstream communities indicative of an actively recruiting population?

Table 2 and Figure 3 indicate that there were more than twice as many fish downstream of the weir as immediately upstream of the weir, both in the current survey and in the previous survey completed in 2014. In 2014, the majority of these fish were eels, which would have had no problem migrating past the weir, indicating that this higher abundance was habitat related, rather than reflective of fish accrual. In the

current survey, redfin bully were more abundant immediately below the weir, but had an equal abundance as a site 1.6 km further downstream. This also suggests that this result is more related to the influence of habitat rather than the weir presenting a barrier. Although there were more redfin bully recorded downstream than upstream, the relative abundance was low at all sites, and therefore no firm conclusions can be made. It is likely that the abundance of redfin bully in this reach had been reduced by downstream barriers, such as the railway weir.

Although species richness was equal at sites 2, 3 and 4, the species richness downstream of the weir was higher in terms of native species. However, these differences in species richness does not provide any indication that there the weir presents a barrier to fish passage, as it is likely flow conditions at the time of the survey, altitude and other barriers downstream have contributed to this reduced richness. Previous surveys have recorded koaro further upstream, and it is likely that this species is still present in that area.

Due to the low numbers recorded, it is not possible to draw any conclusions from the size class data. However, the previous survey recorded juvenile koaro and longfin eel upstream of the weir, indicating that these species are recruiting. The presence of a redfin bully above the weir in the current survey supports that conclusion.

Table 2 Fish species and abundance recorded during the current survey.

		Upstream of weir		Downstream of weir	
Site:		**Site 1**	**Site 2**	**Site 3**	**Site 4**
Area fished (m^2):		**30**	**30**	**30**	**30**
Longfin eel (*Anguilla dieffenbachii*)	Number	-	1	-	-
	Length range (mm)	-	300	-	-
Shortfin eel (*Anguilla australis*)	Number	-	-	-	1
	Length range (mm)	-	-	-	380
Unidentified eel	Number	-	-	1	-
	Length range (mm)	-	-	300	-
Redfin bully	Number	-	1	3	3
	Length range (mm)	-	55	70-80	50-60
Koaro (*Galaxias brevipinnis*)	Number	-	-	-	-
	Length range (mm)	-	-	-	-
Brown trout	Number	1	-	-	-
	Length range (mm)	100	-	-	-
Unidentified trout	Number	-	-	-	-
	Length range (mm)	-	-	-	-
Crayfish	Number	-	-	1	-

	Upstream of weir		Downstream of weir	
Site:	**Site 1**	**Site 2**	**Site 3**	**Site 4**
Area fished (m^2):	**30**	**30**	**30**	**30**
Total number of species	1	2	2	2
Total number of fish	1	2	4	4

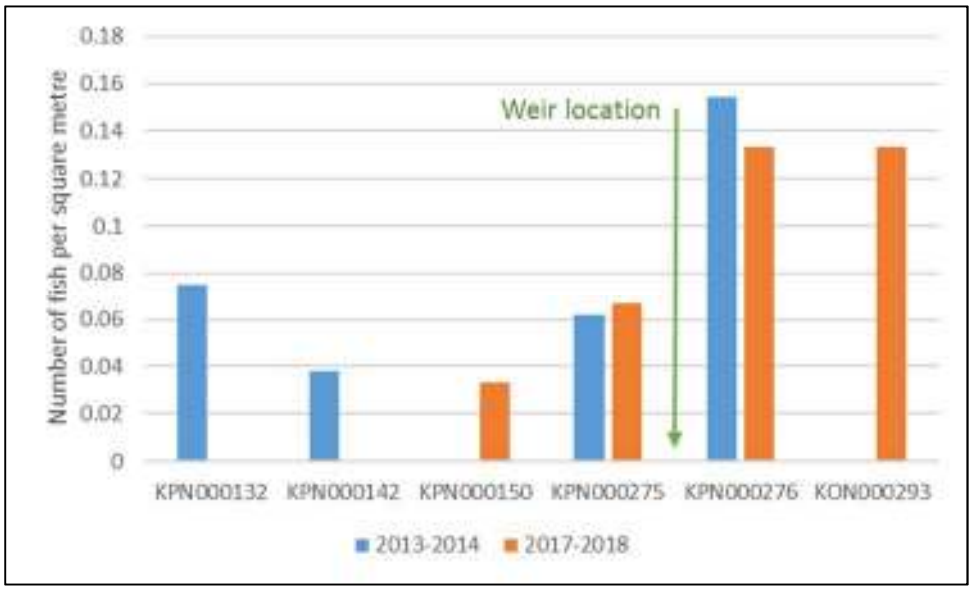

Figure 3 Number of fish per square metre recorded at each site, compared with previous results

Summary and Conclusions

A four site fish survey was undertaken in the Kapuni Stream on 24 April 2018, in order to determine whether the water intake structure on the bed of the Kapuni Stream effectively provided for fish passage. The fish communities were surveyed using the electric fishing technique, with all fish identified where possible, counted, and lengths estimated. It should be noted that fish migration in the Kapuni Stream may be impeded by other structures, although the railway weir, located approximately 900m downstream of the STDC weir, was remediated in late 2014.

There are three primary aspects to monitoring fish communities in order to determine whether passage is provided for at a structure:

- Is there evidence of fish accrual below the structure?
- there a significant difference in species richness when comparing upstream and downstream communities?
- Is the size structure of the upstream communities indicative of an actively recruiting population?

Four fish species were recorded during this survey, being longfin and shortfin eel, redfin bully and brown trout. Redfin bully were the most abundant species recorded, and they were also present at three of the four sites. However, overall abundances were low, reflecting the high flow conditions that affected the effectiveness of the survey.

Three of the four species recorded were recorded upstream of the intake weir, although only two were migratory (longfin eel and redfin bully). Although koaro were recorded in the previous survey, they are generally more abundant closer to the national park, and as such were not recorded in the current survey.

In addition, although the highest fish abundance was recorded downstream of the weir, this is considered to be a reflection of habitat variation, rather than fish accrual. This is because there was no difference in abundance at the site immediately downstream of the weir and the site 1.6 km downstream. This is consistent with that concluded in the previous (2014) survey. Juvenile koaro and small eels were recorded upstream of the weir in the previous survey. This, coupled with the presence of redfin bully upstream of the weir in the current survey, indicates that these species are actively recruiting.

Overall, due to the low numbers of fish recorded in the current survey, these results can only be used to provide an indication as to whether the weir presents a barrier to fish passage. The results of the current and previous survey do not indicate that the weir presents a barrier. It is worth considering employing the spotlighting technique in subsequent surveys, especially if those sites surveyed in 2014 are to be resurveyed. However, this will need to be done with consideration of flow conditions at the time.

The current survey frequency, being a four site survey completed every three years, is considered adequate, and it is recommended that this level of monitoring continue.

References

Jansma, B, 2015: Fish survey in the Kapuni Stream in relation to the STDC water intake weir and fish pass, January 2014. Report No. BJ252.

McDowall, RM, 2000: The Reed Field Guide to New Zealand Freshwater Fishes. Reed books, Reed Publishing (New Zealand) Ltd. 224pp.

Stark, JD, 2018: Kapuni Biomonitoring Electric-Fishing Survey (24 April 2018). Stark Environmental Report No. 2018-04, Nelson, New Zealand.