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# Christchurch Wastewater Treatment Plant

## Quarterly Monitoring Report

**August – October 2016**

CHRISTCHURCH WASTEWATER TREATMENT PLANT · SHUTTLE DRIVE OFF PAGES ROAD
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File: Monitoring Report Aug Oct 2016
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# Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period August – October 2016 in accordance with consent CRC051724. Consent CRC051724 allows the discharge of treated wastewater from the CWTP Oxidation Ponds into the Pegasus Bay Coastal Marine Area via an ocean outfall.

Of the comprehensive sampling programme required by the consent, all samples were collected during the monitoring period and most monitored parameters achieved the required standards.

# Christchurch Wastewater Treatment Plant Contents

## Quarterly Monitoring Report

**August – October 2016**

# 1 Outfall Discharge

## 1.1 *Resource Consent Conditions*

Consent CRC051724 allows CWTP to discharge up to 518,000 cubic metres per day of treated wastewater from the CWTP Oxidation Ponds at a maximum rate of six cubic metres per second into the Pegasus Bay coastal marine area. Compliance conditions regarding the physical discharge to the estuary are summarised in Table 1.1.1. Daily records of maximum outfall discharge flow rates and volumes are attached as an appendix to this report, and shown in summary in Figures 1.2.1 and 1.2.2.

**Table 1.1.1** Pond Discharge Consent Compliance for Monitoring Period CRC051724

| Consent Condition | Parameter | Compliance Condition | Compliance | | | |
|---|---|---|---|---|---|---|
| | | | Aug 16 | Sept 16 | Oct 16 | Overall |
| 2 | Discharge Content | Discharge is only wastewater from the CWTP ponds | J | J | J | J |
| 3 | Discharge Volume | Recorded | J | J | J | J |
| 4 | Discharge Rate | Recorded | J | J | J | J |
| 9 | Outfall Maintenance | Routine maintenance completed and recorded | J | J | J | J |
| 10 | Outfall Condition | Visual inspection of outfall | n/a | n/a | n/a | n/a |
| 12 | Pumping Pressure for a given flow | Monitored | J | J | J | J |

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

## 1.2 Comments on Compliance

Flowrate and pressure data were recorded as per consent requirements.

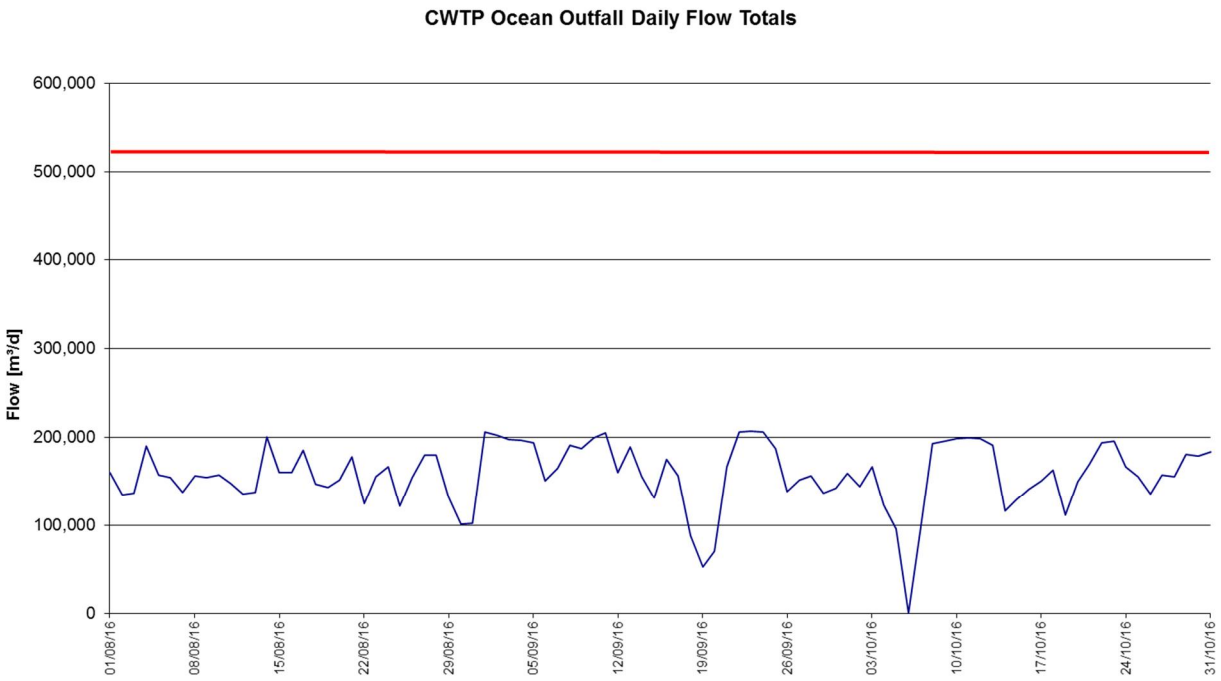



**Figure 1.2.1** - Daily Outfall Flow Totals

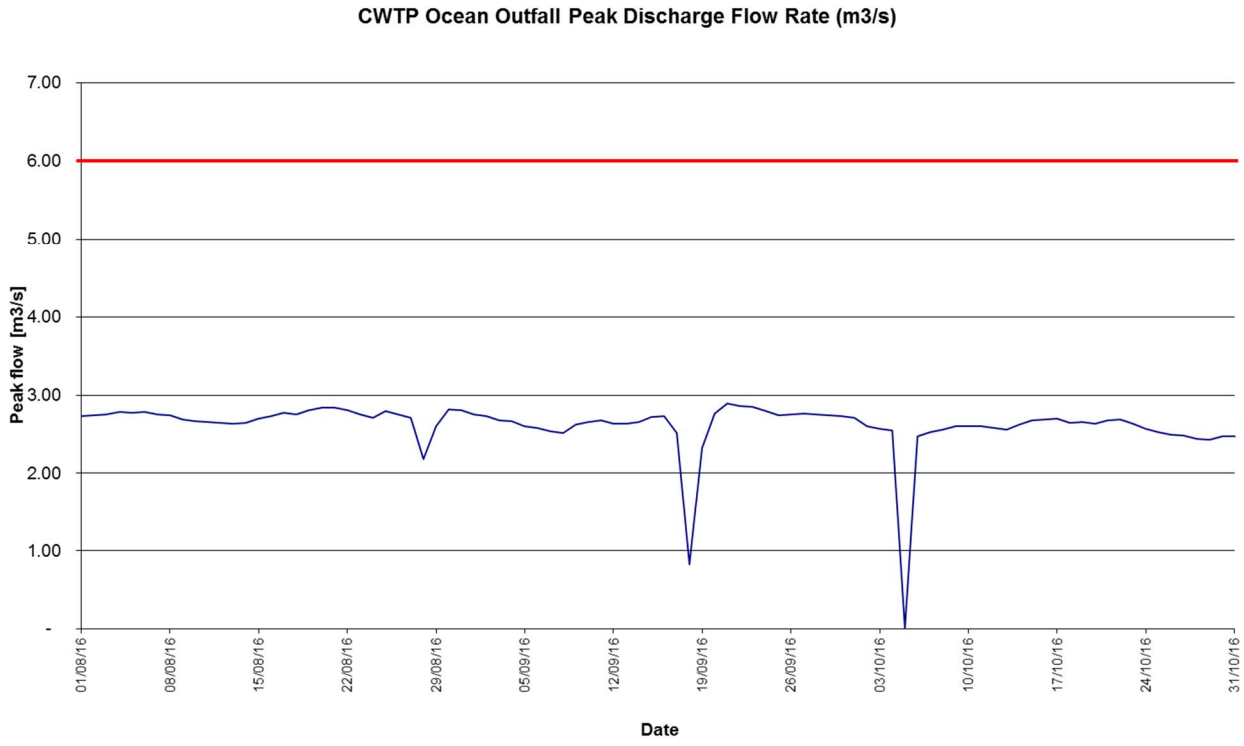



**Figure 1.2.2 -** Daily Peak Outfall Flows

## 1.3 *Resource Consent Standard Conditions*

Conditions 15 and 16 of consent CRC051724 set out concentration standards for a selection of parameters monitored in compliance with condition 13. No more than 16 samples in each rolling 26 week period should exceed the standard value for contaminants listed under condition 15a, and if more than seven from eight consecutive samples should exceed the standard value ECan must be notified within 48 hours. No more than six from eight consecutive samples should exceed the standard value for contaminants listed under condition 16a, and no more than two from eight consecutive samples should exceed the higher value. If more than seven from eight exceed the standard value, or three from eight exceed the higher value, ECan must be notified within 48 hours. Compliance conditions regarding adherence to these standard values are summarised in Table 1.3.1. Analysis results are supplied to Environment Canterbury at quarterly intervals. Contaminant monitoring results for consent CRC051724 are discussed further in Sections 1.4 – 1.9.

**Table 1.3.1** Contaminant Limits Consent Compliance August – October 2016 CRC051724

| Consent Condition | Parameter | Compliance Condition | Compliance | | | |
|---|---|---|---|---|---|---|
| | | | Aug 16 | Sept 16 | Oct 16 | Overall |
| 15a | Dissolved $BOD_5$ | Concentration does not exceed 20 $g/m^3$ | J | J | J | J |
| | Total Suspended Solids | Concentration does not exceed 50 $g/m^3$ | J | J | J | J |
| | Ammoniacal Nitrogen | Concentration does not exceed 40 $g/m^3$ | J | J | J | J |
| 16a | Faecal Coliforms | Concentration does not exceed 1,000(standard)/5,000(higher) MPN/100mL | J | J | J | J |
| | Enterococci | Concentration does not exceed 1,500 MPN/100mL | J | J | J | J |

Key: J Compliance Achieved with no Exceedance of Standard K Compliance Achieved with Occasional Exceedance of Standard L Exceedance of Standard resulting in Non-Compliance

## 1.4 *Comments on Compliance*

All samples were collected and analysed. There were a number of exceedances for the TSS target due to algae growth in May; however CWTP still complied with Condition 15.

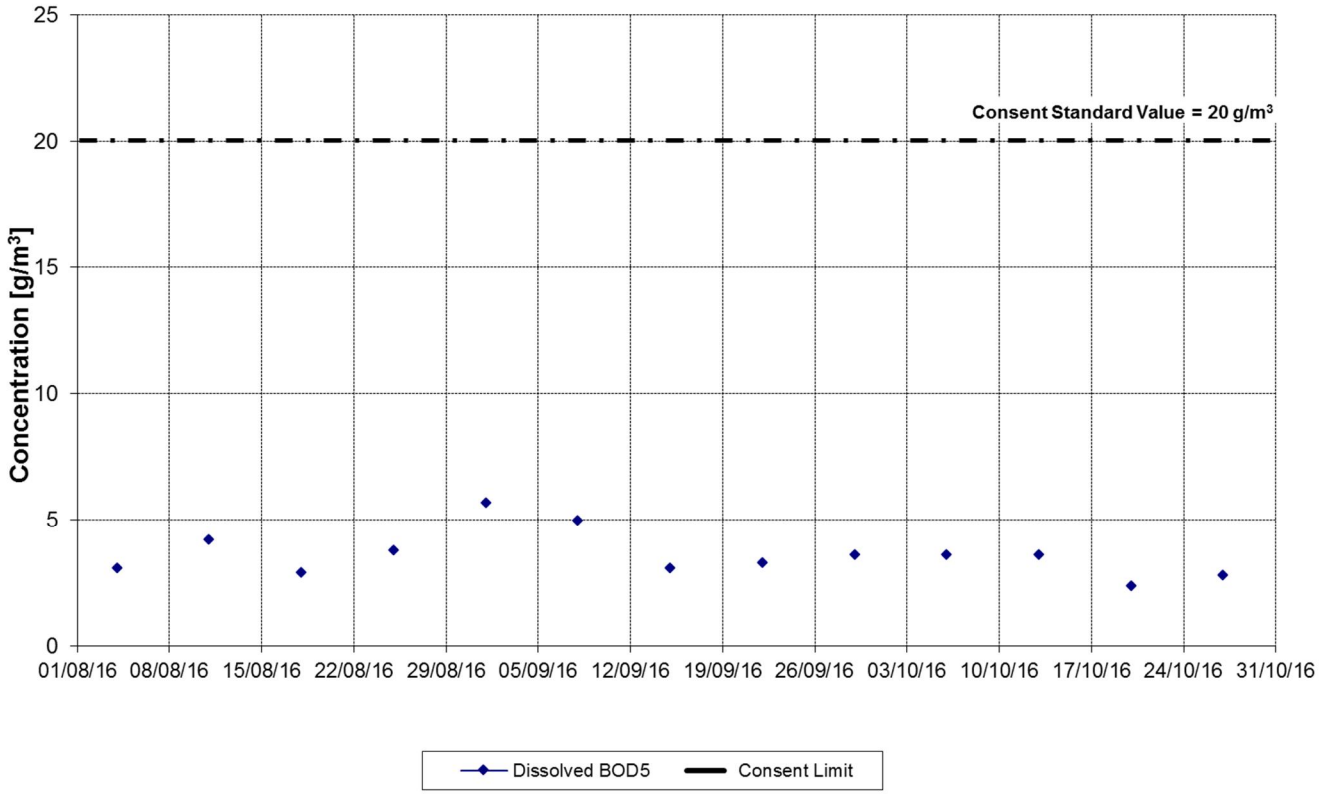
## 1.5 *Dissolved $BOD_5$ Compliance*

The median dissolved $BOD_5$ concentration for the reporting period was 3.6 g/m$^3$. This is similar to the median concentrations in the previous quarter and similar to the same quarter in 2015. There were no exceedances of the standard value (20.0 g/m$^3$) in the current monitoring quarter.

**Table 1.5.1** Pond Discharge Dissolved $BOD_5$

| | | | |
|---|---|---|---|
| Median Value [g/m$^3$]<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 3.6 | Number of Exceedances<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 0 |
| Median Value [g/m$^3$]<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 2.2 | Number of Exceedances<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 0 |
| Median Value [g/m$^3$]<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 3.3 | Number of Exceedances<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 0 |

**1.5.2** Pond Discharge Dissolved $BOD_5$



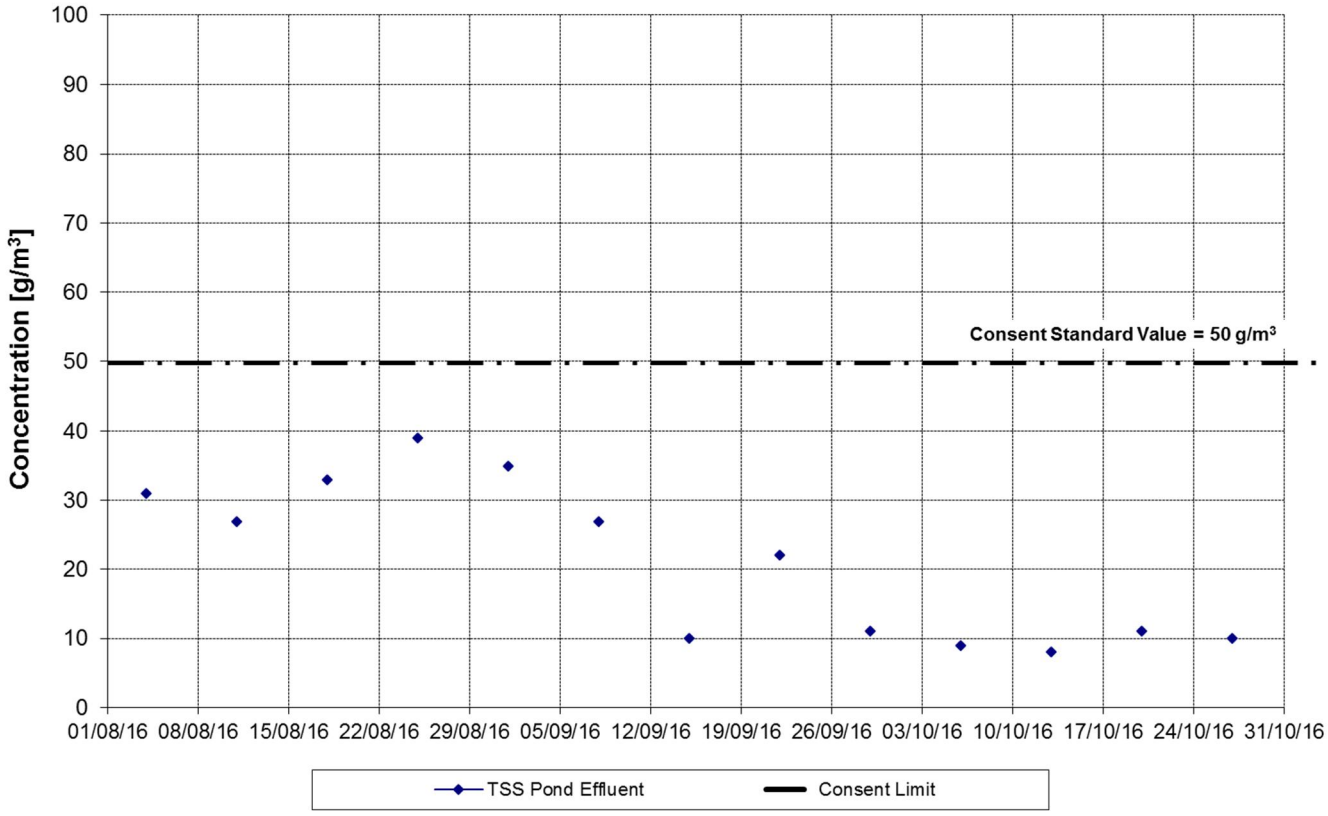
## 1.6 *Total Suspended Solids Compliance*

The median total suspended solids concentration for the monitoring period was 22 g/m$^3$. This is higher than the previous quarter and higher than the same quarter last year. There were no exceedances of the standard value (50 g/m$^3$) this quarter.

**Table 1.6.1** Pond Discharge Total Suspended Solids

| | | | |
|---|---|---|---|
| Median Value [g/m$^3$]<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 22 | Number of Exceedances<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 0 |
| Median Value [g/m$^3$]<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 7 | Number of Exceedances<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 0 |
| Median Value [g/m$^3$]<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 15 | Number of Exceedances<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 0 |

**1.6.2** Pond Discharge Total Suspended Solids



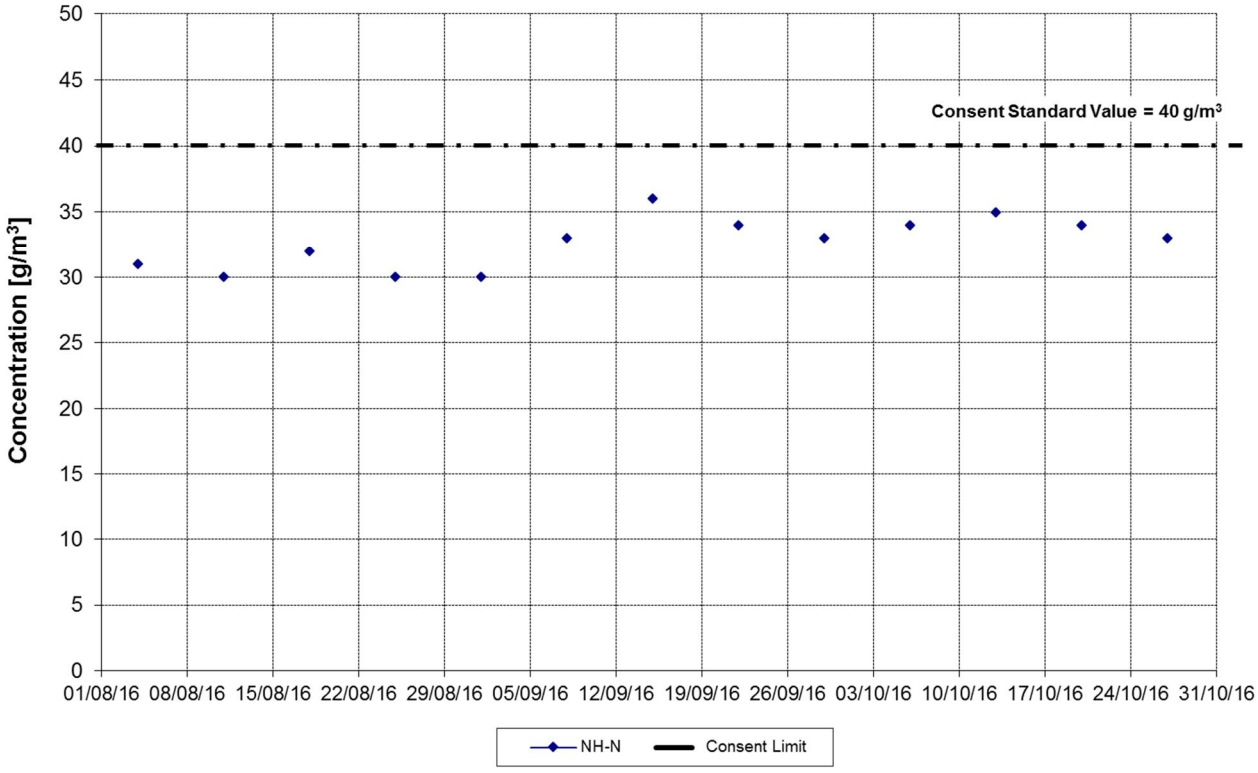
## 1.7 *Ammonia Nitrogen Compliance*

The median total ammonia nitrogen concentration for the monitoring period was 33 g/m$^3$. This was similar to the previous quarter and the same quarter last year. There were no exceedances of the 40 g/m$^3$ limit.

**Table 1.7.1** Pond Discharge Ammoniacal Nitrogen

| | | | |
|---|---|---|---|
| Median Value [g/m$^3$]<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 33 | Number of Exceedances<br>Current Monitoring Quarter<br>(August 2015 – October 2015) | 0 |
| Median Value [g/m$^3$]<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 33 | Number of Exceedances<br>Previous Monitoring Quarter<br>(May 2015 – Jul 2015) | 0 |
| Median Value [g/m$^3$]<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 26 | Number of Exceedances<br>Same Monitoring Quarter of Previous Year<br>(August 2014 – October 2014) | 0 |

**1.7.1** Pond Discharge Ammoniacal Nitrogen



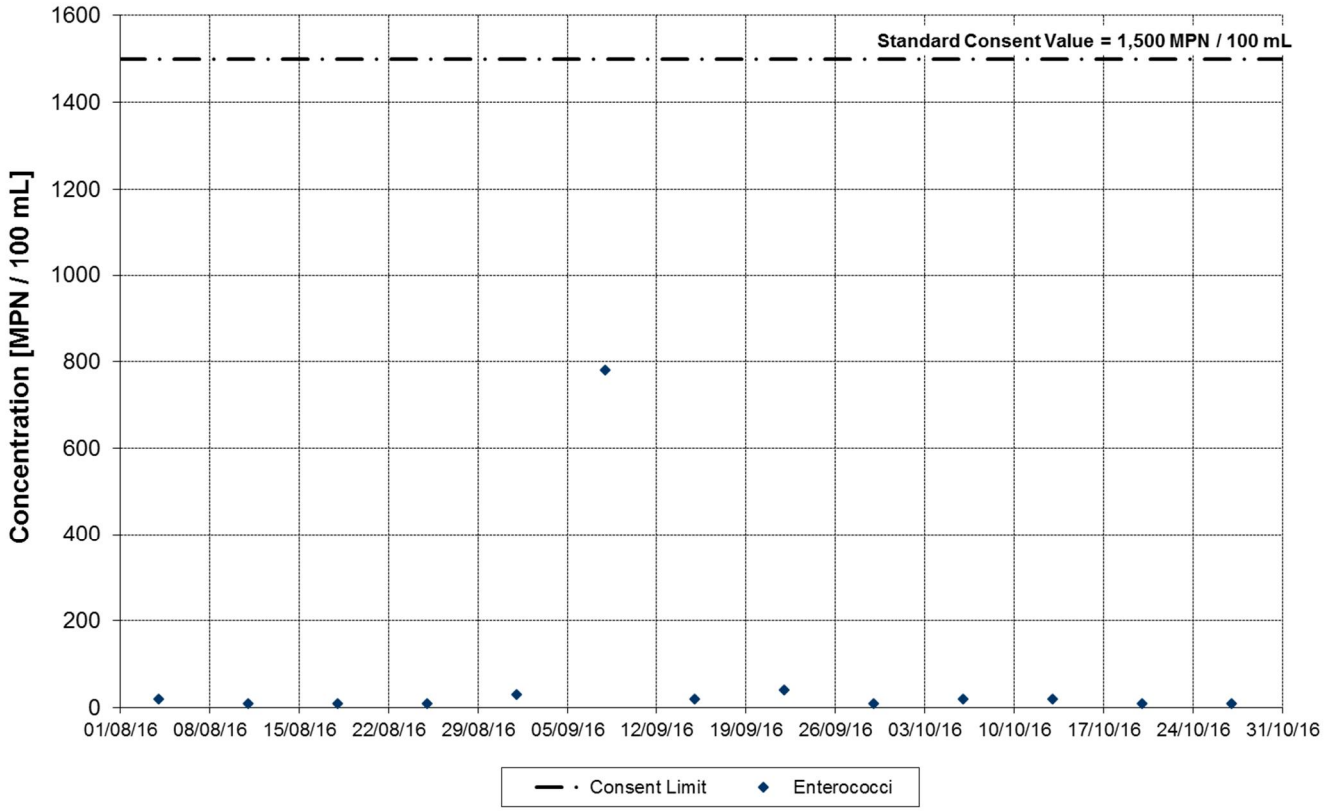
## 1.8 *Enterococci Monitoring*

The median enterococci concentration during the reporting period was 20 MPN/100mL. This was the same as the previous quarter and the same quarter last year. There were no exceedances of the 1,500 MPN/100ml limit during the reporting quarter.

**Table 1.8.1** Pond Discharge Enterococci

| | | | |
|---|---|---|---|
| Median Value [MPN/100mL]<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 20 | Number of Exceedances<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 0 |
| Median Value [MPN/100mL]<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 20 | Number of Exceedances<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 0 |
| Median Value [MPN/100mL]<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 20 | Number of Exceedances<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 0 |

**1.8.1** Pond Discharge Enterococci



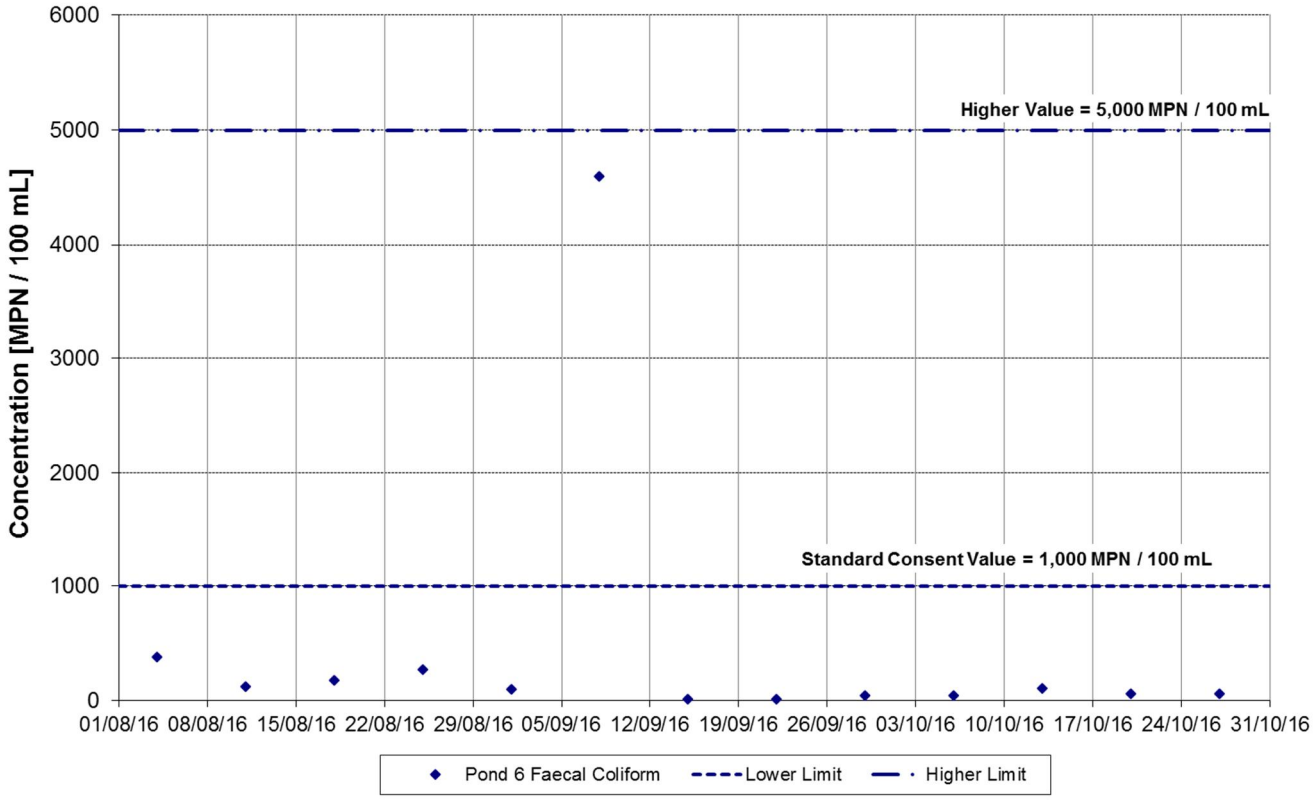
## 1.9 *Faecal Coliform Compliance*

The median concentration for the reporting period was 100 CFU/100 mL, which is higher than the median for the previous quarter, and higher than the same quarter last year. There was one exceedance of the standard and none of the upper faecal coliform limit.

Table 1.9.1 **Pond Discharge Faecal Coliforms**

| | | | |
|---|---|---|---|
| Median Value [CFU/100 mL]<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 100 | Number of Exceedances<br>Current Monitoring Quarter<br>(August 2016 – October 2016) | 1 |
| Median Value [CFU/100 mL]<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 80 | Number of Exceedances<br>Previous Monitoring Quarter<br>(May 2016 – Jul 2016) | 0 |
| Median Value [CFU/100 mL]<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 20 | Number of Exceedances<br>Same Monitoring Quarter of Previous Year<br>(August 2015 – October 2015) | 0 |

**1.9.1** Pond Discharge Faecal Coliforms



# 2 Receiving Environment Monitoring in Pegasus Bay

## 2.1 *Water Quality Resource Consent Conditions*

All samples were collected and analysed as required by consent condition 18. Samples for condition 18 are collected from South New Brighton Beach at Jellicoe Street, Sumner Beach at the surf club, and New Brighton at the Surf Club. Sampling for condition 22a is due March 2017.

**Table 2.1.1 Receiving Environment Water Quality Consent Compliance**

| Consent Condition | Parameter | Compliance Condition | Compliance |
|---|---|---|---|
| | | | Aug – Oct 16 |
| 18 | Faecal Coliforms | Sampled and Analysed | J |
| | Enterococci | Sampled and Analysed | J |
| 22a | Temperature | 2 yearly | na |
| | DO | 2 yearly | na |
| | Salinity | 2 yearly | na |
| | Total Suspended Solids | 2 yearly | na |
| | Nitrogen Oxides | 2 yearly | na |
| | Ammoniacal Nitrogen | 2 yearly | na |
| | Dissolved Reactive Phosphorus | 2 yearly | na |
| | Chlorophyll-a | 2 yearly | na |
| | Trace Metals | 2 yearly | na |
| | Faecal Coliforms | 2 yearly | na |
| | Enterococci | 2 yearly | na |
| | Phytoplankton Species | 2 yearly | na |

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

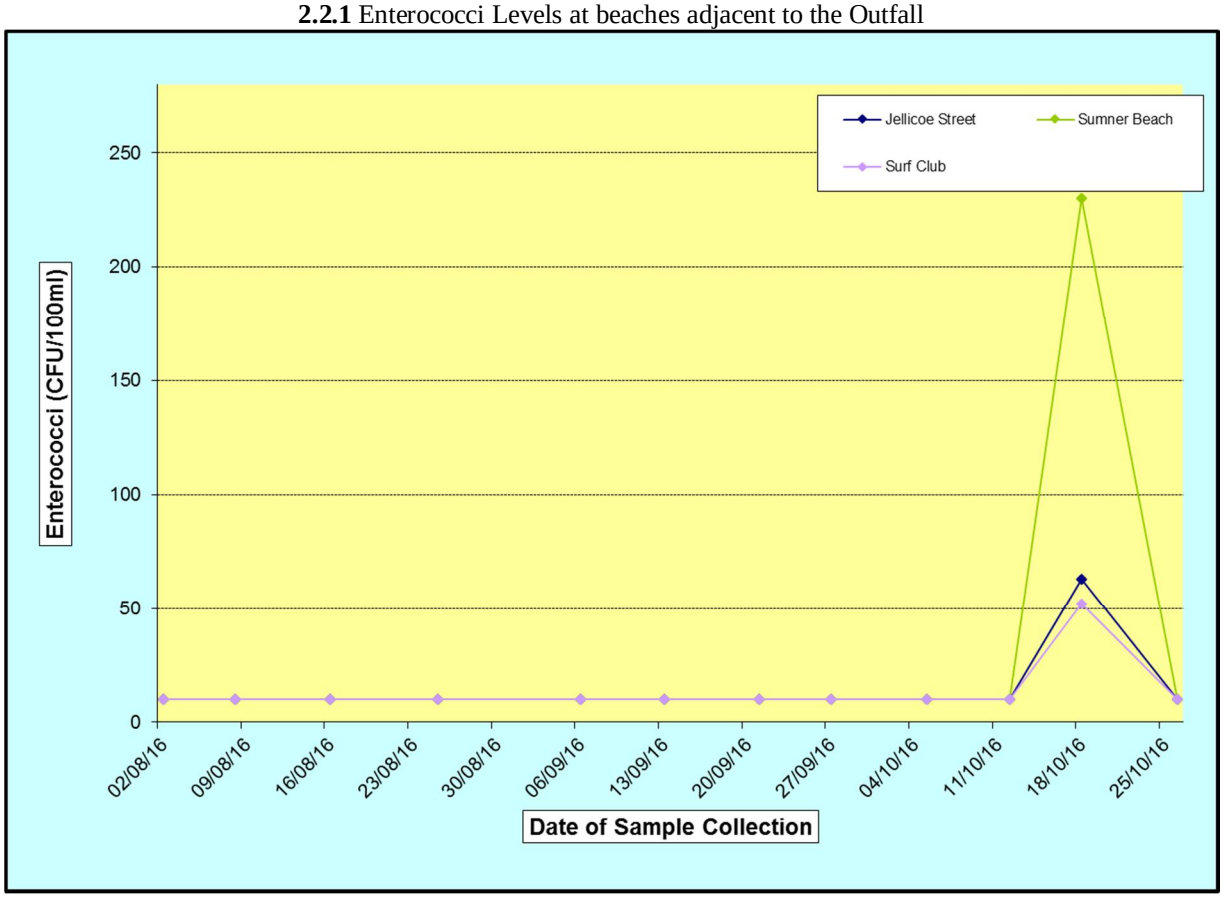
## 2.2 *Comments on Compliance*

All results for the Pegasus Bay area were within consent for the recording period.

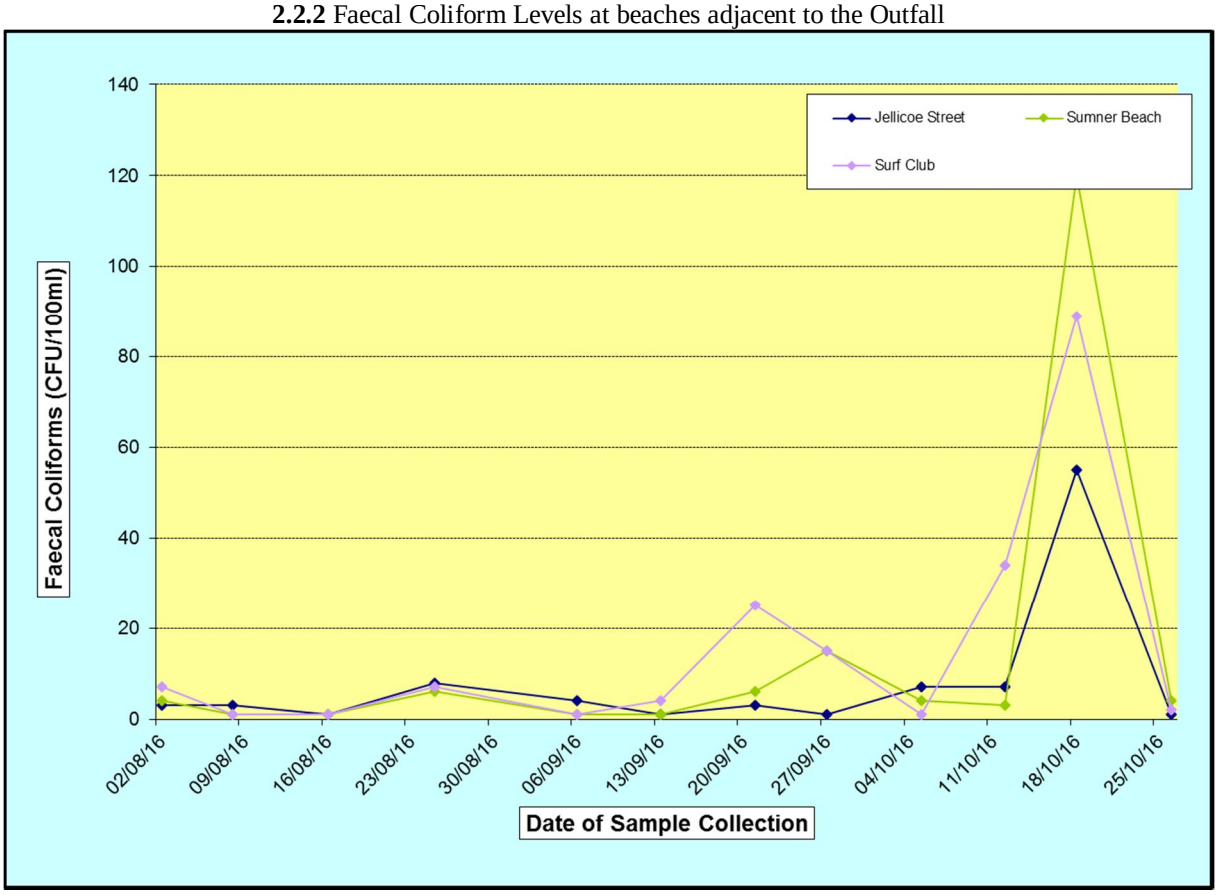
*Beach Water Quality Analysis Results*

Samples for condition 18 were taken at weekly intervals from the prescribed onshore locations. Results are presented in Figures 2.3.1 and 2.3.2. Any retest results are contained in the appendices.

**2.2.1** Enterococci Levels at beaches adjacent to the Outfall




**2.2.2** Faecal Coliform Levels at beaches adjacent to the Outfall



## 2.3 *Other Receiving Environment Analysis*

Consent conditions 23, 25, 26 and 27 call for monitoring of the marine environment around the outfall at various frequencies, some of which fall in the monitoring period. These requirements are summarised in Table 2.4.1, and the results are attached as an appendix to this report. Sampling for Conditions 23 – 26 are due 2017, while condition 36 is due in December.

**Table 2.3.1** Receiving Environment Monitoring Consent Compliance

| Consent Condition | Parameter | Frequency | Compliance Condition | Compliance |
|---|---|---|---|---|
| | | | | Aug – Oct 16 |
| 23 | Marine Sediments | 5-yearly | Not monitored this quarter | — |
| 25 | Benthic Invertebrates | 5-yearly | Not monitored this quarter | — |
| 26 | Epibenthic Fauna | 5-yearly | Not monitored this quarter | — |
| 27 | Shellfish | Quarterly | Sampled and analysed | J |
| 29 | Complaints | As required | Recorded and reported | J |
| 31 | Report | Quarterly and Annually | Report and information lodged with ecan | J |
| 36 | Community Liaison Group | Annually | Not done this quarter | — |

Key: J Full Compliance K Minor, Isolated or Risk of Non-Compliance L Major or Consistent Non-Compliance

## 2.4 *Comments on Compliance*

No complaints regarding the ocean outfall have been received this quarter. This report and supporting documentation will be submitted to Environment Canterbury.