Report

Blenheim Sewage Treatment Plant Annual Consent Compliance Report - 1 July 2014 - 30 June 2015

Prepared for Marlborough District Council (Client)

By CH2M Beca Limited

3 December 2015

Revision History

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Table of Contents

1 Introduction 1
1.1 Purpose of Report 1
1.2 Background 1
2 Consent U071181 3
2.1 Consent Purpose 3
2.2 Condition 7 3
2.3 Discharge to land 5
2.4 Discharge to Air 11
2.5 Discharge to Wairau Estuary 14
3 Summary 22
4 Conclusions 23

Appendices

Appendix A – Consent U071181 including Site Plan and Monitoring Locations

Appendix B – Amended Consent Drawings and Condition 32(b) of U071181 prepared by CH2M Beca

Appendix C – Amended Consent Drawings and Minor Amendments to Condition 32 prepared by MDC

Appendix D – Annual Inspection of the MDC Wairau Bar Effluent Pipeline

1 Introduction

1.1 Purpose of Report

The purpose of this report is to assess the compliance of the discharges from the Blenheim Sewage Treatment Plant (BSTP) with the conditions of Consent U071181, for the reporting period 1 July 2014 to 30 June 2015. As the new wetlands and outfall to the Wairau Estuary have been operating since 5 February 2014 and the Opawa River outfall is no longer used, the conditions relating to the discharge of treated wastewater from the domestic ponds to this outfall are no longer relevant and have not been considered in this report.

The BSTP and outfall sampling locations are shown in Consent U071181 which is included in **Appendix A.**

1.2 Background

Marlborough District Council (MDC) owns and operates the BSTP site at Hardings Road, which treats wastewater from residential and commercial premises (termed domestic flows), from within the Blenheim urban area, as well as industrial flows (mainly wineries) and tankered wastes.

1.2.1 Treatment Upgrading History

Prior to 2002, the BSTP consisted of a number of treatment ponds used to treat domestic wastewater from Blenheim and industrial flows from Canterbury Meat Packers and the Riverlands Industrial Estate. The industrial ponds were formerly owned by the PPCS Meat Processing Plant, but were purchased by MDC in 2002, after the PPCS operation closed. The former PPCS factory site was subdivided and is now known as Cloudy Bay Business Park. Various new industries, including two wineries, have moved onto this site and the number of wineries in the Riverlands Industrial Estate has also increased.

From 2006 to 2008, MDC made a series of upgrades and changes to the treatment pond system to accommodate significant peak trade waste loads during the wine vintage, which occurs in the period March to May each year. The changes included diverting major industrial flows from the domestic to the industrial ponds, and increasing the aeration capacity of the industrial ponds in order to treat the increased load. Small trade waste discharges in Blenheim continue to contribute about 15% of the domestic flow into the BSTP.

MDC was granted consents in late 2010 to upgrade the BSTP treated wastewater disposal system. This upgrading (completed in February 2014), included the construction of a series of wetland cells which convey the combined treated flows from both the domestic and industrial pond systems, before discharging to a new outfall in the Wairau Estuary. The new wetland system provides some further “polishing” treatment of the combined flows. Approximately 190ha of MDC-owned land around the BSTP is also available for wastewater irrigation on a soil moisture deficit basis from spring to autumn.

1.2.2 Current Treatment Systems

The BSTP consists of two separate treatment systems. A fine screen, as well as facultative and maturation ponds, are used to treat domestic flows while the industrial stream is treated using fine screening and mechanically aerated and facultative ponds. During the vintage, industrial wastewater is redirected through twin DAF units for solids separation and recycling to create an activated sludge process.

Prior to February 2014, treated wastewater from the domestic system was continuously discharged to the Opawa River, and treated industrial flows were discharged to the Wairau Estuary on the ebb tide. Historically, some industrial effluent from the now-closed PPCS Meat Processing Plant was applied to land during the summer months.

On 5 February 2014, discharge of treated wastewater from the domestic system to the Opawa River was ceased. The flow from Domestic Pond 5 is now conveyed to Pond 6 and combined with industrial wastewater before being discharged to the new wetland (Ponds 7-14). Treated wastewater is then discharged from Pond 14 to the Wairau Estuary via a new larger capacity outfall. The completed upgrade also includes land application of treated wastewater, when soil and groundwater conditions allow, via K-line irrigation and drip lines. Irrigation has occurred since the upgrade was completed.

A schematic of the current treatment systems and combined estuarine discharge is shown in Figure 1-1.

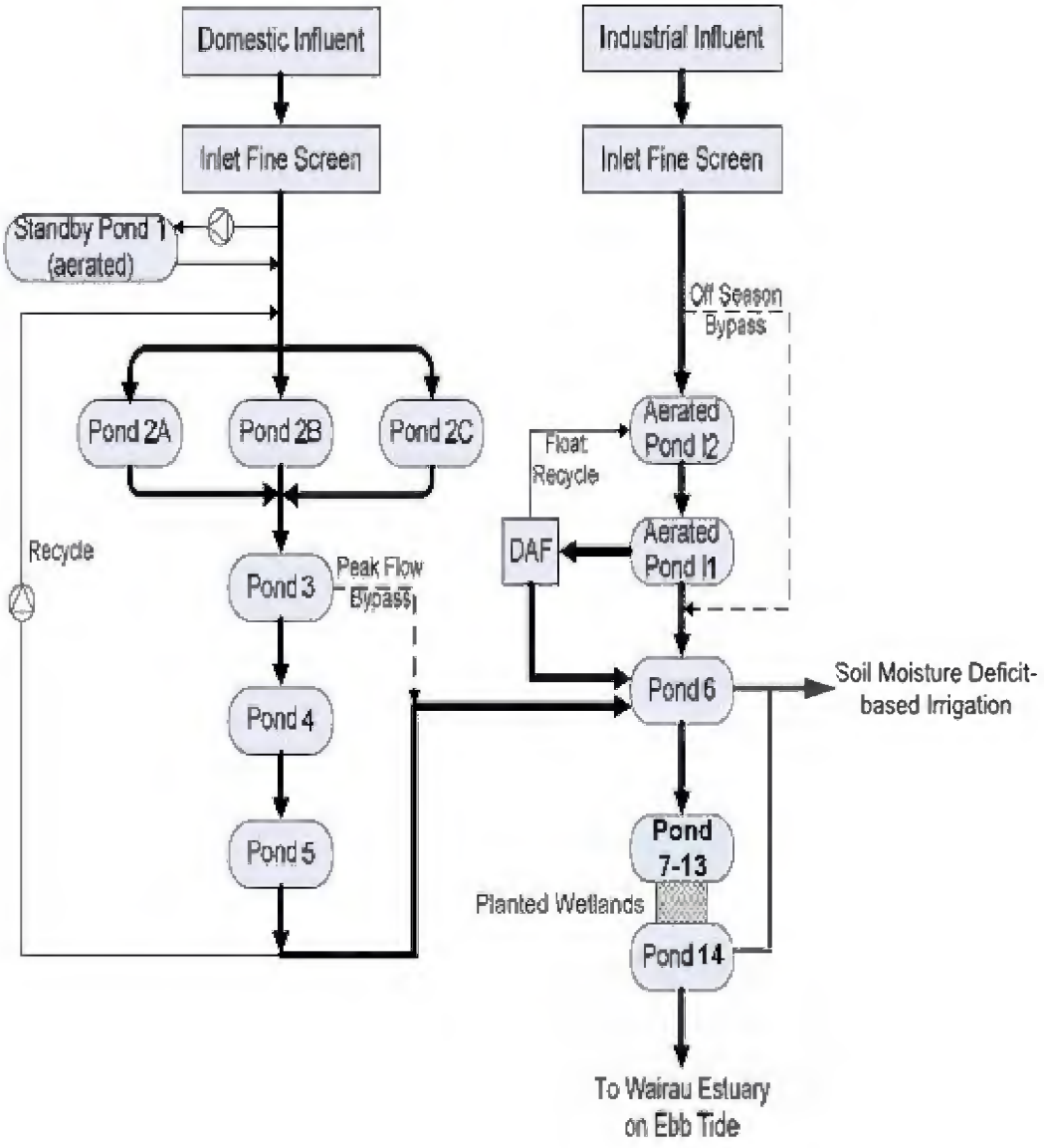


Figure 1-1 – BSTP Wastewater flow schematic (post-February 2014)

2 Compliance with Consent U071181

2.1 Consent Purpose

Consent U071181 authorises discharges from the BSTP treatment ponds to land, air and the Wairau Estuary. Some of the consent conditions do not have on-going monitoring requirements, and are not covered in this report. Only those conditions that have numerical or qualitative monitoring requirements are assessed. For clarity, consent conditions are quoted in *italics*, with other commentary in normal font.

2.2 Condition 7

The Consent Holder shall provide to the Manager, Regulatory Department, Marlborough District Council, on or before 31 August in each year of the term of consent, from and including 2011, an Annual Monitoring Report (AMR) which must contain at least the following information:

7.1 General

a) An analysis of the extent to which the Consent Holder has, in operating the BTSP and exercising these consents, complied with these Conditions of Consent and the extent and cause of any noncompliance, in each case with a summary of the environmental effects of the operation of the BTSP during the preceding 12 month period from 1 July- 30 June inclusive (the Reporting Period).

This annual monitoring report (AMR) has been produced to achieve compliance with this condition.

b) An identification and discussion of any operational difficulties, changes or improvements made to the wastewater treatment or operating processes, which would cause any material difference in environmental outcomes from the previous Reporting Period.

This annual monitoring report (AMR) has been produced to achieve compliance with this condition.

c) A comparison of results obtained over the Reporting Period with the results from previous reporting periods.

This is not applicable as this is the first full year reporting period since U071181 commenced.

d) An identification of any maintenance works needed, proposed or undertaken to ensure compliance with these Conditions of Consent.

None identified.

e) An identification of any improvements or changes required and the timetable for implementation.

None identified.

7.2 Discharge of Treated Wastewater to land

a) The volume of treated wastewater applied to each of the Areas 1 – 3 (see Appendix B for the Proposed amended Consent Drawings and Condition 32(b) and Appendix C for the acceptance of these by MDC Regulatory Department)

See Section 2.3.1.

b) A summary and analysis (including graphical and statistical representations) of all data collected as a requirement of the Specific Conditions applicable to the discharge consent to discharge treated wastewater to land.

See Section 2.3.1.

c) *A record and discussion of any complaints received regarding the discharge to land and the consent holder's response to those complaints.*

No complaints received. See Section 2.3.7.

d) An analysis of any environmental effects, positive, neutral and adverse, which are attributable to the discharge of treated wastewater to land.

See Section 2.3.

7.3 Discharge of Odour

a) Identification and discussion of any complaints received with respect to odour as per Condition 42 of the Discharge Permit to Air and any action taken to address the complaints.

No complaints received. See Section 2.4.1.

b) The measurements of Dissolved Oxygen (DO) concentrations as per Conditions 44 and 45 of the Discharge Permit to Air.

See Section 2.4.2 and 2.4.3.

c) An analysis of the data in terms of consent compliance and environmental effects.

See Section 2.4.2 and 2.4.3.

d) A discussion of any relevant operational changes or improvements carried out during the Reporting Period.

None identified.

e) A comparison of results in the Reporting Period to previous reporting periods and a discussion of any trends.

This is not applicable as this is the first full year reporting period since U071181 commenced.

f) Any complaints received in regard to the operation of the BSTP and the action(s) taken to address each complaint.

No complaints received. See Section 2.4.1.

7.4 Wastewater Monitoring and Benthic and Water Quality Monitoring

a) A summary of all the monitoring data collected as a requirement of the conditions of the discharge permit to discharge treated wastewater to the Wairau Estuary during the Reporting Period.

See Section 2.5.

b) An analysis of the data in terms of consent compliance and environmental effects during the Reporting Period.

See Section 2.5.

c) A discussion of any relevant operational changes or improvements carried out during the Reporting Period.

See Section 2.5.

d) A comparison of results with previous years and a discussion of any trends during the Reporting Period.

This is not applicable as this is the first full year reporting period since U071181 commenced.

e) Any complaints received in regard to the operation of the BSTP and the action(s) taken to address each complaint.

No complaints received.

7.5 Outfall Pipelines

a) A record of any maintenance works undertaken in accordance with Condition 52 of the Coastal Permit for the new and existing outfall pipelines.

This AMR addresses the requirements of Condition 7. However, full compliance was not achieved as the requirement to submit the AMR before 31st August was not met.

2.3 Discharge to land

2.3.1 Condition 7.2

Condition 7.2 requires that the AMR must include:

The volume of treated wastewater applied to each of the Areas 1-3 (see **Appendix B** for the revised consent and **Appendix C** for MDC acceptance) *in the reporting period.*

Table 2-1 shows the volume of treated wastewater and total application rate/ha that was discharged to each irrigation area.

Table 2-1: Total Volume of treated wastewater discharged to each irrigation area (June 2014/ July 2015)

Irrigation Area	Volume of Wastewater Applied (m^3)	Area (ha)	Total application rate (m^3/ha)
1	51,745	59	877
2	49,712	34	1,458
3	253,140	95	2,678

2.3.2 Condition 24

The following net nitrogen loading limits shall be observed:

a) The maximum annual application of nitrogen shall not exceed a net loading of 200 kilograms of nitrogen per hectare per year.

b) Monthly applications shall not exceed a net loading of 50 kilograms of nitrogen per hectare.

Irrigation of treated wastewater from Pond 6 was carried out from October 2014 to April 2015 when conditions were suitable. During this period, a total of 48.6 kg of nitrogen per hectare was applied which is below the consent limit of 200kg/ha/yr.

In February, 12.73 kg of nitrogen per ha was applied. This was the highest amount of any month but is well below the consent limit of 50kg/ha/month.

2.3.3 Condition 29

Groundwater shall be sampled monthly while irrigation is occurring in each area identified in Plan Consent No A in Appendix 1 [see **Appendix B** for the revised consent and **Appendix C** for the MDC acceptance] *to these conditions of consent, except that if irrigation has occurred for less than 14 days in the previous month no sampling is required. For each Irrigation Area, the wells identified within that area shown on Plan Consent No B attached in Appendix 1* [see **Appendix B** for the revised consent and **Appendix C** for the MDC acceptance] *to these conditions of consent, shall be sampled. The samples shall be analysed for.*

a) Ammoniacal nitrogen.

b) Nitrate nitrogen.

c) Conductivity.

d) E-coli.

The water level in each bore shall be measured and recorded at the time the sample is taken.

Irrigation of treated wastewater occurred from October 2014 to April 2015. Samples were taken from each of the six wells between July 2014 and May 2015. No sample was collected in June 2015. The results are shown in Figures 2-1 to 2-3.

The results show that all parameters tested were reasonably consistent over the monitoring period other than a spike in the E. coli concentration at all wells on 12 March 2015 (Figure 2-3).

Electrical conductivity was also consistently high at well 10031 from the start of 2015 until the end of the reporting period (Figure 2-2). This well is located next to the Opawa River and is likely to be influenced by salinity as the river is tidally influenced at this point. There is a strong relationship between conductivity and salinity.

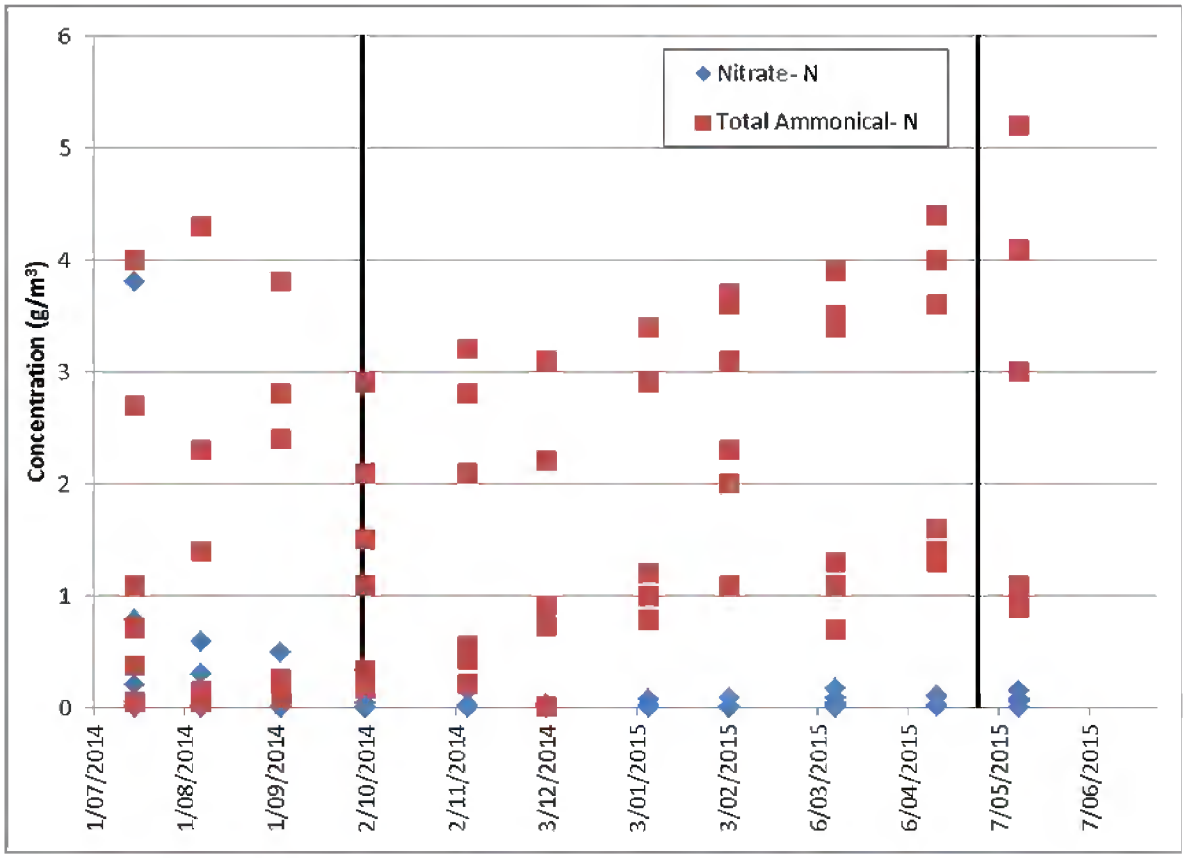


Figure 2-1: Groundwater testing results from six wells – Nitrate N and Ammoniacal N

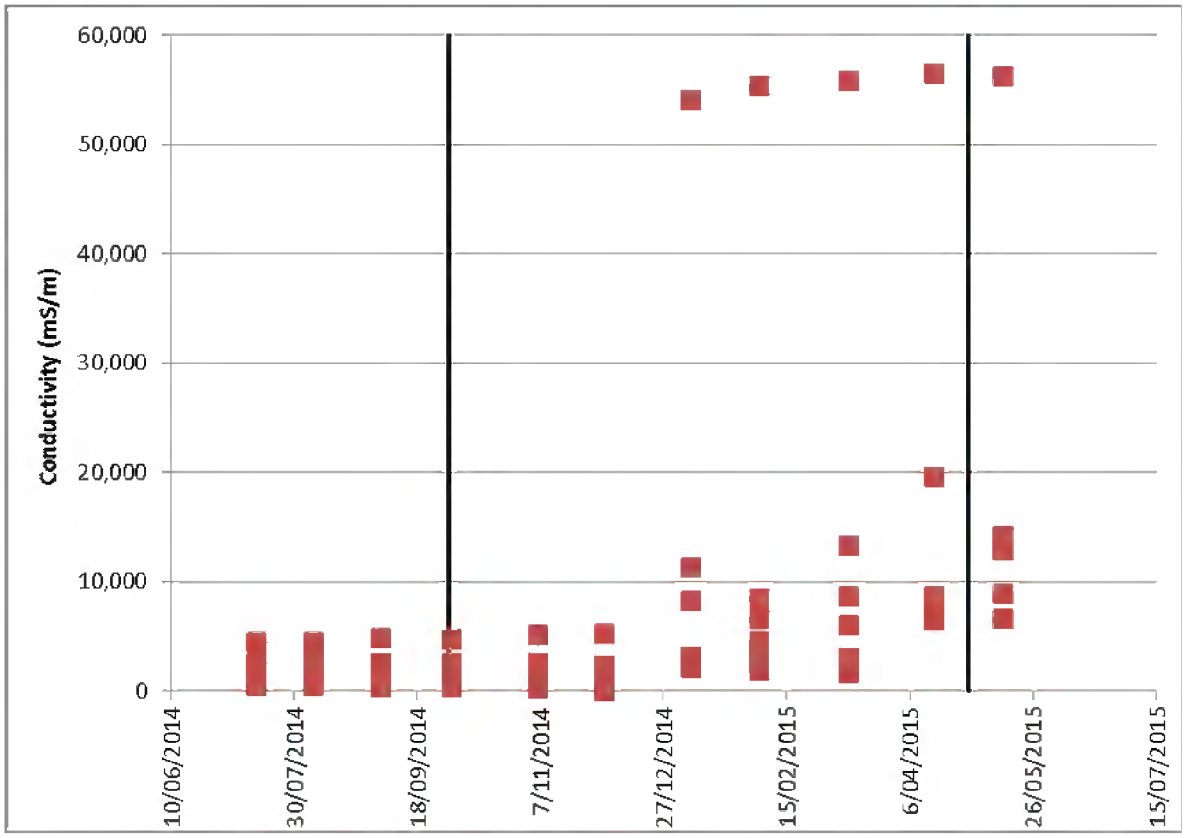


Figure 2-2: Groundwater testing results from six wells - electrical conductivity

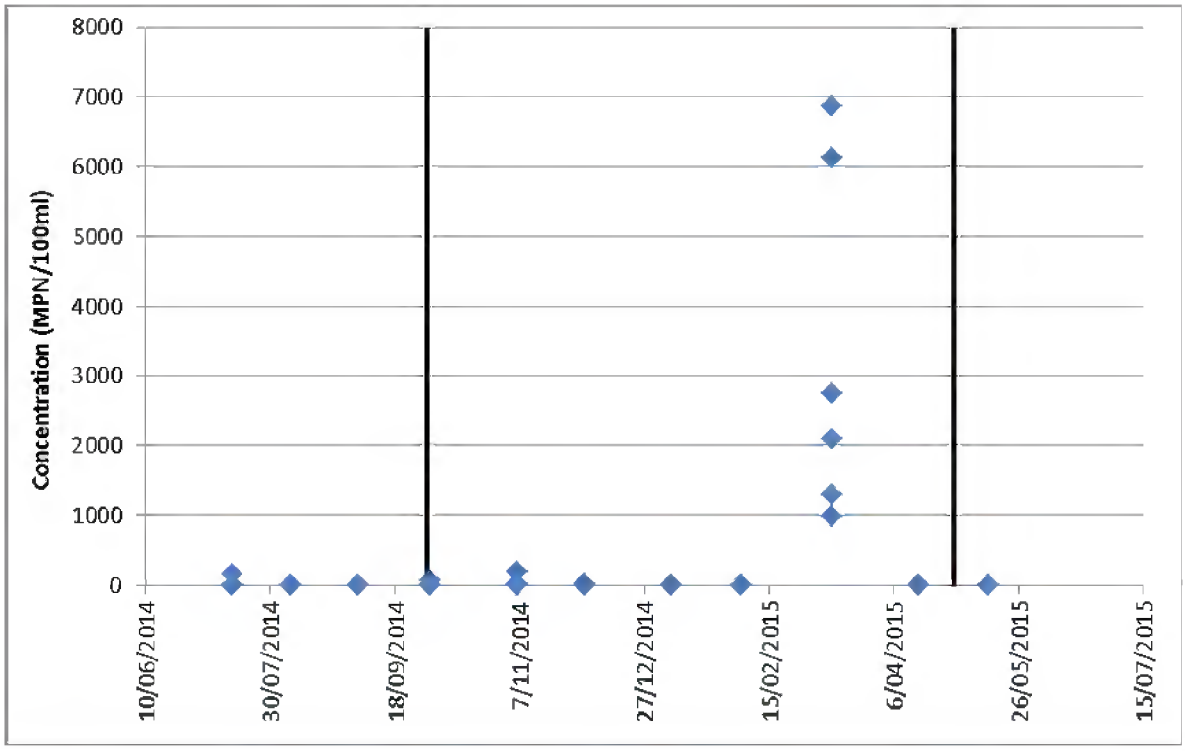


Figure 2-3: Groundwater testing results from six wells – E. coli

2.3.4 Condition 30

The groundwater level in the wells shown on Plan Consent No B attached in Appendix 1 [see **Appendix B** for the Revised Plan Consent and **Appendix C** for the MDC acceptance] *to these conditions of consent shall be monitored prior to wastewater irrigation commencing and at least fortnightly thereafter while irrigation is occurring. If the groundwater level measured in any monitoring well, for a particular irrigation area, is closer than 0.3 metres from the ground surface, irrigation shall cease in that area. Irrigation shall not recommence until the groundwater level is greater than 0.3 metres below the ground surface.*

As per Condition 30 of the consent, the groundwater levels were recorded and are shown in Table 2-2. Levels were recorded monthly, not fortnightly as required by the consent. Only one of the measured levels was less than the consent irrigation cut-off requirement of 0.3 m below the ground surface. This occurred in July 2014 prior to irrigation commencing (see Column 2 of Table 2-2). All groundwater depths measured during the period October 2014 to April 2015 were greater than 0.3m below ground.

Table 2-2: Groundwater levels

	Depth to groundwater (m)					
Date	MSC-049	MSC-055	MSC-070	MSC-071	10027	10031
15/07/2014	**0.02**	0.7	1	1.68	0.93	0.3
7/08/2014	0.37	0.94	1.8	1.02	0.67	0.37
3/09/2014	0.7	1.1	1.17	1.8	1	0.6
2/10/2014	0.6	0.97	0.55	1.77	0.83	0.55
6/11/2014	1.16	1.24	1.55	1.88	1.35	1.05
3/12/2014	1.43	1	2	2	1.7	1.38
7/01/2015	1.55	1.9	2.08	2.1	1.77	1.58
4/02/2015	1.7	2	2.1	2.17	1.9	1.8
12/03/2015	1.65	1.99	2.23	1.83	2	1.78
16/04/2015	1.6	1.95	2.17	2.1	2.1	1.8
14/05/2015	1.8	2	1.99	1.83	1.9	1.65

2.3.5 Condition 31

The potable water in well P28/4446 and one well on Lot 2 DP12207 shall be monitored as follows:

c) Sampling of both wells shall continue at monthly intervals during the wastewater irrigation season with a final sample being taken no later than 30 days after wastewater irrigation ceases each season.

d) Sampling shall continue for a period of 5 years after wastewater irrigation commences. If E. coli are detected then the sampling shall continue for a further 5 years from that time.

As per the consent requirements, potable water from Wells P28w/4447 and P28w/4446 was tested monthly during the reporting period (see Table 2-3). The only exception was that a sample was not taken in January for Well P28w/4447. However, there is no reason to suggest that E. coli results would have been detected in this month. All E. coli results received were <1 cfu/100ml and therefore no further action is considered necessary.

Table 2-3: Potable Water Monitoring Results

Site Name	Measurement	Date	Value	Units
p28w/4446	E. coli	28-Oct-14	<1	cfu/100ml
p28w/4446	E. coli	06-Nov-14	<1	cfu/100ml
p28w/4446	E. coli	03-Dec-14	<1	cfu/100ml
p28w/4446	E. coli	10-Feb-15	<1	cfu/100ml
p28w/4446	E. coli	18-Mar-15	<1	cfu/100ml
p28w/4446	E. coli	14-Apr-15	<1	cfu/100ml
p28w/4447	E. coli	07-Oct-14	<1	cfu/100ml
p28w/4447	E. coli	06-Nov-14	<1	cfu/100ml
p28w/4447	E. coli	03-Dec-14	<1	cfu/100ml
p28w/4447	E. coli	05-Jan-15	<1	cfu/100ml
p28w/4447	E. coli	10-Feb-15	<1	cfu/100ml
p28w/4447	E. coli	12-Mar-15	<1	cfu/100ml
p28w/4447	E. coli	14-Apr-15	<1	cfu/100ml

2.3.6 Condition 32

Condition 32a and b have been revised (as proposed in **Appendix B** and accepted by MDC Regulatory in **Appendix C)**. The condition is now as follows:

Prior to commencing the discharge;

a) A weather station shall be installed at the office building shown on Plan Consent No B attached in Appendix 1 [see **Appendix B** for the Revised Plan Consent and **Appendix C** for the MDC acceptance] *to these conditions of consent. The weather station shall measure and record wind speed and direction and rainfall and have sufficient instrumentation to allow calculation of evapotranspiration. The wind speed and direction recorded at the weather station shall be deemed to represent the wind speed and direction for Areas 1 and 2.*

b) An anemometer and wind vane shall be installed at the location shown as Wind Measurement Site (Area 3) on Plan Consent No B attached in Appendix 1 [see **Appendix B** for the Revised Plan Consent and **Appendix C** for the MDC acceptance] *to these conditions of consent. The anemometer and wind vane shall measure and record wind speed and direction. The wind speed and direction recorded shall be deemed to represent the wind speed and direction for Irrigation Area 3.*

c) The weather station, anemometers and wind vanes shall be maintained in an operational condition throughout the term of this consent.

The two weather stations are set up and operating in accordance with the requirements of Condition 32.

2.3.7 Condition 35

The Consent Holder shall maintain a register of any complaints received relating to any aspect of the land discharge system. The record shall include the date and time of complaint, cause of the complaint, weather conditions at the time of complaint and action taken in response to the complaint. The register shall be made available to the Manager, Regulatory Department, Mar1borough District Council, on request. A summary of complaints received by the consent holder shall be included in the AMR required by Condition 7.

As no complaints were received during the reporting period, compliance with the requirements of Condition 35 was achieved.

2.3.8 Condition 36

For the duration of these consents, the Consent Holder shall install and maintain appropriate signage on any access points to the BSTP warning that partially treated wastewater is discharged to the land. Written confirmation of the signage wording, size and placement shall be provided to the Manager, Regulatory Department, Marlborough District Council, within three months of the commencement of this consent.

Signage has been installed according to the requirements of Condition 36.

2.4 Discharge to Air

2.4.1 Condition 42

Any complaints received in regard to odour shall be recorded in a Complaints Register specifying the complaint, time and date, weather conditions and action required. A copy of the complaints shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request. A summary of these complaints shall be part of the AMR required by Condition 7 of these Conditions of Consent

As no complaints were received during the reporting period, compliance with the requirements of Condition 42 was achieved.

2.4.2 Condition 44

The Consent Holder shall measure the Dissolved Oxygen (DO) concentrations in the wastewater near the outlet of Ponds 2A, 2B, 2C, 6 and 10 every Wednesday, except when a Wednesday falls on a public holiday, when the measurement shall be taken on the nearest following working day. The DO concentration shall be measured between 11 am and 2pm and shall not be less than 2 grams of DO per cubic metre, on a rolling 10 percentile weekly measurement basis.

Figure 2-4 shows the weekly DO results for the reporting period and Table 2-4 summarises these results in relation to the consent limit. The DO concentration was measured in Pond 14 instead of Pond 10 (as required by the consent condition). However, Pond 14 is the appropriate monitoring site as it is now the final wetland cell before discharge to the Estuary. Samples were generally taken weekly but they were not consistently taken on Wednesdays. Figure 2-4 shows that DO concentrations in the domestic pond (Ponds 2A, 2B and 2C), remained high and Table 2-4 shows that consent DO limits were being met in all ponds sampled.

Samples were not always taken within 11am and 2pm as required by the condition. As solar radiation (and therefore algal photosynthesis), is usually greatest between 11am and 2pm, pond DO concentrations should be always measured (for compliance purposes), during this period. Operators are now ensuring that pond DO concentration is measured in accordance with the condition.

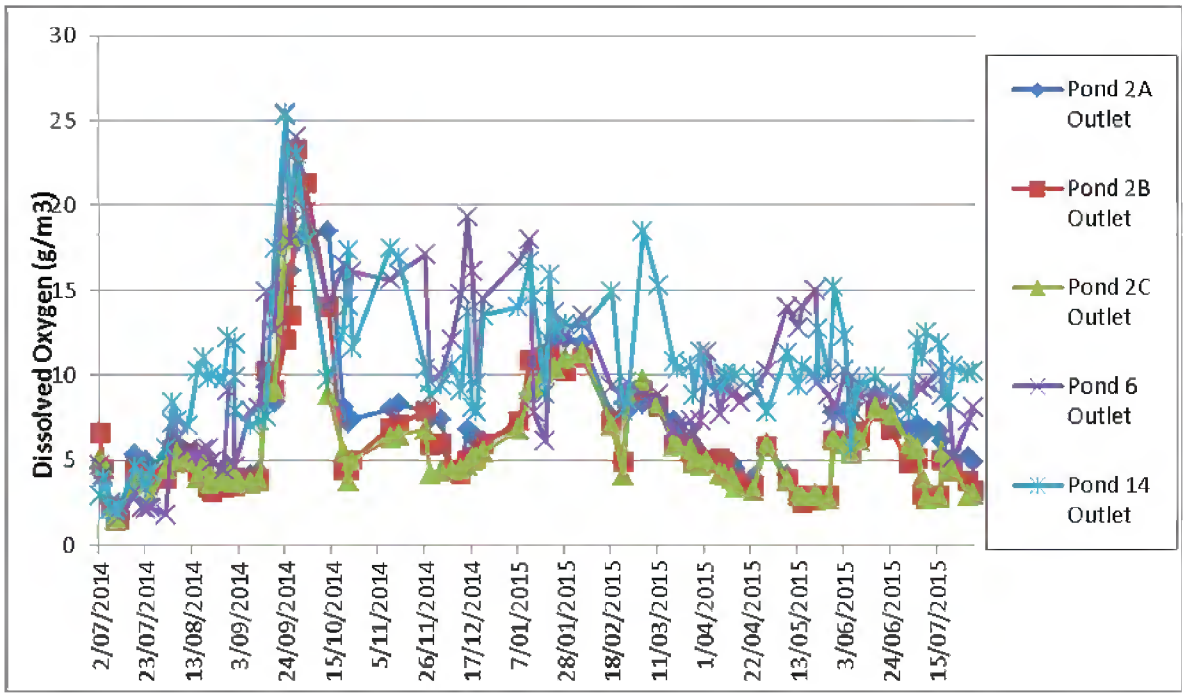


Figure 2-4: Dissolved oxygen monitoring results in domestic ponds, Ponds 6 and 14

Table 2-4: Dissolved oxygen monitoring results for domestic ponds, Ponds 6 and 14

	10th percentile
Consent Limit	**>2.0g/m^3**
Pond 2A	3.71
Pond 2B outlet	2.91
Pond 2C outlet	3
Pond 6 outlet	4.44
Pond 14 outlet	5.61

2.4.3 Condition 45

The DO of the wastewater in Ponds I1 and I2 shall be measured daily between 11am and 2pm during peak loading periods associated with the annual vintage, with DO concentrations maintained at not less than 0.5 grams per cubic metre on a 50 percentile basis. The time of the peak loading periods shall be determined by consultation between the Consent Holder and the Manager, Regulatory Department, Marlborough District Council. The results of the measurements shall be included in the AMR required by Condition 7.

The annual peak vintage period occurs between March and May. Probes recorded DO concentrations in Ponds I1 and I2 every hour over this period. Daily average DO concentrations recorded between 11am and 2pm each day are shown in Figure 2-5. This figure shows that DO concentrations in Pond I2 dropped to zero in early April 2015, at a time which coincided with peak BOD loading. However, as shown in Table 2-5, the 50th percentile DO concentration in both industrial ponds was well above the 0.5 g/m³ required by the consent during the vintage period.

The decrease in DO concentrations in Pond I2 was the result of a power cut at the BSTP over Easter. The 110 kW aerators on Pond I2, which operate on manual, were not restarted until the operators returned following the Easter break. This does not appear to have adversely affected DO concentrations downstream in Pond 6, as shown in Figure 2-4. This is assumed to be due to the larger volume of Pond 6 providing a buffer against the incoming low DO wastewater, and good BOD reduction in Ponds I1 and I2. The performance of Pond 6 is notable, considering the regularly high BOD loads during the vintage. It appears that the diversion of treated domestic wastewater from Pond 5 to Pond 6 has enhanced the performance of Pond 6, despite a significant reduction in retention time.

DO concentration in Pond I2 is not shown after 21 May 2015 as Ponds I1 and I2 were bypassed on 18 May (end of vintage) and then the probes were turned off a few days later.

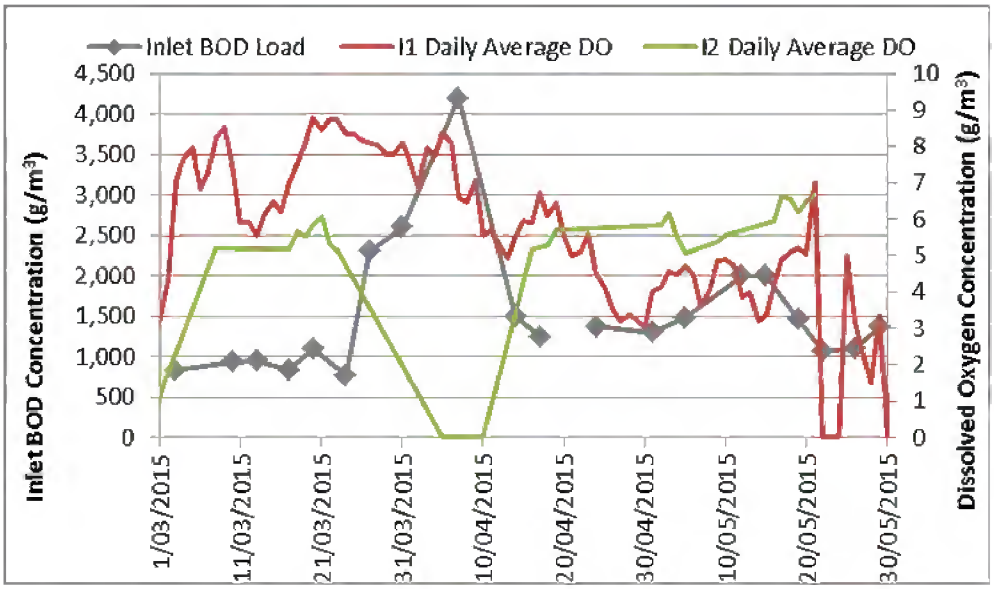


Figure 2-5: Dissolved oxygen daily averages in Ponds I1 and I2 compared to inlet BOD concentration

Table 2-5: Dissolved oxygen monitoring results for Ponds I1 and I2

	50th percentile during peak period
Consent Limit	**>0.5g/m^3**
Pond I1	5.8
Pond I2	3.3

2.5 Discharge to Wairau Estuary

2.5.1 Condition 51

The Consent Holder shall undertake annual external visual inspections of the outfall pipeline structures for the duration of the consent. A report shall be submitted to the Manager, Regulatory Department, Marlborough District Council, within 20 working days of the inspection being carried out. The report shall include but not be limited to:

a) The date and time of the inspection.

b) The condition of the outfall structures.

c) Any maintenance work that may be required, and if it is required, when the work will be carried out

The first annual inspection of the outfall pipeline occurred during the 2014/2015 monitoring period (see report by Commercial Diving Consultants Ltd in **Appendix D**). The overall condition of the outfall structures was noted to be good and no maintenance work was recommended.

2.5.2 Condition 54

*The existing buoy marking the location of the end of the existing outfall shall be marked with the words **Sewer Outfall** and the lettering used shall be bold and clear such that it can easily be read from a distance of 10 metres.*

The existing marker buoy has been marked according to the requirements of the condition.

2.5.3 Condition 55

The total discharge of treated wastewater authorised by this consent shall not exceed an average daily volume of 28,500 cubic metres, where the average volume is calculated on a continuous basis over a period of 365 consecutive days. The maximum discharge volume per day shall not exceed 103,680 cubic metres.

The daily treated wastewater discharge volume to the Wairau Estuary is shown in Figure 2-6. The average discharge volume over the monitoring period was 10,973m^3/day while the maximum volume was 30,745m^3/day. These volumes are both well below the consent limits.

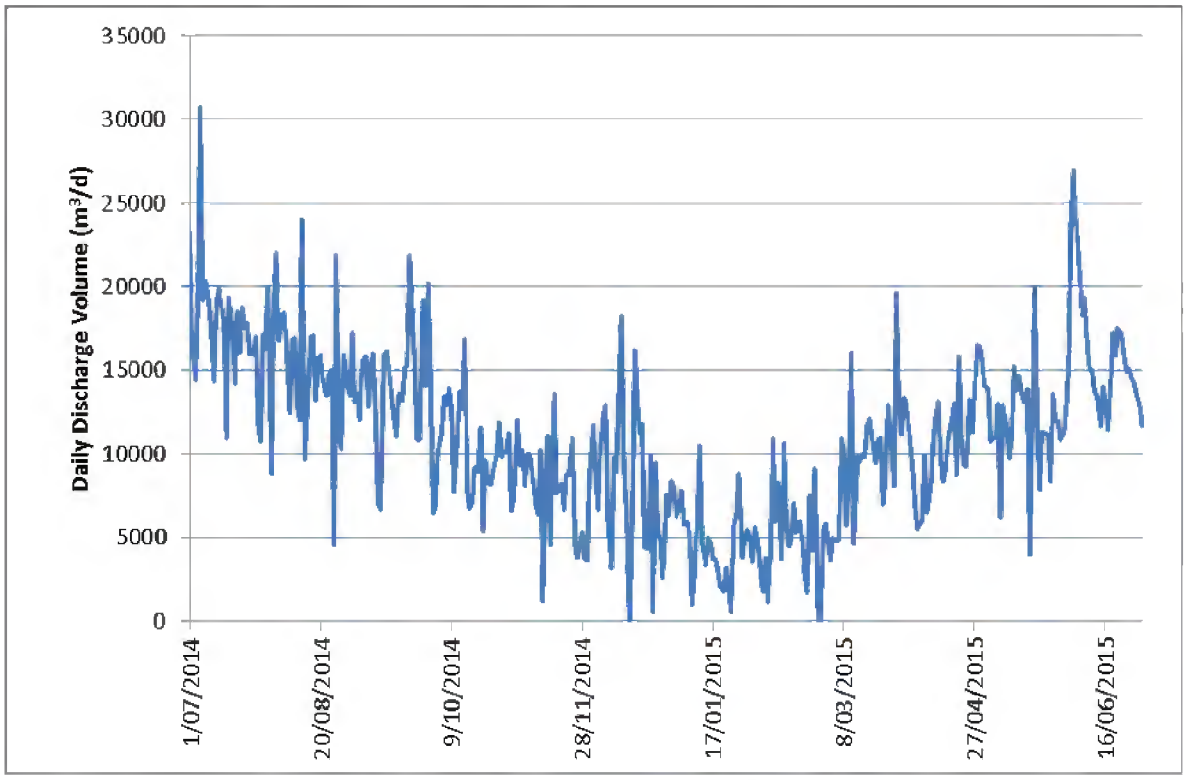


Figure 2-6: Daily discharge volume to Wairau Estuary

2.5.4 Condition 56

The Consent Holder shall install flow measuring devices after the outlet from wetland Pond 10 and Pond 6 (as shown on Plan Consent No C attached in Appendix 1 [see Appendix B for the Revised Plan Consent and Appendix C for the acceptance of this] *to these conditions of consent) and record the daily volume of treated wastewater discharged to the Wairau Estuary. A copy of these records shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request. A summary of this data shall be provided in the AMR required by Condition 7.*

A flow meter has been installed at the outlet from the wetlands, which is at Pond 14 rather than Pond 10. A flow meter has also been installed at the outlet to Pond 6 to record wastewater flow to irrigation areas.

2.5.5 Condition 59

The discharge of treated wastewater from the upgraded BSTP shall not cause any of the following effects outside the mixing zone described in Condition 58:

a) The natural temperature of the receiving water to change by more than 3 degrees Celsius;

b) Any conspicuous change in colour or clarity of the receiving water such that visual clarity of water is reduced by more than 50% as per the Water Quality Guidelines No 2 Ministry for the Environment (1994);

c) The concentration of dissolved oxygen of the receiving water to fall below 80 percent of the saturation content

While the above effects have not been directly monitored in the receiving water, the results of wastewater monitoring (see Figures 2-7 to 2-10), indicate that there are unlikely to be any significant effects on water quality after reasonable mixing. Beca (2007) indicated that, based on computer modelling, the "worst case" initial dilution in the Estuary under existing average flows would be 50:1. In addition, the treated wastewater is only discharged under ebb tide conditions when there is a strong outflow from the estuary. On this basis, none of the effects noted in Condition 59, are likely to have occurred after reasonable mixing, as a result of the discharge.

Successive surveys of the Estuary by Cawthron, in 2001 and 2007, show that the outfall "*was having no discernible effect on sediment quality or the seabed dwelling community*". A wastewater plume that was submerged for some distance following the outfall, strong tidal flows, sediment re-suspension and bed movement mitigate against any adverse effects occurring on the bed of the Estuary. The strong tidal flows results in significant re-oxygenation so that the potential for the creation of anoxic sediments is also very low.

The decommissioning of the Opawa River outfall and discharge of the combined wastewater to an area of rapid flushing in the Estuary, as well as the relatively high quality treated wastewater (ie low concentrations of total and ammoniacal nitrogen), means that there is a very low likelihood of nuisance biological growths occurring in the receiving water as a result of the discharge.

2.5.6 Condition 61

The Consent Holder shall take grab samples of treated wastewater at the outlet of Pond 10 following commissioning of the new wetland. Samples shall be analysed for the parameters and frequency shown in Table 1 (reproduced in Table 2-6 in this report)*. The results shall be reported in the AMP required by Condition 7.*

Condition 61 of the consent requires that grab samples be taken at the outlet of Pond 10. However, after changes made during detailed design, Pond 14 now represents the final wetland cell before discharge to the Estuary. The results of sampling at the outlet of the wetland are shown in Figures 2-7 to 2-11.

Metals and metalloids were not sampled during this monitoring period. It is recommended that annual testing for these parameters be carried out as required by Condition 61.

Table 2-6: Wastewater Monitoring Requirements

Parameter	Unit	Frequency of Analysis
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	g/m^3	Monthly
Suspended Solids (SS)	g/m^3	Monthly
Faecal Coliforms and Enterococci	cfu/100ml	Monthly
Ammoniacal Nitrogen (NH_3-N)	g/m^3	Monthly
Total Nitrogen (TN)	g/m^3	Monthly
Dissolved Inorganic Nitrogen	g/m^3	Monthly
Dissolved Reactive Phosphorus	g/m^3	Monthly
Total Phosphorus (TP)	g/m^3	Monthly
pH	pH units	Monthly
Temperature	Celsius	Monthly
Metals/metalloids: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc	g/m^3	Annually

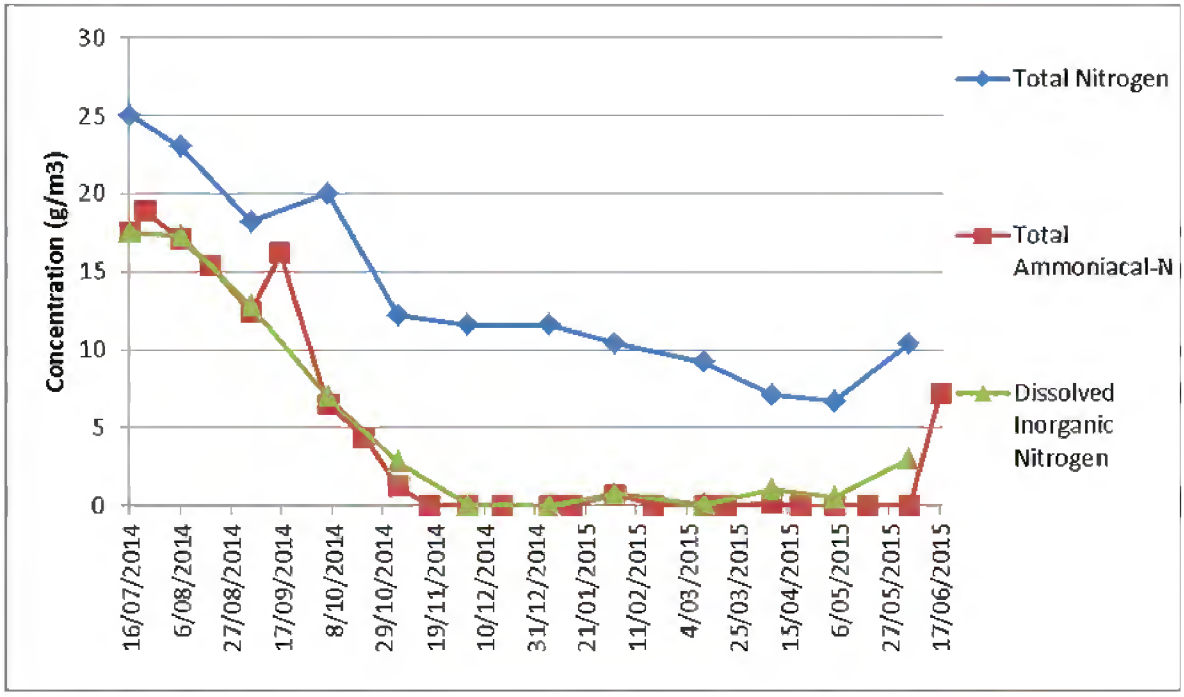


Figure 2-7: Wastewater monitoring results Pond 14 outlet – nitrogen species

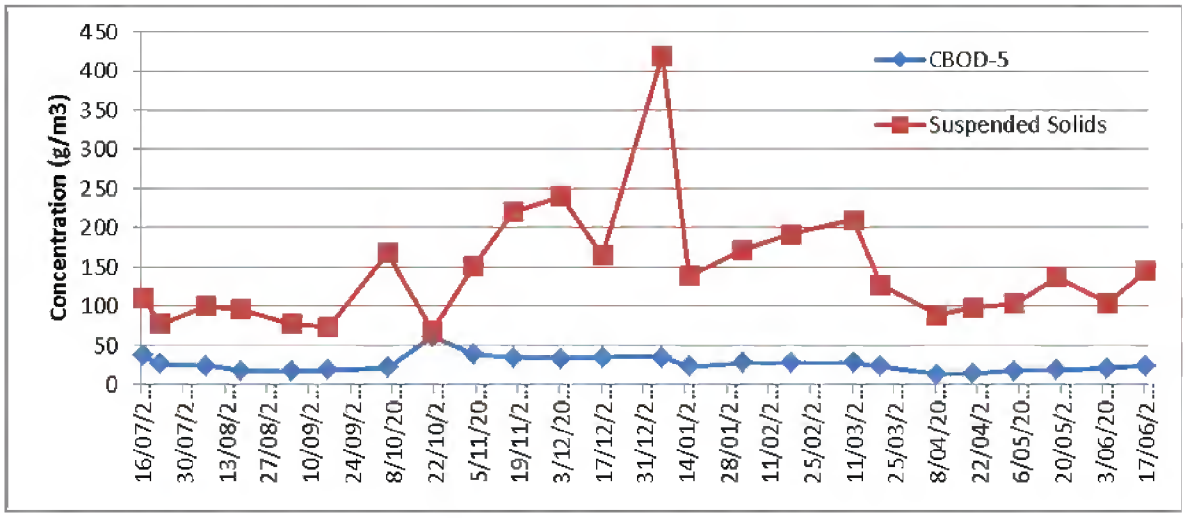


Figure 2-8: Wastewater monitoring results Pond 14 outlet – $cBOD_5$ and suspended solids

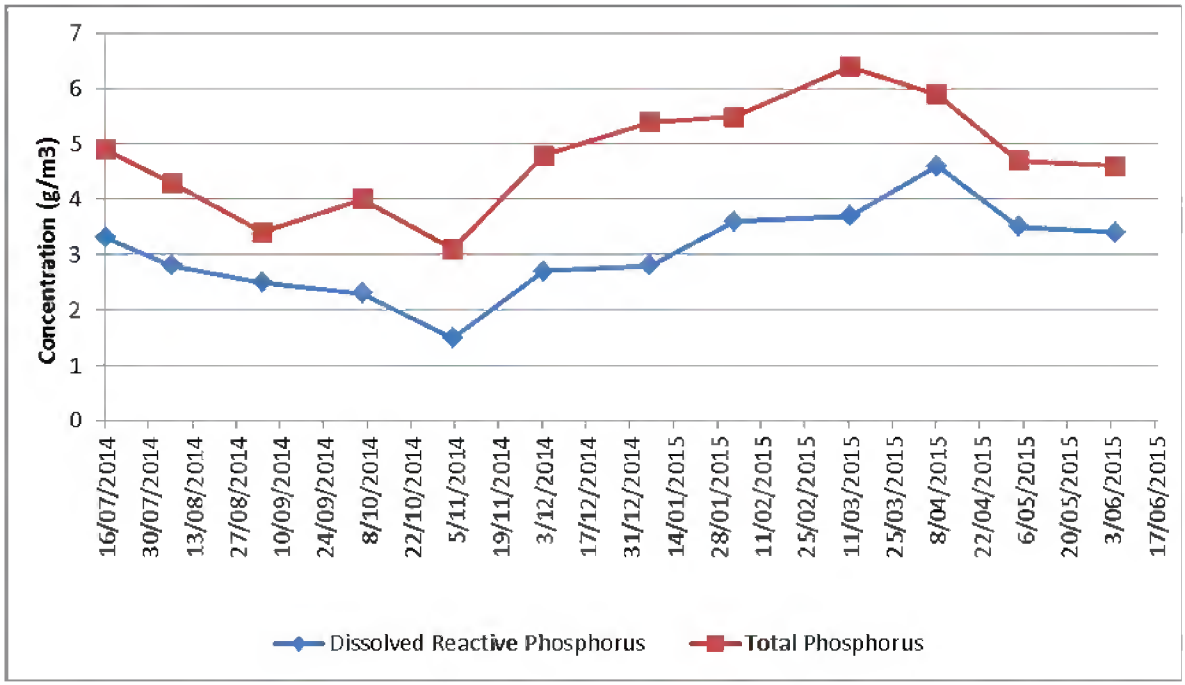


Figure 2-9: Wastewater monitoring results Pond 14 outlet – phosphorus species

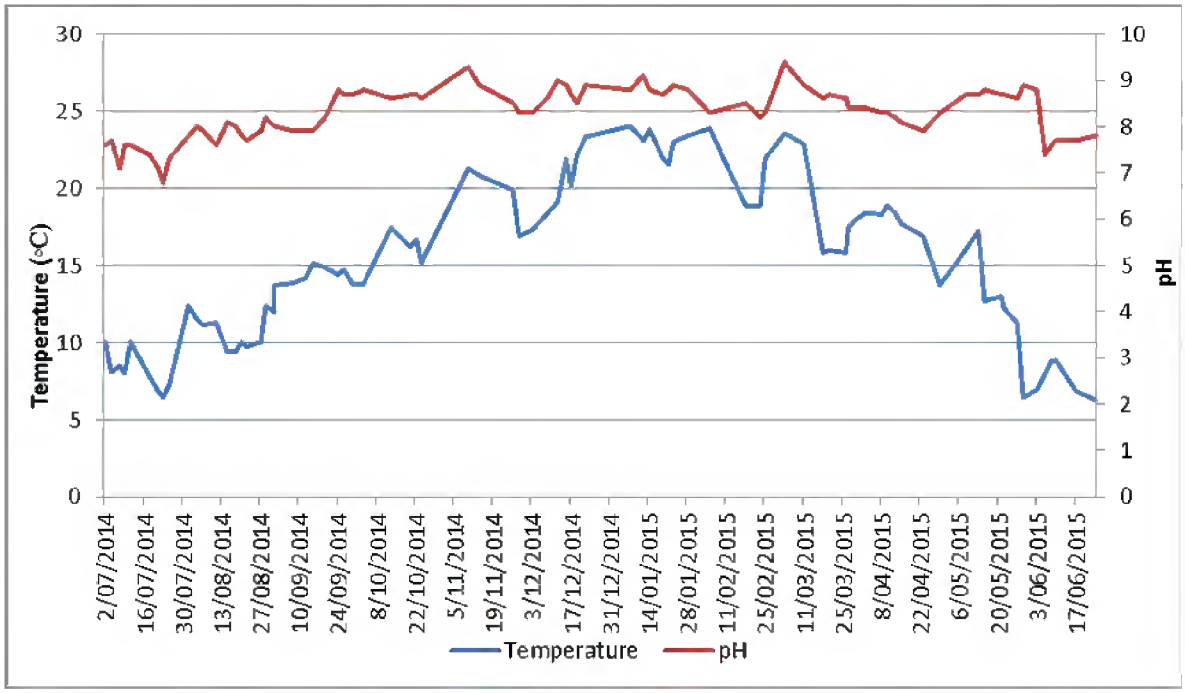


Figure 2-10: Wastewater monitoring results Pond 14 outlet – temperature and pH

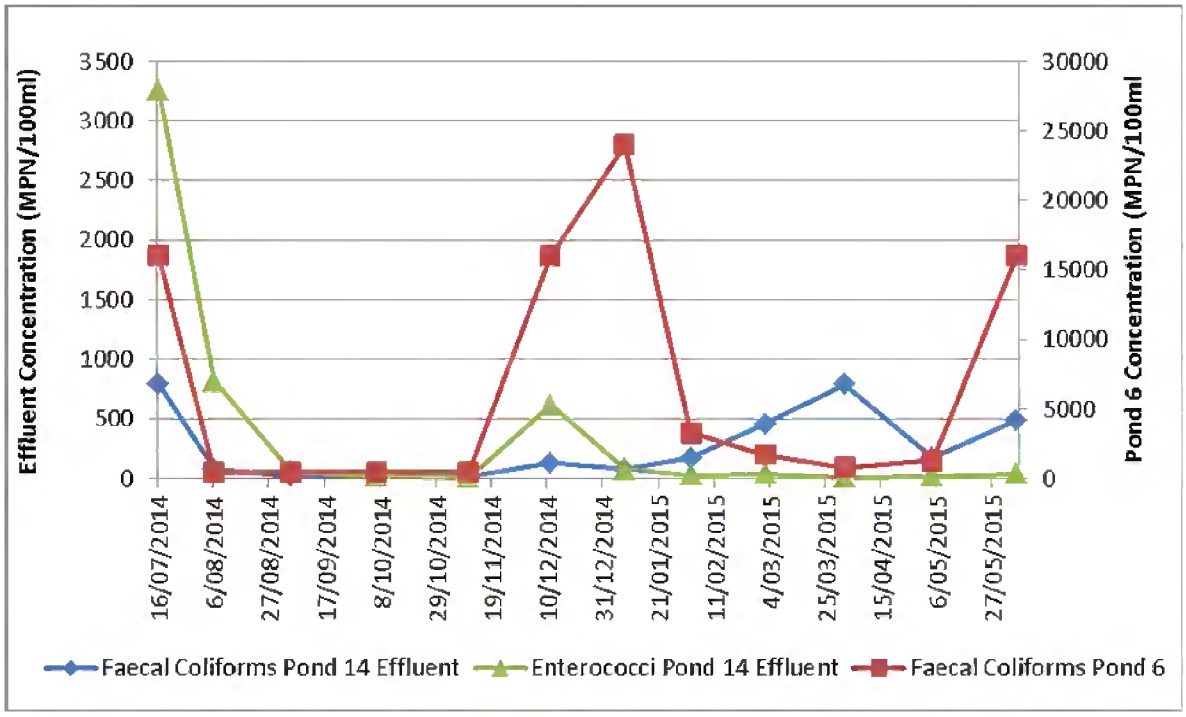


Figure 2-11: Wastewater monitoring results – Faecal coliforms and Enterococci at Pond 14 effluent and faecal coliforms at the outlet of Pond 6

2.5.7 Condition 62 - Wastewater Monitoring Limits

The treated wastewater sampled under Condition 61 shall comply on an annual basis with the ammoniacal nitrogen and faecal coliform limits listed in Table 2 [reproduced in the Consent Limits columns of Table 2.7].

The monitoring results and consent limits for ammoniacal nitrogen and faecal coliform concentrations are given in Table 2.7. From Table 2.7, it can be seen that all results were well within consent limits.

Figure 2-11 shows the results of the wastewater faecal coliform and enterococci monitoring as well as results of faecal coliform testing at the outlet of Pond 6. All wastewater faecal coliform concentrations were well below the 90th percentile consent limit. Faecal coliform concentrations from samples at the outlet of Pond 6 (taken around the same time as the wastewater samples), were substantially higher than the wastewater values. These results show that Ponds 7 to 14 (ie wetlands), are effective in providing further disinfection of the wastewater before discharge to the Estuary. This is especially true of the 90th percentile values.

Options to increase the treatment capacity of the industrial ponds are currently being investigated. These options include using the existing ponds but altering the treatment flow path. The goal of this study is to provide for further BOD and faecal coliform removal as winery production increases.

Table 2.7: Wastewater microbiological monitoring results and consent limits

	Units	Median		90th Percentile	
		Consent Limits under existing flows	Results	Consent Limits under existing flows	Results
Ammoniacal Nitrogen (NH_3-N)	g/m^3	30	0.46	40	17.0
Faecal Coliforms	cfu/100ml	700	475	2,150	790
Pond 6 Faecal Coliforms	cfu/100ml	-	490	-	16,000

2.5.8 Conditions 63-70

The Consent Holder shall carry out benthic surveys and water quality monitoring in the receiving environment to identify changes (notably adverse ecological impacts), as a result of the treated wastewater discharge. The survey design shall be consistent with the survey conducted by the Cawthron Institute (Technical Report on Effects of Outfall Discharge in Appendix D of Assessment of Environmental Effects for Upgrading of Blenheim Sewage Treatment Plant, September 2007).

Condition 64 requires that benthic and water quality surveys commence in the Estuary, 2 years after commissioning of the new outfall (ie February 2016). Surveys are then required to be repeated at a further 2 year interval (ie February 2018) and thereafter at 5 yearly intervals, for the duration of the consent. The results of the 2016 survey will be included in the 2015/16 AMR.

3 Summary

3.1 Overview

Groundwater testing was carried out at the required frequency and the results (with the exception of some high E. coli concentrations in March 2015 and some high conductivity values in well 10031), were reasonably consistent over all the wells tested. The nitrogen load applied while irrigating remained below the monthly and yearly limits required by Condition 24. Potable water from wells p28w/4447 and p28w/4446 was tested monthly (with the exception of January for Well p28w/4447), and all results were <1 cfu/100ml, including in March.

DO concentrations in the treatment ponds met the consent limits. However, a power outage over Easter resulted in the 110 kW aerators in Pond I2 being left off, which caused a drop in DO concentrations during that period.

Treated wastewater at the outlet of Pond 14 was monitored at the required frequency. Ammoniacal nitrogen and faecal coliform concentrations were well below the consent limits.

While the effects of the discharge on receiving waters have not been directly measured to date, the first benthic and water quality survey of the Estuary, required under the consent, will be carried out in early 2016. Regardless, the reasonably high wastewater quality, coupled with the expected initial dilution (predicted as approximately 50:1 under current flows), as well as rapid flushing during the ebb tide-only discharge, means that there is little likelihood of any significant adverse effects on receiving water or bed sediment quality after reasonable mixing.

3.2 Compliance with Consent Conditions

From an assessment of the results of monitoring in the period 1 July 2014 to 30 June 2015, all consent conditions were met with the exception of:

- Condition 7 – This AMR report was not submitted before 31 August.
- Condition 30 – Groundwater levels were not measured at the required fortnightly intervals but all recorded levels during irrigation were above the 0.3 metre requirement.
- Condition 31 – E. coli was not measured in Well p28/4447 in January. However, for the six samples analysed, all E. coli results were <1 cfu/100ml.
- Condition 44 - DO samples were not taken consistently on Wednesdays between 11am and 2pm.
- Condition 61 – Metals and metalloids were not sampled during this monitoring period.

It is recommended that as far as practicable, all sampling be carried out according to consent requirements.

4 Conclusions

Overall, the BSTP treatment ponds and wetlands appear to be performing well. While some minor improvements in the sampling regime are required, there is overall compliance with consent conditions.

No direct monitoring of the water or sediments within the Estuary has been required by consent (or carried out), to date. However, no significant adverse effects are likely because of the reasonably high quality discharge and the physical characteristics of the receiving water.

Appendix A

Consent U071181 including Site Plan and Monitoring Locations

U071181

PART I: CONSENTS GRANTED

1. Land Use Consents:

A To disturb land, clear indigenous vegetation and excavate land for the purposes of constructing a wetland, an outfall pipeline, sludge ponds and drying beds.

B To use land for the purpose of disposing treated wastewater to land.

2. Discharge Permits:

C To discharge treated wastewater to land.

D To discharge seepage from treatment ponds, wetlands, sludge ponds and drying beds.

E To discharge odour to air from treatment ponds, wetlands, sludge ponds and drying beds and from the land used for the disposal of treated wastewater.

F To discharge treated wastewater to the Opawa River.

3. Coastal Permit:

G. Coastal Permit to:

a) use and maintain an existing outfall pipeline and a new outfall pipeline in the Coastal Marine Area of the Wairau Estuary

b) occupy space in the Coastal Marine Area of the Wairau Estuary with an existing outfall pipeline and a new outfall pipeline

c) discharge treated wastewater to the Wairau Estuary from a new outfall pipeline

PART II: GENERAL CONDITIONS

1. The consents identified in Part I above are to be exercised in a manner which is consistent with the proposal and methodologies described in the documents, information and analysis provided by the Consent Holder in support of its Application for Resource Consents and held on Council file U071181.

2. Unless an alternative term is identified in the Specific Conditions, the resource consents granted have a term of 35 years from the date that the consents commence.

3. The Consent Holder shall, at least one month prior to the commencement of the works that are the subject of this consent, submit to the Manager, Regulatory Department, Marlborough District Council, final copies of the following draft management plans:

a) Blenheim Sewage Treatment Plant: Construction Management Plan - Wetlands, Sludge Ponds and Drying Beds, 5 July 2010, as amended by the evidence of H Archer dated 6 September 2010

b) Blenheim Sewage Treatment Plant: Construction Management Plan - Outfall and Outfall Pump Station, 5 July 2010, as amended by the evidence of H Archer dated 6 September 2010

c) Blenheim Sewage Treatment Plant: Buffer Planting Plan (undated)

d) Wastewater Irrigation Management Plan Blenheim Sewage Treatment Plant, version 3, 6 September 2010

e) Blenheim Sewage Treatment Plant: Operation and Management Plan, Revision C, July 2010

f) Blenheim Sewage Treatment Plant – Wetland Management Plan, 5 July 2010, as amended by the evidence of H Archer dated 6 September 2010

4. The final versions of the management plans listed in Condition 3 shall be prepared by qualified and experienced personnel with expertise in the matters that the individual management plans address. The management plans may be prepared as separate plans or as part of a combined plan.

5. When preparing the final versions of the management plans listed in condition 3, the Consent Holder shall take into account any comments provided by the Manager, Regulatory Department, Marlborough District Council, on the draft management plans. No works may commence until the final management plans have been approved in writing by Council, through the Manager, Regulatory Department.

6. All work shall be carried out in accordance with the approved final management plans, except that the Consent Holder may, at any time, submit to the Manager, Regulatory Department, Marlborough District Council, amendments to the plans for approval, provided those amendments improve the efficiency and/or quality of the construction works or operational activities, or avoid, remedy or mitigate an adverse effect.

7 The Consent Holder shall provide to the Manager, Regulatory Department, Marlborough District Council, on or before 31 August in each year of the term of consent, from and including 2011, an Annual Monitoring Report (AMR) which must contain at least the following information:

7.1 General

a) An analysis of the extent to which the Consent Holder has, in operating the BTSP and exercising these consents, complied with these Conditions of Consent and the extent and cause of any noncompliance, in each case with a summary of the environmental effects of the operation of the BTSP during the preceding 12 month period from 1 July – 30 June inclusive (the Reporting Period).

b) An identification and discussion of any operational difficulties, changes or improvements made to the wastewater treatment or operating processes, which would cause any material difference in environmental outcomes from the previous Reporting Period.

c) A comparison of results obtained over the Reporting Period with the results from previous reporting periods.

d) An identification of any maintenance works needed, proposed or undertaken to ensure compliance with these Conditions of Consent.

e) An identification of any improvements or changes required and the timetable for implementation.

7.2 Discharge of Treated Wastewater to Land

a) The volume of treated wastewater applied to each of the Areas 1 – 3 (as shown at Plan Consent No A in Appendix 1 to these conditions of consent) in the Reporting Period.

b) A summary and analysis (including graphical and statistical representations) of all data collected as a requirement of the Specific Conditions applicable to the discharge consent to discharge treated wastewater to land.

c) A record and discussion of any complaints received regarding the discharge to land and the consent holder's response to those complaints.

d) An analysis of any environmental effects, positive, neutral and adverse, which are attributable to the discharge of treated wastewater to land.

7.3 Discharge of Odour

a) Identification and discussion of any complaints received with respect to odour as per Condition 42 of the Discharge Permit to Air and any action taken to address the complaints.

b) The measurements of Dissolved Oxygen (DO) concentrations as per Conditions 44 and 45 of the Discharge Permit to Air.

c) An analysis of the data in terms of consent compliance and environmental effects.

d) A discussion of any relevant operational changes or improvements carried out during the Reporting Period.

e) A comparison of results in the Reporting Period to previous reporting periods and a discussion of any trends.

f) Any complaints received in regard to the operation of the BSTP and the action(s) taken to address each complaint.

7.4 Wastewater Monitoring and Benthic and Water Quality Monitoring

a) A summary of all the monitoring data collected as a requirement of the conditions of the discharge permit to discharge treated wastewater to the Wairau Estuary during the Reporting Period.

b) An analysis of the data in terms of consent compliance and environmental effects during the Reporting Period.

c) A discussion of any relevant operational changes or improvements carried out during the Reporting Period.

d) A comparison of results with previous years and a discussion of any trends during the Reporting Period.

e) Any complaints received in regard to the operation of the BSTP and the action(s) taken to address each complaint.

7.5 Outfall Pipelines

a) A record of any maintenance works undertaken in accordance with Condition 52 of the Coastal Permit for the new and existing outfall pipelines.

8. With the agreement of the residents around the BSTP the Consent Holder shall set up a Community Liaison Group (CLG) which will consist of representatives of the community of residents affected by the BTSP who wish to participate and representatives of the Consent Holder. The CLG will meet every six months for the first two years following the commencement of these consents and, thereafter, at times to be agreed by the parties. The CLG's administration costs, including the taking and distribution of minutes, will be the responsibility of the Consent Holder.

9. All water and wastewater samples required to be taken under these Conditions of Consent shall be analysed in accordance with Standard Methods for the Examination of Water and Wastewater prepared and published by the American Public Health Association, the American Waterworks Association and the Water Environment Federation or any other suitable and comparable methodology approved by the Consent Authority.

10. Any laboratory carrying out analyses required under these Conditions of Consent shall be accredited for those analyses to NZS/ISO/IEC/17025 or equivalent, or to any other comparable standard approved by the Consent Authority.

11. The Consent Holder shall undertake a Performance Review of the BSTP five years after the commencement of the consents. The Performance Review shall include, but not be limited to:
    a) compliance with consent conditions
    b) analysis and conclusion of monitoring results
    c) other available treatment technologies that may be options for the future

12. The Consent Holder shall undertake a Best Practice and further Performance Review of the BSTP ten years after the commencement of the consents. The Best Practice Review shall include, but not be limited to, research of available treatment technologies that would enable the removal of the discharge to the Wairau Estuary and improve the quality of the discharge.

13. The Consent Authority may review these Conditions of Consent by serving notice in September or October of any year for any of the following purposes:
    a) To deal with any adverse effect on the environment which may arise from the exercise of these consents, which was not foreseen at the time of the granting of the consents.
    b) To require the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.
    c) To address any matters raised in the AMR required by General Condition 7.
    d) To comply with the relevant requirements of a Council resource management plan.
    e) To implement any outcomes of the Performance and Best Practice Reviews required under Conditions 11 and 12.

14. The Consent Holder shall be responsible for all costs associated with the monitoring of these resource consents and Conditions of Consent as required by Section 36 of the Resource Management Act 1991 and Marlborough District Council's Schedule of Fees.

15. The Consent Holder shall be responsible for all costs incurred by the Consent Authority associated with the review of or requested changes to any Management Plans which form part of this consent.

16. A copy of all resource consents granted under U071181, including conditions imposed, shall be readily available at Marlborough District Council's office building.

PART III: SPECIFIC CONDITIONS

A. Applicable to Land Use Consent to disturb land, clear indigenous vegetation and excavate land for the purposes of constructing a wetland, an outfall pipeline, sludge ponds and drying beds.

17. This consent will have a term of three years from the date this consent commences.

18. The works the subject of this consent shall be undertaken in terms of Plan Consent No C in Appendix 1 to these conditions of consent.

19. The Consent Holder shall notify the Manager, Regulatory Department, Marlborough District Council, in writing of the proposed date of commencement of the construction works, at least 1 week prior to the start date of the works.

B Applicable to Land Use Consent use land for the purpose of disposing of treated wastewater to land

Advisory Note: There are no special conditions for this land use consent.

C Applicable to Discharge Consent to discharge treated wastewater to land

20. This consent will have a term of fifteen years from the date this consent commences.

21. The discharge shall only be of treated wastewater from the BTSP taken from the outlet of Pond 6, or from any point between Pond 6 and the outlet of Pond 10.

22. The discharge of wastewater to land shall be via drip irrigation or spray irrigation in the areas shown on Plan Consent No A. Only surface or subsurface drip irrigation shall be used within 25 metres of the site boundary and public walking tracks, except that on the western boundary adjoining neighbouring land, only surface or subsurface drip irrigation shall be used within 80 metres of the site boundary. For all other areas of the site, spray irrigation may be used.

23. The treated wastewater shall only be applied to the land using a deficit irrigation management regime. Deficit irrigation is defined as irrigation of a depth of wastewater that does not exceed the soil moisture deficit at the time of application. The soil moisture deficit shall be calculated in accordance with the Wastewater Irrigation Management Plan (IMP). The Consent Holder shall maintain records of rainfall and evapotranspiration that shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request and which must be summarised in the AMR required by Condition 7.

24. The following net Nitrogen Loading Limits shall be observed:
    a) The maximum annual application of nitrogen shall not exceed a net loading of 200 kilograms of nitrogen per hectare per year.
    b) Monthly applications shall not exceed a net loading of 50 kilograms of nitrogen per hectare.
    c) Net loadings shall be calculated by taking into account the amounts of nitrogen contained in the pasture removed from the Irrigation Areas 1-3 of the site.

25. Spray irrigation shall not commence within 150 metres of adjacent property boundaries until the buffer planting required by the Buffer Planting Plan has grown to a height of at least 2 metres.

26. Spray irrigation of wastewater shall not occur within 10 metres of flowing surface water. Drip irrigation of wastewater shall not occur within 3 metres of flowing surface water.

27. Records shall be maintained of: the area of land used in each discharge event; the date, time and duration of the event; the wind speed and direction; and the wastewater application rate and dry matter quantities removed from specific areas and associated nitrogen content. A copy of these records shall be made available to

the Manager, Regulatory Department, Marlborough District Council, on request. A summary of this data shall be provided in the AMR required by Condition 7.

28. Groundwater shall be sampled monthly for a minimum of six months prior to commissioning of the irrigation system. Groundwater shall be sampled from the wells shown on Plan Consent No B in Appendix 1 to these conditions of consent. The samples shall be analysed for:

    a) Ammoniacal nitrogen.
    b) Nitrate nitrogen.
    c) Conductivity.
    d) *E-coli.*

    The water level in each bore shall be measured and recorded at the time the sample is taken.

29. Groundwater shall be sampled monthly while irrigation is occurring in each area identified in Plan Consent No A in Appendix 1 to these conditions of consent, except that if irrigation has occurred for less than 14 days in the previous month no sampling is required. For each Irrigation Area, the wells identified within that area shown on Plan Consent No B attached in Appendix 1 to these conditions of consent, shall be sampled. The samples shall be analysed for:

    a) Ammoniacal nitrogen.
    b) Nitrate nitrogen.
    c) Conductivity.
    d) *E-coli.*

    The water level in each bore shall be measured and recorded at the time the sample is taken.

30. The groundwater level in the wells shown on Plan Consent No B attached in Appendix 1 to these conditions of consent shall be monitored prior to wastewater irrigation commencing and at least fortnightly thereafter while irrigation is occurring. If the groundwater level measured in any monitoring well, for a particular irrigation area, is closer than 0.3 metres from the ground surface, irrigation shall cease in that area. Irrigation shall not recommence until the groundwater level is greater than 0.3 metres below the ground surface.

31. The potable water in well P28/4446 and one well on Lot 2 DP12207 shall be monitored as follows:

    a) A sample of water shall be taken from well P28/4446, within 30 days of wastewater irrigation commencing in Area 3 south of Hardings Road or Area 1 north of Hardings Road.
    b) A sample of water shall be taken from one potable supply well on Lot 2 DP12207, within 30 days of wastewater irrigation commencing in Area 1 north of Hardings Road.
    c) Sampling of both wells shall continue at monthly intervals during the wastewater irrigation season with a final sample being taken no later than 30 days after wastewater irrigation ceases each season.
    d) Samplying shall continue for a period of 5 years after wastewater irrigation commences. If *E.coli* are detected then the sampling shall continue for a further 5 years from that time.
    e) The samples shall be tested for *E.coli.* If *E.coli* are detected:

(i) The Consent Holder shall immediately advise the well owner and the Manager, Regulatory Department, Marlborough District Council. A further sample shall be taken and tested for *E.coli* within 5 working days.

(ii) The Consent Holder shall undertake an investigation into the likely causes of contamination and any measures recommended to avoid further contamination. Within 14 days of the first sample the Consent Holder shall provide a written report on the investigation to the well owner and the Manager, Regulatory Department, Marlborough District Council.

32 Prior to commencing the discharge;

a) A weather station shall be installed at the office building shown on Plan Consent No B attached in Appendix 1 to these conditions of consent. The weather station shall measure and record windspeed and direction and rainfall and have sufficient instrumentation to allow the calculation of evapotranspiration. The wind speed and direction recorded at the weather station shall be deemed to represent the wind speed and direction for Irrigation Area 1.

b) An anemometer and wind vane shall be installed at each of the two locations shown on Plan Consent No B attached in Appendix 1 to these conditions of consent. The anemometers and wind vanes shall measure and record wind speed and direction. The wind speed and direction recorded shall be deemed to represent the wind speed and direction for Irrigation Areas 2 and 3 respectively.

c) The weather station, anemometers and wind vanes shall be maintained in an operational condition throughout the term of this consent.

33. Spray irrigation shall cease within 150 metres of the adjacent property boundaries as shown on Plan Consent No B attached in Appendix 1 to these conditions of consent for each Irrigation Area when the wind speed exceeds 15 kilometres per hour (as an average over 15 minutes) in the direction of the adjacent property boundaries as recorded at the respective weather recording device for that Irrigation Area. Drip irrigation may continue in such circumstances.

34. Treated wastewater shall only be applied to land at a rate such that ponding for a period greater than 12 hours does not occur.

35. The Consent Holder shall maintain a register of any complaints received relating to any aspect of the land discharge system. The record shall include the date and time of complaint, cause of the complaint, weather conditions at the time of complaint and action taken in response to the complaint. The register shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request. A summary of complaints received by the consent holder shall be included in the AMR required by Condition 7.

36 For the duration of these consents, the Consent Holder shall install and maintain appropriate signage on any access points to the BSTP warning that partially treated wastewater is discharged to the land. Written confirmation of the signage wording, size and placement shall be provided to the Manager, Regulatory Department, Marlborough District Council, within three months of the commencement of this consent.

D. Applicable to Discharge Consent to discharge seepage from treatment ponds, wetlands, sludge ponds and drying beds.

37. The discharge the subject of this consent is limited to discharge from the base of the treatment ponds, the base of the wetlands and the base of the sludge ponds and drying beds.

38. The discharge shall only be exercised to the extent that it does not cause flooding or ponding on adjoining ground surfaces.

E. Applicable to Discharge Consent to discharge odour to air from treatment ponds, wetlands, sludge ponds and drying beds and from the land used for the disposal of treated wastewater.

39. The Consent Holder shall take all practicable steps to minimise the potential for generation of objectionable or offensive odour that causes an adverse effect at the legal boundary of any property adjoining the consent site.

40. For the purpose of monitoring compliance with Condition 39, an objectionable or offensive odour that causes an adverse effect is considered to have occurred if the Manager, Regulatory Department, Marlborough District Council, deems it so, applying the FIDOL (frequency, intensity, duration, offensiveness and location) criteria as set out in the Good Practice Guide for Assessing and Managing Odour in New Zealand (Ministry for Environment, 2003).

41. The Consent Holder shall respond as quickly as practicable to any complaints about odour and shall take all practicable measures to minimise the odour and prevent reoccurrence.

42. Any complaints received in regard to odour shall be recorded in a Complaints Register specifying the complaint, time and date, weather conditions and action required. A copy of the complaints shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request. A summary of these complaints shall be part of the AMR required by Condition 7 of these Conditions of Consent.

43. Should an event occur which results in an objectionable or offensive odour at the boundary of any property, the Manager, Regulatory Department, Marlborough District Council, may request the Consent Holder to provide a written report within 15 days of the request being made, specifying:
    a) The cause or likely cause of the event and any factors which influenced its severity.
    b) The nature and timing of any measures implemented by the consent holder to avoid, remedy or mitigate any adverse effects.
    c) The steps to be taken, if any, in the future to prevent a recurrence of similar events.

44. The Consent Holder shall measure the Dissolved Oxygen (DO) concentrations in the wastewater near the outlet of Ponds 2A, 2B, 2C, 6 and 10 every Wednesday, except when a Wednesday falls on a public holiday, when the measurement shall be taken on the nearest following working day. The DO concentration shall be measured between 11am and 2pm and shall not be less than 2 grams of DO per cubic metre, on a rolling 10 percentile weekly measurement basis.

45. The DO of the wastewater in Ponds I1 and I2 shall be measured daily between 11am and 2pm during peak loading periods associated with the annual vintage, with DO concentrations maintained at not less than 0.5 grams per cubic metre on a 50 percentile basis. The time of the peak loading periods shall be determined by consultation between the Consent Holder and the Manager, Regulatory Department, Marlborough District Council. The results of the measurements shall be included in the AMR required by Condition 7.

F. Applicable to Discharge Consent to discharge treated wastewater to the Opawa River.

46. This consent shall have a term of three years from the date the consent commences.

47. The conditions of consent U961050.6 as shown in Appendix 2 to these conditions of consent will remain in force and will apply to this consent until the wetland is established and the new outfall pipeline is completed so that the Opawa outfall is able to be decommissioned.

G. Applicable to Coastal Permit to:

a) use and maintain an existing outfall pipeline and a new outfall pipeline in the Coastal Marine Area of the Wairau Estuary

b) occupy space in the Coastal Marine Area of the Wairau Estuary with an existing outfall pipeline and a new outfall pipeline

c) discharge treated wastewater to the Wairau Estuary that has passed through a wetland (Pond 10)

Advice Note: *This coastal Permit does not authorise the discharge of wastewater from the existing outfall pipeline where that wastewater has not passed through the new wetland (Pond 10). That discharge is authorised under existing discharge consent U950167.1 which expires on 1 October 2011.*

48. This consent shall have a term of fifteen years from the date that it commences.

49 The outfall pipelines shall be located in general accordance with Plan Consent No C attached in Appendix 1 to these conditions of consent with the outlets at about NZMG E 2,598,349 NZMG N 5,966,313.

50. The outfall pipelines shall be maintained in an operational condition at all times.

51. The Consent Holder shall undertake annual external visual inspections of the outfall pipeline structures for the duration of the consent. A report shall be submitted to the Manager, Regulatory Department, Marlborough District Council, within 20 working days of the inspection being carried out. The report shall include but not be limited to:

a) The date and time of the inspection.

b) The condition of the outfall structures.

c) Any maintenance work that may be required, and if it is required, when the work will be carried out.

52. Should the report required by Condition 51 identify the requirement for maintenance, confirmation of the completion of the works shall be forwarded to the Manager, Regulatory Department, Marlborough District Council, within twenty working days of the completion of the works.

53. The outfall pipelines shall not interfere with any public right of navigation.

54. The existing buoy marking the location of the end of the existing outfall shall be marked with the words *Sewer Outfall* and the lettering used shall be bold and clear such that it can easily be read from a distance of 10 metres.

55. The total discharge of treated wastewater authorised by this consent shall not exceed an average daily volume of 28,500 cubic metres, where the average volume is calculated on a continuous basis over a period of 365 consecutive days. The maximum discharge volume per day shall not exceed 103,680 cubic metres.

56. The Consent Holder shall install flow measuring devices after the outlet from wetland Pond 10 and Pond 6 (as shown on Plan Consent No C attached in Appendix 1 to these conditions of consent) and record the daily volume of treated wastewater discharged to the Wairau Estuary. A copy of these records shall be made available to the Manager, Regulatory Department, Marlborough District Council, on request. A summary of this data shall be provided in the AMR required by Condition 7.

57. The discharge of treated wastewater shall generally take place over a four hour period, commencing one hour after high tide, except that longer discharge periods may be used after a prolonged wet weather event when peak wastewater flows and/or high rainfall cause the storage capacity of the ponds/wetland to be exceeded.

58. The proposed mixing zone for the discharge to the Wairau Estuary shall be as shown on Plan No D in Appendix 1 to these conditions of consent.

59. The discharge of treated wastewater from the upgraded BSTP shall not cause any of the following effects outside the mixing zone described in Condition 58 above:
    a) The natural temperature of the receiving water to change by more than 3 degrees Celsius;
    b) Any conspicuous change in colour or clarity of the receiving water such that visual clarity of water is reduced by more than 50% as per the Water Quality Guidelines No 2 Ministry for the Environment (1994);
    c) The concentration of dissolved oxygen of the receiving water to fall below 80 percent of the saturation content.

60. There shall be no undesirable biological growths as a result of the discharge.

Wastewater Monitoring

61. The Consent Holder shall take grab samples of treated wastewater at the outlet of Pond 10 following commissioning of the new wetland. Samples shall be analysed for the parameters and frequency shown in Table 1. The results shall be reported in the AMP required by Condition 7.

62. The treated wastewater sampled under Condition 61 shall comply on an annual basis with the ammonical nitrogen and faecal coliform limits listed in Table 2.

Table 1: Monitoring Parameters

Parameter	Unit	Frequency of Analysis
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	g/m^3	Monthly
Suspended Solids (SS)	g/m^3	Monthly
Faecal Coliforms and Enterococci	cfu/100ml	Monthly
Ammoniacal Nitrogen (NH_3-N)	g/m^3	Monthly
Total Nitrogen (TN)	g/m^3	Monthly
Dissolved Inorganic Nitrogen (DIN)	g/m^3	Monthly
Dissolved Reactive Phosphorus (DRP)	g/m^3	Monthly
Total Phosphorus (TP)	g/m^3	Monthly
pH	pH units	Monthly
Temperature	°Celsius	Monthly
Metals/metalloids: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc	g/m^3	Annually

Table 2: Wastewater Limits

Parameter	Unit	Median		90 Percentile	
		Estimated Existing Flow	Future Design Flow	Estimated Existing Flow	Future Design Flow
Ammoniacal Nitrogen (NH_3-N)	g/m^3	30	15	40	20
Faecal coliforms	cfu/100 ml	700	350	2150	1075

Advice Note: *The future design flows are an average daily volume of 28,500 cubic metres and to meet the limits the initial dilution has been calculated as 25:1. When lower flows are being discharged, the wastewater concentration limits can be increased after discharge based on a back calculation from the assessed initial dilution. The Cawthron Institute (Technical Report on Effects of Outfall Discharge in Appendix D of Assessment of Effects for Upgrading of Blenheim Sewage Treatment Plant, September 2007) has determined that an initial dilution of 50:1 can be achieved at an average daily volume of 14,250 cubic metres (estimated existing flow).*

Table 3: Benthic Survey Parameters

Station Location			Replicates per Station		
Station Code	**NZMG E (m)**	**NMG N (m)**	**Infauna**	**Sediment Chemistry**	**Shellfish**
OF P	2,598,336	5,966,320	3	4	1[a]
25DS P	2,598,350	5,966,340	3	4	1
50DS P	2,598,357	5,966,361	3	4	1
100DS P	2,598,404	5,966,466	3	4	1
200DS P	2,598,476	5,966,466	3	4	1
300DS P	2,598,539	5,966,546	3	4	1
OF O	2,598,326	5,966,314	3	4	1[a]
25DS O	2,598,353	5,966,301	3	4	1
50DS O	2,598,335	5,966,368	3	4	1
100DS O	2,598,361	5,966,417	3	4	1
200DS O	2,598,434	5,966,500	3	4	1
300DS O	2,598,496	5,966,582	3	4	1[a]

Key:

OF Outfall
DS Downstream
P Plume
O Outside (of the plume)

a No target species of shellfish found at this station during 2006 survey

Receiving Environment Monitoring

63. The Consent Holder shall carry out benthic surveys and water quality monitoring in the receiving environment to identify changes (notably adverse ecological impacts), as a result of the treated wastewater discharge. The survey design shall be consistent with the survey conducted by the Cawthron Institute (Technical Report on Effects of Outfall Discharge in Appendix D of Assessment of Environmental Effects for Upgrading of Blenheim Sewerage Treatment Plant, September 2007).

Benthic Survey

64. A benthic survey shall be carried out in accordance with the station designation, locations, and replication as set out in Table 3:
    a) Within two years of commissioning the new outfall pipeline, but not less than 12 months after commissioning.
    b) Within four years of commissioning the new outfall pipeline, but not less than three years after commissioning.
    c) Thereafter at five yearly intervals.

65. Twelve stations (six pairs, located both inside and outside the wastewater plume) shall be sampled at discreet distances (i.e. <5m, 25m, 50m, 100m, 200m and 300m) downstream from the discharge.
    a) Infauna shall be collected via 13 cm diameter cores (approx 10 cm depth) and samples shall be processed using a 0.5 mm sieve with taxa collected counted and identified to the lowest practicable taxonomic level.
    b) Sediment samples shall be collected via 6 cm (minimum) diameter cores manually driven into the benthic sediments to a depth of 10-15 cm. The colour and the visible presence/absence of any anoxic patches or layers within the cores shall be recorded. One of the four replicate cores per station shall be split and photographed to provide a permanent visual record. The top 5 cm of the remaining three cores shall be sub-sampled for analysis of the following:
        i) Sediment texture – particle grain size distribution
        ii) Organic content (total organic carbon or ash-free dry weight)
        iii) Metals/Metalloids – arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), and zinc (Zn)

66. Where present, 15-20 shellfish of the target species *Paphies austral* (pipi) shall be collected and composite tissue samples analysed for faecal coliforms and trace metals/metalloids (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn).

Water Quality

67. At the same time as the seabed surveys, near surface (within 1m) and near-bottom (within 1m) water quality samples shall be taken at the following sites during the ebb tide discharge: 300-550 metres upstream of the discharge; at the downstream edge of the mixing zone (300 metres downstream of the discharge) and at the bar entrance (500-600 metres downstream).

68. The water quality at each site shall be visually assessed for:
    a) Scums, foams and other floatable material
    b) Conspicuous changes in colour or clarity

69. Water quality samples shall be taken and tested for the following:

a) Presence of any objectionable odour

b) Biochemical oxygen demand (BOD), total suspended solids (TSS), faecal coliforms, Enterococci, and trace metals/metalloids (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn).

c) Nutrients (Total-N, Ammonical-N, Dissolved reactive phosphorus)

d) Standard hydrological parameters (pH, temperature, dissolved oxygen, salinity and turbidity)

70. The Consent Holder shall forward a record of the outcomes of Conditions 63 to 69 to the Manager, Regulatory Department, Marlborough District Council, within one month of the analysis of the monitoring being completed.

Iwi Liaison

71. The Consent Holder shall make a senior Marlborough District Council representative available to meet with Ngati Toa, Ngati Rarua and Rangitane at six monthly intervals throughout the duration of the consent, to review treatment plant performance, including the results of any monitoring.

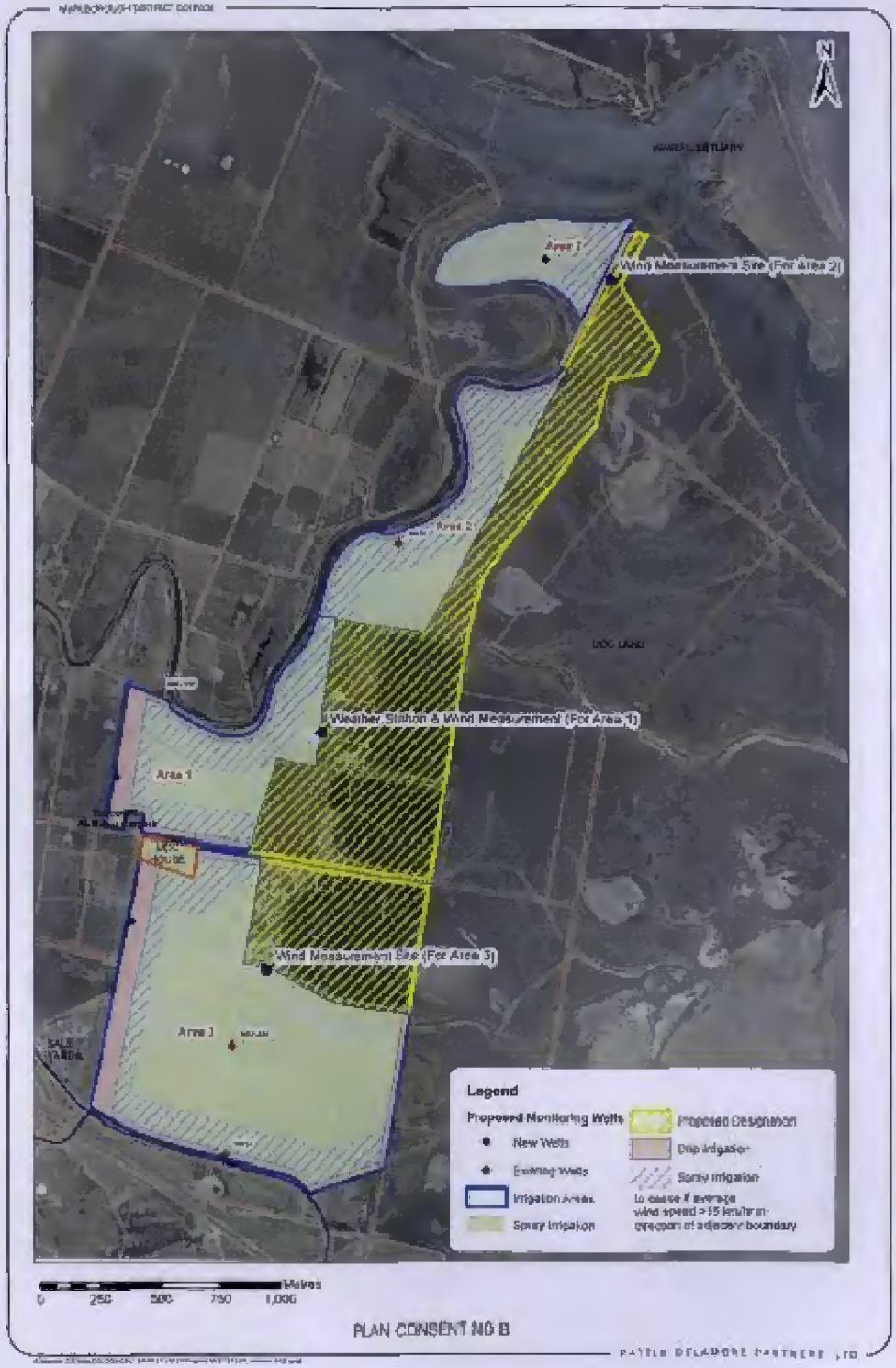
Changes/Modifications

72. Any changes in the scope, frequency or timing of the monitoring programme identified as being necessary by the Consent Authority shall be addressed in the course of any review of conditions initiated by the Consent Authority under Section 128 of the RMA, as contemplated by Condition 13.

Appendix 1

Plan Consent No A
Plan Consent No B
Plan Consent No C
Plan Consent No D

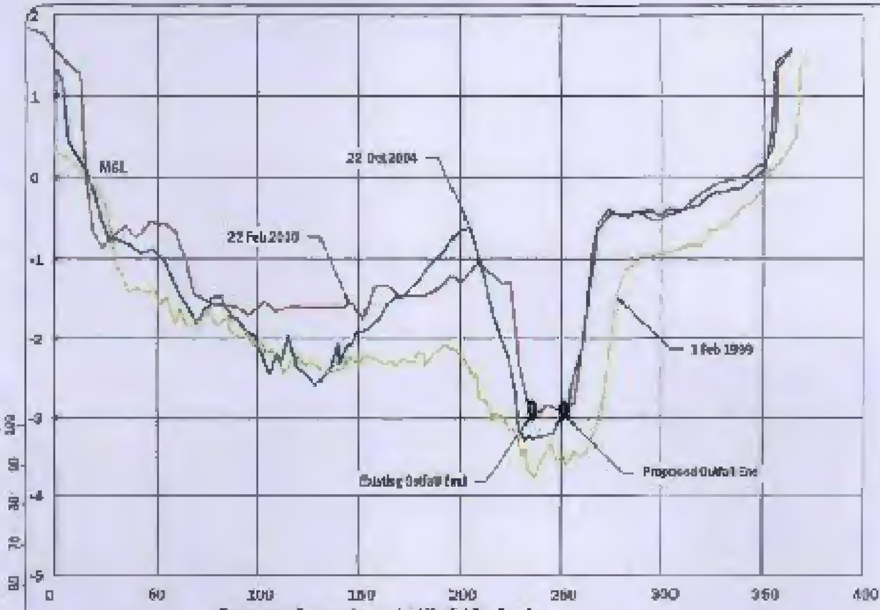
PLAN CONSENT NO A



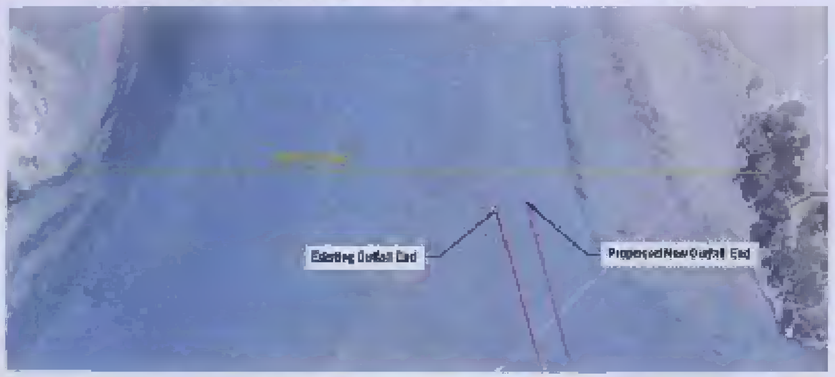
PLAN CONSENT NO B

PLAN CONSENT NO. C

BLENHEIM SEWAGE TREATMENT PLANT
UPGRADING CONCEPT PLAN



Cross Section WR XS 0.4



Plan : Cross Section WR XS 0.4 Scale 1:2000

Plan : Zone of Reasonable Mixing

Scale 1:4000

Station Code	NZMG E	NZMG N
OFP	2,588,349	5,966,313
25D SP	2,596,367	5,966,331
50D SP	2,588,364	5,966,249
100D SP	2,588,478	5,966,386
200D SP	2,588,460	5,966,462
300D SP	2,588,538	5,966,545
OFD	2,588,308	5,966,348
25D SO	2,598,324	5,966,365
50D SO	2,588,339	5,966,385
100D SO	2,588,370	5,966,424
200D SO	2,588,434	5,966,500
300D SO	2,588,498	5,966,582

MARLBOROUGH DISTRICT COUNCIL
SEYMOUR SQUARE, P.O. BOX 443
BLENHEIM 7240, NEW ZEALAND
TEL: (03) 520-7400, FAX: (03) 520-7496

Blenheim Sewerage
BSTP
Wairau Estuary Outfall and Cross Section

A | For Resource Consent

As Shown

2/604

Plan Consent No. D

Appendix B

Amended Consent Drawings and Condition 32(b) of U071181 prepared by CH2M Beca

CH2M Beca

PO Box 13960, Christchurch , New Zealand
T: +64 3 366 3521 // F: +64 3 366 3188
E: info@beca.com // www.ch2mbeca.co.nz

Marlborough District Council
PO Box 443
Blenheim 7240

11 June 2012

Attention: Guy Boddington

Dear Guy

Blenheim Sewage Treatment Plant Upgrade-Amended Consent Drawings and Condition 32 (b) of U071181

At a meeting between yourself, Paul Whyte and Graeme Jenner (Beca) on 5th April 2012, the status of additional activities, in respect of the upgrading of the Blenheim Sewage Treatment Plant (BSTP), was agreed. In a subsequent letter to (MDC) dated 10th May 2012, it was noted that Beca would send amended Consent Plans Nos A and B to MDC, together with an amendment to Conditions 32 (a) and(b) of Consent U071181.

Consent Plans Nos A and B have now been updated and are included as Attachment A.

The proposed amended consent conditions (amendments in bold) are:

Condition 32(a)

A weather station shall be installed at the office building shown on Plan Consent No B attached in Appendix 1 to these conditions of consent. The weather station shall measure and record wind speed and direction and rainfall and have sufficient instrumentation to allow calculation of evapotranspiration. The wind speed and direction recorded at the weather station shall be deemed to represent the wind speed and direction for Areas 1 ***and 2****.*

Condition 32 (b)

"An anemometer and wind vane shall be installed at the location ***shown as Wind Measurement Site (Area 3)*** *on Plan Consent No B attached in Appendix 1 to these conditions of consent. The anemometer and wind vane shall measure and record wind speed and direction. The wind speed and direction recorded shall be deemed to represent the wind speed and direction for* ***Irrigation Area 3".***

Please contact the undersigned to acknowledge receipt of the following:

- Letter to MDC dated 10th May 2012 with agreed status of additional activities
- This letter with amended consent drawings and proposed amendments to Condition 32 (a) and (b) of UO71181

Our Ref: 6516840
NZ1-5982929-1 0.1

CH2M Beca

Yours faithfully
Graeme Jenner
Associate - Environmental

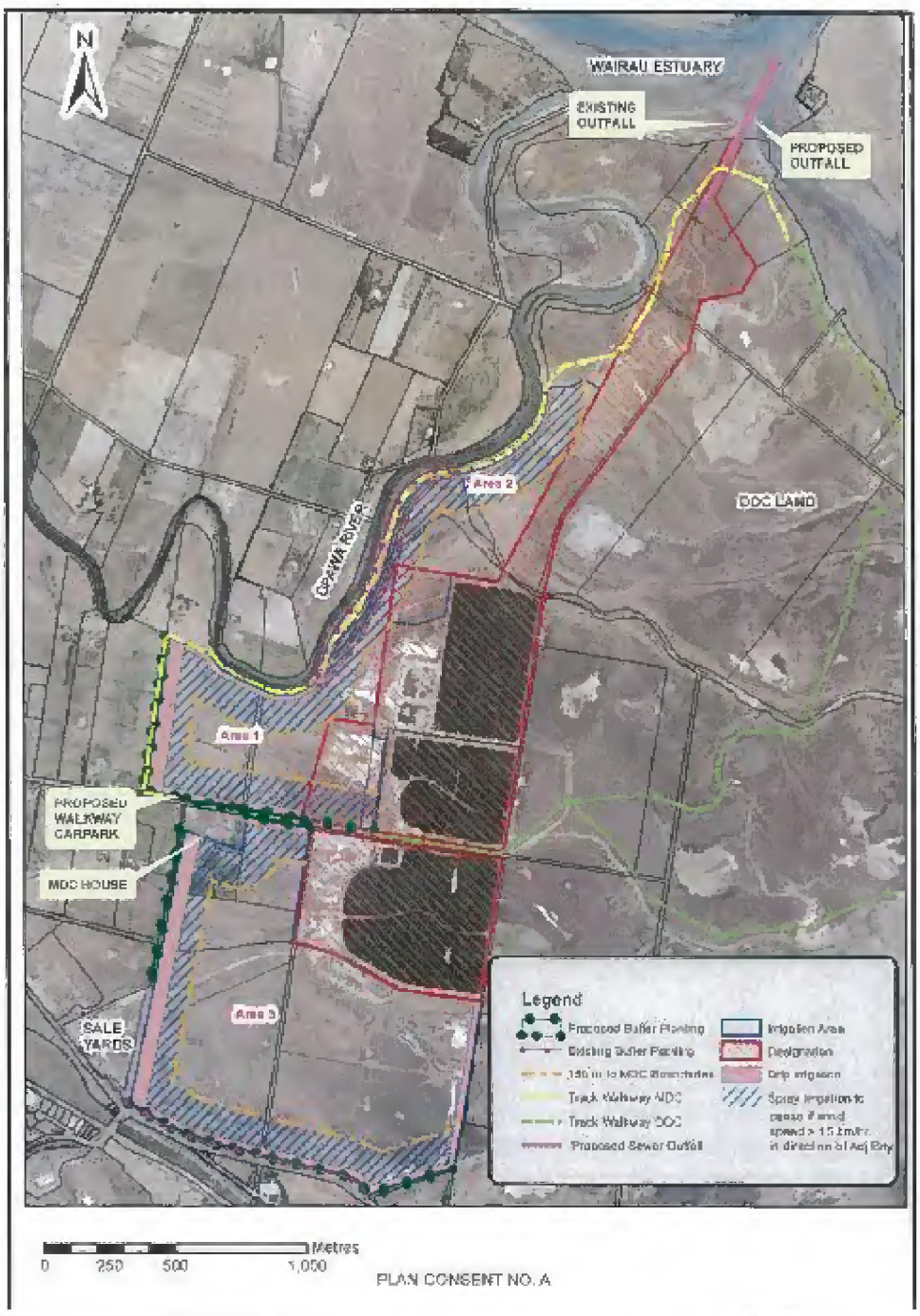
on behalf of
CH2M Beca Ltd
Direct Dial: +64 3 374 3156
Email: graeme.jenner@beca.com

Copy
Stuart Donaldson: Marlborough District Council

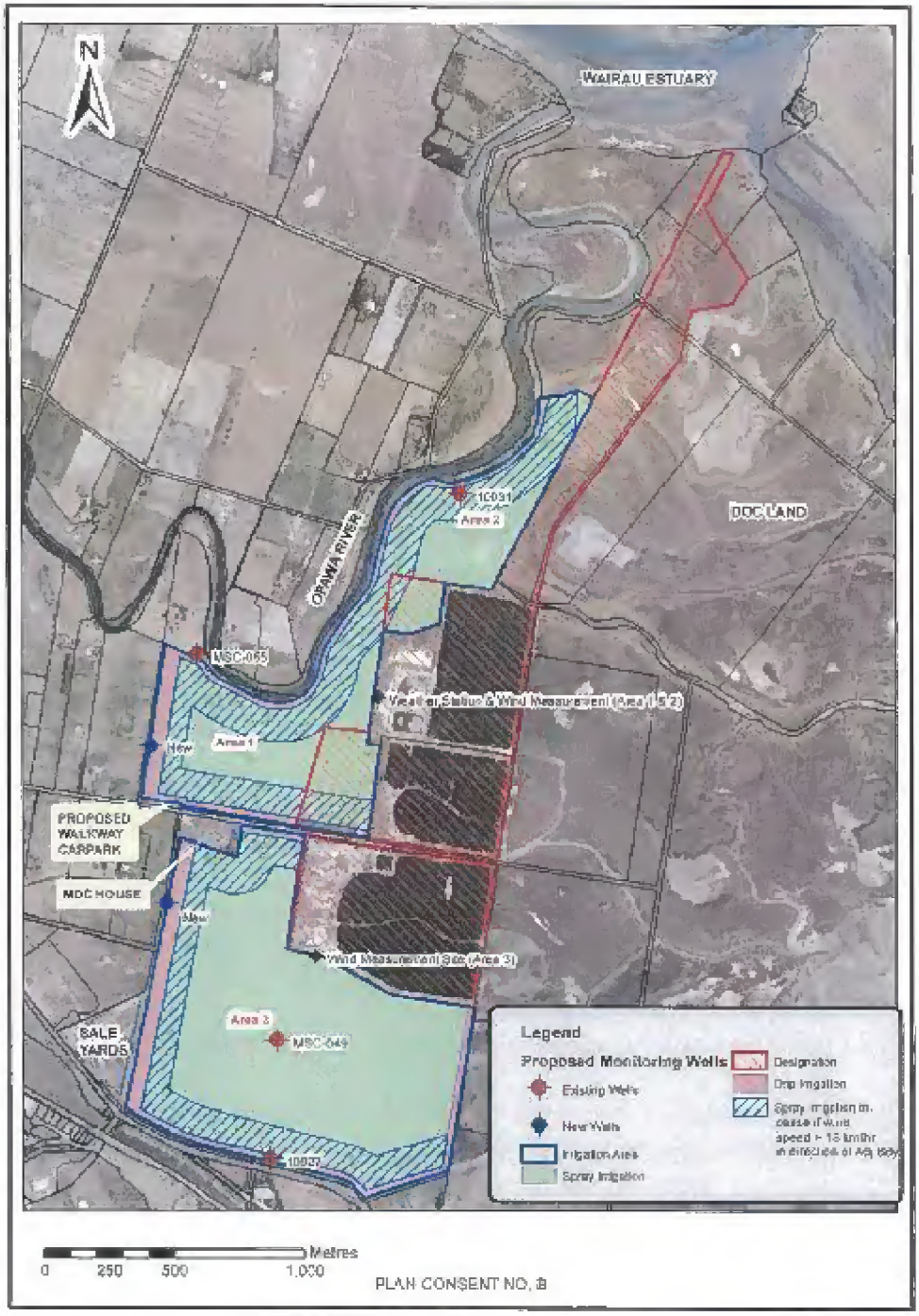
Att.

CH2M Beca

Attachment A: Plan Consent Nos A and B



PLAN CONSENT NO. A


N
WAIRAU ESTUARY
OPAWA RIVER
DOC LAND
1C031
Area 2
MSC 055
Weather Station & Wind Measurement (Area 1 & 2)
New
Area 1
PROPOSED WALKWAY CARPARK
MDC HOUSE
New
Wind Measurement Site (Area 3)
Area 3
MSC 049
SALE YARDS
10027
Legend
Proposed Monitoring Wells
Existing Wells
New Wells
Irrigation Area
Spray Irrigation
Designation
Drip Irrigation
Spray irrigation in cases if wind speed > 15 km/hr
Metres
0
250
500
1,000
PLAN CONSENT NO. B

Appendix C

Amended Consent Drawings and Minor Amendments to Condition 32 prepared by MDC

MARLBOROUGH DISTRICT COUNCIL
PO BOX 443
BLENHEIM 7240
NEW ZEALAND

TELEPHONE (03641 3 520 7400
FACSIMILE (03641 3 520 7496
EMAIL mdc@marlborough.govt.nz
WEB www.marlborough.govt.nz

MARLBOROUGH
DISTRICT COUNCIL

25 July 2012

Record No: 12245650
File Ref: U071181
Ask For: Guy Boddington

Mr Graeme Jenner
CH2M Beca Ltd.
PO Box 13960
Christchurch

Dear Graeme

BSTP Upgrade - Amended Consent Drawings and Minor Amendments to Condition 32

I refer to your letters of 10 May 2012 and 11 June 2012, addressed for my attention. The letter of 10 May 2012 summarised our discussion of 5 April 2012 which covered the installation of various infrastructure in and around the stopbank and Orua Canal crossing, drain filling and slotted pipe installation in irrigation areas, the use of herbicides in the new wetland and crossing under the Riverlands Industrial Drain by an irrigation mainline.

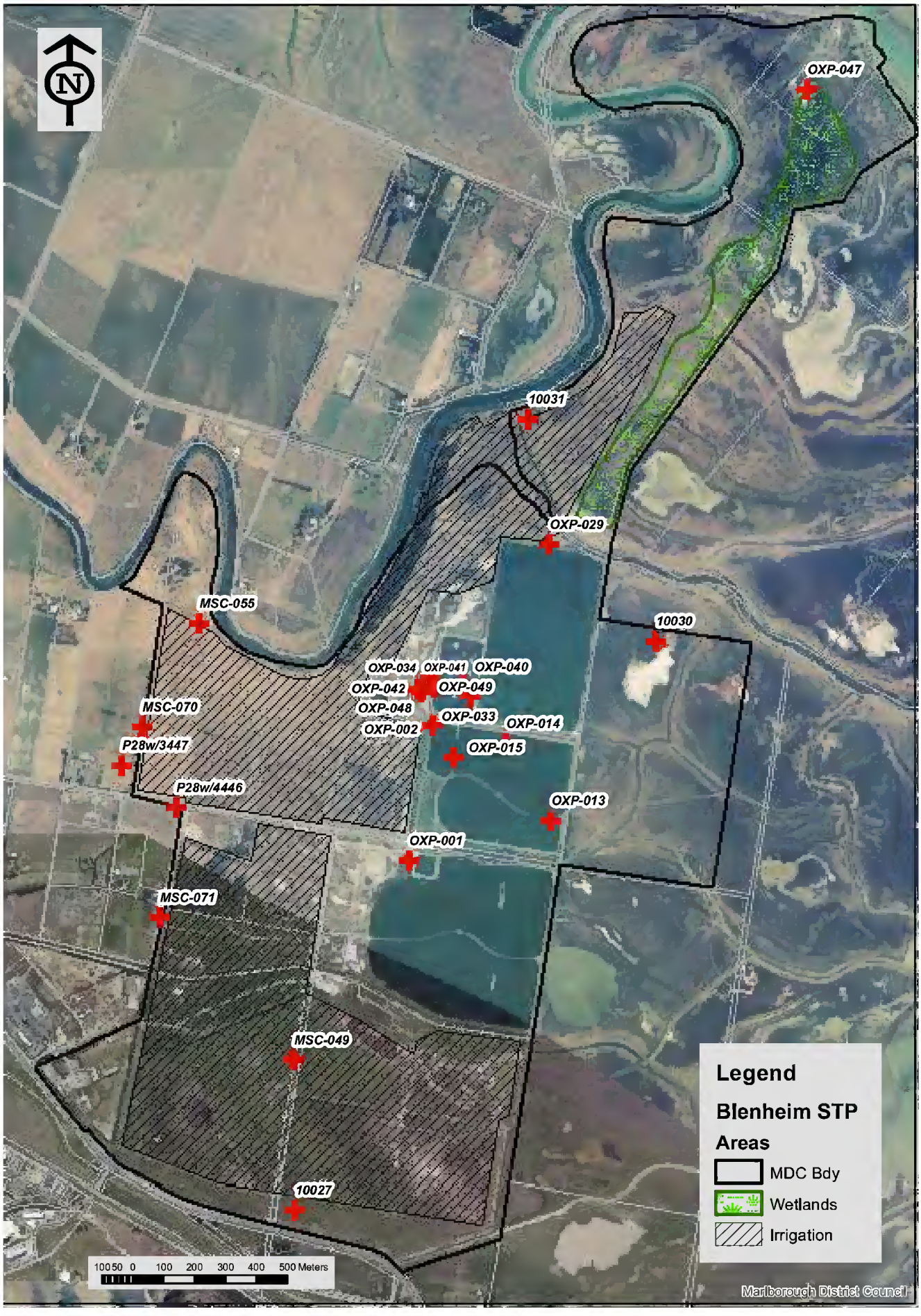
The Regulatory Department is in agreement with the reasons stated in para 2 of the 10 May letter that these activities are permitted in terms of various conditions of consent U071181, the new Designation and an existing Resource Consent for aquatic herbicide application held by MDC (U070702).

On 5 April we also discussed required amendments to Plan Consent Nos A and B and condition 32 (brought about by a reduction in the irrigation areas), without the requirement of having to apply for a s127 variation. The rationale for this was that the changes would result in *improvements in the efficiency of the operation* (and thus falls within the ambit of Part II General Condition 6 of Resource Consent U071181). Council's Regulatory Department supports this view.

I trust that this response is suffice for your records - please call me if you have any queries.

Yours sincerely

GUY BODDINGTON
RESOURCE MANAGEMENT OFFICER


N
OXP-047
10031
OXP-029
MSC-055
10030
OXP-034
OXP-041
OXP-040
OXP-042
OXP-049
OXP-048
MSC-070
OXP-033
OXP-014
OXP-002
P28w/3447
OXP-015
P28w/4446
OXP-013
OXP-001
MSC-071
MSC-049
10027
100 50 0 100 200 300 400 500 Meters
Legend
Blenheim STP
Areas
MDC Bdy
Wetlands
Irrigation
Marlborough District Council

Appendix D

Annual Inspection of the MDC Wairau Bar Effluent Pipeline

Commercial Diving Consultants Ltd

Mike and Donna Baker
12 Kent Street,
Picton, 7220 New Zealand
E-mail: donna@divecdc.co.nz
Phone: (64) 03 573 8045
Fax: (64) 03 573 8991
Mobile: 027 44 66 725 Donna

Annual Inspection of the MDC Wairau Bar Effluent Pipeline

As per request from Rob Addis:

Marlborough District Council
P O Box 443
Blenheim 7240

Order No: WP-030291 RAD2

- There is a sand bank in front of both pipeline diffusers

Old Pipeline:

- The old pipeline is completely buried in the river bed
- The special marker buoy is almost touching the riverbed with only 300mm of chain exposed
- Chain feels okay and shackle to the buoy is still moused – both of them
- Could not find anode

New Pipeline:

- The buoy is all good
- Small chain is in good condition
- All shackles are moused
- The only part of the new pipeline exposed is the top of the last saddle weight and the diffuser
- Everything else is under the riverbed

- The 3 anodes that are exposed are in new condition
- The end flange bolts are tight
- Some of the bigger of the two sets of flanges bolts have denso tape on them but it is coming off
- The divers tried to find more exposed pipe but they couldn't find it
- Scanned photos supplied via e-mail along with this report

Regards

Donna & Mike Baker
Managing Directors

Donna Mobile: 0274 466 725 Email: donna@divecdc.co.nz www.divecdc.co.nz