



CNIDWAU
Central North Island Drinking Water Assessment Unit



Report on Compliance with the Drinking-Water Standards for New Zealand 2005 (Revised 2008/18) and duties under Health Act 1956

For Period: 1st July 2018 to 30th June 2019

Water Supplies:

Gisborne City (GIS001)
Te Karaka (TEK002)
Whatatutu (WHA004)

Water Supplier:

Gisborne District Council

Central North Island Drinking Water Assessment Unit

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Report Identifier

GisborneDistrictCouncil_DWSNZ2005/18Compliance_100919_v1

Terminology and Abbreviations

Non-Compliance = Areas where the drinking water supply does not comply with the Drinking-Water Standards for New Zealand 2005 Revised 2008 and 2018 (DWSNZ).

CNIDWAU	Central North Island Drinking Water Assessment Unit
c.t	Contact time
DWA	Drinking Water Assessor
DWSNZ	Drinking-Water Standards for New Zealand 2005 (Revised 2008 and 2018)
DWO	Drinking Water Online
<i>E. coli</i>	<i>Escherichia coli</i>
FAC	Free Available Chlorine
FACE	Free Available Chlorine Equivalent
GDC	Gisborne District Council
MAV	Maximum Acceptable Value
MoH	Ministry of Health
MPN	Most Probable Number
The Act	Health (Drinking Water) Amendment Act 2007
WSP	Water Safety Plan
WTP	Water Treatment Plant

DWO Codes

Supply:	Gisborne City	GIS001
Source(s):	Mangapoike Dam No. 1	S00104
	Mangapoike Dam No. 2	S00105
	Te Arai River	S00106
	Waipaoa River at Waipaoa	S00107
Treatment Plant(s):	Waingake	TP00174
	Waipaoa	TP00175
Distribution zone(s):	Gisborne City	GIS001GI
	Gisborne Rural	GIS001RU
Supply:	Te Karaka	TEK002
Source(s):	Waipaoa River at Te Karaka	S00108
Treatment Plant(s):	Te Karaka	TP00176
Distribution zone(s):	Te Karaka	TEK002TE
Supply:	Whatatutu	WHA004
Source(s):	Mangatu River	S00109
Treatment Plant(s):	Whatatutu	TP00177
Distribution zone(s):	Whatatutu	WHA004WH

Purpose

The purpose of this report is to provide GDC with the results from the assessments carried out on their supplies under the following compliance standard and statute:

- The DWSNZ
- Part 2A of the Act.

The assessments are based on the information provided by GDC during the 2018/2019 Annual Survey.

Executive Summary

DWAs are required under section 69ZL of the Act to assess whether a drinking water supplier complies with the DWSNZ and specific sections of the Act. An assessment for the compliance period 1st July 2018 to 30th June 2019 has been undertaken by a DWA from CNIDWAU (Gisborne Branch). The final results of the assessment are detailed within this report.

This report aligns with the information entered in the MoH 'Annual Survey of Drinking Water Quality 2018-2019' which will populate the Minister of Health's 'Annual Report on Drinking Water 2018-2019'. The Minister's report will be publicly released during the 2019/2020 year.

The Gisborne Branch of the CNIDWAU gives deserved recognition to the hard work of the GDC water team, operators and contractors throughout the 2018/2019 year in working towards the delivery of a compliant supply of drinking water.

Summary of DWSNZ Compliance

Drinking water supplies

Full compliance with the DWSNZ and the Act for the 2018-2019 compliance year was achieved for

- Gisborne City supply

Partial compliance with DWSNZ and the Act for the 2018-2019 compliance year was achieved for

- Te Karaka supply
- Whatatutu supply

Treatment Plants

Plant name	Bacterial Compliance	Protozoa Compliance	Cyanotoxin Compliance	Chemical Compliance	Radiological Compliance	Overall Compliance
Waingake	✓	✓	✓	✓	N/A	✓
Waipaoa	✓	✓	✓	N/A	N/A	✓
Te Karaka	✓	✗	✓	N/A	✓	✓
Whatatutu	✓	✗	✓	N/A	✓	✓

Distribution Zones

Distribution zone name	Bacterial Compliance	Cyanotoxin Compliance	Chemical Compliance	Overall Compliance
Gisborne City	✓	N/A	✓	✓
Gisborne Rural	✓	N/A	✓	✓
Te Karaka	✓	N/A	N/A	✓
Whatatutu	✓	N/A	N/A	✓

Compliance with Duties in the Act

Section of the Act	Compliance	
69S: Duty of suppliers in relation to the provision of drinking water	✗	Achieved for Gisborne City supply and Whatatutu supply Not achieved for Te Karaka supply
69U: Duty to take reasonable steps to contribute to protection of source of drinking water	✓	Achieved for all supplies
69Z: Duty to prepare and implement a Water Safety Plan (WSP)	✓	Achieved for all supplies
69ZD: Duty to keep records and make them available	✓	Achieved for all supplies
69ZE: Duty to investigate complaints	✓	Achieved for all supplies

Summary of Ongoing Compliance Requirements

The purpose of this section is to give an overall summary for ongoing compliance and upcoming tasks for all supplies covered in this report. Every effort has been made by the DWA to make it complete, but please be aware that it is possible that some items/actions may have been missed and that compliance requirements may change, or be added to in future, depending on any changes to the source/supply/legislation etc.

Summary of key dates for all supplies

Date	Task	Supply
October 2019	Authorisation assessment of the calibration and verification of water quality monitoring equipment	
November 2019	WSP Revision and send summary of changes to DWA	Te Karaka
November 2019	WSP Implementation Audit	Whatatutu
Before Waipaoa brought online	Update WSP (UV process) and send summary of changes to DWA	Gisborne City
February 2020	WSP Implementation Audit	Gisborne City
May 2020	WSP Implementation Audit	Te Karaka
September 2022	WSP Revision and submission to DWA for re-approval	Gisborne City
September 2023	WSP Revision and submission to DWA for re-approval	Te Karaka
December 2022	WSP Revision and submission to DWA for re-approval	Whatatutu

Gisborne City supply

Treatment Plants – Bacterial Compliance

- Waingake WTP - Compliance criterion 2A of the DWSNZ has been nominated by GDC to achieve bacterial compliance in the 2019/20 compliance period, for water leaving the treatment plant, for the Gisborne City zone.
- Waingake WTP - Compliance criterion 1 of the DWSNZ has been nominated by GDC to achieve bacterial compliance in the 2019/20 compliance period, for water leaving the treatment plant, for the Gisborne Rural zone. *E. coli* monitoring is required to meet this criterion. GDC may wish to review this in future as the criterion 2A requirements have changed. In the current version of the DWSNZ, chlorine c.t value has to be at least 6, and a minimum retention of five minutes is required.
- Waipaoa WTP - Compliance criterion 1 of the DWSNZ has been nominated by GDC to achieve bacterial compliance in the 2019/20 compliance period for water leaving the treatment plant. *E. coli* monitoring is required to meet this criterion.
- To demonstrate ongoing bacterial compliance for the Gisborne City supply, treatment plant monitoring must be carried out in accordance with section 4.2 of the DWSNZ.

Treatment Plants – Protozoal Compliance

- Waingake WTP - Compliance requirements in section 5.4 and section 5.5 (when the clarifier is out of service) of the DWSNZ have been nominated by GDC to achieve protozoal compliance in the 2019/20 compliance period. Please be aware that the monitoring compliance period is one month.
- Waipaoa WTP - Compliance requirements in section 5.4 of the DWSNZ has been nominated by GDC to achieve protozoal compliance for the 2019/20 compliance period.

Treatment Plants – Cyanotoxin Compliance

- Management of the risk of cyanotoxins in the source waters for all supplies is to be carried out as per the management protocol for the Waingake supply.

Treatment Plants – Chemical Compliance

- Waingake WTP –Section 8 of the DWSNZ outlines the requirements to achieve chemical compliance in the 2019/20 compliance period for Fluoride (as a Priority 2a determinand).

Distribution Zones – Bacterial Compliance

- Gisborne City zone - Compliance criterion 6A of the DWSNZ has been nominated by GDC to achieve bacterial compliance in the 2019/20 compliance period. *E. coli* monitoring is required to meet this criterion.
- Gisborne Rural zone - Compliance criterion 6A of the DWSNZ has been nominated by GDC to achieve bacterial compliance in the 2019/20 compliance period. *E. coli* monitoring is required to meet this criterion.
- To demonstrate ongoing bacterial compliance in the Gisborne City supply, distribution zone monitoring must be carried out in accordance with section 4.3 of the DWSNZ.

Distribution Zones – Chemical Compliance

- To demonstrate ongoing chemical compliance a public warning regarding plumbosolvent water must be provided to all consumers of the Gisborne City supply at least twice a year as per section 8.2.1.4 of the DWSNZ.

Te Karaka and Whatatutu supply

10.2 Compliance requirements

Water suppliers must meet the following compliance requirements.

1. A DWA must have approved a WSP, and the supplier must be implementing the plan.
2. Appropriate bacterial, protozoal and chemical treatment, as determined from the catchment assessment in the WSP, must be in use (Table 10.1).
3. Water suppliers must monitor water quality and ensure it meets the requirements of section 10.4.
4. Water suppliers must undertake the remedial actions that have been specified in the water safety plan when a MAV is exceeded or treatment process controls are not met.

When the water supplier can show it has met these requirements, the supply will be deemed to comply with the DWSNZ, otherwise the compliance requirements for the supply revert to those in sections 4 and 5 and 7–9.

Cyanotoxin

- Management of the risk of cyanotoxins in the source waters for all supplies is to be carried out as per the WSP for each supply.
- It is expected GDC will advise the DWA if the source water supplying any supply experiences algal blooms.

Other

- The Gisborne City supply is required to have an approved and implemented WSP (in accordance with section 69Z of the Act).
- An approved and implemented WSP (in accordance with section 69Z of the Act) is mandatory to comply with section 10 DWSNZ.
- Ensure that GDC can demonstrate that all of their duties as a drinking water supplier under the Act are being met at all times.

Authorisation of Analysts

Subsections 69ZL(e) and (f) and 69ZP of the Act establish the functions of a DWA to assess, authorise and verify that a person has sufficient competency for the purposes of complying with the Act, DWSNZ or WSP. The assessment and authorisation process is necessary to verify that:

- the individual(s) who are to undertake the analyses and/or testing are competent to accurately and reliably undertake the relevant activities and/or
- the drinking water supplier's calibration and analysis procedures are undertaken in accordance with the requirements of the DWSNZ and the equipment manufacturer's instructions.

An Authorisation of Analysts' (Scope 2) assessment is programmed to be carried out with the GDC in November 2019. Authorisation was previously granted and is valid until the end of 2019.

Treatment Plant Compliance

The following compliance information is derived from GDC and DWO. Other compliance information is derived from CNIDWAU records.

Treatment Plant: Bacterial Compliance

Bacterial compliance is under section 4 of the DWSNZ.

Summary of section 4.2.2: Compliance criterion 1 for water leaving the treatment plant

Water leaving the Waingake WTP, supplying the Rural Zone, is assessed under criterion 1. GDC have opted for this criterion, as criterion 2A, in the previous version of the DWSNZ required 30 minutes contact time to achieve. GDC could not demonstrate 30 minutes contact time at high flows and low reservoir levels. GDC may wish to review the criterion, as criterion 2A requirements have changed.

Summary of sampling results

Plant name	Number of samples required	Number of samples collected <i>E. coli</i>	Number of samples positive <i>E. coli</i>	Number of samples collected Total coliforms	Number of samples positive Total coliforms	Compliance with other requirements	Overall Compliance
Waingake (for rural zone) (TP00174)	104	126	0	126	1 1 MPN	✓	✓
Waipaoa (TP00175)	13	13	0	13	0	✓	✓
Te Karaka (TP00176)	DWO = 4 WSP = 4	25	0	25	0	✓	✓
Whatatutu (TP00177)	DWO = 4 WSP = 0	27	0	27	2 (range 4-870*)	✓	✓

* Total coliforms high on 8/8/2018. Supply retested on 13/8/19 - result = 0

Summary of compliance with sampling / analytical / remedial / operational requirements

Compliance was achieved for the WTP's listed above for the following criteria of the DWSNZ:

Section 4.2

1. The water leaving each WTP was monitored for *E. coli* at a frequency greater than required.
2. No *E. coli* was found.
3. The applicable sampling and analytical requirements in sections 4.2.6.2, 4.2.7.1 and 4.2.8.1 were met (see below).
4. Requirements for remedial action for *E. coli* (or equivalent) were met as no *E. coli* was detected in any sample.

Section 4.2.6.2

- GDC have procedures that outline the aseptic collection of *E. coli* samples.
- GDC have procedures to ensure timing, transport and temperature requirements are met.
- A MoH recognised laboratory was used: Linneaus.
- An MPN method was used to enumerate for both Total Coliforms and *E. coli*

Section 4.2.7.1

- *E. coli* samples are collected from water leaving the reservoirs.

Section 4.2.8.1

- Maximum days between sample requirements were met.
- Minimum days of the week used for sampling requirements were met.

Section 4.2.9

- No transgressions occurred.

Summary of section 4.2.2: Compliance criterion 2A for water leaving the treatment plant

Plant name	Treatment Parameter	Requirements in DWSNZ	Summary of monitoring results	Compliance
Waingake (for Gisborne City zone) (TP00174)	Turbidity	Daily 95% samples <1NTU No sample >2 NTU	Daily 95% samples <1NTU No sample >2 NTU	✓
	FACE* ¹	Daily 98% of samples ≥ 0.2mg/L	Daily 98% of samples ≥ 0.2mg/L	✓

Summary of compliance with sampling / analytical / remedial / operational requirements

Compliance was achieved for the following criteria of the DWSNZ:

Section 4.3.2.1

1. The applicable sampling and analytical requirements in sections 4.2.6 and 4.2.7 were met (see below).
2. FAC, pH and turbidity are measured continuously. The requirements of section 3.2 & 4.2.8.2 - 4.2.8.4 were met (see below).
3. Monitoring requirements for FACE*¹ were met. Retention time is greater than five minutes.

Section 4.2.6: Compliance sampling and analytical requirements

Section 4.2.6.1: General

- Standardisation and quality assurance procedures were assessed by the DWA; GDC was authorised in 2016.
- Records provided showed verifications and calibrations² were carried out as required.

Section 4.2.7.2: Disinfectants

- FAC and pH monitoring are taken as the water leaves the reservoir. This is after the five minutes minimum retention.

Section 4.2.8.2: FAC disinfection

- FAC is continuously monitored
- Continuous monitors met section 3.2 requirements (see below)

Section 4.2.8.3: pH

- pH is continuously monitored
- Continuous monitors met section 3.2 requirements (see below)

Section 4.2.8.4: Turbidity

- Turbidity is continuously monitored
- Continuous monitors met section 3.2 requirements (see below)

3.2 Continuous monitoring requirements

1. (a) One minute measurements are made for:
 - i. Turbidity
 - ii. Differential pressure
 - iii. Flow(b) Five minute measurements are made for:
 - i. Chlorine concentration
 - ii. pH
2. Continuous monitors were standardised as required. An alarm is installed on all compliance meters.

¹ DWA agreed FACE reported and analysed, as opposed to c.t. value, for this compliance year. FACE ≤ 0.2mg/L meets DWSNZ c.t requirements.

² Calibration of the online turbidity meters did not strictly meet the DWSNZ requirements. Late arrival of Thermofisher and a scheduling error resulted in a four month gap. Primary calibrations were done in August 2018, December 2018, April 2019 and June 2019. Discretion was given by the DWA.

3. The monthly reports supplied to the DWA show no non-compliant water was delivered to customers.
4. Turbidity monitors are independent.

Treatment Plant: Protozoa Compliance

Protozoal compliance is under section 5 of the DWSNZ. The compliance criteria for protozoa are based around the probability the treatment process will have inactivated or removed any protozoa present.

Source water from surface catchments

The default requirement for protozoa in surface waters is 3-log inactivation or removal. WSP's include an assessment of the catchment; if this indicates that 4-log credits may be required, *Cryptosporidium* monitoring is needed. *Cryptosporidium* monitoring is not required if the water supplier elects to provide 4 log credits.

Log credit Assessment

Plant Name	Protozoal Risk Category	Log Credit Required
Waingake	Water from forest, bush, scrub or tussock catchments with no agricultural activity	3*
Waipaoa	Water from pastoral catchment that always has low concentrations of cattle, sheep, horses or humans in immediate vicinity or upstream	3*
Te Karaka	Water from pastoral catchment that always has low concentrations of cattle, sheep, horses or humans in immediate vicinity or upstream	4
Whatatutu	Water from pastoral catchment that always has low concentrations of cattle, sheep, horses or humans in immediate vicinity or upstream	4

*Determined from 5 yearly *Cryptosporidium* monitoring

Log Credit Assessment

Summary of Treatment Processes and associated Log Credits

WTP Name	Treatment Process ¹	Potential Log Credit Available	Summary of Turbidity results	Compliance with all other requirements of DWSNZ criterion ²	Log credit achieved	Compliance
Waingake	Coagulation, sedimentation and filtration	3	Compliant	✓	3	✓
Waingake	Coagulation direct filtration Enhanced filtration – combined filter performance (October)	3	Compliant	✓	3	✓
Waipaoa	Coagulation, sedimentation and filtration	3	Compliant	✓	3	✓
Te Karaka	Coagulation direct filtration UV	5.5	Compliant	x	0	x
Whatatutu	Coagulation direct filtration UV	5.5	Compliant	x	2.5	x

¹Treatment Process meeting DWSNZ definition of available combination of treatment technology

² Further detail provided below

Summary of compliance with sampling / analytical / remedial / operational requirements

Waingake (TP00174) – Protozoa compliance was achieved.

Section 5.4: Coagulation, sedimentation and filtration

5.4.1 Log credit assessment

1. (a) Filtration is of a rapid granular media design.
- (b) All water passes through the process
- (c) The monitoring requirements of section 5.4.2 are met (see below)
- (d) Measurements of turbidity of the water leaving each filter met the following requirements
 - i) The turbidity does not exceed
 - A. 0.30 NTU for more than 5% of the time over the compliance monitoring period.
 - B. 0.50 NTU for more than 1% of the time over the compliance monitoring period.
 - C. 1.0 NTU for the duration of any 3 minute period.

5.4.2 Monitoring

1. The turbidity of the water leaving each filter is measured as required.
3. Requirements of section 3.2 are met.

3.2 Continuous monitoring requirements (see bacteriological section, pg. 7)

5.7 Combined filter performance

Further requirements to achieve an extra 0.5 log credit when the clarifier was off line in October 2018 are as follows:

5.7.1 Log credit assessment

Measurements of turbidity of the water leaving each filter met the following requirements

The turbidity measurements of the filtrate from the combined filters must not exceed:

- a. 0.15 NTU for more than 5% of the time over the compliance monitoring period.
- b. 0.30 NTU for more than 1% of the time over the compliance monitoring period.
- c. 0.5 NTU for the duration of any 3 minute period.

Waipaoa (TP00175) – Protozoa compliance was achieved.

Section 5.4: Coagulation, sedimentation and filtration

5.4.1 Log credit assessment

1. (a) Filtration is of a rapid granular media design.
- (b) All water passes through the process.
- (c) The monitoring requirements of section 5.4.2 are met.
- (d) Measurements of turbidity of the water leaving each filter met the following requirements
 - i) The turbidity does not exceed
 - A. 0.30 NTU for more than 5% of the time over the compliance monitoring period.
 - B. 0.50 NTU for more than 1% of the time over the compliance monitoring period.
 - C. 1.0 NTU for the duration of any 3 minute period.

5.4.2 Monitoring

1. The turbidity of the water leaving each filter is measured as required.
3. Requirements of section 3.2 are met.

3.2 Continuous monitoring requirements (see bacteriological section, pg 7)

Te Karaka (TP00176) – Protozoa compliance was not achieved.

Section 5.5: Coagulation, Direct filtration - not able to gain log credits

GDC advised on 2/7/2019 there had been no coagulation dosing at the treatment plant. The filtration process at Te Karaka requires coagulation dosing to gain log credits.

Section 5.16: Ultraviolet light disinfection - Did not meet all requirements

Section 5.16: Ultraviolet Light Disinfection - Requirements not met

5.16.1 Log credit assessment

3. Measurements of UVI met the requirements
 - a. In May 2019 and June 2019 there was a period greater than three minutes, when the UVI measured < 80% of 17.4 W/m².

5.16.3 Monitoring

Water suppliers must install an alarm to alert the operator in the event of the parameter being outside the range of its validated limits. GDC advised there is an alarm on the UVI meter. The alarm failed to alert the operator the UVI was not providing the required dose, for a period of three minutes, in May 2019 and June 2019. This appears to have happened when the duty UV unit was changed. This matter is being investigated by GDC against procedural process.

Section 5.16: Ultraviolet light disinfection - Requirements met

5.16.1 Log credit assessment

1. The UV irradiance, measured by the UV intensity meters (UV sensor) for the two UV units, was not less than:
 - a. The value established by validation required to achieve the claimed log credit for more than 5% of the monitoring period.
 - b. The water entering the reactor met the following turbidity requirements:
 - i. For continuous monitoring the turbidity did not exceed
 - A. 1.0 NTU for more than 5% of the monitoring period.
 - B. 2.0 NTU for any 3 minute period.
 - ii. Three samples were between 80% and 90% UV Transmittance. All others were over 90% UV Transmittance.
- (2) The equipment was operated within the validated flow range of <3 l/sec.

5.16.2 Validation

Filtrec advised the UV is validated for 3 l/s @ 80% UV Transmittance. At 3 l/s the UV Intensity has to be above 17.4 W/m². Provided it is above this value and the flow does not exceed 3 l/s then the unit is providing a guaranteed min dose of 40 mJ/cm². This meets DWSNZ compliance requirements.

5.16.3 Monitoring

1. The monitoring requirements were met
 - Total flow is continuously monitored.
 - A flow restrictor is in place for each UV reactor.
 - Turbidity is monitored continuously, online.
 - UVI is measured continuously.
 - UVT is measured daily (weekly monitoring is required).
 - Lamp replacement hour meter is continuously monitored and recorded daily.
 - Lamp outage is monitored continuously. UVI is alarmed.
2. The standardisation and replacement met the requirements
 - a. Duty sensors
 - i. Standardisation of the duty sensor is done monthly.
 - ii. A reference sensor is used.
 - b. Reference sensor
 - i. The reference sensor replaces a duty sensor after 12 months and a new sensor is purchased for standardisation purposes.

Whatatutu (TP00177) – Protozoa compliance was not achieved.

Section 5.5: Coagulation, direct filtration - All applicable requirements met

5.5.1 Log credit assessment

1. Filtration is of a rapid granular media design.
2. Measurements of turbidity met the following requirements
 - (a) For continuous monitoring the turbidity does not exceed
 - i. 0.30 NTU for more than 5% of the time over the compliance monitoring period.
 - ii. 0.50 NTU for more than 1% of the time over the compliance monitoring period.
 - iii. 1.0 NTU for the duration of any 3 minute period.

5.5.2 Continuous monitoring requirements

1. Turbidity is measured at the required frequency – continuous measurements are made every minute, manual measurements are made daily.
3. Requirements of section 3.2 are met for continuous monitoring (see below).
5. The compliance monitoring period is one month for continuous monitoring and one year for manual monitoring.

3.2 Continuous monitoring requirements

1. (a) One minute measurements are made for:
 - i. Turbidity
 - ii. Differential pressure
 - iii. Flow
- (b) Five minute measurements are made for:
 - i. Chlorine concentration
 - ii. pH
2. Continuous monitors were standardised² as required. An alarm is installed on all compliance meters.
3. The monthly reports supplied to the DWA show no non-compliant water was delivered to customers.
4. Turbidity monitors are independent.

Section 5.16: Ultraviolet light disinfection - Did not meet all requirements

Section 5.16: Ultraviolet light disinfection - Requirements not met

Log credit assessment

1. UV irradiance, measured by the UV intensity meters (UV sensor) for the two UV units, **was less than:**
 - b. 80 percent of the value (established by validation) required for the claimed log credit for the duration of any three-minute period. There was a period in both May 2019 and June 2019 when the UVI measured < 80% of 20.3 W/m² for greater than three minutes.

5.16.3 Monitoring

Water suppliers must install an alarm to alert the operator in the event of the parameter being outside the range of its validated limits. GDC advised that there is an alarm on the UVI meter. The alarm failed to alert the operator that the UVI was not providing the required dose, for a period of three minutes, in May 2019 and June 2019. This appears to have happened when the duty UV unit was changed. This matter is being investigated by GDC against procedural process.

Section 5.16: Ultraviolet light disinfection - Requirements met

5.16.1 Log credit assessment

2. The UV irradiance, measured by the UV intensity meters (UV sensor) for the two UV units, was not less than:
 - a. The value established by validation required to achieve the claimed log credit for more than 5% of the monitoring period.
 - b. The water entering the reactor met the following turbidity requirements:
 - ii. For continuous monitoring the turbidity did not exceed
 - A. 1.0 NTU for more than 5% of the monitoring period.
 - B. 2.0 NTU for any 3 minute period.
3. a. ii. Three samples were between 80% and 90% UV Transmittance. All others were over 90% UV Transmittance.

(3) The equipment was operated within the validated flow range of <3 l/sec.

5.16.2 Validation

GDC advised the UV is validated for 9 m³/hr @ 85% UV Transmittance. At 9 m³/hr the UV Intensity has to be above 20.3 W/m². Provided it is above this value and the flow does not exceed 9 m³/hr then the unit is providing a guaranteed min dose of 40 mJ/cm². This meets DWSNZ compliance requirements.

² See footnote 2 on page 7

5.16.3 Monitoring

3. The monitoring requirements were met
 - Total flow is continuously monitored.
 - A flow restrictor is in place for each UV reactor.
 - Turbidity is monitored continuously, online.
 - UVI is measured continuously.
 - UVT is measured daily (weekly monitoring is required).
 - Lamp replacement hour meter is continuously monitored and recorded daily.
 - Lamp outage is monitored continuously. UVI is alarmed.
4. The standardisation and replacement met the requirements
 - a. Duty sensors
 - i. Standardisation of sensor is done monthly.
 - ii. A reference is used.
 - b. Reference sensor
 - ii. The reference sensor replaces a duty sensor after 12 months and a new sensor is purchased and a new sensor is purchased for standardisation purposes.

Treatment Plant: Cyanotoxin Compliance

Cyanotoxin compliance is under section 7 of the DWSNZ

Summary of Management Protocol Compliance

Waingake (TP00174) – GDC have developed a protocol that was approved by the DWA in 2012. No evidence of cyanobacteria bloom was found in the source water for the period of 1 July 2018 to 30 June 2019.

Waipaoa (TP00175) – The source water for this drinking water supply has not previously been identified as experiencing algal blooms.

Te Karaka (TP00176) – Based on the relatively consistent turbidity results from this bore and the criteria stated within DWSNZ2005/18, the DWA does not consider this to be applicable to the source bore.

Whatatutu (TP00177) – The source water for this drinking water supply has not previously been identified as experiencing algal blooms.

GDC are expected to advise the DWA if cyanobacteria or cyanotoxins are found in the source water supplying any of their treatment plants.

Treatment Plant: Chemical Compliance

Chemical compliance is under section 8 of the DWSNZ.

Priority 2 Determinands: Monitoring Results

Plant Name	Priority 2 Determinands	No. of samples required	No. of samples taken	Transgressions	Compliance
Waingake	Fluoride	52	52	0	Compliant
Waipaoa	No Priority 2 Determinands assigned				
Te Karaka	No Priority 2 Determinands assigned				
Whatatutu	No Priority 2 Determinands assigned				

Priority 2 Determinands: Summary of compliance with general sampling/ remedial actions / analytical requirements - Waingake (TP00174)

8.2 Compliance criteria

8.2.1.1 General

1. Sampling and analytical techniques comply with DWSNZ. The referee method is used - Ion selective electrode. Testing is undertaken by Watercare Services Ltd, a MoH recognised laboratory.
2. No samples were above the MAV.

8.3 Monitoring

8.3.1 Sampling sites: Samples are collected in the distribution zone as the concentration is unlikely to change during distribution.

8.3.5 Procedures: GDC have procedures for sample collection and storage, testing and reporting.

8.3.6 Testing: Testing is undertaken by Watercare Services Ltd, a MoH recognised laboratory.

8.4 Transgressions and remedial actions

- No samples were above the MAV.

<p style="text-align: center;">Treatment Plant: Radiological Compliance</p>
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Radiological compliance is under section 9 of the DWSNZ

Radiological compliance is not applicable to surface or shallow groundwater that is considered to be the equivalent of surface water.

Distribution Zones

The following compliance information is derived from GDC and DWO. Other compliance information is derived from CNIDWAU records.

Distribution Zone: Bacterial Compliance

Bacterial compliance is under section 4 of the DWSNZ.

Summary of Section 4.3.1 Compliance criterion 6A for drinking-water in a distribution zone

Distribution zone name	Number of samples required <i>E.coli</i>	Number of samples collected <i>E.coli</i>	Number of transgressions <i>E.coli</i>	Number of samples collected Total coliforms	Number of samples positive Total coliforms	Compliance with other requirements	Overall Compliance
Gisborne City	112	136	0	13	3 (range 1-23)	yes	✓
Gisborne Rural	52	57	0	136	1 (1)	yes	✓
Te Karaka	4	12	0	25	0	yes	✓
Whatatutu	4	12	0	27	0	yes	✓

Summary of compliance with general sampling / analytical / remedial action requirements

Section 4.4.1

1. Water in the distribution is monitored for the presence of *E. coli*.
2. The sampling sites and frequency met section 4.3.3 and 4.3.4 requirements (see below).
3. *E. coli* was not detected in any sample.
4. The sampling and analytical procedures comply with section 4.2.6.

Section 4.3.3

- Sampling is undertaken to a plan that provides a wide coverage of the distributions. The sampling points have been agreed with the DWA.

Section 4.3.4

- Sampling frequencies met or exceeded requirements.
- Maximum days between samples were met.
- Minimum days of the week used for sampling.

Section 4.2.6: Compliance sampling and analytical requirements

Section 4.3.6.1: General

- Persons performing analyses or calibration have been assessed by the DWA; GDC was authorised in 2016. Reassessment is due in 2019.
- Procedures for sample collection and storage, testing and reporting are appropriate.
- Referee methods in Appendix 2 were followed.

Section 4.2.6.2

- GDC have procedures that outline the aseptic collection of *E. coli* samples
- GDC have procedures to ensure timing, transport and temperature requirements are met.
- A MoH recognised laboratory was used: Linneaus.
- An MPN method was used to enumerate for both Total Coliforms and *E. coli*

Section 4.3.6 Remedial actions involving criteria 6A

- No *E.coli* was found in any sample.

Distribution Zone: Cyanotoxin Compliance

Cyanotoxin compliance is under section 7 of the DWSNZ.

No cyanotoxins are assigned to GDC distribution zones.

Distribution Zone: Chemical Compliance

Chemical compliance is under section 8 of the DWSNZ.

No Priority 2 determinands are assigned to GDC distribution zones.

Plumbosolvent

A Plumbosolvent water warning/public notice was provided to all consumers at the specified frequency during the compliance period – published in the newspaper and featured on the GDC website.

Summary of Distribution Zone Compliance 2018 – 2019

Distribution zone name	Bacterial Compliance	Cyanotoxin Compliance	Chemical Compliance	Overall Compliance
Gisborne City	✓	N/A	✓	✓
Gisborne Rural	✓	N/A	✓	✓
Te Karaka	✓	N/A	N/A	✓
Whatatutu	✓	N/A	N/A	✓

Summary of Audit Activities to Verify DWSNZ Monitoring Data

Data verification activities were completed during the Ministry of Health's annual drinking water survey. Sampling results for the GDC's water supplies is collated in DWO. In addition, monthly plant monitoring reports for compliance with bacteriological and protozoan requirements, were received for all treatment plants. These are generated from SCADA data. Where non compliances were identified, GDC provide SCADA printouts, diary notes and event notification forms if applicable. These are reviewed by the DWA and any queries are addressed to the utilities manager and senior water treatment plant operator at GDC.

Information provided to the DWA was reviewed and compared to information provided in DWO. Further information was requested where required to enable the DWA to make a decision on compliance.

Assessment of Compliance with Duties of drinking-water suppliers under the Act

The duties of the water supplier under the Act have all been met for the Gisborne City and Whatatutu supplies.

The duty of the water supplier under the Act, in relation to the provision of drinking water was not met for the Te Karaka supply.

Section 69S – Duty of suppliers in relation to the provision of drinking water	Met for Gisborne City and Whatatutu supplies Not met for Te Karaka supply.
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This decision is based on the following:

GDC advised (26/7/2019) that the Te Karaka supply was interrupted for >8 hours for planned works between 22/11/18 and 23/11/19. GDC did not seek approval from the Medical Officer of Health, as they thought this was not required, as the supply is a top-up supply. However, the Act requires the supplier to ensure that there is an adequate supply of drinking water provided at the 'point of supply' which is the toby.

Section 69U – Duty to take reasonable steps to contribute to protection of source of drinking water	Met for all GDC supplies
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This decision is based on the following:

- GDC is a member of the Drinking Water Joint Working Group for Tairāwhiti
- GDC is a unitary authority. Regular quarterly water meetings are held with the regional arm of GDC along with the DWA

GDC have advised (26/7/2019) of the following actions to show compliance with 69U of the Health Act:

- Tairāwhiti Plan Rules and consent controls for discharges to land to water generally – (on-site wastewater, land drainage, horticultural and intensive farming).
- Desludging of Te Karaka sewage oxidation pond to land disposal June-July 2019 to improve pond retention time leading to optimal effluent solid removal prior to any discharge to Waipaoa River upflow of Waipaoa WTP intake.
- Consent controls for forestry harvest and replanting for sedimentation control, slash control and land stability.
- GDC Regional Soil and Water Conservation Teams - Promotion of riparian planting on farmland for improved natural water quality.
- Annual chemical screens for the source waters for all supplies was completed June 2019.
- GDC managed pest control within existing Controlled Catchment Areas (GDC Water Supply Bylaw 2015).
- Cryptosporidium monitoring for the combined source water at Waingake.
- Feral animal culling in the controlled catchments.
- Improving and maintaining fencing around water supply dams.
- Raw water pipeline risk identification and planning for protection works.
- Repairs on Clapcott Dam wall April 2019.

Section 69Z – Duty to prepare and implement water safety plan	Met for all GDC supplies
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This decision is based on the following:

GDC currently have an approved WSP for all supplies.

Section 69ZD – Duty to keep records and make them available	Met for all GDC supplies
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This decision is based on the following:

The decision to acknowledge that this duty has been met is based on the ability of GDC to retrieve records and the records supplied to the DWA on a regular basis for WTP and reticulation monitoring.

Section 69ZE – Duty to investigate complaints	Met for all GDC supplies
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This decision is based on the following:

GDC has a council-wide system to record and manage complaints. GDC advised (26/7/2019) that no complaints about water quality or wholesomeness were received during reporting period.

Administration

The results in this report relate only to the compliance of the above listed WTP's and distribution zones.

For Large Network Supplies

Please be aware that under the Act, the Gisborne City supply falls into the category of a large drinking water supply. Therefore the legal requirement to take all practicable steps to comply with the DWSNZ applied from 1 July 2012.

For Small Network Supplies

Please be aware that under the Act, the Te Karaka and Whatatutu supplies fall into the category of a small drinking water supply. Therefore the legal requirement to take all practicable steps to comply with the DWSNZ applied from 1 July 2015.


Information in this report may be provided to the MoH at their request. With the exception of the MoH, this report shall not be reproduced without the approval of the CNIDWAU and GDC.

Completed 19 September 2019



Cathy Walker
Drinking Water Assessor
Central North Island Drinking Water Assessment Unit-Gisborne Branch

Assessment Report Information

Report identifier	GisborneDistrictCouncil_DWSNZ2005/18Compliance100919_v1
Drinking Water Assessment Unit (Inspection Body)	Central North Island Drinking Water Assessment Unit Gisborne Branch Population Health Private Bag 7001, Gisborne Phone: 06 869 1311
Drinking Water Assessor	Cathy Walker
Assessment Date	July – August 2019
Description of assessment work	Assessment of Compliance with Drinking Water Standards for New Zealand 2005 (Revised 2018) for Supplies: Gisborne City (GIS001); Te Karaka (TEK002); Whatatutu (WHA004) Sources: (Mangapoike Dam No. 1 (S00104), Mangapoike Dam No. 2 (S00105), Te Arai River (S00106), Waipaoa River at Waipaoa (S00107), Treatment Plants: Waingake (TP00174), Waipaoa (TP00175), Te Karaka (TP00174); Whatatutu (TP00175) Distribution Zones: Gisborne City (GIS001GI), Gisborne Rural (GIS001RU); Te Karaka (TEK002TE); Whatatutu (WHA004WH).
Equipment Used	Drinking Water Online (DWO) (v1.0.19196.2)
Water Supply Owner / Person Responsible	Gisborne District Council Chris Hopman (Team Leader 4 Waters)
Assessment method	Standard assessment as per Scope 1A Procedure Drinking Water Standards for New Zealand 2005 (Revised 2008/18)
Documents and Information	Heath act 1956 Drinking Water Standards for New Zealand 2005 (Revised 2008/18)
Site of Assessment	Central North Island Drinking Water Assessment Unit Gisborne Branch
Omissions from proposed assessment	Nil
Sub-contracted work	Nil
Document checked by:	Reynold Ball Drinking Water Assessor Date: 30/10/2019
Release of report authorised by:	Cathy Walker Drinking Water Assessor Signature:  Date: 01/10/2019

If you do not agree with the findings of this report a written appeal must be lodged with the Technical Manager, **Peter Wood, Central North Island Drinking Water Assessment Unit, C/- MidCentral Public Health Service, Private Bag 11036, Palmerston North 4442**, within 2 months of receipt of this report. The Technical Manager will arrange for a review to be undertaken using the Ministry of Health appeals procedure.