

Consent Name	Ngaruawahia Wastewater Treatment System
Consent	119642
Year	1 July 2013 – 30 June 2014
File No.	USV0305
Date	30 September 2014

## **NGARUAWAHIA WASTEWATER TREATMENT SYSTEM**

### **ANNUAL REPORT 2013 - 2014**

#### **RC 119642, 119643, 119644, 119645 & 119646**

The Waikato District Council (WDC) holds the above resource consent associated with the treatment and discharge of wastewater from the Ngaruawahia wastewater treatment plant (WWTP) to the Waikato River. The consent was issued April 2011 and will expire March 2029.

The conditions issued by Waikato Regional Council include the following:

119642 To discharge up to 11,200 cubic metres per day of treated wastewater from the plant, subject to a number of conditions.

Based on the available data the discharge volumes are compliant with resource consent limits. However, the system struggles to cope with rain events due to ageing infrastructure coupled with inflow & infiltration issues.

The WWTP generally showed good performance, however difficulty continued in meeting some of the discharge consent conditions particularly for cBOD5 and suspended solids. *E.coli* results were significantly improved with the introduction of the UV treatment in September 2013.

The Actiflo unit had not been able to run effectively since operation began in January 2014 due to insufficient wash-water supply. This matter has now been resolved which should improve the ability to meet discharge consent conditions significantly.

The combined discharge quality of the Huntly and Ngaruawahia treatment plants has improved in the 2013-14 compliance year with the installation and commissioning of new treatment steps at both plants. The combined mass loading for Total Nitrogen and Total Phosphorus to Waikato River is compliant with consented median, 90<sup>th</sup> percentile and trigger limits.

#### **OPERATIONAL COMMENTS**

*Main Stepping Screen & Inlet:* The screen works well and there have been no major problems with the screen itself. There was one incident in June 2014 where the Inlet Chamber overflowed onto surrounding land; a full report was submitted to Waikato Regional Council.

*Aerators:* The existing aerators provide good dissolved oxygen levels in the oxidation pond.

*Actiflo Plant:* The potable water supply to the WWTP has recently been upgraded. This improvement enables the Actiflow plant to treat all the effluent from the WWTP.

*Gravel Channel:* The gravel channel is operating satisfactorily

*Staff Maintenance Visits:* An operations staff member visits the site at least twice a week.

*Flow Meters:* Both the plant inlet flowmeter and outlet flowmeter will be checked for accuracy in 2013/14.

### **FUTURE WORKS**

WDC is resourced in this financial year to make further improvements including a treatment improvement programme and upgrade of the data management system.

A Waikato District Infiltration & Inflow Management Framework has also been completed which will be the basis for completing Infiltration Management Plans for individual treatment plants this year.



.....  
**Mark Curtis**  
**TREATMENT & OPERATIONS TEAM LEADER**



.....  
**Martin Mould**  
**WATERS MANAGER**

**DATA SUMMARY**

July 2013 - June 2014

RC 119642 - Ngaruawahia WWTP

In Flow Summary	m3
Average Daily Flow	1,494
Average Daily Flow (Dec - May)	1,358
Max Daily Flow	5,759
Average Monthly Total	45,205
Max Monthly Total	58,876
Annual Total	542,460

Out Flow Summary	Daily Limit - 11,200m3
Average Daily Flow	Incomplete Data
Max Daily Flow	6,182
Average Monthly Total	Incomplete Data
Max Monthly Total	69,189
Annual Total	Incomplete Data

Monthly Discharge Tests Post UV	Consent Limit				Compliance						
	Median	90 Percentile	Median Trigger	90 Percentile Trigger	Measured Median	Measured 90 Percentile	Median	90 Percentile	2012 Trigger	2013 Trigger	2014 Trigger
pH Between 6 & 9					7.8		0 / 12	0 / 10	n/a	n/a	n/a
BOD5	30	60	27	54	36.4	42.6	7 / 12	0 / 10	X	X	X
Ammoniacal Nitrogen	10	20	9	18	6.5	11.8	3 / 12	0 / 10	Compliant	Compliant	Compliant
Total Nitrogen	25		22.5		14.3		0 / 12	0 / 10	Compliant	Compliant	Compliant
Total Nitrogen Summer (Dec - May)	20		18		16.2		1 / 6	n/a	n/a	n/a	n/a
Summer TN (Huntly & Ngaruawahia)	57		51.3		35.8		3 / 6	n/a	Compliant	Compliant	Compliant
Total Phosphorous	8		7.2		3.3		0 / 12	0 / 10	Compliant	Compliant	Compliant
Total Phosphorous Summer (Dec-May)	8		7.2		3.4		0 / 6	n/a	n/a	n/a	n/a
Summer TP (Huntly & Ngaruawahia)	17.3		15.6		6.4		0 / 6	n/a	Compliant	Compliant	Compliant
Suspended Solids	30	60	27	54	86.0	119.8	11 / 12	7 / 10	X	X	X

Discharge Weekly Tests Post UV	Consent Limit		Compliance	
	Median Trigger	90 Percentile Trigger	Median	90 Percentile
E-Coli	126	113.4	17	21 / 52

*To determine compliance with the median limits (excluding E.coli), no more than six samples in any 12 consecutive monthly samples over the period 1 July to 30 June each year shall exceed the specified limit.*

*To determine compliance with the median E. coli limit, no more than 26 samples in any 52 consecutive weekly samples shall exceed the specified limit.*

*To determine compliance with the 90th percentile limits, no more than one sample in any ten consecutive monthly sampling events shall exceed the specified limit.*

Compliance with the discharge quality conditions are summarized in the above table within the Compliance column. The measurement stated in the Compliance column cell indicates the number of test results exceeding the median or 90<sup>th</sup> percentile limit. The shading in the Compliance column cells indicates the state of compliance for each parameter; if the cell is shaded green the parameter is compliant, if the cell is shaded red the parameter is non-compliant.

<b>EVENT SUMMARY</b>		<b>JULY 2013 - JUNE 2014</b>
Sept 2013		Installation of new tertiary treatment system (Actiflow)
Jan 2014		Outfall pipeline failure leading to ground discharge. Appropriate repairs were made.
June 2014		High inflow spill at inlet stepscreen due to storm event. A concrete bund wall is being installed to prevent further occurrences
June 2014		Insufficient disinfection during Actiflow bypass event. Operator training has been provided to prevent this from reoccurring
July 2014		New waveband and road installed around main treatment ponds

<b>COMPLAINTS SUMMARY</b>		<b>JULY 2013 - JUNE 2014</b>
		Nil complaints received during the 2013/14 period

The Ngaruawahia Wastewater Treatment Plant has generally operated in compliance with the conditions of Resource Consent 119642. Important matters to note and non-compliances are detailed below against the corresponding summary of the condition.

A summary of results are included in the spreadsheet above and a summary of key matters are included in the cover letter.

Condition Comments	
4	<p><i>The maximum volume of treated wastewater discharged shall not exceed 11,200 cubic metres per day.</i></p> <ul style="list-style-type: none"> <li>● Please see the attached spreadsheet. Note this data is incomplete due to WDC telemetry issues.</li> </ul>
6	<p><i>The consent holder shall ensure that, no later than 1 December 2012, the quality of the discharge immediately prior to entering the rock-lined channel shall comply with the following limits:</i></p> <ul style="list-style-type: none"> <li><i>i) The pH of the discharge shall not be less than 6 or greater than 9 pH units;</i></li> <li><i>ii) The median 5 day carbonaceous biochemical oxygen demand concentration shall not exceed 30 grams per cubic metre and the 90<sup>th</sup> percentile shall not exceed 60 grams per cubic metre;</i></li> <li><i>iii) The median suspended solids concentration shall not exceed 30 grams per cubic metre and the 90<sup>th</sup> percentile shall not exceed 60 grams per cubic metre;</i></li> <li><i>iv) The median ammoniacal-nitrogen concentration shall not exceed 10 grams per cubic metre and the 90<sup>th</sup> percentile shall not exceed 20 grams per cubic metre;</i></li> <li><i>v) The median total nitrogen concentration shall not exceed 25 grams per cubic metre;</i></li> <li><i>vi) The median summer (December to May inclusive) total nitrogen (TN<sub>summer</sub>) concentration shall not exceed 20 grams per cubic metre;</i></li> <li><i>vii) The median summer (December to May inclusive) total nitrogen load (TN<sub>load</sub>) for Ngaruawahia Wastewater Treatment Plant and Huntly Wastewater Treatment Plant combined shall not exceed 57 kilograms per day;</i></li> <li><i>viii) The median total phosphorous (TP) concentration shall not exceed 8 grams per cubic metre;</i></li> <li><i>ix) The median summer (December to May inclusive) total phosphorus (TP<sub>summer</sub>) concentration shall not exceed 8 grams per cubic metre;</i></li> <li><i>x) The median summer (December to May inclusive) total phosphorus load (TP<sub>load</sub>) for Ngaruawahia Wastewater Treatment Plant and Huntly Wastewater Treatment Plant combined shall not exceed 17.3 kilograms per day;</i></li> <li><i>xi) The median Escherichia coli (E.coli) concentration shall not exceed 126 cfu per 100 millilitres.</i></li> </ul> <ul style="list-style-type: none"> <li>● Please see the attached spreadsheet.</li> <li>● WDC is resourced in this financial year to review the treatment plant processes and also to make improvements to discharge quality.</li> <li>● The Actiflo unit has not been able to run constantly due to insufficient washwater supply. Within the third quarter of 2014 a larger bore pipeline was laid to the Actiflo unit to allow continuous operation. This should significantly improve the discharge quality and address the issues with non-compliance.</li> </ul>

10	<i>These conditions relate to trigger limits and the need to complete the following if these limits are exceeded:</i>
12	<p><i>“design, build and commission the appropriate upgrade to the treatment process within two years after the “trigger” level is reached. The upgrade undertaken shall be designed to reduce the median concentration for the parameter for which the trigger was reached to less than 80% of the consented limit for that parameter.</i></p> <ul style="list-style-type: none"> <li>• cBOD &amp; SS triggers are still being exceeded.</li> <li>• Fine tuning of the Actiflo unit operation will significantly improve the discharge quality and address the issues with non-compliance.</li> </ul>
13	<p><i>Unless otherwise agreed with the Waikato Regional Council in writing, the consent holder shall ensure that the treatment system is upgraded in accordance with the application documentation to the satisfaction of Waikato Regional Council.</i></p> <ul style="list-style-type: none"> <li>• The 2013 upgrade has been completed and is currently being fine-tuned for effective performance.</li> </ul>
14	<p><i>The consent holder shall continuously monitor the flow rate of wastewater entering and leaving the treatment plant and shall record the total daily influent and discharge volumes.</i></p> <ul style="list-style-type: none"> <li>• Unfortunately WDC experienced telemetry issues which resulted in incomplete records. This issue has been addressed and manual recording of daily data is now taking place.</li> </ul>
15	<p><i>The consent holder shall continuously monitor and record rainfall at the site on a daily basis.</i></p> <ul style="list-style-type: none"> <li>• Continuous weather monitoring has now been installed and the Datran system is being fine tuned to record and store the historic data.</li> </ul>
16	<p><i>The consent holder shall, prior to January each year, calculate the ratio of daily Peak Wet Weather Flow (PWWF) to Average Dry Weather Flow (ADWF). Where the ratio of PWWF to ADWF exceeds 4.5, the consent holder shall prepare an Infiltration Management Plan and provide this to Waikato Regional Council for review prior to implementation. For the purposes of this condition, calculation of ADWF will be taken as the median daily wastewater flow measured at the inlet to the oxidation pond during the month of March for the preceding year.</i></p> <p>Using the March 2012 median wastewater flow (1396m<sup>3</sup>) and the peak wet weather flow (6190m<sup>3</sup>) in July 2013, the following applies: ADWF =1279m<sup>3</sup>/day, PWWF = 6190m<sup>3</sup>/day, Ratio = 4.4</p> <ul style="list-style-type: none"> <li>• This ratio is very close to the limit and as a matter of improving performance WDC has written a District Wide Infiltration &amp; Inflow Management framework. This will be the basis of a district wide I &amp; I programme of works for each treatment plant.</li> </ul>
20 - 21	<p><i>The consent holder shall prepare an Operations and Management Plan. This Plan shall be prepared by a suitably qualified and experienced person and shall detail how the treatment system is to be operated and maintained to ensure compliance with the conditions of this consent and consent 119643, 119644 and 119645.</i></p> <ul style="list-style-type: none"> <li>• The updated Operations and Management Plan – Updated April 2014, was forwarded to Waikato Regional Council by 30 May 2014. Section 4 refers to the management structure; the newest addition is Mark Curtis, Operations Team Leader with 17 years experience in the Wastewater industry.</li> </ul>

22	<p><i>The consent holder shall ensure contractors are made aware of the conditions of this resource consent and ensure compliance with those conditions.</i></p> <ul style="list-style-type: none"> <li>• All contractors employed at the treatment site are inducted in both health and safety procedures and relevant conditions of this consent.</li> </ul>
23	<p><i>In conjunction with consent 119642 the consent holder shall maintain and keep a Complaints Register.</i></p> <ul style="list-style-type: none"> <li>• Council's CRM database records all complaints from the public. There were no complaints from the public during the consent year regarding the Ngaruawahia WWTP.</li> </ul>
24 - 26	<p><i>The consent holder is responsible for appropriate signage, maintaining plantings and managing any necessary erosion works in conjunction with Ngaruawahia wastewater treatment system.</i></p> <ul style="list-style-type: none"> <li>• Appropriate signage is in place,</li> <li>• The maintenance operator maintains all plantings at the wastewater sites,</li> <li>• There are no current issues regarding erosion at the Ngaruawahia discharge site.</li> </ul>
30	<p><i>The consent holder shall undertake a survey of the diffuser at six monthly intervals.</i></p> <ul style="list-style-type: none"> <li>• The most recent inspection report 13<sup>th</sup> August 2014 concluded that dredging was carried out to reinstate diffuser caps. PE trims were removed from diffuser following pipe replacement.</li> </ul>
31	<p><i>The consent holder shall forward the results of the monitoring undertaken pursuant to conditions 14, 15 and 18 to the Waikato Regional Council via electronic means, within one month of receipt of the results by the consent holder.</i></p> <ul style="list-style-type: none"> <li>• This information has been provided monthly with exception during a period of high staff turnover (Nov 13 – Feb 14).</li> </ul>
32	<p><i>The consent holder shall provide to the Waikato Regional Council, Waikato-Tainui Te Kauhanganui Incorporated (Claims and Environment Unit) and Hōpūhōpū Manawhenua Roopu a written report by 30 September.</i> <i>A quarterly report shall be prepared and distributed at the end of March, June and December each year.</i></p> <ul style="list-style-type: none"> <li>• This report is submitted in compliance with this condition.</li> <li>• A QSSR was sent to the two interested parties in July 2014.</li> </ul>
33	<p><i>The consent holder shall notify the Waikato Regional Council within 24 hours (where practicable) of the consent holder becoming aware of the limits specified in conditions 4, 5 and 6 of this resource consent being exceeded or any accidental discharge, plant breakdown or other circumstance which is likely to result in the limits of this consent being exceeded. The consent holder shall, within 10 working days of the incident occurring, provide a written report to the Waikato Regional Council, identifying the breach, possible causes and steps to ensure future compliance.</i></p> <ul style="list-style-type: none"> <li>• Please see the attached summary spreadsheet.</li> <li>• Suspended solids, cBOD5 and E.coli results were outside consent limits on numerous occasions. Improvements are expected with the fine-tuning of the new Actiflo unit.</li> <li>• There was one overflow event onto land in June 2014. A full report was submitted to WRC within the required timeframe.</li> </ul>

34	<p><i>The consent holder shall as soon as reasonably practicable, notify the Waikato District Council (Service Delivery, Water and Waste), Watercare Services Ltd and the Waikato Regional Council of an event that may in itself, or as a consequence of an event, have a significant adverse effect on the quality of the water within the Waikato River at the abstraction points of the Hopuhopu, Huntly, Te Kauwhata and Tuakau (Auckland) Water Supplies.</i></p> <ul style="list-style-type: none"> <li>• There were nil instances of events which had a significant adverse effect on the water quality of the Waikato River such that water abstraction parties required notification.</li> </ul>
35 – 37	<p><i>The consent holder shall, by 30 September 2015 and every five years thereafter, submit to Waikato Regional Council, a Wastewater Treatment Review Report.</i></p> <ul style="list-style-type: none"> <li>• Condition 35 refers to a report due by 30 Sept 2015.</li> <li>• Condition 37 refers to reviews that may be carried out after 30 September 2015.</li> <li>• The second review is due before 31 March 2016.</li> <li>• The third review is due before 31 March 2022.</li> </ul>

#### RC 119643 – Discharge to Air - Condition Comments

4 & 7	<p><i>The operation, management and maintenance of the Huntly wastewater treatment plant shall not result in any objectionable odours at or beyond the boundary of the properties on which the treatment plant is located.</i></p> <p><i>In conjunction with consent 119647, the consent holder shall maintain and keep a complaints register for all complaints made about the treatment and discharge operations received by the consent holder.</i></p> <ul style="list-style-type: none"> <li>• Council's CRM database records all complaints from the public. There were no complaints from the public during the consent year regarding the Ngaruawahia WWTP.</li> </ul>
5	<p><i>There shall be no discharge of airborne contaminants as a result of the activities authorised by this resource consent to the extent that it causes an adverse effect at or beyond the boundary of the subject property on which the treatment plant is located.</i></p> <ul style="list-style-type: none"> <li>• Council's CRM database records all complaints from the public. There were no complaints from the public during the consent year regarding the Ngaruawahia WWTP.</li> </ul>
8	<p><i>The consent holder shall notify the Waikato regional council of any incident, including power, mechanical or process failure, leading to a significant emission of odour from the plant, within 24 hours of the incident being brought to the attention of the consent holder, or the next working day.</i></p> <ul style="list-style-type: none"> <li>• Based on the available data there were nil events which caused significant emission of odour from the plant during the reporting period.</li> </ul>

#### RC 119644 – Spread Sludge to land - Condition Comments

4 - 8	<p><i>At the beginning of each programme of sludge removal from the oxidation pond or holding pond, the consent holder shall inform the Waikato Regional Council in writing, at least 10 working days prior to commencement of each event, of the start date of the works authorised by this resource consent.</i></p> <ul style="list-style-type: none"> <li>• 2,600m<sup>3</sup> of sludge was spread onto land early 2013. Nil spread was programmed for the 2013-14 reporting period and the next spread is due in 2015-16 reporting period. The area is being let to rest for an increased period due to concerns around the nitrogen loading rate.</li> </ul>
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9 - 10	<p>The consent holder shall provide the Waikato Regional Council with a sludge dewatering management plan. This plan shall be prepared by a suitably qualified and experienced person and shall detail the methods and operational procedures adopted by the consent holder to ensure compliance with the conditions of this consent. The plan may form part of the operations and management plan specified in consent 119642.</p> <ul style="list-style-type: none"> <li>• A current O &amp; M plan was submitted to WRC in June and within this was a plan which covered the requirements of this condition.</li> </ul>
11 - 13	<p>The consent holder shall maintain and keep a complaints register for all complaints made about the desludging, dewatering and sludge removal operation received by the consent holder.</p> <ul style="list-style-type: none"> <li>• Council's CRM database records all complaints from the public. There were no complaints from the public during the consent year regarding the Ngaruawahia WWTP</li> </ul>

<b>RC 119645 –Outflow Pipeline Structure- Condition Comments</b>	
4 - 8	<p>The discharge of treated wastewater to the Waikato River shall be via a multi-port diffuser located on the bed of the Waikato River.</p> <p>Ports 2, 4, 6 and 8 of the diffuser, as numbered from the true right bank of the Waikato river, shall remain closed unless specifically permitted in writing by the Waikato Regional Council. The consent holder shall maintain the outfall diffuser in an operational state such that the discharge from ports 1, 3, 5, 7 and 9 is uniform along the operational length of the diffuser and providing effective dispersion of the wastewater in the river flow.</p> <p>The consent holder shall undertake a survey of the diffuser at six monthly intervals to demonstrate compliance with conditions 5 and 6 of this consent. The frequency of the surveys may be reduced to no less than every two years following written request to and approval from the Waikato Regional Council. The results of each survey and any recommendation as to the frequency of future surveys shall be provided to the Waikato Regional Council within 30 days of the survey. The consent holder shall notify the Waikato Regional Council in writing at least five working days prior to commencement of survey works.</p> <ul style="list-style-type: none"> <li>• The results of a dive report, for the pipes along the length of Waikato River, forwarded to WRC in September 2014.</li> <li>• WRC was notified by email prior to inspection, however the actual inspection date was deferred a number of times due to poor weather and river turbidity.</li> <li>• In the coming 12 months WDC intend to carry out more inspections in October and May to better meet the divers requirements.</li> </ul>
9 - 11	<p>The consent holder shall be responsible for the structural integrity and maintenance of the multi-port diffuser and for the provision and maintenance of any erosion control works that become necessary to preserve the structural integrity of the multi-port diffuser, and/or to control erosion as a result of exercise of this consent. Any such works shall be to the satisfaction of the Waikato Regional Council.</p> <p>The consent holder shall maintain the structure so that no part of the structure is lost (e.g. breaks loose due to water) or results in a navigational hazard. Any material that is lost from the structure shall be immediately retrieved by the consent holder. Should the material lost be a hazard to navigation the Waikato Regional Council shall be informed immediately.</p> <ul style="list-style-type: none"> <li>• The most recent inspection report 13<sup>th</sup> August 2014 concluded that dredging was carried out to reinstate diffuser caps. PE trims were removed from diffuser following pipe replacement There has been no further structural issues, reports of erosion or possible navigational</li> </ul>

hazards.
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<b>RC 119646 – Discharge via Seepage - Condition Comments</b>
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| 4 | <p><i>The consent holder shall manage and maintain the integrity of all ponds, wetlands, rock filters and other structures that form any part of the wastewater treatment process so as to minimise the volume of seepage from such structures so far as practicable.</i></p> <ul style="list-style-type: none"><li>• A new waveband and road was completed around the main treatment pond in July 2014.</li><li>• There have been no other major works or deterioration to these systems during the reporting period which would affect the 'liners' performance.</li></ul> |
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