Wellington Water

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

# Moa Point Wastewater Treatment Plant

## Annual Resource Consents Report 2020/2021

Your public water company

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# Control Sheet

**Document Title**: Moa Point Wastewater Treatment Plant Annual Resource Consents 2020/2021

**Prepared by:** Joemar Cacnio

**Reviewed by:** Anna Hector

## Document Control Register

| Version | Status | Date | Details of Revision |
|---|---|---|---|
| 0 | Draft | 22/07/2021 | First version of report for review |
| 1 | Final | 22/07/2021 | Reviewed by Anna Hector |
| | | | |

# Executive Summary

This report has been prepared on behalf of the Wellington City Council (WCC) for compliance with the following resource consents:

WGN080003 [31505]

This discharge permit allows WCC to continuously discharge up to 260,000 cubic meters per day of secondary treated and disinfected wastewater from the Moa Point Wastewater Treatment Plant into the coastal marine area via an existing submarine outfall. The coastal marine area is designated between map references NZMS 260: R27; 2660742.5982398 and NZMS 260: R27; 2660710.5982311.

WGN080003 [35047]

This coastal permit allows WCC to occasionally discharge up to 4500 litres per second of mixed disinfected secondary treated and milli-screened wastewater to the coastal marine area via an existing submarine outfall during and/or immediately after heavy rainfall, when the quantity of wastewater arriving at the Moa Point Wastewater Treatment Plant exceeds 3000 litres per second. The coastal marine area is designated between map references NZMS 260: R27; 2660742.5982398 and NZMS 260: R27; 2660710.5982311.

WGN080003 [26182]

This coastal permit allows WCC to occupy the foreshore and seabed of the coastal marine area with an existing submarine outfall pipeline. The coastal marine area is designated between map references NZMS 260: R27; 2660742.5982398 and NZMS 260: R27; 2660710.5982311.

WGN080003 [26183]

This discharge permit allows WCC to continuously discharge contaminants (including odour) to air from the Moa Point Wastewater Treatment Plan ventilation system. The Moa Point WWTP is located at map reference NZMS 260: R27; 2661614.5984078.

The report will cover the period from 1 July 2020 to 30 June 2021.

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# Resource Consent

## WGN080003 [31505]

Effluent discharge from the Moa Point WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN8003 [31505]. In general, the consent allows the continuous discharge of up to 260,000 cubic metres per day of secondary treated and disinfected wastewater from Moa Point Wastewater Treatment Plant into coastal marine area via an existing submarine outfall.

The following outlines the conditions of this resource consent required for this report.

## WGN980003 [35047]

In addition to the above resource consent, the discharge from the Moa Point WWTP is governed by another resource consent under the Greater Wellington Regional Council consent file number WGN8003 [35047]. In general, the consent allows the discharge up to 4500 litres per second of mixed disinfected secondary treated and milli-screened wastewater to the coastal marine area via an existing submarine outfall during and/or immediately after heavy rainfall, when the quantity of wastewater arriving at the Moa Point Wastewater Treatment Plant exceeds 3000 litres per second.

The following will also outline the conditions of this resource consent required for this report.

## WGN980003 [26182]

The outfall pipeline from the Moa Point WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN8003 [26182]. In general, the WCC is allowed to occupy the foreshore and seabed of the coastal marine area with an existing submarine outfall pipeline.

The following will also outline the conditions of this resource consent required for this report.

## WGN980003 [26183]

Emissions from the Moa Point WWTP are governed by the resource consent under the Greater Wellington Regional Council consent file number WGN8003 [26183]. In general, the WCC is allowed to continuously discharge contaminants (including odour) to air from Moa Point Wastewater Treatment Plan ventilation system.

The following will also outline the conditions of this resource consent required for this report.

# WGN080003 [31505]

## Condition (5)

The permit holder shall continue to engage with the Moa Point Community Liaison Group (CLG) established and maintained under the Wellington City Council destination.

A summary of each meeting that includes, but is not limited to, issues discussed, actions agreed upon and any follow-up on agreed actions from previous meetings shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of each CLG meeting.

A CLG meeting was held on 23rd September 2020. The minutes of the meeting were sent to the group.

## Condition (6)

The permit holder shall continuously monitor and record the flow rate and volume of treated wastewater entering the submarine outfall pipeline, to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council. A summary of the records listing the daily discharge volumes and average and maximum flow rates shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council at quarterly intervals, in accordance with condition 19 of this permit.

Although the data requested in Condition (6) is not a requirement for the annual report, the total daily effluent volume is shown with rainfall data.

The rainfall data was taken from GWRC Environmental Monitoring and Research at Miramar Bowling Club Site. Plant's flow data was taken from Veolia's system.

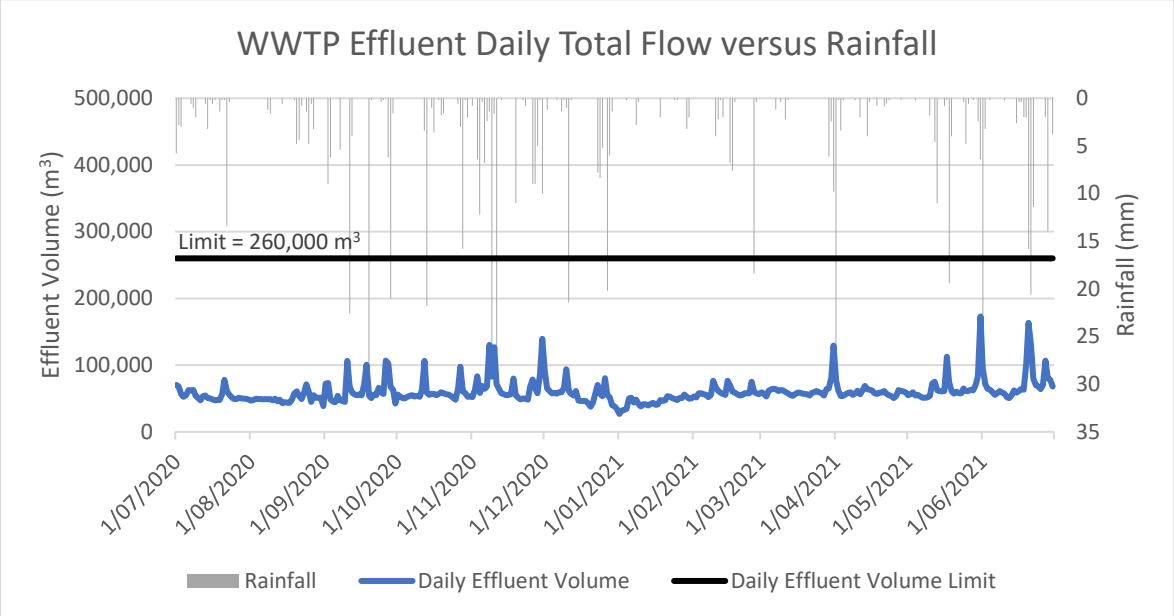



Figure 1: WWTP Effluent Flow versus Rainfall

# Condition (10)

The wastewater discharged from the Moa Point Wastewater Treatment Plant to the coastal waters shall comply with the following effluent quality criteria:

(a) $cBOD_5$

The geometric mean of 90 consecutive daily sampling results shall not exceed $20g/m^3$ and no more than 10% of 90 consecutive sample results shall exceed $45g/m^3$.

(b) Suspended solids

The geometric mean of 90 consecutive daily sampling results shall not exceed $30g/m^3$ and no more than 10% of 90 consecutive sample results shall exceed $68g/m^3$.

(c) Faecal Coliforms

The geometric mean of 90 consecutive daily sampling results shall not exceed 200 colony forming units per 100mL and no more than 10% of 90 consecutive sample results shall exceed 950 colony forming units per 100mL.

Compliance with the effluent quality criteria shall be determined from the results of wastewater monitoring undertaken in accordance with conditions (9)(a) and (9) (b) of this permit, with running geometric mean and ninetieth percentile calculated following each sampling event using the preceding 90 consecutive sample results.

## Section (a)

Below is a summary of the geometric mean and ninetieth percentile for the Carbonaceous Biological Oxygen Demand.

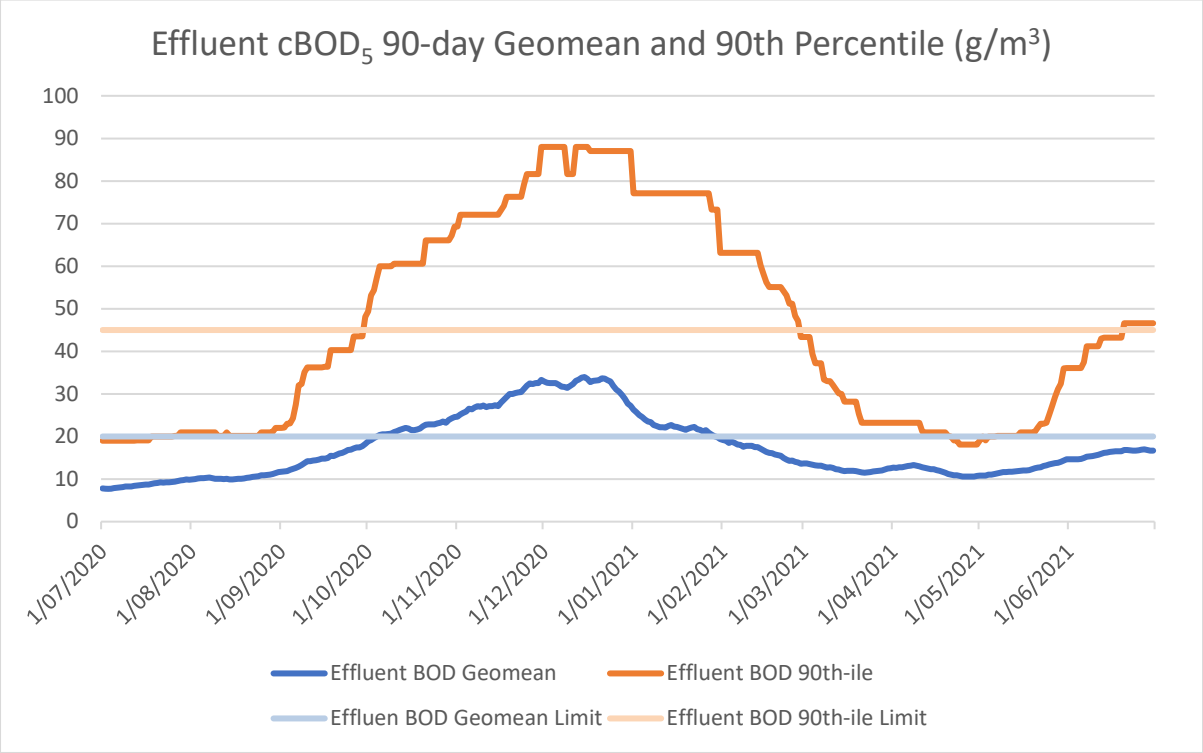



**Figure 2: Effluent Carbonaceous Biological Oxygen Demand Results Geometric Mean and 90th Percentile**

A graphical representation of the daily effluent results can be found in Appendix i: Daily Effluent Results. The daily values can be found in quarterly reports and certificates of laboratory analysis can be provided upon request.

## Section (b)

Below is a summary of the geometric mean and ninetieth percentile for the Suspended Solids.

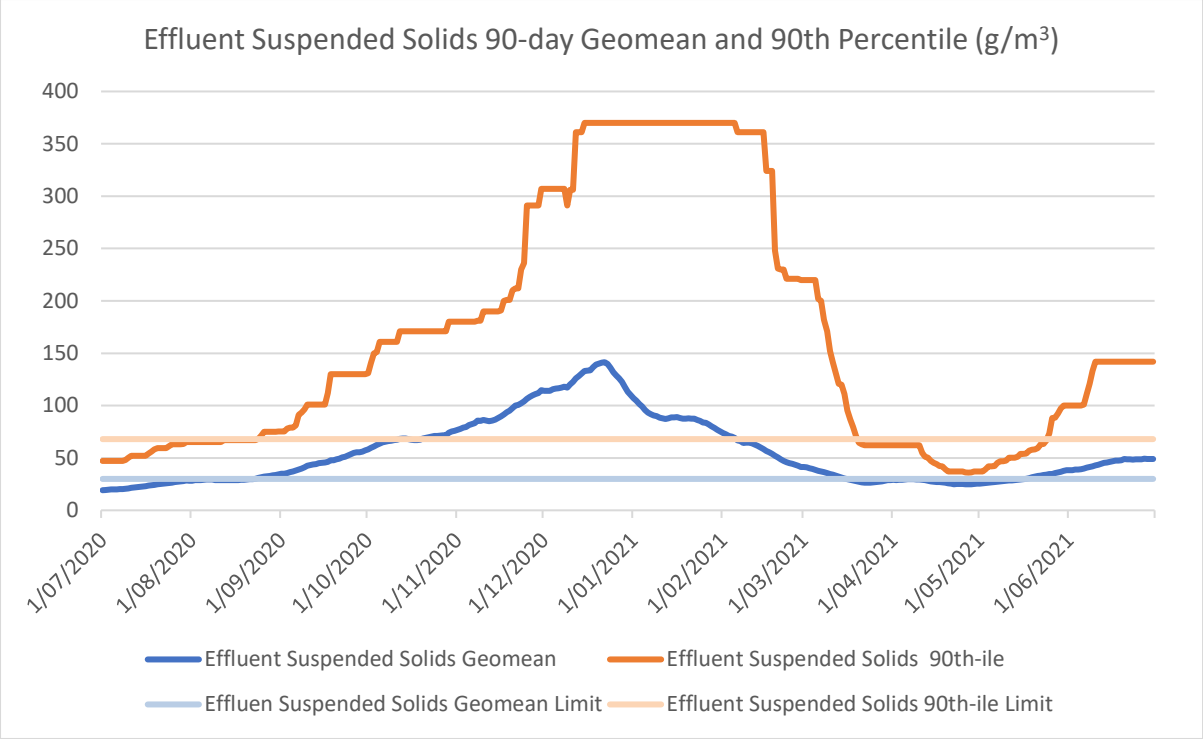



**Figure 3: Effluent Suspended Solids Results Geometric Mean and 90th Percentile**

A graphical representation of the daily effluent results can be found in Appendix i: Daily Effluent Results. The daily values can be found in quarterly reports and certificates of laboratory analysis can be provided upon request.

## Section (c)

Below is a summary of the geometric mean and ninetieth percentile for the Faecal Coliforms.

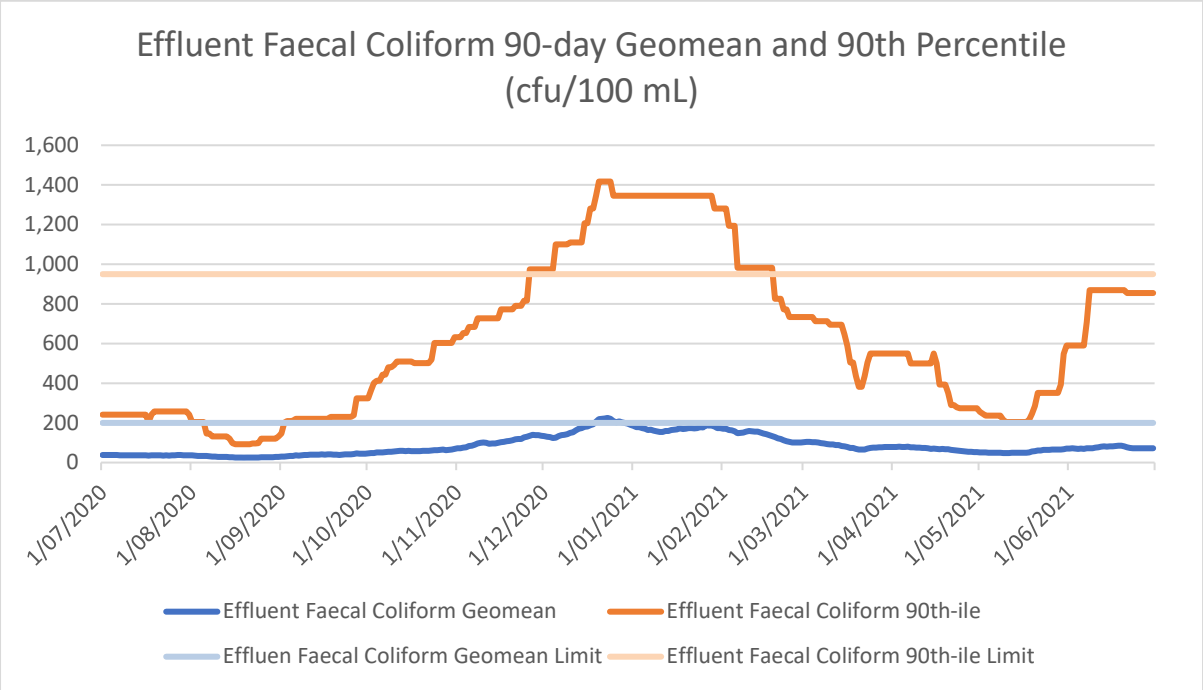



**Figure 4: Effluent Faecal Coliform Geometric Mean, and 90th Percentile**

A graphical representation of the daily effluent results can be found in Appendix i: Daily Effluent Results. The daily values can be found in quarterly reports and certificates of laboratory analysis can be provided upon request.

# Condition (11)

The permit holder shall at least once every three months obtain a sample of the treated wastewater discharged from the treatment plant to the outfall. This sample shall be analyzed for and not exceed the following:

| | |
|---|---|
| Total arsenic | 0.26g/$m^3$ |
| Total cadmium | 0.08 g/$m^3$ |
| Total chromium | 0.48 g/$m^3$ |
| Total copper | 0.14 g/$m^3$ |
| Total lead | 0.48 g/$m^3$ |
| Total mercury | 0.01 g/$m^3$ |
| Total nickel | 0.77 g/$m^3$ |
| Total zinc | 1.65 g/$m^3$ |
| Phenol | 0.80 g/$m^3$ |
| Cyanide as CN | 0.10 g/$m^3$ |

The sample shall also be analysed for:
pH
Ammoniacal Nitrogen
Oil and Grease

Below is a summary of the analytical results for the quarterly effluent samples.

| Compound | Units | Limit | 10 July 2020 | 12 October 2020 | 4 January 2021 | 16 April 2021 |
|---|---|---|---|---|---|---|
| **Total arsenic** | **g/m$^3$** | **0.26** | 0.00089 | 0.00130 | 0.001 | 0.001 |
| **Total cadmium** | **g/m$^3$** | **0.08** | 0.00005 | 0.00025 | 0.00010 | 0.00025 |
| **Total chromium** | **g/m$^3$** | **0.48** | 0.00086 | 0.00250 | 0.00120 | 0.00250 |
| **Total copper** | **g/m$^3$** | **0.14** | 0.00370 | 0.02600 | 0.02200 | 0.0047 |
| **Total lead** | **g/m$^3$** | **0.48** | 0.00042 | 0.00200 | 0.00160 | 0.0005 |
| **Total mercury** | **g/m$^3$** | **0.01** | 0.00005 | 0.00025 | 0.00010 | 0.00025 |
| **Total nickel** | **g/m$^3$** | **0.77** | 0.00110 | 0.00150 | 0.00120 | 0.002 |
| **Total zinc** | **g/m$^3$** | **1.65** | 0.03900 | 0.04900 | 0.04900 | 0.027 |
| **Phenol** | **g/m$^3$** | **0.80** | 0.00200 | 0.00200 | 0.00200 | 0.004 |
| **Cyanide as CN** | **g/m$^3$** | **0.10** | 0.00500 | 0.00500 | 0.00500 | 0.005 |
| **pH** | **N/A** | **N/A** | 7 | 7 | 7 | 7 |
| **Ammoniacal Nitrogen** | **g/m$^3$** | **N/A** | 5 | 6 | 8 | 4 |
| **Oil and Grease** | **g/m$^3$** | **N/A** | 10 | 11 | 5 | 6 |

**Table 1: Quarterly Effluent Sample Results**

The analytical data sheet results can be viewed in the Moa Point WWTP quarterly reports. All analytical results for the quarterly effluent samples are well below the limits set in the resource consent. This is because of the lack of heavy industry in Wellington City.

All data for the 2020/2021 reporting year is compliant.

## Condition (13)

| |
|---|
| The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council immediately in the event that a running geometric mean and/or ninetieth percentile effluent quality value or other value calculated following each wastewater quality sampling event exceeds the criteria stipulated in conditions 10 and 11 of this permit for more than three consecutive sampling events. Such a notification shall include the likely reason for exceedance, and measures to be undertaken by the permit holder to remedy the situation.<br><br>The permit holder shall also immediately notify the Medical Officer of Health of any such event. |

The plant was not able to consistently meet the consent requirements for effluent quality for this reporting period. Veolia have submitted investigation report to GWRC explaining the causes of non-compliances. In summary, the noncompliance was caused by mechanical failures in the plant's final clarifiers and process control issues. The clarifiers have been completely repaired and Veolia is looking at optimizing the process. Veolia had received a formal warning from GWRC regarding the May 2021 effluent non-compliance.

# Condition (20)

The permit holder shall provide to the Manager, Environmental Regulation, Wellington Regional Council an Annual Assessment and Analysis Report for the period 1 July to 30 June by 31 July each year summarising compliance with the conditions of this permit. This report shall include, but not be limited to the following:

a) A summary of all monitoring undertaken in accordance with the conditions of this permit and a critical analysis of the information in terms of compliance and adverse environmental effects;
b) A comparison of data with previously collected data in order to identify any emerging trends;
c) Comments on compliance with the conditions of this permit;
d) Any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit;
e) Any measures that have been undertaken to improve the environmental performance of the wastewater treatment and disposal system;
f) A copy of any complaints recorded (in accordance with condition 18 of this permit) during the year;
g) Any other issues considered to be important;

A copy of the repot shall be provided to Community Liaison Group, Te Atiawa, Te Runanganui O Taranaki Whanui kit e Upoko o te Ika a Maui, Ngati Toa Rangatira and the Wellington Tenths Trust, if requested.

## Section (a)

Table 2 summarises all the treatment plant data monitored from July 2020 to June2021. The median, minimum and maximum values are tabulated for each parameter.

| Parameter | Units | Geomean Limit | N | Minimum | Median | 90$^{th}$ Percentile | Maximum |
|---|---|---|---|---|---|---|---|
| WWTP Effluent Discharge | $m^3$ | 260,000 | 365 | 26,900 | 56,852 | 73,875 | 172,961 |
| Daily Effluent BOD | $g/m^3$ | 20 | 365 | 2 | 16 | 60 | 130 |
| Daily Effluent Suspended Solids | $g/m^3$ | 30 | 365 | 3 | 50 | 196 | 570 |
| Daily Effluent Faecal Coliform | cfu/100mL | 200 | 365 | 2 | 70 | 711 | 11,504 |

**Table 2: Summary of Monitoring Results**

The failure in the clarifiers caused solids carry over in the effluent which affected the plant's effluent quality.

In 2007, MWH (now Stantec) conducted an AEE study regarding the effects of the plant's discharge to the receiving environment. The document stated that Cawthorn Institute had done a dilution and dispersion modelling in 2003. It stated that a minimum of 120:1 dilution can be achieved in the receiving waters.

Although the plant was not able to consistently meet its discharge requirements for this reporting period, it is expected that its effects on the receiving environment would be less than minor. This is due to high dilution capability of the receiving waters. Using the 90$^{th}$ percentile value for faecal coliform of 711 cfu/100 mL and a background concentration of 5 cfu/100 mL, the expected receiving water faecal coliform concentration would be 11 cfu/100 mL for a 120:1 dilution scenario. This is way lower than the beach bathing guideline limits for faecal coliform of 150 cfu/100 mL.

Elevated suspended solids concentration in the effluent discharge is also expected to have a less than minor effect in the receiving environment. Using the 90$^{th}$ percentile value for suspended solids of 196 g/m$^3$ and a background concentration of 10 g/m$^3$, the expected receiving water suspended solids concentration would be 12 g/m$^3$ for a 120:1 dilution scenario.

## Section (b)

A comparison of data was made between the last five financial years.

WWTP Effluent Discharge Volume:

WWTP effluent discharge volume is used to establish a trend. Rainfall data from GWRC site is compared with the WWTP effluent daily discharge volume. In figure 5, it can be noted that the plant's effluent discharge volume is affected during wet weather.

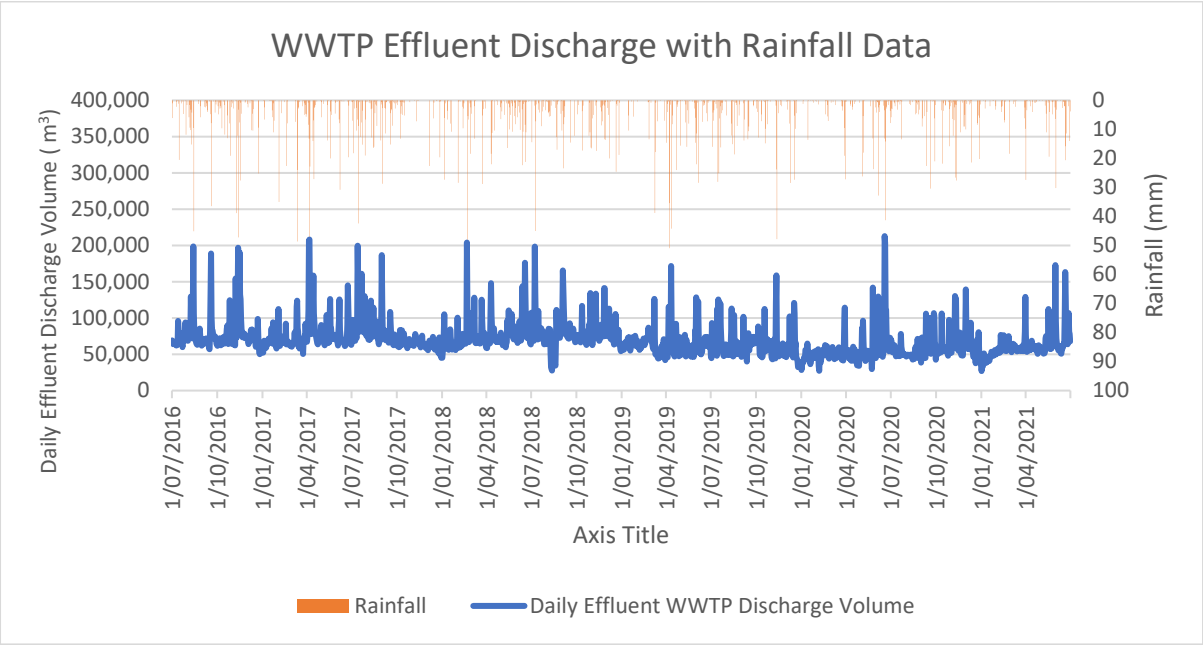



**Figure 5: WWTP Effluent Discharge Volume versus Rainfall**

WWTP Effluent $BOD_5$:

To establish a trend, all daily effluent $BOD_5$ in the last five years have been used.

In figure 6, it can be noted that the daily effluent $BOD_5$ had an increase in daily values since August to December 2020 which was due to mechanical issues in the clarifers. One of the clarifiers was repaired in 23rd December which dramatically improved the plant's effluent quality. In May 2021, the plant's effluent quality started to deteriorate again. Veolia's investigation report stated that the failures in the clarifiers and mechanical failures in the sludge dewatering plant have caused the issue.

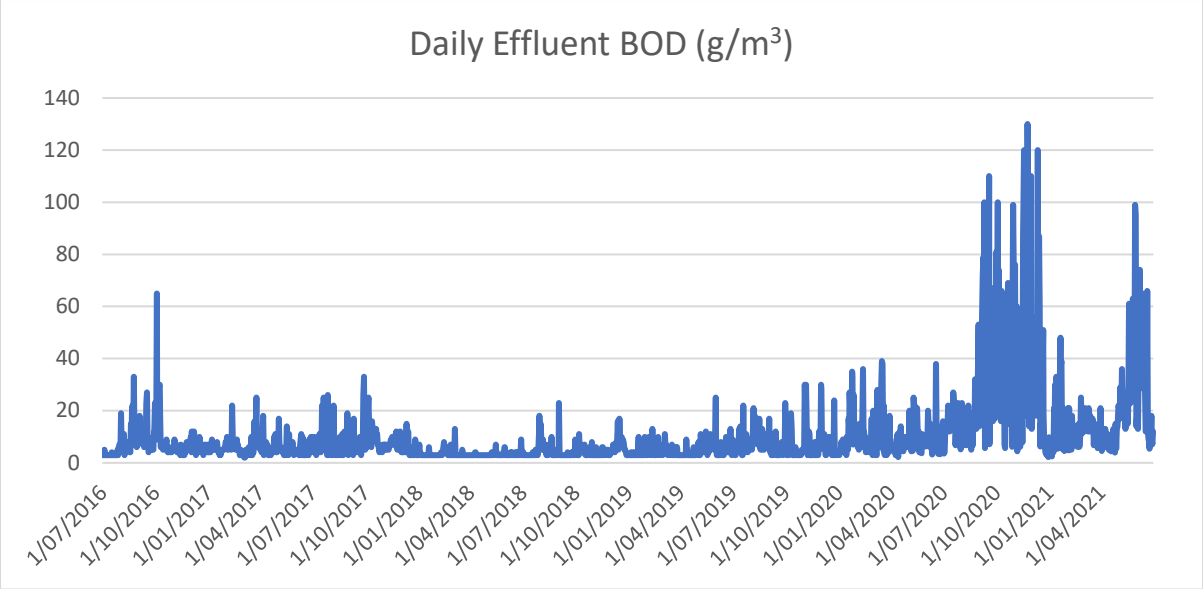



**Figure 6: Daily Effluent $cBOD_5$ Results**

WWTP effluent suspended solids:

To establish a trend, all daily effluent suspended solids in the last five years have been used.

In figure 7, it can be noted that the daily effluent suspended solids had an increase in daily values since August to December 2020 which is due to mechanical issues in the clarifers. One of the clarifiers was repaired in 23rd December which dramatically improved the plant's effluent quality. In May 2021, the plant's effluent quality started to deteriorate again. Veolia's investigation report stated that the failures in the clarifiers and mechanical failures in the sludge dewatering plant have caused the issue.

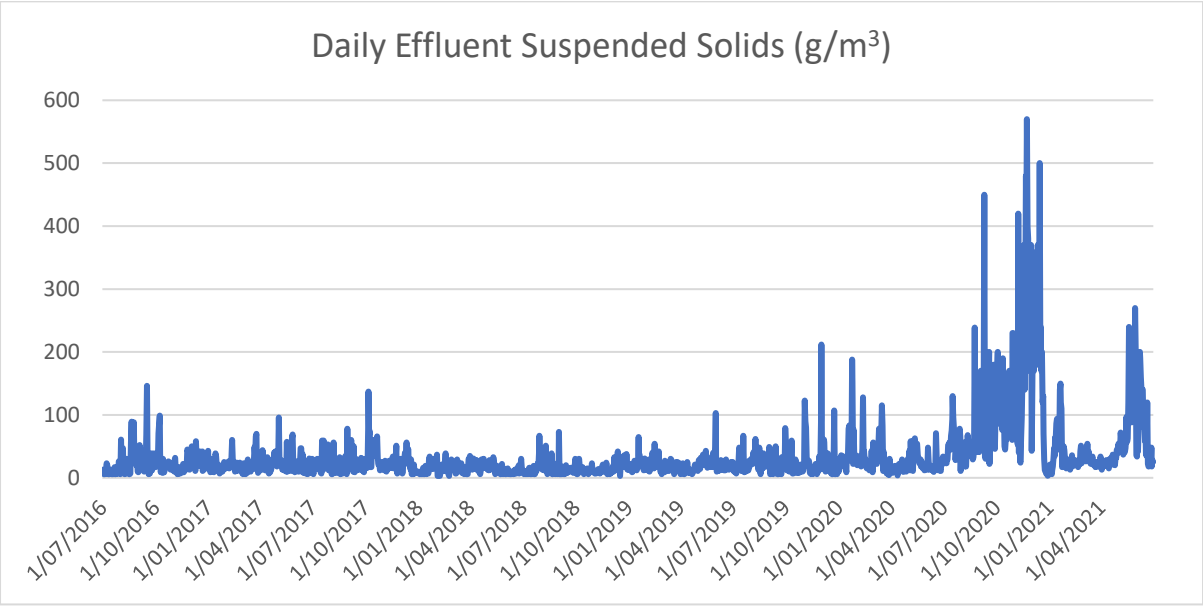



**Figure 7: Daily Effluent Suspended Solids Results**

WWTP effluent faecal coliform:

To establish a trend, all daily effluent suspended solids in the last five years have been used.

In figure 8, it can be noted that the daily effluent faecal coliforms had spikes in January and February 2020 due to sludge pipeline failure. It then experienced an increase in daily values since August to December 2020 which is due to mechanical issues in the clarifers. One of the clarifiers was repaired in 23rd December which dramatically improved the plant's effluent quality. In May 2021, the plant's effluent quality started to deteriorate again. Veolia's investigation report stated that the failures in the clarifiers and mechanical failures in the sludge dewatering plant have caused the issue.

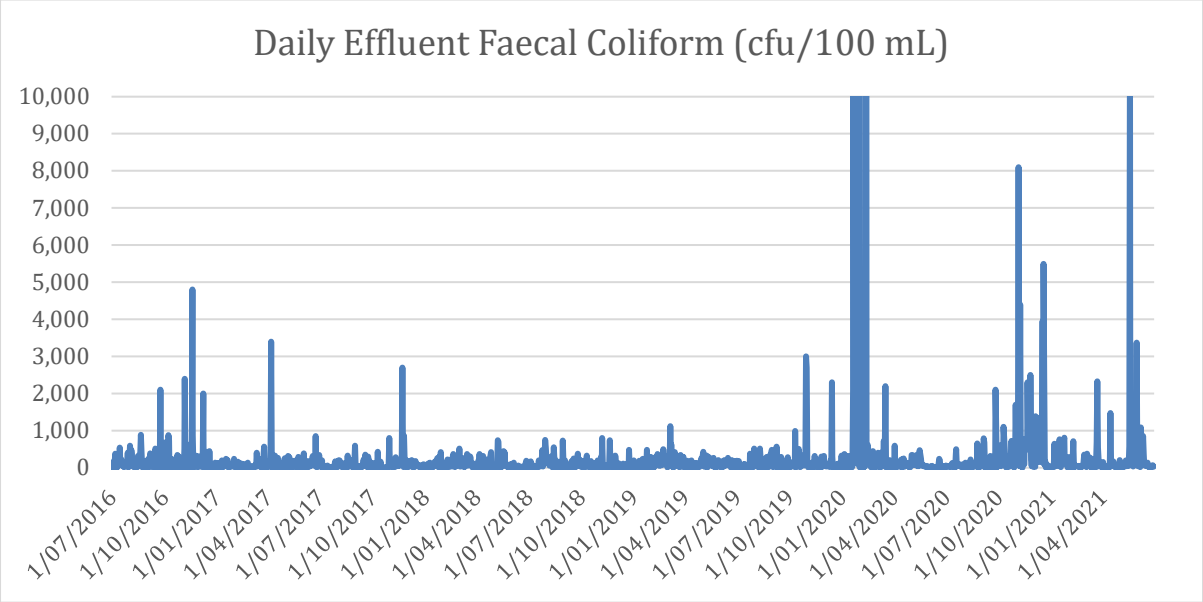



**Figure 8: Daily Effluent Faecal Coliform Results**

The following is a comparison of the analytical results for the quarterly effluent sample:

| Parameters | Units | Limits | July - September | | | | | October - December | | | | | January - March | | | | | April - June | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 |
| Total arsenic | g/m$^3$ | 0.26 | 0.002 | 0.002 | 0.002 | 0.002 | 0.0009 | 0.002 | 0.002 | 0.002 | 0.002 | 0.0013 | 0.002 | 0.002 | 0.002 | <0.002 | 0.001 | 0.002 | 0.010 | 0.002 | <0.001 | 0.001 |
| Total cadmium | g/m$^3$ | 0.08 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0003 | 0.001 | 0.001 | 0.001 | <0.001 | 0.0001 | 0.001 | 0.001 | 0.001 | <0.001 | 0.0003 |
| Total chromium | g/m$^3$ | 0.48 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0009 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0025 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0012 | 0.001 | 0.002 | 0.003 | <0.001 | 0.0025 |
| Total copper | g/m$^3$ | 0.14 | 0.007 | 0.015 | 0.010 | 0.004 | 0.0037 | 0.017 | 0.017 | 0.013 | 0.004 | 0.026 | 0.010 | 0.003 | 0.010 | 0.015 | 0.0220 | 0.006 | 0.006 | 0.020 | 0.0037 | 0.0091 |
| Total lead | g/m$^3$ | 0.48 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0004 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0016 | 0.001 | 0.001 | 0.001 | <0.001 | 0.0006 |
| Total mercury | g/m$^3$ | 0.01 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0003 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0005 | 0.0005 | 0.0005 | <0.001 | 0.0003 |
| Total nickel | g/m$^3$ | 0.77 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0011 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0015 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0012 | 0.002 | 0.002 | 0.001 | 0.0011 | 0.0014 |
| Total zinc | g/m$^3$ | 1.65 | 0.005 | 0.045 | 0.025 | 0.017 | 0.039 | 0.027 | 0.041 | 0.032 | 0.017 | 0.049 | 0.049 | 0.029 | 0.032 | 0.044 | 0.0490 | 0.035 | 0.046 | 0.038 | 0.039 | 0.0340 |
| Phenol | g/m$^3$ | 0.80 | 0.02 | 0.02 | 0.05 | 0.05 | 0.002 | 0.02 | 0.05 | 0.05 | 0.05 | 0.0020 | 0.02 | 0.25 | 0.05 | 0.05 | 0.0020 | 0.02 | 0.10 | 0.05 | 0.002 | 0.0020 |
| Cyanide as CN | g/m$^3$ | 0.10 | 0.010 | 0.010 | 0.010 | 0.010 | 0.005 | 0.010 | 0.014 | 0.014 | 0.010 | 0.0050 | 0.028 | 0.010 | 0.022 | 0.063 | 0.0050 | 0.024 | 0.061 | 0.021 | 0.005 | 0.0050 |
| pH | N/A | N/A | 7.1 | 6.8 | 6.9 | 7.2 | 7 | 7.4 | 6.9 | 6.9 | 7.4 | 7 | 7.4 | 6.9 | 6.7 | 6.8 | 7 | 6.6 | 6.8 | 7.0 | 6.7 | 7 |
| Ammoniacal Nitrogen | g/m$^3$ | N/A | 22.8 | 14.2 | 7.7 | 24.4 | 5 | 21.4 | 9.1 | 13.9 | 26.5 | 6 | 8.5 | N/A | 5.2 | 5.5 | 8 | 4.9 | 5.0 | 7.3 | 4.8 | 4 |
| Oil and Grease | g/m$^3$ | N/A | 4 | 5 | 5 | 4 | 10 | 4 | 5 | 5 | 4 | 11 | 4 | 11 | 4 | 11 | 5 | 4 | 4 | 19 | 9.8 | 5 |

Table 3: Analytical Results for Quarterly Effluent Sample

The results for the quarterly effluent samples were consistent over the 5 year period.

### Section (c)
The plant was not able to consistently meet its effluent quality compliance requirements due to asset failures.

### Section (d)
As stated in section (c), the failure of final clarifiers in the plant had a major impact on the plant's capability of attaining consent compliance.

### Section (e)
Veolia submitted investigation and quarterly reports to GWRC covering the corrective actions that was undertaken to improve the plant's environmental performance.

### Section (f)
No complaints were recorded for the 2020/2021 reporting period.

### Section (g)
There were no other issues that arose relating to the resource consent for the 2020/2021 reporting year.

# WGN080003 [35047]

## Condition (8)

The permit holder shall monitor and record the flow rate, total volume and duration of any bypass discharge from the Moa Point Wastewater Treatment Plant to the long outfall, and calculate and record a dilution ratio (secondary treated: screened effluent) for each bypass event based on average rates of flow during that event. The results of this monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the bypass discharge occurring.

The following is a summary of the bypass events from the Moa Point WWTP for the 2020/2021 reporting period. The discharge letters can be found in Appendix v.

| Date | Duration | Average Discharge Flow Rate | Total Volume of Bypass | Total Volume Treated Effluent During Overflow | Dilution Ratio | Consented | Cause |
|---|---|---|---|---|---|---|---|
| dd/mm/yyyy | hrs/mins | L/s | $m^3$ | $m^3$ | -- | Y/N | -- |
| 08 Nov 2020 | 04hr 40m | 237 | 2,928 | 46,327 | 16:1 | Y | Influent flows exceeded 3000 L/s. |
| 30 Nov 2020 | 04hr 31m | 185 | 3,199 | 54,181 | 17:1 | Y | |
| 01 Apr 2021 | 00hr 55m | 183 | 296 | 10,132 | 34:1 | Y | |
| 31 May 2021 | 02hr 37m | 288 | 2,177 | 28,014 | 13:1 | Y | |

Table 4: Bypass Events from 2020/2021 Reporting Period

# Condition (10)

During a bypass discharge (if during normal working hours) and on days one, two and three after the discharge, the permit holder shall take **a grab sample** of coastal water at each of the following locations, providing safe access is available:

- Dorrie Leslie Park at boat ramp
- Hue Te Taka Peninsula;
- Tarakena Bay Beach at boat ramp
- Tarakena Bay Beach, Western side
- Hue te Taka Peninsula, Western side;
- Moa Point Road, opposite number 49
- Lyall Bay Beach, Eastern side
- Dorrie Leslie Park, South side of boat ramp
- Dorrie Leslie Park, West of boat ramp
- Peninsula at Queens Drive and The Esplanade
- Houghton Bay, Western side
- Marine Centre, Island Bay, Eastern side
- Island Bay, Western side

Each sample shall be analysed for faecal coliforms and enterococci.
The permit holder shall identify and record the location of the sampling points (including map references) and supply this information to the Manager, Environmental Regulation, Wellington Regional Council, within three months of the commencement of this permit.

The details of the monitoring programme, as outlined in the Overflow Contingency Plan (required under condition 12 of this permit), shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

*Note: These sample locations have been selected to act as audit sites to determine if the results obtained from the modelling undertaken in regards to public health risks from bypass discharges are substantiated by sample results.*

The resource consent WGN080003 [35047], Condition 10 was amended on 13 December 2017 to add another ten (10) shoreline monitoring sites. The additional shoreline monitoring sites are located near storm water discharges which may affect the monitoring results.

The following map displays the (13) sites for shoreline sampling:

Figure 9: Moa Point WWTP Shoreline Sampling Sites

The following is a summary of the shoreline samples taken for the bypass event(s) listed in Condition.

| Date | 49 Moa Point Road | | Dorrie Leslie Park at Boat Ramp | | Dorrie Leslie Park - South End | | Dorrie Leslie Park - Western End | | Houghton Bay - Western Side | | Hue te Taka Peninsula | | Hue te Taka Peninsula West | | Island Bay Marine Centre Eastside | | Island Bay Westside | | Lyall Bay Beach Eastern Side | | Peninsula at Queens Drive | | Tarakena Bay Beach at Boat Ramp | | Tarakena Bay Western Side | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci | Faecal Coliform | Enterococci |
| | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL | cfu/ 100mL |
| 8/11/2020 | 24 | 9.1 | 88 | 110 | 110 | 200 | 110 | 80 | 460 | 620 | 120 | 220 | 16 | 5.5 | 420 | 420 | 160 | 180 | 120 | 130 | 15 | 3.6 | 74 | 50 | 72 | 48 |
| 9/11/2020 | 20 | 48 | 33 | 42 | 62 | 120 | 29 | 48 | 24 | 44 | 34 | 42 | 44 | 25 | 46 | 70 | 27 | 96 | 29 | 20 | 36 | 42 | 36 | 58 | 48 | 74 |
| 10/11/2020 | 64 | 44 | 110 | 66 | 58 | 38 | 6 | 3.6 | 11 | 9.1 | 60 | 29 | 27 | 5.5 | 13 | 5.5 | 7.3 | 7.3 | 20 | 16 | 190 | 72 | 25 | 22 | 16 | 24 |
| 1/12/2020 | 4 | 15 | 2 | 9 | 2 | 15 | 18 | 25 | 4 | 4 | 9 | 20 | 20 | 18 | 31 | 6 | 40 | 11 | 4 | 2 | 6 | 6 | 2 | 2 | 82 | 78 |
| 2/12/2020 | 2 | 2 | 15 | 9 | 2 | 9 | 15 | 2 | 4 | 6 | 16 | 9 | 16 | 13 | 9 | 6 | 16 | 11 | 15 | 40 | 4 | 4 | 9 | 6 | 20 | 18 |
| 3/12/2020 | 2 | 2 | 7 | 6 | 35 | 20 | 2 | 4 | 6 | 11 | 2 | 6 | 35 | 18 | 4 | 4 | 7 | 13 | 9 | 2 | 4 | 2 | 4 | 13 | 7 | 6 |
| 1/04/2021 | 20 | 13 | 6 | 5.5 | 36 | 1.8 | 10 | 3.6 | 60 | 42 | 12 | 18 | 40 | 11 | 10 | 7.3 | 14 | 24 | 2 | 9.1 | 10 | 1.8 | 8 | 25 | 2 | 11 |
| 2/04/2021 | 20 | 7.3 | 48 | 40 | 8 | 3.6 | 50 | 54 | 28 | 9.1 | 10 | 1.8 | 12 | 3.6 | 54 | 16 | 38 | 15 | 6 | 11 | 46 | 36 | 10 | 13 | 6 | 22 |
| 3/04/2021 | 6 | 4 | 4 | 6 | 90 | 12 | 2 | 2 | 14 | 2 | 18 | 18 | 18 | 14 | 32 | 42 | 38 | 22 | 42 | 20 | 8 | 4 | 8 | 6 | 16 | 16 |
| 1/06/2021 | 42 | 31 | 38 | 25 | 500 | 90 | 25 | 25 | 480 | 110 | 98 | 38 | 36 | 31 | 500 | 76 | 54 | 18 | 820 | 80 | 760 | 76 | 31 | 44 | 33 | 18 |
| 2/06/2021 | 1.8 | 7.3 | 27 | 5.5 | 42 | 52 | 120 | 52 | 11 | 3.6 | 72 | 40 | 36 | 15 | 11 | 3.6 | 7.3 | 3.6 | 110 | 48 | 7.3 | 7.3 | 9.1 | 5.5 | 11 | 1.8 |
| 3/06/2021 | 5.5 | 1.8 | 27 | 11 | 15 | 16 | 24 | 5.5 | 5.5 | 11 | 24 | 3.6 | 7.3 | 1.8 | 50 | 11 | 62 | 20 | 78 | 25 | 7.3 | 5.5 | 18 | 15 | 16 | 15 |

Table 5: Additional Moa Point Shoreline Sample Results

# Condition (13)

The annual report required by condition 19 of this permit shall detail what steps have been taken in the reporting year and what steps are proposed to be undertaken in the future to reduce infiltration and stormwater ingress into the Wellington City sewerage network.

This information shall include, but not be limited to, the following information:

a) Details on the adoption of a policy to identify, and to repair or replace, defective private sewer drains in the Wellington City catchment. If such a policy is adopted, detail on its implementation made within the previous year
b) Details of additional works that have been undertaken and what these works are expected to achieve
c) An indication of when any on-going works will be completed
d) Details of any investigations undertaken with regard to inflow and infiltration in the Wellington City catchment
e) Details of any works or investigations planned for the next financial year

An inflow and infiltration report can be found in appendix vi.

# Condition (16)

The permit holder shall provide suitable wastewater sample locations for monitoring the quality of:

a) The bypass flows; and
b) Secondary treated wastewater (i.e. both wastewater streams prior to mixing) during bypass discharges.

The permit holder shall obtain grab samples of both wastewater streams within the first two hours of a bypass discharge occurring during normal working hours or as soon as practicable for those events occurring outside normal working hours. These Samples shall be analysed for:

- cBOD5
- suspended solids
- faecal coliform
- pH
- ammoniacal nitrogen
- oil and grease

And on at least one bypass event each year these samples shall also be analysed for the following indicator contaminants:

- Total cadmium
- Total chromium
- Total copper
- Total lead
- Total nickel
- Total zinc

The wastewater quality results, together with the results of wastewater flow monitoring shall be used to calculate, by mass balance, the quality of the wastewater discharge after both wastewater streams have mixed. The mass balance calculation for a contaminant (a) is:

$C_{mixed}(a) - (C_{tr}(a)*Q_{tr} - C_{by}(a)*Q_{by})/Q_{mixed}$

Where: **C** is contaminant concentration
**Q** is the flow rate (litres/sec)
**tr** subscript relates to parameter of the secondary treated wastewater stream
**by** subscript relates to parameter of the bypassed wastewater stream
**mixed** subscript relates to the parameter of the mixed secondary treated and bypassed waste streams.

The calculated mixed wastewater discharge quality results shall be reported to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring.

Four (4) consented bypass events occurred during this reporting period. The information was provided to GWRC within 10 days the discharge event occurring.

## Condition (17)

The permit holder shall obtain grab samples of bypass flows and secondary treated wastewater during discharges (i.e. at the locations required by conditions 16) within the first two hours of a bypass discharge occurring during normal working hours until 7 bypass events have been sampled. The permit holder will use best endeavours to obtain these samples in the first 5 years of the permit. These samples shall be analysed for:

- Total cadmium
- Total chromium
- Total copper
- Total lead
- Total nickel
- Total zinc
- Total arsenic
- Total phenol
- Volatile organic compounds
- Semi-volatile organic compounds
- Organochlorine pesticides

The wastewater quality results, together with the results of wastewater flow monitoring shall be used to calculate, by mass balance, the quality of the wastewater discharge after both wastewater streams have mixed. The Calculated mixed wastewater monitoring results shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council, as soon as they are available.

Condition 17 is no longer enforced since seven (7) bypass events have been sampled and the five (5) year date has passed. Therefore, no reporting for this condition is required.

# Condition (19)

The permit holder shall provide to the Manager, Environmental Regulation, Wellington Regional Council an Annual Assessment and Analysis Report for the period 1 July to 30 June by 31 July each year summarising compliance with the conditions of this permit. This report shall include, but not be limited to the following:

a) A summary of all monitoring undertaken in accordance with the conditions of this permit and a critical analysis of the information in terms of compliance and adverse environmental effects;
b) A comparison of data with previously collected data in order to identify any emerging trends;
c) Comments on compliance with the conditions of this permit;
d) Any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit;
e) Any measures that have been undertaken to improve the environmental performance of the wastewater treatment and disposal system;
f) A copy of any complaints recorded (in accordance with condition 18 of this permit) during the year;
g) Any other issues considered to be important;

## Section (a)

Several parameters are used to monitor the Moa Point WWTP in the event that the influent flow rate exceeds 3000L/s and there is a bypass through the long outfall. A summary of all the monitoring data can be found in preceding parts of this consent report. It can be noted that elevated microbial concentrations are recorded in some sites for the first 24-hours of the discharge. These elevated results can be caused by several factors such as discharges from treatment plant, storm water and wastewater network during wet weather events. Site- specific microbial results tend to return to safe levels after 24 hours of the cessation of discharge.

## Section (b)

Because the discharges from the WWTP are highly dependent on the wet weather events, it is difficult to compare the data from year to year. Instead of comparing the actual data, a comparison of the averages of the data from the 2020/2021 reporting period will be made to the previous four (4) years. The following section summarises that comparison.

Below is a comparison of the annual average of the monitoring parameters:

| Parameter | Units | WWTP Bypass Discharges Annual Averages | | | | |
|---|---|---|---|---|---|---|
| | | 2016/2017 | 2017/2018 | 2018/2019 | 2019/2020 | 2020/2021 |
| Average WWTP Bypass Flow Rate | L/s | 328 | 201.5 | 160.5 | 167 | 223 |
| WWTP Bypass Total Volume | $m^3$ | 13,476 | 8,310 | 3,522 | 5,827 | 2,150 |
| Dilution Ratio | -- | 13:1 | 16:1 | 35:1 | 19:1 | 20:1 |
| Ammoniacal Nitrogen | $g/m^3$ | 9 | 9.5 | 6.5 | 11.05 | 7 |
| Carbonaceous Biological Oxygen Demand | $g/m^3$ | 25 | 22 | 28 | 99 | 66 |
| Faecal Coliforms of Bypass | cfu/100mL | 1,394,429 | 3,427,500 | 948,250 | 1,811,667 | 153,432 |
| Oil and Grease | $g/m^3$ | 15 | 21 | 6.75 | 30.33 | 9 |
| pH of Bypass | -- | 6.7 | 6.95 | 7.125 | 6.27 | 7 |
| Suspended Solids | $g/m^3$ | 79 | 57.5 | 72.75 | 183.5 | 134 |
| Total cadmium | $g/m^3$ | 0.001 | 0.001 | 0.001 | 0.00 | 0.0002 |
| Total chromium | $g/m^3$ | 0.005 | 0.0035 | 0.002 | 0.01 | 0.003 |
| Total copper | $g/m^3$ | 0.021 | 0.026 | 0.027 | 0.04 | 0.044 |
| Total lead | $g/m^3$ | 0.006 | 0.003 | 0.003 | 0.01 | 0.005 |
| Total nickel | $g/m^3$ | 0.002 | 0.0015 | 0.0015 | 0.01 | 0.002 |
| Total zinc | $g/m^3$ | 0.063 | 0.0725 | 0.145 | 1.22 | 0.078 |

Table 6: Discharge Parameters Comparison

The average bypass volume for FY2020/2021 has increase versus the previous financial year. The annual averages for the monitoring parameters are similar over the 5-year period.

### Section (c)
All monitoring parameters were compliant with the conditions of this permit.

### Section (d)
The plant has been compliant with all conditions of this resource consent.

### Section (e)

No measures have been undertaken to improve the environmental performance of the wastewater treatment for bypass discharges as the plant is compliant.

### Section (f)
The have been no complaints recorded for the 2020/2021 reporting period.

### Section (g)
There have been no issues regarding the consent for this reporting period.

# WGN 080003 [26812]

## Condition (3)

The permit holder shall undertake an annual physical assessment of the condition of the outfall pipeline. This assessment shall include, but not be limited, the following:

a) An assessment of the structural condition of the pipeline

b) An inspection of the diffuser ports

c) An assessment of the erosion or scour around exposed sections of the pipeline and

d) Recommend any maintenance that is required

The results of the assessment shall be submitted to the manager, Environmental Regulation, Wellington Regional Council not later than three months after the assessment has been undertaken.

The assessment of the structural condition of the pipeline was conducted in February 2021. A report of the assessment can be found in Appendix ii: Outfall Pipeline Inspection Report.

# WGN 080003 [26813]

## Condition (7)

The permit holder shall monitor air quality in the vicinity of the plant to confirm the absence of faecal coliforms and salmonella originating from the plant. Sampling is to be carried out at least once every six months.

The sampling method and locations are to be agreed with the Manager, Environmental Regulation, Wellington Regional Council within three months of the granting of this permit. Tests are to be carried out at a minimum of three sites downwind and three sites upwind of the plant, with at least one in the vicinity of Air New Zealand kitchens and one at a level of Kekerenga Street. The other sites are to be located outside of/and within 100 metres of the site boundary.

The results shall be provided annually in the annual report required under condition 14 of this permit, or on request.

Ambient Microbe Monitoring was performed at the Moa Point WWTP. The following table is a summary of the air quality monitoring in the vicinity of the WWTP:

Full reports can be found in the Moa Point WWTP quarterly reports.

| | Faecal Coliforms | | Salmonella | |
|---|---|---|---|---|
| Date | 24 August 2020 | 17 February 2021 | 24 August 2020 | 17 February 2021 |
| Site 1 | Absent | Absent | Absent | Absent |
| Site 2 | Absent | Absent | Absent | Absent |
| Site 3 | Absent | Absent | Absent | Absent |
| Site 4 | Absent | Absent | Absent | Absent |
| Site 5 | Absent | Absent | Absent | Absent |
| Site 6 | Absent | Absent | Absent | Absent |

Table 7: Semi-Annual Air Quality Monitoring

# Condition (8)

Hydrogen Sulphide ($H_2S$) and other reduced Sulphur compounds shall be monitored in the deodorized gas discharge. Monitoring shall be undertaken in the stack leading from the chemical scrubber system on a monthly basis.

The results shall be provided annually in the annual report required under condition 14 of this permit, or on request.

The monthly results from the Hydrogen Sulphide ($H_2S$) and Total Reduced Sulphur (TRS) has been summarised in the in the following table:

| Month | WWTP | |
|---|---|---|
| | $H_2S$ | TRS |
| | ppm | ppm |
| July 2020 | 0.001 | 0.002 |
| August 2020 | 0.003 | 0.002 |
| September 2020 | 0.001 | 0.002 |
| October 2020 | 0.003 | 0.002 |
| November 2020 | 0.003 | 0.002 |
| December 2020 | 0.003 | 0.002 |
| January 2021 | 0.000154 | 0.002 |
| February 2021 | 0.000198 | 0.002 |
| March 2021 | 0.000176 | 0.002 |
| April 2021 | 0.002 | 0.002 |
| May 2021 | 0.0033 | 0.002 |
| June 2021 | 0.0002 | 0.002 |
| **Limits** | **0.01** | **0.05** |

Table 8: Monthly $H_2S$ and TRS Concentrations

The full reports can be found in the quarterly reports for the 2020/2021 reporting period. All results are within the resource consent limits.

## Condition (9)

The discharge to air from the chemical scrubber system shall contain no more than 0.01ppm hydrogen sulphide ($H_2S$) and no more than 0.05ppm total reduced Sulphur compounds (including $H_2S$).

These limits have been included in the summary under WGN080003[26813] Condition (8).

## Condition (10)

| |
|---|
| The permit holder shall undertake smoke testing of the Moa Point wastewater treatment plant and ventilation system. The smoke tests are to be carried out on an annual basis between the months of August and November.<br><br>The results of the smoke test shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council within one month of the testing being carried out by the permit holder. A copy of the analysed results shall also be provided to Community Liaison Group, if requested. |

A smoke test was performed on the WWTP on 3rd November 2021. The smoke test report can be found in Appendix iii: Smoke Test Report.

# Condition (14)

The permit holder shall provide to the Manager, Environmental Regulation, Wellington Regional Council an annual monitoring report for the period 1 July to 30 June, by 31 July each year summarising compliance with the conditions of this permit. A copy of the report shall be provided to Community Liaison Group, if requested.

This report shall include, but not be limited to the following:

a) A summary of all monitoring undertaken in accordance with the conditions of this permit and a critical analysis of the information in terms of compliance and adverse environmental effects
b) A comparison of data with previously collected data in order to identify any emerging trends
c) Comments on compliance with the conditions of this permit
d) Any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit
e) Any measures that have been undertaken, to improve the environmental performance of the wastewater treatment and disposal system
f) A copy of any complaints recorded (in accordance with condition 13 of this permit) during the year
g) Outcomes from the implementation of the Odour Management Plan
h) Any other issues considered important by the permit holder.

## Section (a)

A summary of all the monitoring data can be found in preceding parts of this consent report. It can be noted that all monitoring parameters are within consent limits which signifies that the effects of the plant's discharge to air is less than minor.

## Section (b)

A comparison of data from the 2020/2021 reporting period was made to the previous four (4) years. The following section summarises that comparison.

The following tables are a comparison of the results from the air quality monitoring:

| Location | Faecal Coliforms | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 - 2017 | Q1 - 2018 | Q1 - 2019 | Q1 - 2020 | Q1 - 2021 | Q1 - 2017 | Q1 - 2018 | Q1 - 2019 | Q1 - 2020 | Q1 - 2021 |
| Site 1 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 2 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 3 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 4 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 5 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 6 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

Table 9: Comparison of Faecal Coliforms in Air

| Location | Salmonella | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 - 2017 | Q1 - 2018 | Q1 - 2019 | Q1 - 2020 | Q1 - 2021 | Q1 - 2017 | Q1 - 2018 | Q1 - 2019 | Q1 - 2020 | Q1 - 2021 |
| Site 1 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 2 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 3 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 4 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 5 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Site 6 | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

Table 1: Comparison of Salmonella in Air

The following is a comparison of the monthly Hydrogen Sulphide and total reduced Sulphur results:

| Month | Moa Point WWTP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $H_2S$ (ppm) | | | | | TRS (ppm) | | | | |
| | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | 2020/ 2021 |
| July | 0.00159 | 0.00602 | 0.00013 | 0.00013 | 0.001 | 0.002 | 0.006 | 0.011 | 0.002 | 0.002 |
| August | 0.0015 | 0.0004 | 0.00915 | 0.00013 | 0.003 | 0.002 | 0.004 | 0.002 | 0.002 | 0.002 |
| September | 0.00262 | 0.00091 | 0.0047 | 0.00013 | 0.001 | 0.002 | 0.022 | 0.004 | 0.002 | 0.002 |
| October | 0.00045 | 0.00157 | 0.00422 | 0.0001 | 0.003 | 0.018 | 0.011 | 0.004 | 0.009 | 0.002 |
| November | 0.00031 | 0.0033 | 0.00327 | 0.0057 | 0.003 | 0.002 | 0.035 | 0.007 | 0.002 | 0.002 |
| December | 0.004 | 0.02333 | 0.00499 | 0.0015 | 0.003 | 0.0049 | 0.043 | 0.011 | 0.002 | 0.002 |
| January | 0.00441 | 0.01005 | 0.00464 | 0.0001 | 0.000154 | 0.002 | 0.045 | 0.007 | 0.002 | 0.002 |
| February | 0.00064 | 0.01754 | 0.00453 | 0.003 | 0.000198 | 0.012 | 0.017 | 0.013 | 0.003 | 0.002 |
| March | 0.0068 | 0.02367 | 0.00073 | 0.002 | 0.000176 | 0.039 | 0.011 | 0.002 | 0.002 | 0.002 |
| April | 0.00056 | 0.01374 | 0.00017 | 0.00011 | 0.002 | 0.003 | 0.019 | 0.002 | 0.002 | 0.002 |
| May | 0.00054 | 0.00102 | 0.00219 | 0.0001 | 0.01 | 0.021 | 0.004 | 0.004 | 0.002 | 0.002 |
| June | 0.00074 | 0.00028 | 0.00013 | 0.001 | 0.001 | 0.021 | 0.004 | 0.002 | 0.002 | 0.002 |
| Limit | 0.01 | | | | | 0.05 | | | | |

**Table 2: Monthly Moa Point WWTP $H_2S$ and TRS Comparison**

The $H_2S$ and TRC results were comparable over the 5 year period.

## Section (c)

As noted in WGN080003[26813] Condition (14) Section (a) all monitoring parameters are compliant to the resource consent.

## Section (d)

As noted in WGN080003[26813] Condition (14) Section (a) all monitoring parameters are compliant to the resource consent. There were no difficulties in achieving compliance with the conditions of this permit.

## Section (e)

The Moa Point WWTP has been performing well below the limits set in the resource consent. No significant measures have been undertaken to improve the environmental performance of the wastewater treatment and disposal system.

## Section (f)

There were 2 complaints received regarding this resource consent during the period of January to March 2021. Both complaints were received erroneously from Wellington City Council call centre as the complainants mentioned rubbish smells. These complaints were redirected back to the WCC call centre to be reassigned to the Southern Landfill. The details of the complaints are found in appendix iv.

### Section (g)
The outcomes for the implementation of the Odour Management Plan are good.

### Section (h)
There were no other issues that arose relating to the resource consent for the 2020/2021 reporting year.

# WGN960094 [1471]

# Condition 11

| |
|---|
| The following monitoring shall be carried out and the results shall be forwarded to the Wellington Regional Council:<br><br>a. The pumping station stack shall be tested for hydrogen sulphide and total reduced sulphur compounds. The concentrations shall not exceed 0.01ppm and 0.05ppm respectively. This testing shall be carried out monthly for the first six months of operation of the pumping station. The Regional Council shall then review the frequency. The method of testing shall be agreed to with the Wellington Regional Council.<br><br>b. Records of the pH and the Oxidation Reduction potential of the scrubber solutions shall be kept by the consent holder and made available to the Wellington Regional Council. The form of these records shall be agreed to with the Wellington Regional Council prior to commissioning of the pumping station. |

a) The H2S concentration in the deodorised air discharged from the Moa Point IPS scrubber system is continuously monitored by an online analyser. To meet the requirements of this consent condition, the daily maximum value is recorded for each day. The maximum of these values is reported as the monthly maximum H2S concentration. For all the maximum values please see Appendix iii: H2S and TRS Concentrations.

   The total reduced sulphur compounds (TRS) concentration are measured once a month by an independent contractor. The reports can be found in H2S and TRS Concentrations.

| Month | WWTP | |
|---|---|---|
| | $H_2S$ | TRS |
| | ppm | ppm |
| July 2020 | 0.001 | 0.002 |
| August 2020 | 0.001 | 0.002 |
| September 2020 | 0.0001 | 0.002 |
| October 2020 | 0.0001 | 0.002 |
| November 2020 | 0.001 | 0.002 |
| December 2020 | 0.012 | 0.002 |
| January 2021 | 0.01055 | 0.002 |
| February 2021 | 0.042157 | 0.002 |
| March 2021 | 0.008 | 0.002 |
| April 2021 | 0.002 | 0.002 |
| May 2021 | 0.01 | 0.002 |
| June 2021 | 0.0016 | 0.002 |
| **Limits** | **0.01** | **0.05** |

**Table 35: IPS Monthly $H_2S$ and TRS Concentrations**

There was a spike in the outlet H2S reading on 15th December 2020. This spike started at 14:25 and continued for 15 minutes. An investigation into the cause of this spike was inconclusive. The scrubber system was operating within the specified parameters and there were no faults with the instrumentation. The only anomaly was the elevated inlet H2S to the pump station. There were also spikes during the following dates that resulted in higher readings but none exceeded the limit.

There was a spike in the H2S in the IPS air discharge on 22nd January 2021 from 21:30 to 21:36. An investigation was conducted into the cause of the spike. During this period, the H2S entering the IPS was elevated as well. This may have caused issues with the scrubber system.

The operations team also inspected the analytical instrumentation and chemical injection system but could not find any issues with any equipment. Regardless, the operations team cleaned the analytical probes and the chemical injection points to try and improve the performance of the system.

There were three H2S spikes in the air discharge from the Moa Point IPS February 2021. They are on the following dates:

- 11 February 2021 from 14:00 to 14:20
- 19 February 2021 from 17:45 to 18:20
- 25 February 2021 from 1:55 to 2:45

An investigation of the scrubber system was carried out to determine the cause of these spikes. The southern operations coordinator reviewed the injection nozzles, chemical dosing equipment, and the H2S analyzer but could not find anything at fault. Veolia will continue to monitor the IPS outlet H2S to determine if there is a cause for these elevated values or if it is an instrument error.

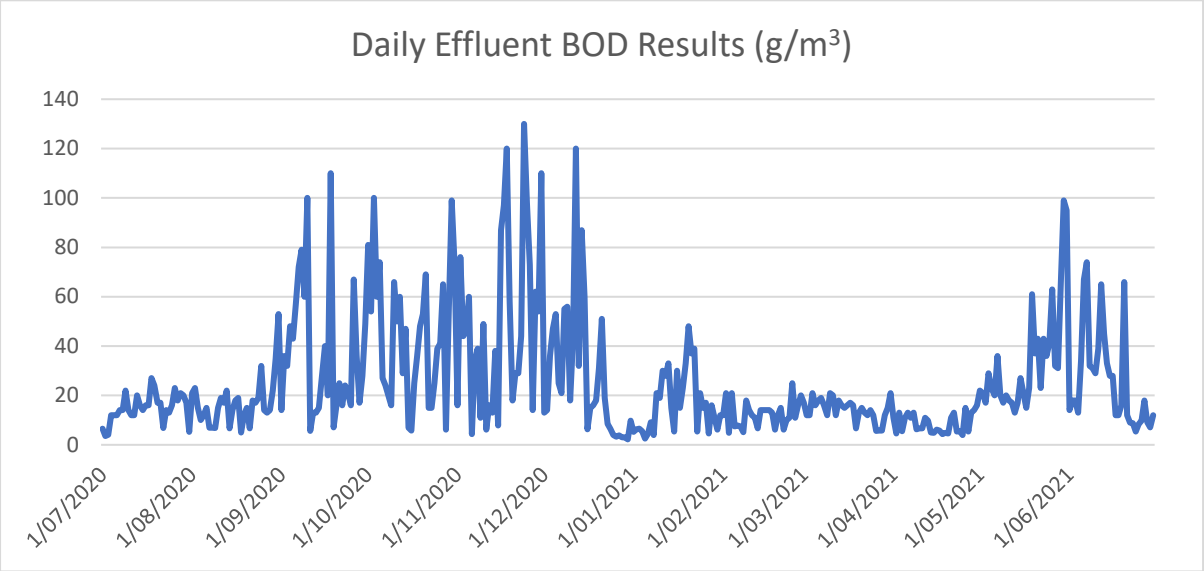
The spike in the discharge H2S of the WWTP on 2nd May 2021 was due to a fault on the instrument. On 3rd May 2021 at 00:55 the readings on the instrument flatlined at 90ppb. This was caused by the

unit running out of chemicals. The operator replaced the chemicals on 3rd May 2021 at 08:05 and the readings quickly dropped below the resource consent limits.

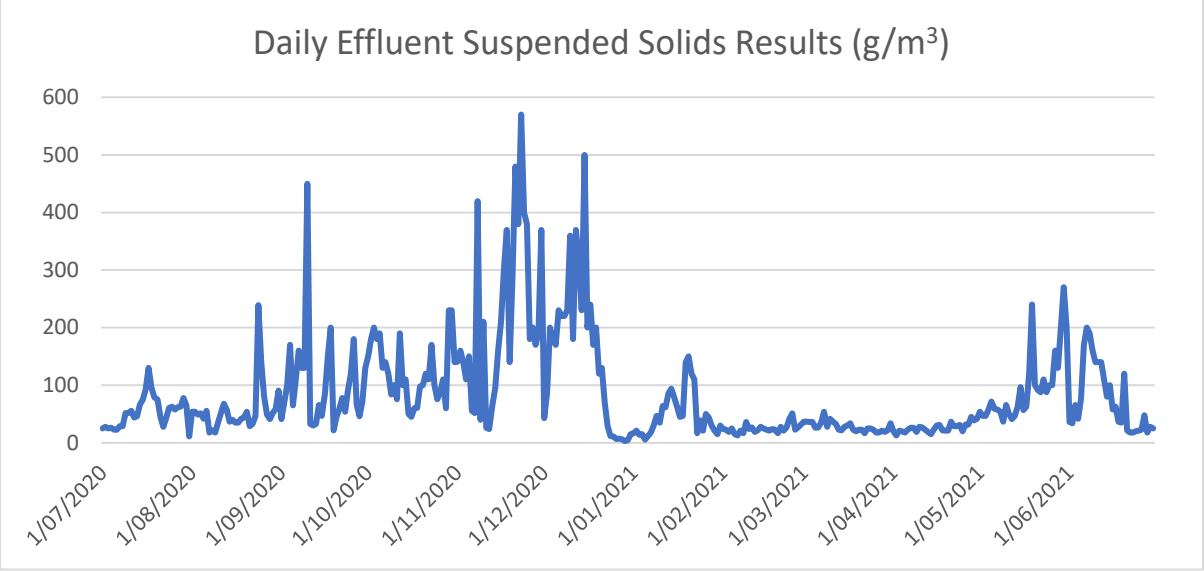
# Appendix i:

## Daily Effluent Carbonaceous Biological Oxygen Demand

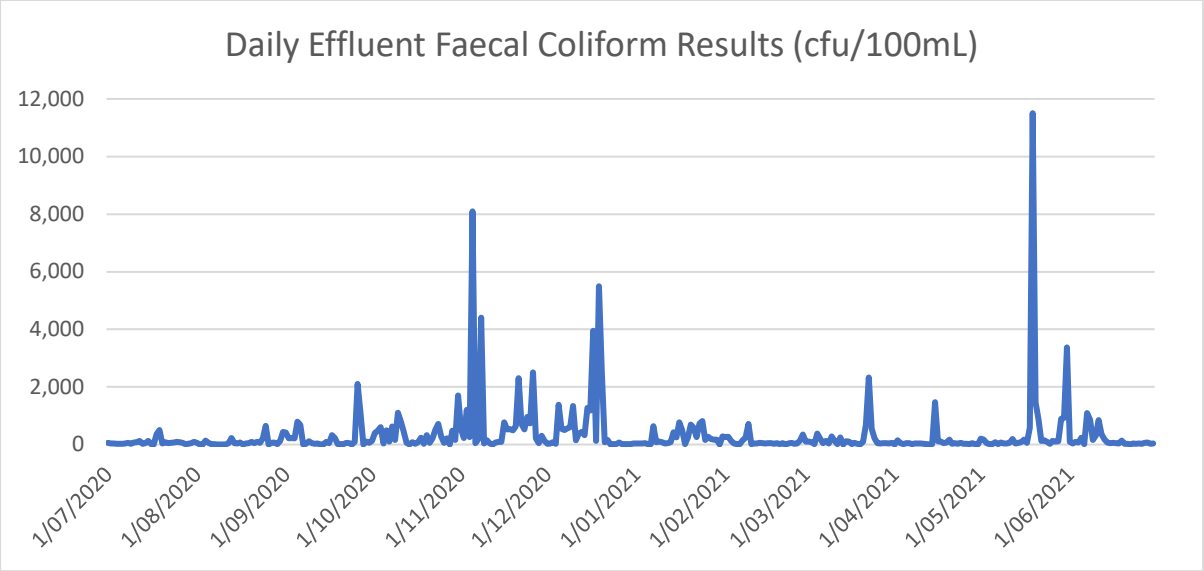
## Results




## Daily Effluent Suspended Solids Results



## Daily Effluent Faecal Coliforms Results



# Appendix ii: Outfall Pipeline Inspection Report

UNDERSEA CONSTRUCTION LTD

# UNDERSEA CONSTRUCTION LIMITED.

## VEOLIA WATER SERVICES NZ LIMITED – MOA POINT WASTEWATER OCEAN OUTFALL PIPELINE & SEABED ANNUAL INSPECTION

February 2021

| | |
|---|---|
| Document Title: | **Moa Point Wastewater Ocean Outfall Pipeline & Seabed Annual Inspection** |
| Document No.: | **UCL – 2021.02 – WWTP Outfall Pipeline – IR001** |
| | **Prepared for:**<br>**Veolia Water Services NZ Ltd.,**<br>**Moa Point WWTP,**<br>**Wellington.** |

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| **Document generated on:** | **22nd February 2021** |
| **Document title:** | **Moa Point Wastewater Ocean Outfall Pipeline & Seabed Annual Inspection** |
| **Document no.:** | **UCL – 2021.02 – WWPT Outfall Pipeline – IR001** |
| **Document release:** | **Released for Client review and comment – 12th March 2021** |

| Document circulation | | | |
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## Preface

Pipeline installations and their life cycle management represent major planning and engineering efforts; especially those subjected to harsh environmental conditions such as Wellington south coasts Moa Point Wastewater Ocean Pipeline Outfall. For Companies and or Government Authorities to obtain the maximum working life and return on their initial investment from assets in a marine environment it is important that they be maintained to an acceptable and safe working standard. To ensure the quality assurance of their asset it is necessary to complete infrastructure surveys, programmed maintenance, and subsequent to inspection findings; remedial works.

When pipeline installations and their ancillary components come into service, it is hoped that they're free of all significant faults. This of course depends on the professional standards of the quality assurance of the numerous involved Parties in design, fabrication, construction, and installation.
To ensure a continuous working life for any marine asset, it is necessary to maintain an adequate inspection programme. Such a programme must be capable of detecting potential problems at an early stage. This allows the designers and engineers time to analyse the inspection information and suggest remedial action if required.

Experience has shown that the vast majority of all faults; damage / defects / deterioration found in marine structures and associated civil works have been done so visually. Visual information is of utmost importance both in programmed visual survey inspection, condition assessment, and diver general observation.
Throughout the progression of these survey inspections personnel observe and record data on numerous components in varying condition states.
The consequences of failure of what initially may only be a minor fault, especially sudden failure, can be catastrophic and very expensive, both in terms of repairs, lost business, and risks to health, safety and the environment.
Programmed survey inspections / condition assessment / asset audits are completed to ensure the continuing operational function and safe condition of the structure is maintained. Providing the Asset Owner, its operators, and subsequently the users with an assurance of reliability and ensuring the integrity of the structure.

Condition assessment is an important step in the life cycle management process of Marine Structural Assets and their ancillary components.
One of UCL's major facets of work and experience is in the inspections, condition assessment and reporting on numerous 'in-water' structures throughout New Zealand and Offshore. It is a facet of our work that we can derive immense satisfaction from; when being able to detect potential problems at an early stage, then work in partnership with Clients towards achieving common goals and economic solutions. Thus minimising risk and therefore maintaining the Clients valuable asset in safe and efficient working condition – "fit for purpose".

## Asset Management

Asset management is a strategic, long-term approach which provides a foundation for improved operational performance and a sustainable business model.
The key benefits of Asset Management Planning are:

- Manage an asset throughout its lifetime and improve performance.
- Consider risks associated with costs and performance in all decisions.
- Help to improve organisational performance and achieve sustainable business objectives.
- Achieve tangible profits over time with optimised return on investment and / or growth.
- Be able to demonstrate to stakeholders, sensible utilisation of assets and associated risks and costs.
- Improve corporate reputation and credibility.

## Asset Maintenance

“It needs to be recognised; to have an effective Asset Management Plan; you’re required to have an effective Asset Maintenance Programme”.

Over the past few decades, the desire of extending the useful service life of infrastructures has become of paramount significance. Where the ageing infrastructure is a serious problem faced by countries across the world, the premature deterioration has also emerged as the major problem that result in reduced service life of structures.
Structural elements are constantly subjected to multiple risk factors that result in deterioration over the course of their service lives.
Structural failure may be defined as the inability of a structure to serve its intended function with the desired levels of safety and serviceability.
Failure of a structure may be attributed to a number of independent and interrelated factors.

Asset condition assessments combine the processes of periodic inspection and testing and the assessment and interpretation of the resultant data to provide an indication of the current condition of a specific asset as to the determination of the requirement for remedial action.
Asset condition assessments determine the physical state of an asset that may affect the performance of the asset and the ability of the asset to provide the required level of service.

The benefits of knowing the current condition of an asset are:

- The ability to plan and manage the delivery of the required level of service of the asset.
- Avoiding premature asset failure by providing the option of cost effective remediation.
- Providing an accurate estimate of future expenditure that is required.
- Determination and refinement of maintenance and rehabilitation strategies.

Asset maintenance to be undertaken over the balance of structure service life is a major challenge to provide reliable and sustainable facility operation. Operating ageing facilities efficiently and safely requires an asset maintenance cycle to include inspection diagnosis, evaluation and implementation of remediation processes.
It is a critical part of asset management to determine the remaining lifecycle of an asset and the capability of the asset to meet the designed performance and level of service requirements.
In today’s environment, the preventative maintenance of ageing structures is much better than the cost of construction of new structures once original design lives have been exceeded. Asset Condition Assessment gathered information assists the determination of the remaining service life of an asset, the scheduling of remediation requirements that are required to reinstate the level of service that is provided by the asset to the desired standard.

Being unaware of the current condition of an asset may lead to the premature failure of the asset leaving limited options to the facility owner with replacement being the most expensive option. Unforeseen failure of an asset provides major consequences that constitute a risk to business operations or potential loss to the organisation. The benefits of knowing the current condition of an asset are the ability to plan and manage the delivery of the required level of service of the asset, avoiding premature asset failure providing the option of cost effective remediation, providing an accurate estimate of future expenditure that is required and the determination and refinement of maintenance and rehabilitation strategies.

Assessment of damaged or deteriorated structures should only be made by qualified and experienced people and the process of should always include the aspects of the condition of the structure including all visible, non-visible and potential damage and defects, a review of the past, current and future service functions / requirements.

With most damaged or deteriorated structures, the facility owner has a number of options which will effectively decide the appropriate remediation strategy that will meet the future service requirements of the structure. These options will include doing nothing, downgrading the capacity or functioning of the structure, preventing or reducing further damage without repair, improving, strengthening or refurbishing the structure, reconstructing all or part of the structure or demolishing the structure.

Proper remediation methodology begins with inspection and testing to identify the type and extent of defects and degradation mechanisms and the overall condition and quality of the structure. Remediation projects are prone to increasing in volume and costs once work has commenced – investing in comprehensive and accurate Asset Condition Assessments before remediation begins has proven cost effective in the long term.

Often there is limited information on “as built” with drawings and construction records being partial at best and more than often incorrect.
An understanding of structures is critical in being able to provide comprehensive reporting on all aspects of the construction envelope. Prior to diagnosing the causes of defects or failure within a structure it is important to understand that defects result from several factors: design, construction practices, materials, the environment, and loading applied to the structure.

The Asset Condition Assessment is intended to form the foundation for short-term maintenance strategies in which structural elements of the facility are prioritised aligned with the degree of deterioration and loss of function.

## General

All structural assets exposed to the marine environment are subjected to considerable deteriorating forces. Of course, the designers take this into account when designing the various components that are constructed to form marine structures; however local anomalies do occur and some detailed aspects of the problem are imperfectly understood. Another point to note is that any marine structure warrants careful monitoring on engineering grounds.
This indicates a need for documentation for marine structures and the importance of these records should not be underestimated. The average working life of structures designed for marine environments is predicted to be between 35 – 50 years. During that life cycle, it would be reasonable to assume that defects of one type or another will occur. It makes good sense for both engineering and economic reasons for any such damage to be dealt with on a planned basis.

# Veolia Water Services NZ Ltd. – Moa Point Wastewater Ocean Outfall Pipeline and Seabed

## Annual Underwater Condition Survey Inspection

## Overview

Report prepared for:
Edward Yong, Safety, Risk, & Compliance Officer /
& Stuart Pearce, Contract Manager
Moa Point WWTP
Veolia Water Services NZ Ltd. (Client)

Survey Inspection Investigations and Report completed by:
Wayne Angus, Civil Engineer / Construction Diver
Undersea Construction Ltd. (UCL) (Diving Contractor / Consultant)

The Moa Point Ocean Outfall Pipeline is approximately 1858m in length, from position 'A' at the roadside southern embankment inspection chamber, then traversing in a southerly direction through Lyall Bay to the pipelines southernmost diffuser (position 'F') at a water depth of 23 metres and a GPS position of 41° 21.119' S 174° 48.080' E.

Wellington City Council holds Resource Consent WGN080003 (26180) to discharge treated wastewater from the Moa Point Wastewater Treatment Plant into Lyall Bay via a 1.8km offshore outfall pipeline.

Following a brief discussion on the survey scope and objectives, staff from UCL completed underwater survey inspections of the Moa Point Wastewater Ocean Outfall Pipeline and seabed.

The emphasis of the survey investigations is to both monitor as per set 'Scope' criteria, observe and report on any defect / damage / deterioration that could affect the current operational working and future service life of the inspection components, the pipeline system as a whole, and to establish documented data that not only provides the Client with reporting on current condition status, but also comparisons with historic values.

## Scope of Work

- Formulate a survey plan.

- Submit Worksafe NZ Notification of Work (Diving – Notifiable work).

- Task assessments, hazard analysis, and equipment preparation.

- Visual survey inspection of pipeline components:
  a) inshore exposed pipeline section; 3.0 – 8.0 metre water depth (positions 'C – D'),
  b) buried pipeline route from diffuser # 18 (position 'E') on a heading back to position 'D',
  c) outfall diffuser section from southernmost diffuser # 1 (position 'F') to diffuser # 18 (position 'E').

- Dimensional measure of scour:
  a) at inshore exposed pipeline section (positions 'C – D'). With reference to existing markers, set at 10 metre increments along the length of exposed pipe to establish repetitive monitoring at fixed positions. Update CAD drawing for 2021 reference and reporting purposes.
  b) at diffuser section.

- Cathodic Potential testing at diffuser test point and outlet nozzles.

- Photograph items of interest.

- Video diffusers in operation.

- Log all observations; defect / damage / deterioration etc., and general condition.

- Compile and submit a report of all inspection findings.

## Positional Data

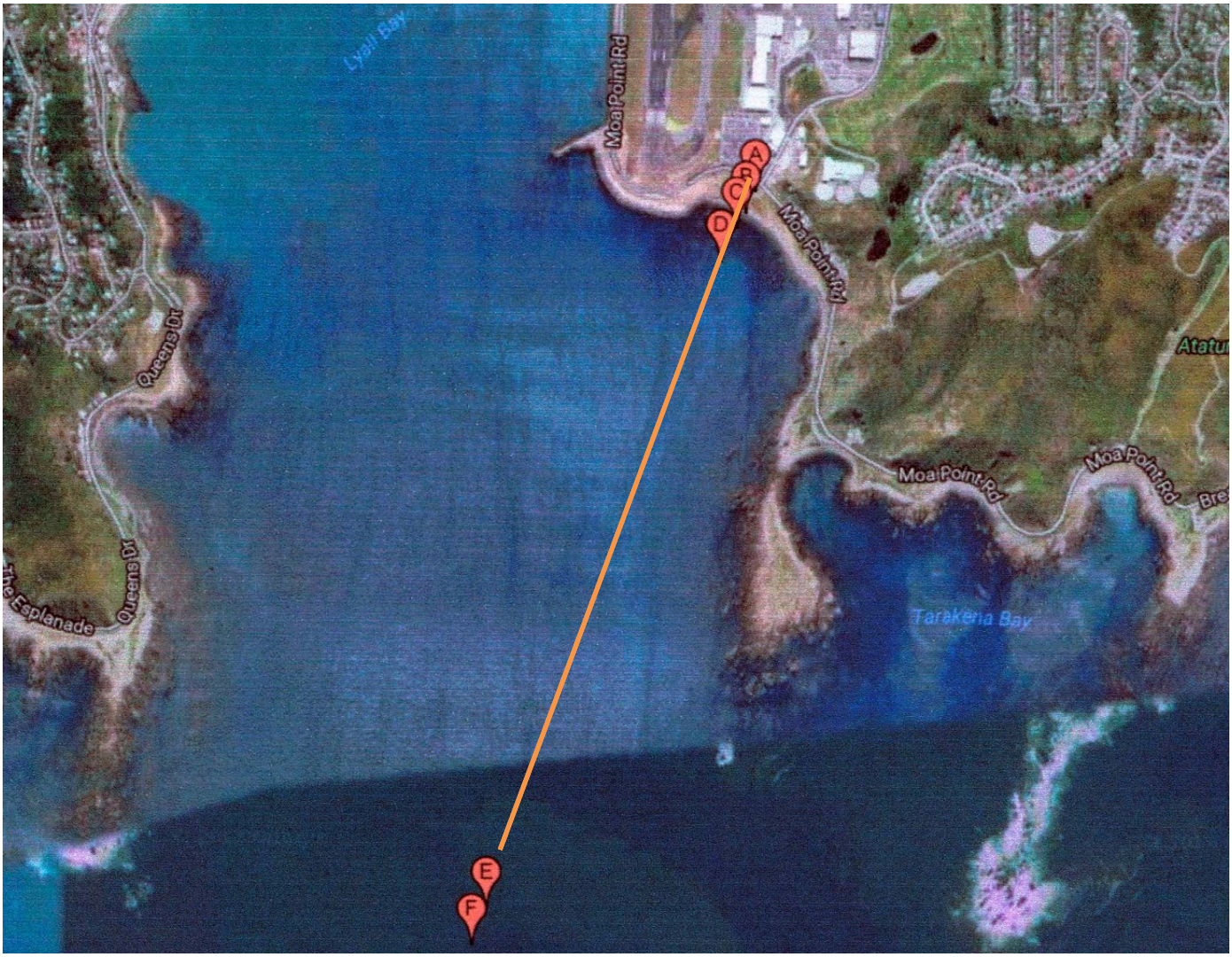


Figure 1: Pipeline route and key reference positions

Position 'A' - Onshore manhole access to buried pipeline

| UTM | | dd.ddddd° | dd° mm.mmm' | dd° mm' ss.s" |
|---|---|---|---|---|
| 60G | 316670 x – ea. | Lat: -41.33630°N | 41° 20.178'S | 41° 20' 10.7"S |
| | 5421594 y – no. | Long: 174.80903°E | 174° 48.542'E | 174° 48' 32.5"E |

Position 'B' - Mean High Water (MHW)

| UTM | | dd.ddddd° | dd° mm.mmm' | dd° mm' ss.s" |
|---|---|---|---|---|
| 60G | 316652 x – ea. | Lat: -41.33673°N | 41° 20.204'S | 41° 20' 12.2"S |
| | 5421545 y – no. | Long: 174.80880°E | 174° 48.528'E | 174° 48' 31.7"E |

Position 'C' - Exposed inshore pipeline section shoreward end

| UTM | | dd.ddddd° | dd° mm.mmm' | dd° mm' ss.s" |
|---|---|---|---|---|
| 60G | 316630 x – ea. | Lat: -41.33707°N | 41° 20.224'S | 41° 20' 13.5"S |
| | 5421507 y – no. | Long: 174.80853°E | 174° 48.512'E | 174° 48' 30.7"E |

Position 'D' - Exposed inshore pipeline section seaward end

| UTM | | dd.ddddd° | dd° mm.mmm' | dd° mm' ss.s" |
|---|---|---|---|---|
| 60G | 316598 x – ea. | Lat: -41.33772°N | 41° 20.263'S | 41° 20' 15.8"S |
| | 5421434 y – no. | Long: 174.80812°E | 174° 48.487'E | 174° 48' 29.2"E |

Position ‘E’ - Shoreward end of pipeline diffuser section

| UTM | | dd.ddddd° | dd° mm.mmm’ | dd° mm’ ss.s” |
|---|---|---|---|---|
| 60G | 316100 x – ea. | Lat: -41.35121°N | 41° 21.073’S | 41° 21’ 44.0”S |
| | 5419923 y – no. | Long: 174.80172°E | 174° 48.103’E | 174° 48’ 06.2”E |

Position ‘F’ - Seaward end (southernmost) of pipeline diffuser section

| UTM | | dd.ddddd° | dd° mm.mmm’ | dd° mm’ ss.s” |
|---|---|---|---|---|
| 60G | 316070 x – ea. | Lat: -41.35198°N | 41° 21.119’S | 41° 21’ 07.1”S |
| | 5419836 y – no. | Long: 174.80133°E | 174° 48.080’E | 174° 48’ 04.8”E |

| Distance between points – (in metres) | | | | | | |
|---|---|---|---|---|---|---|
| **Reference** | **A** | **B** | **C** | **D** | **E** | **F** |
| **A** | 00.0 | 52.0 | 96.0 | 175.0 | 1765.0 | 1858.0 |
| **B** | 52.0 | 00.0 | 44.0 | 123.0 | 1713.0 | 1805.0 |
| **C** | 96.0 | 44.0 | 00.0 | 79.7 | 1670.0 | 1762.0 |
| **D** | 175.0 | 123.0 | 79.7 | 00.0 | 1591.0 | 1683.0 |
| **E** | 1765.0 | 1713.0 | 1670.0 | 1591.0 | 00.0 | 92.1 |
| **F** | 1858.0 | 1805.0 | 1762.0 | 1683.0 | 92.1 | 00.0 |
| | | | | | | |

Table 1: Distances between key positions

## Methodology / Procedure

Using both standard SCUBA and light-weight contaminated water equipment (Divator positive pressure masks), divers inspected pipeline components as per the programmed Scope of Work: firstly the outfall diffuser section from southernmost diffuser # 1 (position ‘F’) to diffuser # 18 (position ‘E’), followed by the buried pipeline route from diffuser # 18 (position ‘E’) on a heading of 18° East of True North back to position ‘D’, then finally the inshore exposed pipeline section 3.0 – 8.0 metre water depth (positions ‘C – D’).
Divers completed the tasks as detailed within the scope of work: carrying out specific investigations, while also observing for any evidence of abnormal or aggressive wear, defect, damage, or deterioration, then logging all details accordingly.
Refer to relevant section of Report for further details.

Specialised Non Destructive Testing (NDT) equipment was used in the Cathodic Potential testing of the diffuser section of the pipeline.

The specialised CP equipment used to extrapolate data was:

BUCKLEYS Bathycorrometer, Serial No. BUC587.
Certificate of Calibration: S.41610, Det Norske Veritas (D.N.V.)


Figure 2: Bathycorrometer (Cathodic Potential Meter) in operation

As standard with the use of this type of equipment; prior to taking Cathodic Potential readings a calibration check is carried-out using a Zinc (Zn) test block; against the CP meters Silver / Silver Chloride (Ag/AgCl) electrode; the returned reading of 1.05V is considered very good.

Notes:

For ease of interpretation, this Report addresses and documents the pipeline inspection components in individual sections as follows:

- Inshore Exposed Pipeline Section and Seabed.
- Buried Pipeline Outfall Route and Seabed.
- Offshore Diffuser Section – General Survey.
- Diffuser section Cathodic Potential Survey.

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LOWER HUTT 5040
NEW ZEALAND.


## DAILY RECORD OF INSPECTION OR NDT

DATES OF DIVES: 22nd February 2021
INSPECTION PERSONNEL: Scott McChesney, Kieran Nelson, Rian Kriel, Wayne Angus
CLIENT: Veolia Water Services NZ Ltd.
LOCATION: Moa Point WWTP, Lyall Bay, Wellington
INSPECTION COMPONENT: Wastewater Ocean Outfall Pipeline and Seabed – Annual Survey

**TYPE OF DIVE:**

| SCUBA | SURFACE SUPPLY | MIXED GAS | OTHER |
|---|---|---|---|
| X | | | Divator + pressure mask |

**DIVE DETAILS:**

| | DIVE 1 | DIVE 2 | DIVE 3 | DIVE 4 |
|---|---|---|---|---|
| MAXIMUM DEPTH OF DIVE | 24.0 metres | 24.0 metres | 23.0 metres | 8.0 metres |
| BOTTOM TIME (minutes) | 32 | 20 | 23 | 45 |

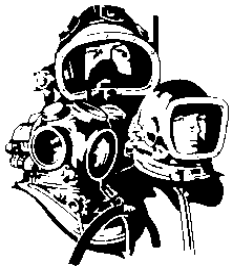
| METHOD | CHECK | PARTICULARS / EQUIPMENT |
|---|---|---|
| **CLEANING** | | |
| TECHNIQUES: | | |
| **SAMPLING** | | |
| TYPE: | | |
| **VISUAL INSPECTION** | | |
| GENERAL SURVEY: | X | Visual condition assessment of inspection components |
| STILL PHOTOGRAPHY: | X | Photograph items of interest |
| VIDEO SURVEY: | X | Take video footage of diffusers in operation & exposed inshore pipeline section |
| **NDT** | | |
| POTENTIAL MEASUREMENT: | X | Cathodic Potential readings |
| DIMENSIONAL SURVEY: | X | Obtain seabed scour measurements at set positions from adjacent exposed inshore pipeline section, & offshore diffusers |
| REMEDIAL GRINDING: | | |
| M.P.I.: | | |
| ULTRASONIC: | | |
| OTHER: | | |

**ANY OTHER REMARKS:** Refer to this Report for result details.

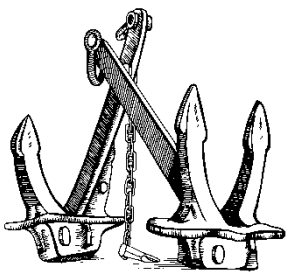
**APPROVED**

NAME OF SUPERVISOR: Wayne Angus
SIGNATURE: *W. T. Angus*
DATE: 22nd February 2021

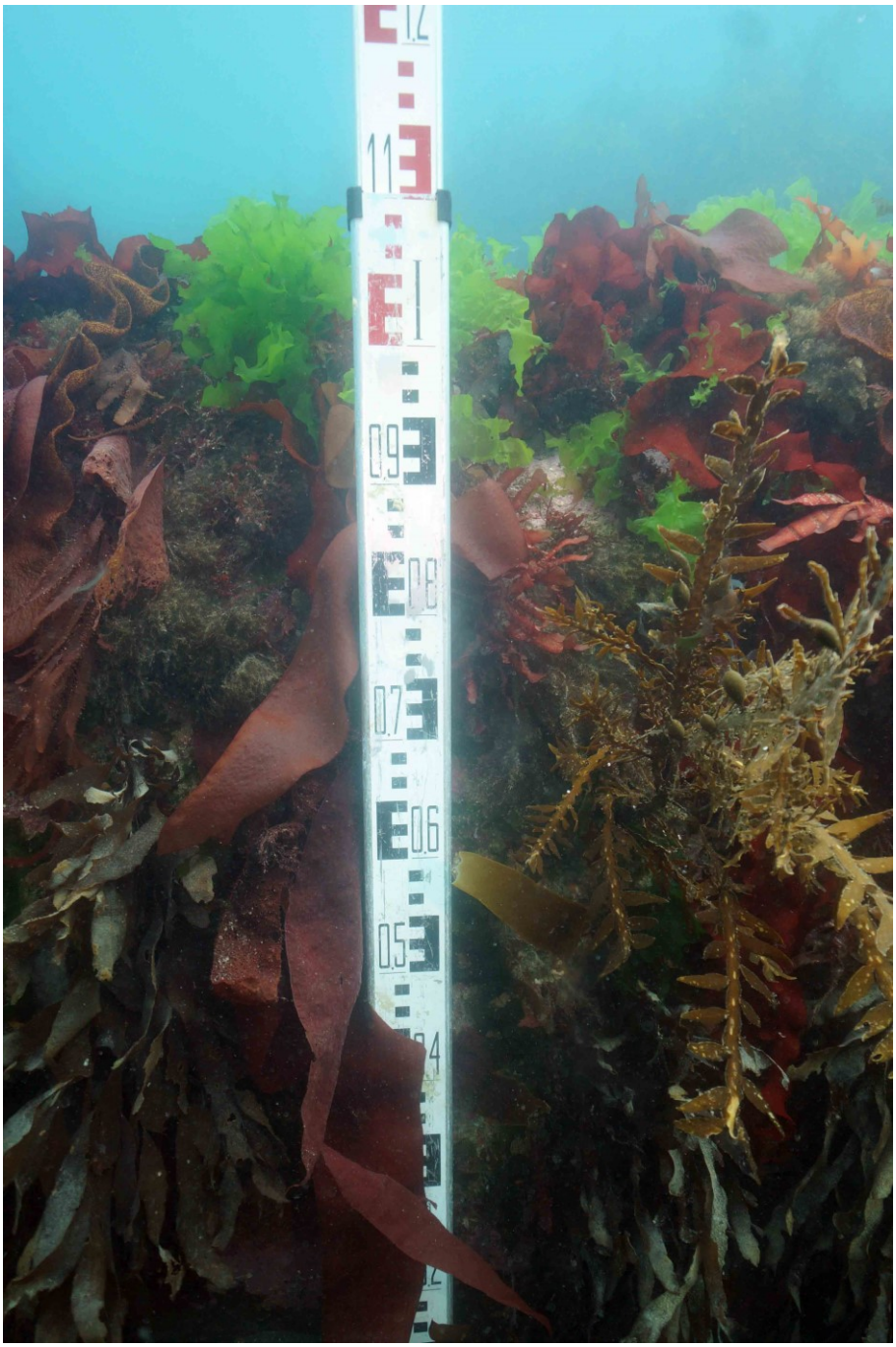
NAME OF CLIENT'S REP: Edward Yong
SIGNATURE:
DATE:



*"To solve it easily, detect it early"*



# Inshore Exposed Pipeline Section and Seabed



The inshore exposed pipeline section (position 'C') commences 44.0 metres below the MHWL at a depth of 3.0M, and extends approximately 80.0 metres to a depth of 7.0M.

Over the past year (between 2020 to 2021 Inspections) sea conditions have tended to remain relatively moderate; with less frequency of strong Southerly wind and severe sea wave and swell conditions. These moderate type conditions resulting in a lesser volume of sand and fine gravel deposits been eroded from adjacent the pipeline, and an increased establishment of marine growth in the shallows.
Visual observations indicate an increase in bed (sand and fine gravel) deposit levels occurring around the exposed pipeline between the inspections period June 2020 to February 2021.

Due to the nature of this coastline; its exposure to severe southerly storms, its wave action and strong currents causing continual aggregate migration, and the shallow depth of burial of the inshore pipeline section; scour adjacent to the pipe will always remain a factor requiring monitoring.

In 2017 with the intention of gaining greater accuracy in the collection and reporting of scour data; UCL drove reference markers into the seabed at 10 metre intervals adjacent the 80 metre length of exposed pipeline section. These markers serve as fixed reference positions for the repetitive logging and comparison of annual data.

Although the exposed length of pipeline has increased slightly since commissioning; exposure progression has remained relatively slow; with exposure length remaining the same over the 2019 to 2021 inspection periods. Over this same period scour adjacent the pipeline has reduced at several designated monitoring positions, largely due to an increase in sand deposits within the shallows.

**Exposed Pipeline Section**
**Scour Depth Data**

| Test point meterage | Year | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | 2019 | | 2020 | | 2021 | | 2022 | | |
| | West (mm) | East (mm) | West (mm) | East (mm) | West (mm) | East (mm) | West (mm) | East (mm) | Seafloor composition |
| Position 'C' 00.0 metres | 200 | 150 | 100 | 100 | 70 | 100 | | | Formed rock reef with loose packed rock and gravels – in close proximity with pipeline |
| 10.0 metres | 200 | 200 | 150 | 200 | 150 | 200 | | | As above |
| 20.0 metres | 350 | 400 | 250 | 300 | 350 | 400 | | | As above |
| 30.0 metres | 500 | 500 | 350 | 400 | 450 | 450 | | | As above |
| 40.0 metres | 700 | 650 | 600 | 650 | 600 | 650 | | | As above |
| 50.0 metres | 1000 | 1000 | 700 | 750 | 850 | 850 | | | As above |
| 60.0 metres | 760 | 1100 | 600 | 600 | 850 | 900 | | | Formed rock reef with gravel and sand deposits – rock reef structuring standing off 1 – 2 metres from pipeline |
| 70.0 metres | 500 | 750 | 400 | 450 | 400 | 450 | | | As above |
| Position 'D' 80.0 metres | 200 | 430 | 150 | 150 | 150 | 200 | | | Sand and cobbles |
| | | | | | | | | | |

Table 2: Scour measure record

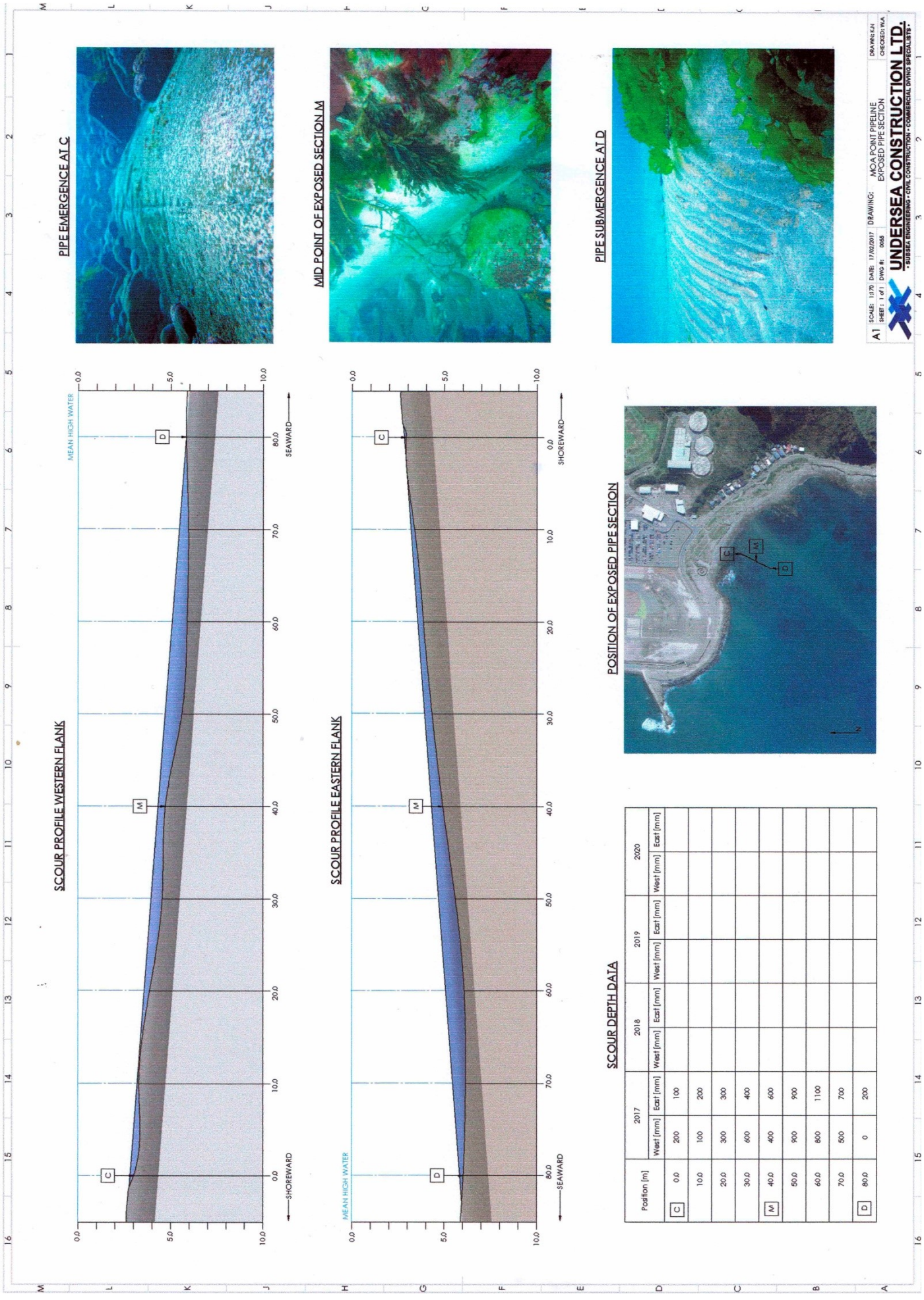



Figure 3: Inshore profile

Notes:
The updated detail for the drawing on Page 16 (Figure 3) can be viewed in A1 size CAD format, as provided on the attached drawing.

Video footage of the Inshore Exposed Pipeline Section can be viewed in file: Inshore – seaward end of exposed pipeline section – 2021.

Figure 4: 00.0 metres

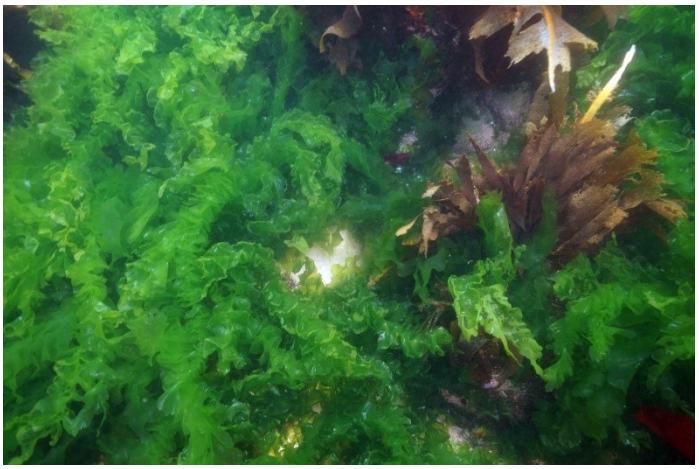


Figure 5: 10.0 metres

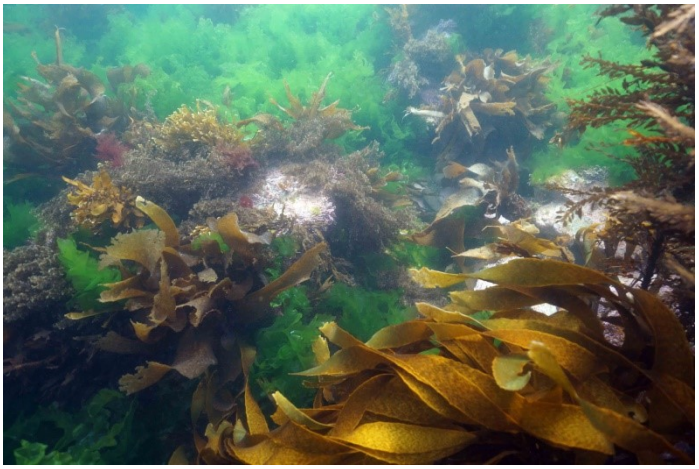


Figure 6: 20.0 metres

Figure 7: 30.0 metres

Figure 8: 40.0 metres

Figure 9: 50.0 metres

Figure 10: 60.0 metres

Figure 11: 70.0 metres

Figure 12: 80.0 metres

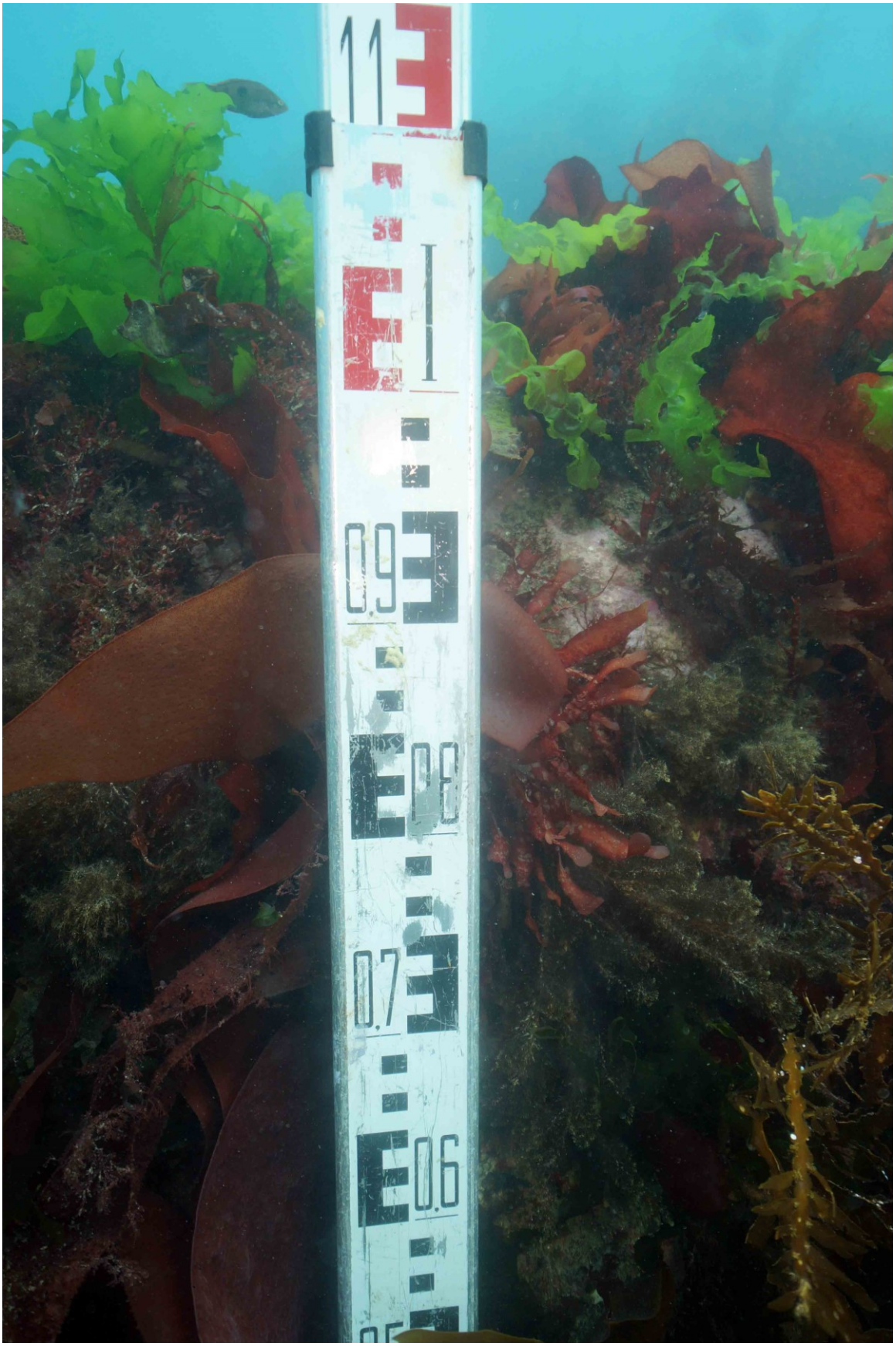
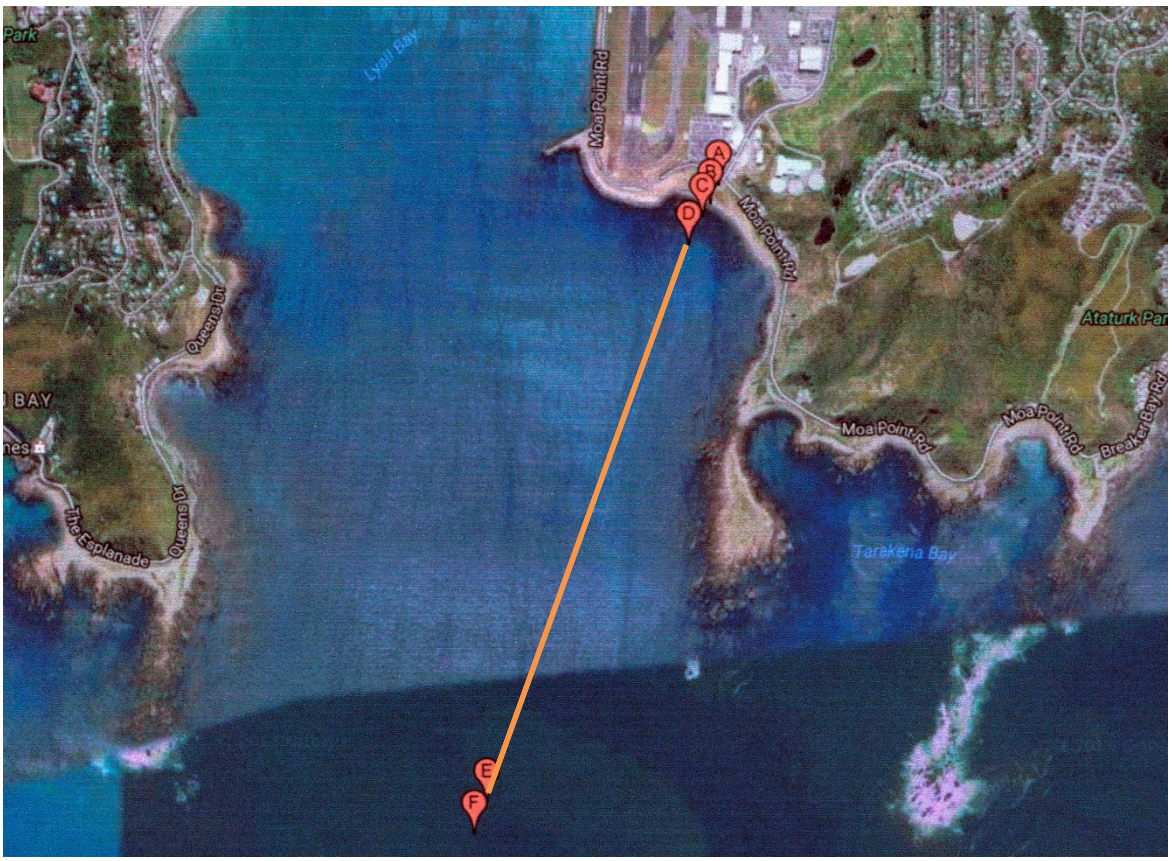



Figure 13: Maximum scour depth was measured between check positions 50.0 – 60.0 metres: **980mm**

Note:
Video footage of the maximum scour depth can be viewed in file: Inshore – Maximum scour depth position – 2021.

# Buried Pipeline Outfall Route and Seabed



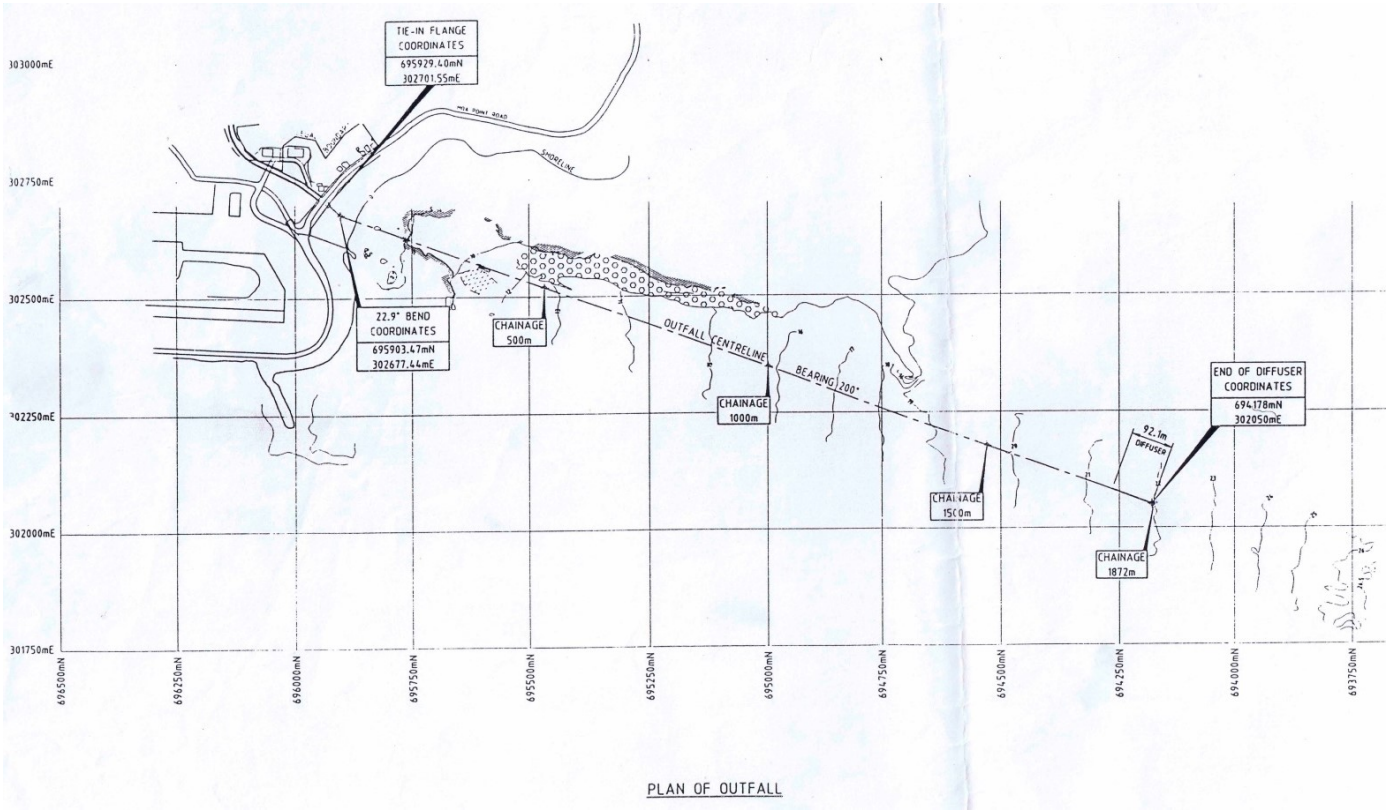



Figure 14: Pipeline route

Prior to underwater inspection of the buried pipeline outfall route and seabed UCL personnel dropped anchored marker buoys at positions ‘D & E’, and placed a survey tripod with prism set at position ‘B’ as a backsight alignment. From the vessel used for the pipeline inspection, a diver with manta-board tethered to the vessel was dropped in the water at position ‘E’ where he descended to the seabed and readied for the tow along the pipeline route. The vessel proceeded slowly on a heading of 18° East of True North towing the diver who also had his underwater computer compass aligned on the same heading.

Travelling just above the seabed along the pipeline route, the diver kept observation for any exposed pipeline sections, or evidence of fouling. The tow commencing at position ‘E’ (Diffuser # 18) and ceased approximately 50 metres from the shoreline at position ‘D’.

Visibility was fair; ranging from 2.0 to 3.0 metres.

The diver experienced no observations of exposed pipe, nor any evidence of fouling by foreign objects.

The offshore seabed, consisting of rocks, and coarse gravels and sand forms a profile of undulating peaks and depressions of +/- 400mm.

The inner route seabed, consisting of coarse sand and gravels forms a profile of undulating peaks and depressions of +/- 300mm.

Seafloor deposits of gravel and sand in the form of undulating, peaks and depressions are typical and commonplace in this type of coastal environment.

The result of the underwater tow inspection being; no areas for concern observed.

Figure 15: Typical seabed composition – offshore route – Position E

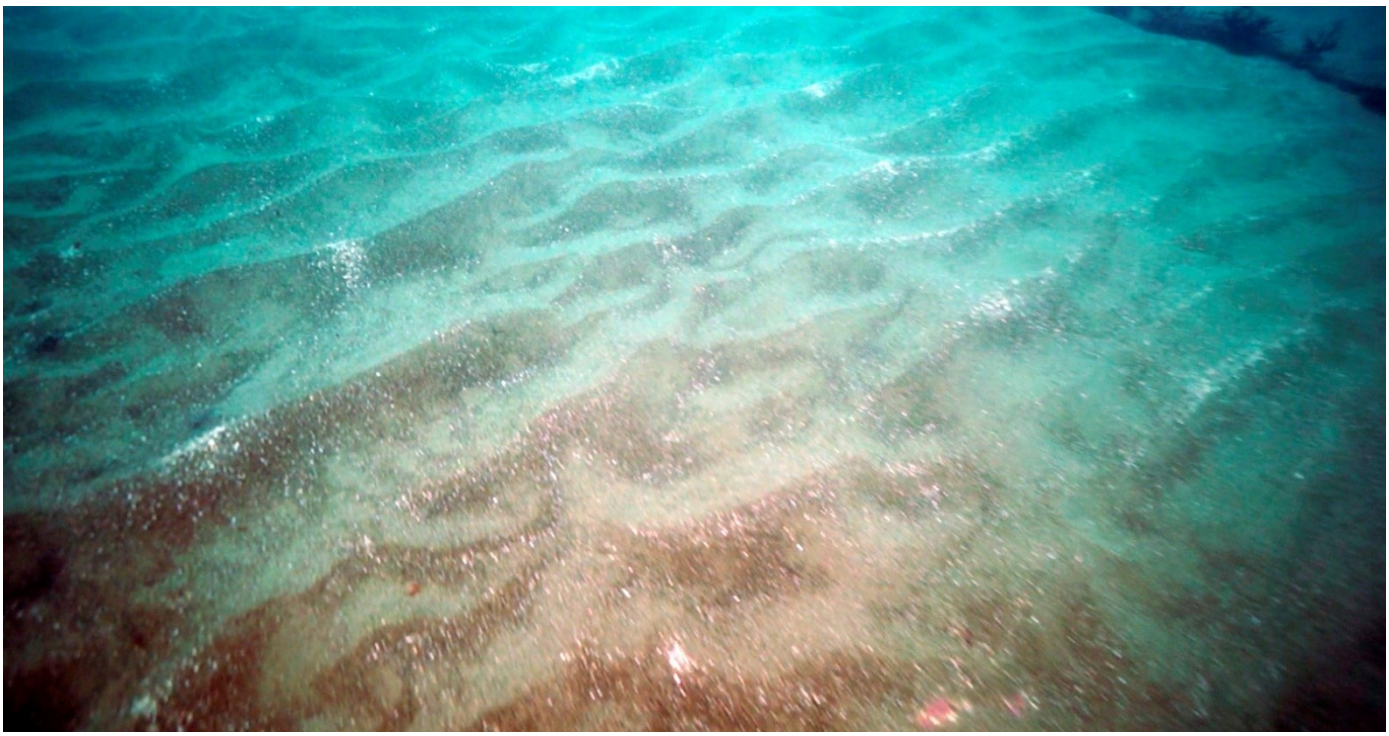
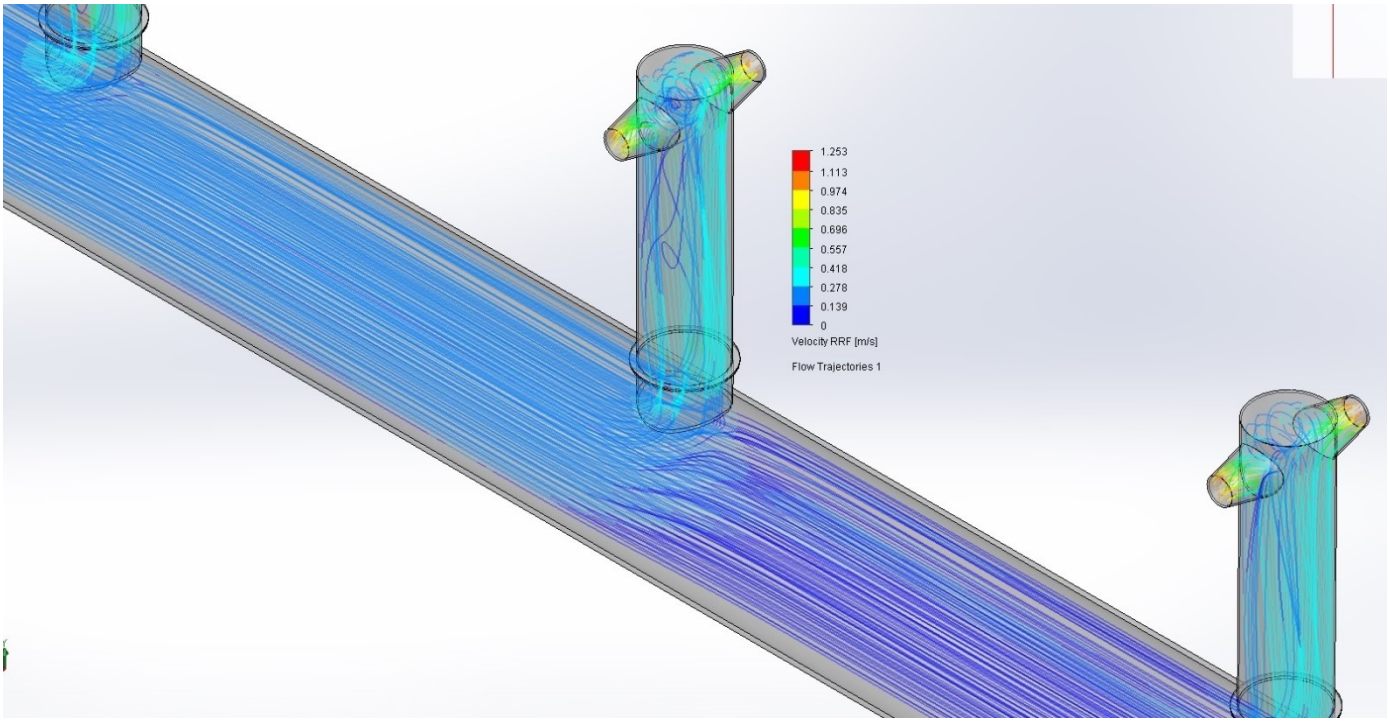


Figure 16: Typical seabed composition – offshore route – Position D

# Offshore Diffuser Section – General Survey



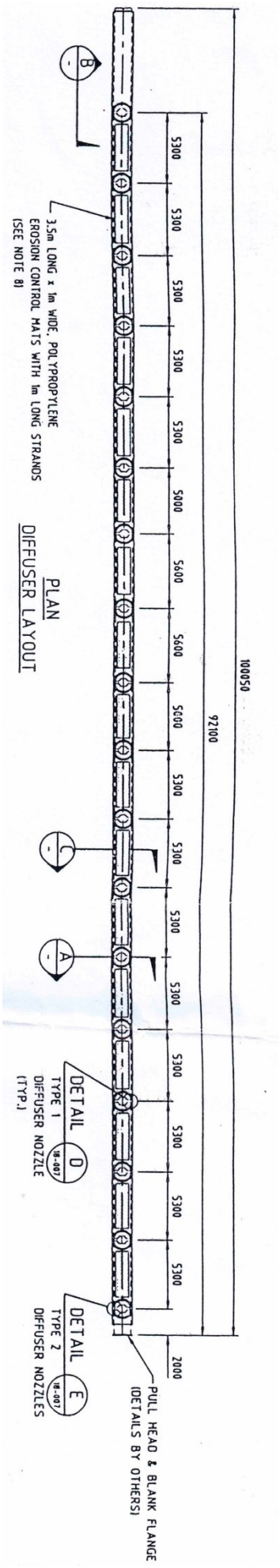
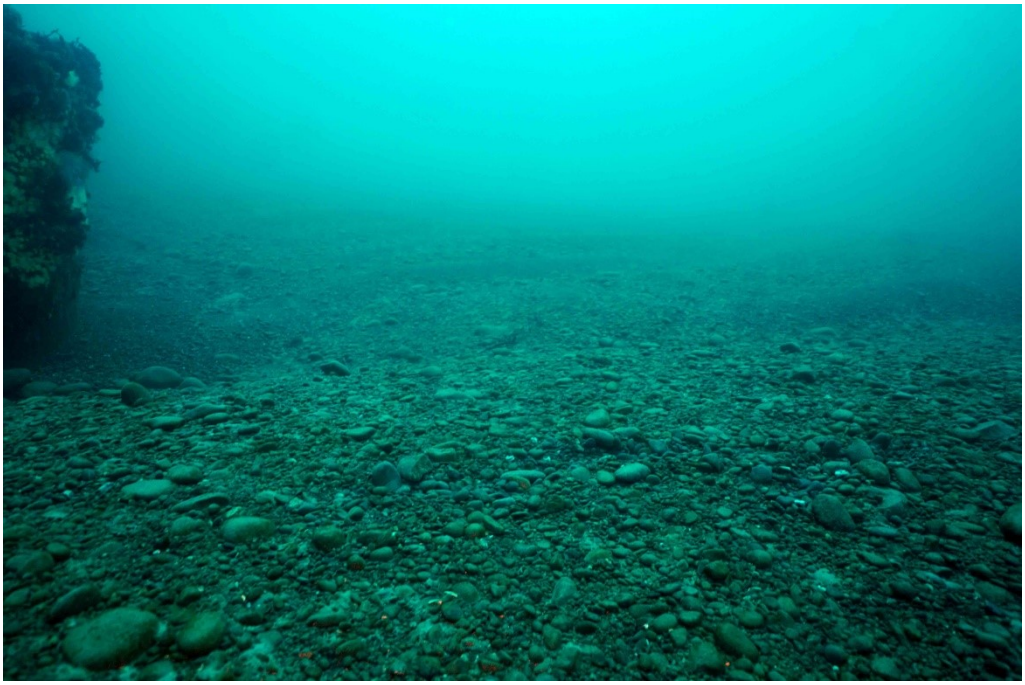



Figure 17: Diffuser layout

Divers inspected the general condition of diffusers, measuring scour depths around riser pipes, and checking for any evidence of fouling, damage, defect, or deterioration.

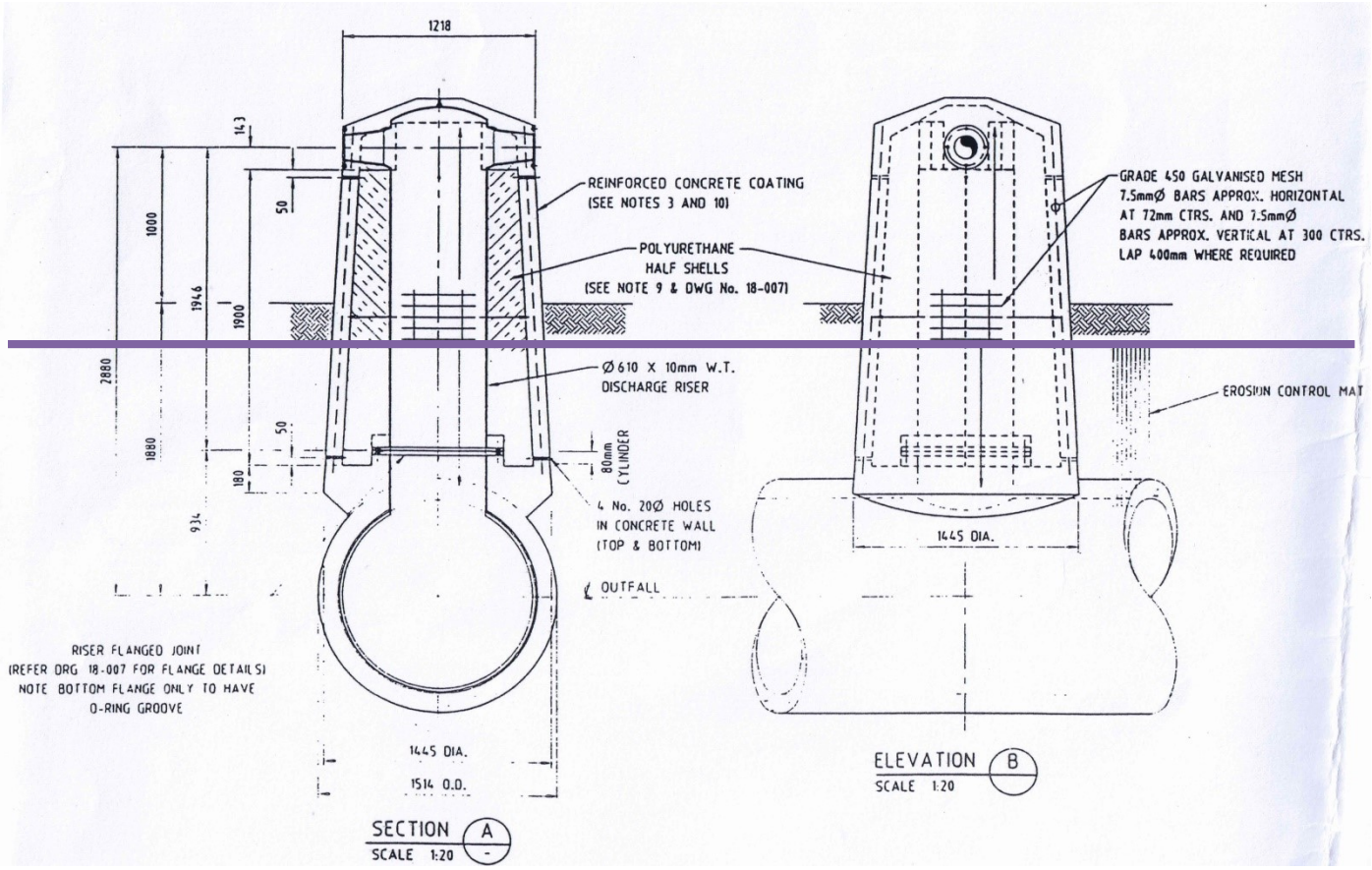
The inspection commenced at the seaward most diffuser, this being diffuser # 1 (position 'F'), and finished at the shoreward diffuser, this being diffuser # 18 (position 'E').

Visual observations were completed around the diffusers that exhibited the greatest scour depths to ensure that none of the bed stabilisation mats were exposed. There were no sightings made, nor any exposed material observed from the erosion control mats.
With reference to the construction drawings it should be noted that at the current recorded scour depths some of the bed erosion stabilisation matting should be exposed; however none was observed.



Figures 18 & 19: At diffusers where greatest scour depths were measured, examination was completed for any evidence of exposed erosion control mats; however no sighting of any such material was made

All 18 diffusers had their exposed heights measured from seabed. All heights ranged between 1.350 to 1.650 metres.




Maximum current scour depth / seafloor level

Figure 20: Diffuser detail

No evidence was observed of any damage or deterioration to any of the 18 diffuser assemblies. Seafloor deposits of rocks, course gravels and sand form undulating, peaks and depressions typically of +/- 400mm in west – east (shoreline) orientation around the diffuser positions.

Figure 21: Typical scale of aggregate sizing observed around the Diffuser positions

| Diffuser from seaward to shoreward | Diffuser Exposed Height out of Seabed | | Open Ports | |
|---|---|---|---|---|
| | North face | South face | West | East |
| 1 | 1.400 metre | 1.500 metre | X | X |
| 2 | 1.400 metre | 1.500 metre | X | X |
| 3 | 1.400 metre | 1.500 metre | X | X |
| 4 | 1.400 metre | 1.500 metre | X | X |
| 5 | 1.500 metre | 1.500 metre | X | X |
| 6 | 1.500 metre | 1.500 metre | X | X |
| 7 | 1.500 metre | 1.550 metre | X | X |
| 8 | 1.600 metre | 1.600 metre | X | X |
| 9 | 1.600 metre | 1.600 metre | | X |
| 10 | 1.600 metre | 1.600 metre | X | |
| 11 | 1.600 metre | 1.600 metre | | X |
| 12 | 1.600 metre | 1.600 metre | X | |
| 13 | 1.600 metre | 1.650 metre | | X |
| 14 | 1.600 metre | 1.550 metre | X | |
| 15 | 1.500 metre | 1.450 metre | | X |
| 16 | 1.400 metre | 1.450 metre | X | |
| 17 | 1.400 metre | 1.400 metre | | X |
| 18 | 1.400 metre | 1.350 metre | X | |

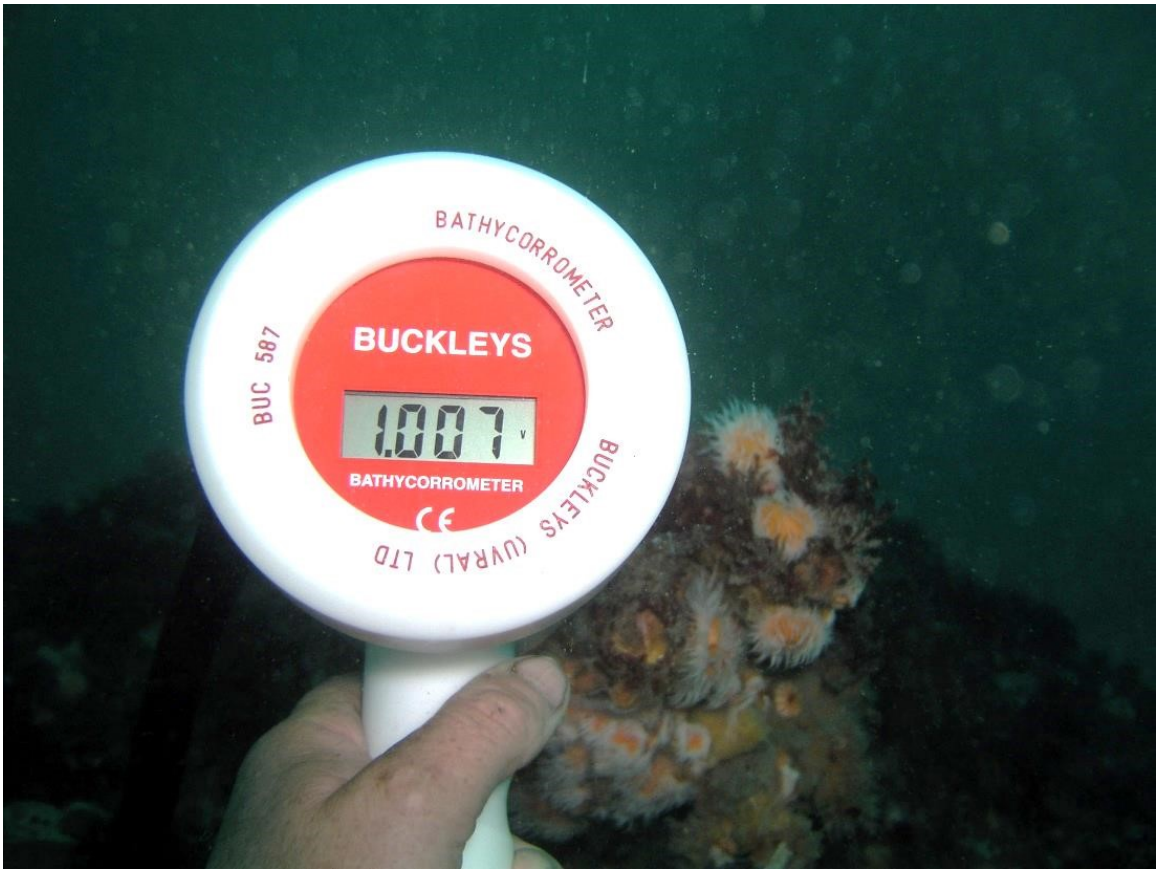
Table 3: Exposed heights of diffusers (seabed scour around diffuser positions)
X Open diffuser ports

Figure 22: Typical flow discharge flume from a diffuser nozzle

Note:
Video footage of Diffusers in Operation and localised seabed can be viewed in files:

- Diffuser 12 in operation
- Diffuser 13 in operation
- Diffuser 14 in operation
- Diffuser 15 in operation

# Diffuser Section Cathodic Potential Survey



To protect a steel structure or installation in seawater, a more active metal than the steel is selected from the galvanic series and placed in contact with the steel below water level.
Current flows as a result of the electrochemical difference, from the active metal, through the seawater, to the steel. Thus the active metal becomes anodic and corrodes, whilst the steel becomes cathodic and is protected; so that in fact the active metal corrodes in order to protect the steel.

The Cathodic Protection System on the Moa Point Wastewater Ocean Outfall Pipeline consists of 26 Zinc Alloy Sacrificial Anodes on the outfall pipeline, and 18 Zinc Alloy Sacrificial Anodes installed on the diffuser risers. The system has a minimum design life of 30 years.

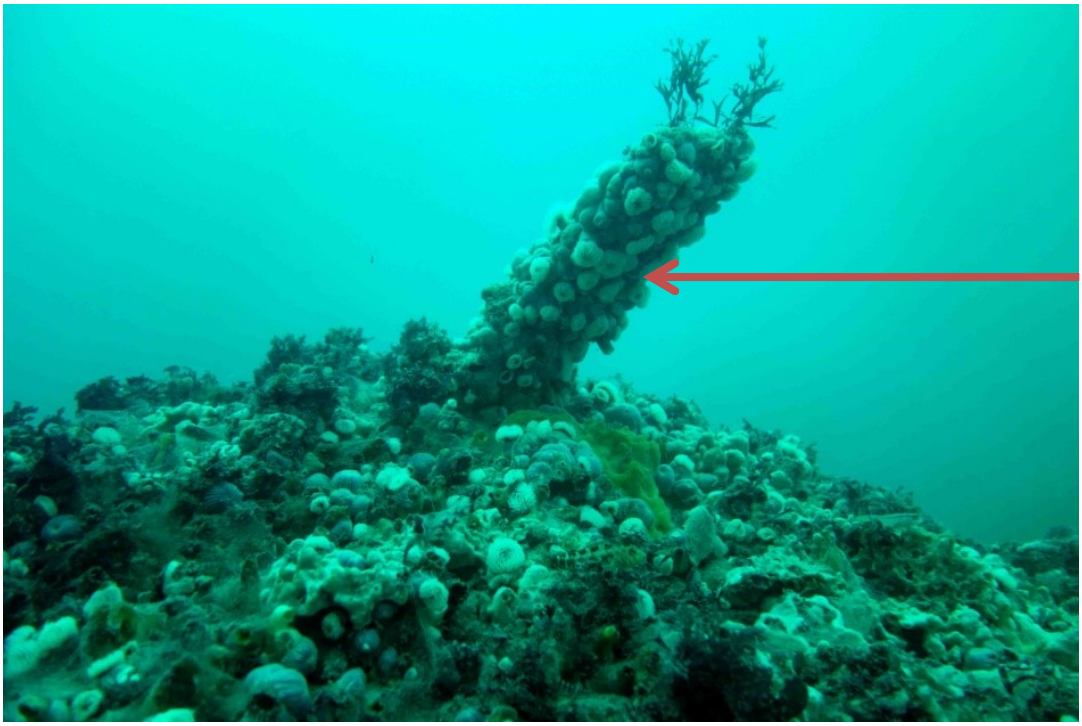


Figure 23:
Diffuser # 1 (seaward southern- most diffuser) – CP test point.
Readings at this position provide evidence of electrical continuity through the diffuser section

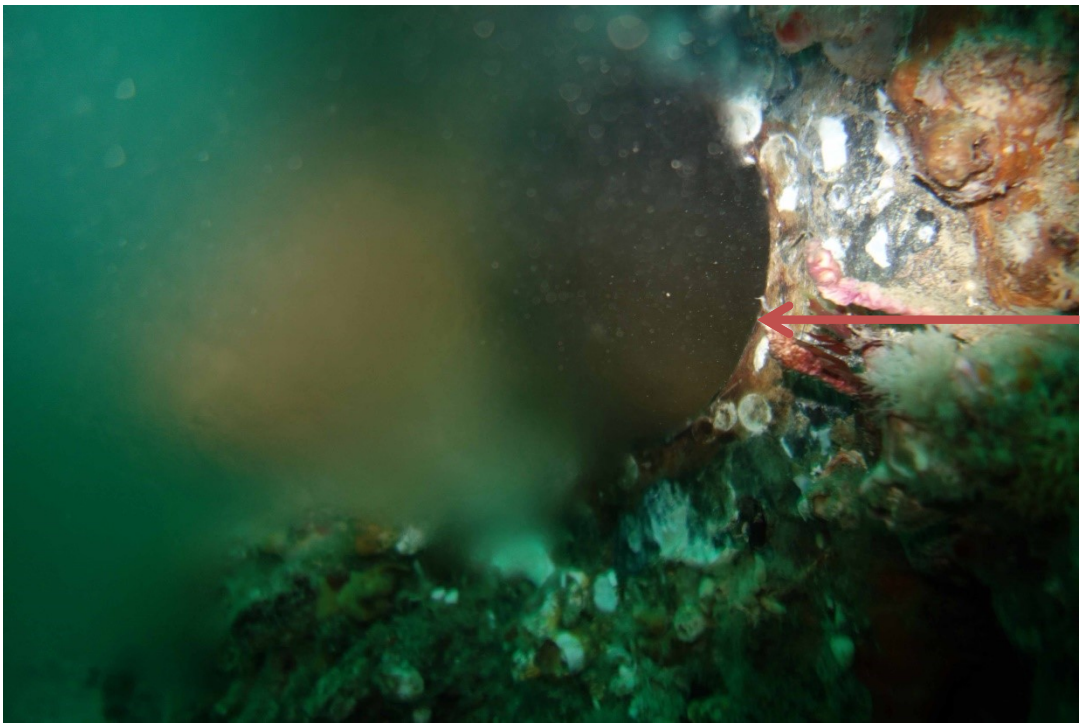


Figure 24:
The steel diffuser nozzle outer flange is where the diver makes contact with the Bathycorrometer to obtain the Cathodic Potential values

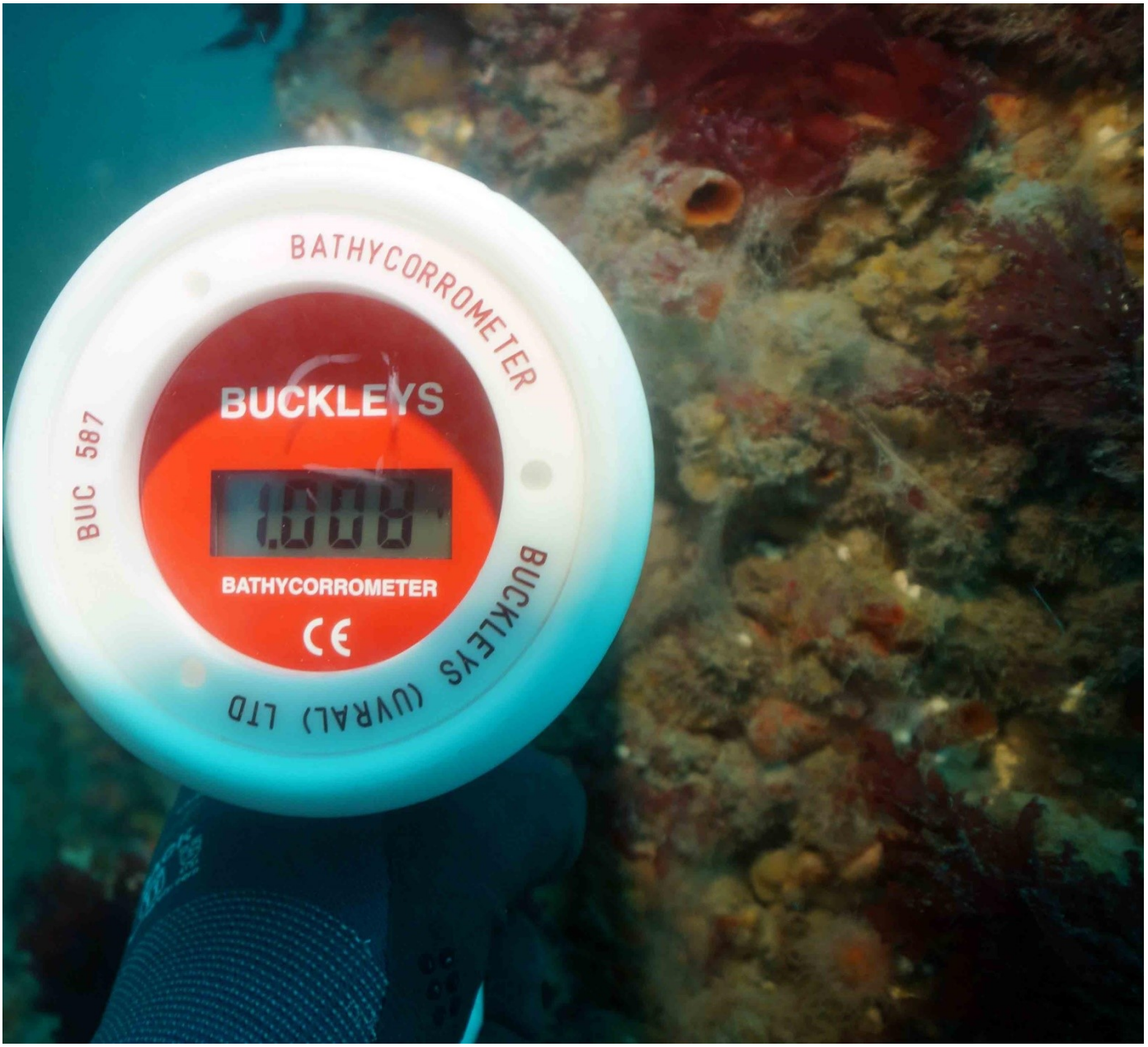



Figure 25: Taking CP reading at Diffuser # 14

Cathodic potential (CP) measurements are taken to monitor the effectiveness (need for anode replacement) of the cathodic protection system.
The main objective of corrosion prevention in structures is to provide enough anodes to keep the potential, or voltage, levels to less than – 800mV.
The function of a cathodic protection system is to provide enough potential to maintain an optimum level of protection through the entire structure.
It is emphasised that this level must be maintained at between –800mV to 1.050V.

It's the Test Point at the top of Diffuser # 1 (position 'F') that provides the most accurate Cathodic Potential readings. Although representative readings are obtained at several diffuser outlet nozzles across the diffuser section; variations in water salinity at nozzle flange locations, and / or significant changes in water temperature can subsequently cause Potential differences.

| Cathodic Potential (CP) Readings | | |
|---|---|---|
| Zinc Calibration Test Block Reading | | 1.050V |
| | | |
| C.P. test point | Diffuser # 1 | 1.007V |
| Discharge flange | Diffuser # 4 (east) | 1.005V |
| Discharge flange | Diffuser # 8 (west) | 1.007V |
| Discharge flange | Diffuser # 12 (west) | 1.007V |
| Discharge flange | Diffuser # 13 (east) | 1.010V |
| Discharge flange | Diffuser # 14 (west) | 1.008V |
| Discharge flange | Diffuser # 15 (east) | 1.008V |
| | | |

Table 4: Cathodic Potential readings

All logged cathodic potential readings confirm that the sacrificial anode system in place is providing effective corrosion protection throughout the diffuser section of the pipeline structure.

# Summary

In completing the tasks as detailed within the scope of work UCL personnel didn't observe any evidence of abnormal or aggressive wear, defect, damage, deterioration, or loss of function.

# Appendix iii: Smoke Test Report

Veolia Water Australia and New Zealand

United Water International (Wellington) Ltd – T/A Veolia Water

Moa Point

PO Box 3253

Wellington

NEW ZEALAND

# Clearwater Wellington

# Wellington City Council

## Moa Point WWTP

Smoke test 3 November 2020

VEOLIA WATER

# Control Sheet

**DOCUMENT TITLE**:Moa Point Wastewater Plant Annual Smoke Test–November 2020

**PREPARED BY:** Tichafara Mundwa

**REVIEWED BY:** Phil Love

**AUTHORISED BY:**

**DOCUMENT CONTROL REGISTER**

| **Version** | **Status** | **Date** | **Details of Revision** |
|---|---|---|---|
| V1 | Final / | 11/2020 | November 2020 |

## Purpose

The purpose of this report is so we comply with resource consent WGN080003 [26183] condition 10 (Monitoring).

*The permit holder shall undertake smoke testing of the Moa Point wastewater treatment plant and ventilation system. The smoke tests are to be carried out on an annual basis between the months of August and November.*

*The results of the smoke test shall be submitted to the manager, environmental regulation, Wellington Regional Council within one month of the testing being carried out by the permit holder. A copy of the analysed results shall be provided to Community Liaison Group, if requested.*

## Summary

On the 3rd of November the Inlet Pump Station (IPS) and Moa Point Wastewater Treatment Plant (Moa Point WWTP) smoke tests were performed.

Smoke was generated and discharged into the IPS inlet sampler chamber, the Primary Tank area and Moving Bed Bio Reactors. The hatches and seal were visually checked and photographs were taken. There were no issues with the process or outcome.

*Smoke Generator*

## Inlet pump station (IPS)

## Scope 16

Establishing that odour causing compounds liberated from the inlet sewer to the pump station wet wells, are contained within the ventilation system and are not escaping directly to the atmosphere.

## Background information

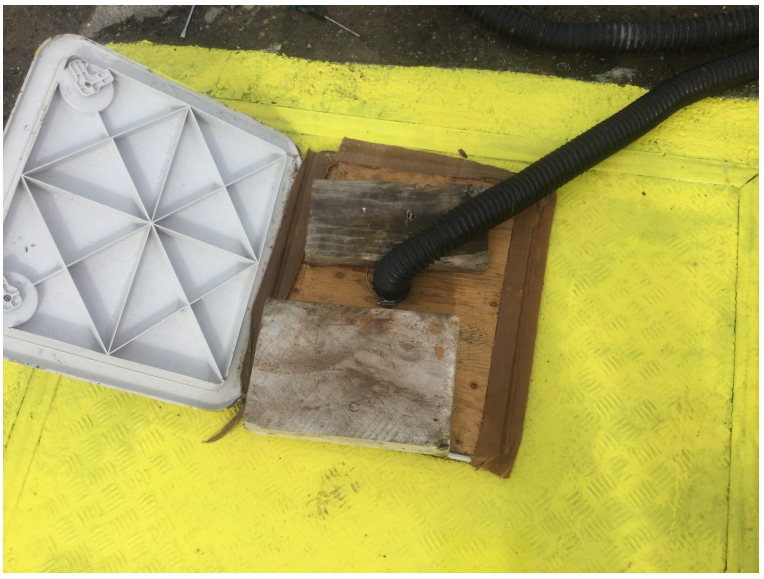
The inlet pumps station processes odorous air through a three stage wet chemical scrubber before discharging to the atmosphere.

In 2003 it was suggested that any possible source of odours emanating from the inlet sewer and the wet well of the pumping station could not be positively identified, and that a process to determine performance and eliminate leakage be carried out. Smoke testing was introduced to verify that negative pressure is maintained, throughout the IPS odour control system.

## Smoke test setup

Location - Inlet Pumps Station (IPS).
Weather conditions – Dry but Cloudy with a light Northerly wind.
Date of test – 3 November 2020
Plant operation – all IPS pumps in normal operational condition, and the odour ventilation system

operating in normal mode.

*Smoke generator discharging into the inlet sampling chamber*

*Smoke inside inlet well chamber*

## Performance

The airtight cover over the main inlet channel into the IPS has an opening hatch which used to be the sample point.

This hatch was fully opened and a temporary timber cover was sealed into place to allow for the smoke generator to inject smoke into the inlet system.

Smoke was discharged into the IPS inlet chamber, and after approximately 30 minutes visible smoke was noted coming out of the IPS stack and being carried south by the Northerly wind. The smoke machine was left operating for another 30 minutes after this to ensure complete saturation of the wet well chamber and ventilation system. During this time constant monitoring took place, there was no visual indication of smoke escaping from around the hatch covers, hinged hatches and the wet and dry wells coverings, additionally any weathered sealing tape was replaced.

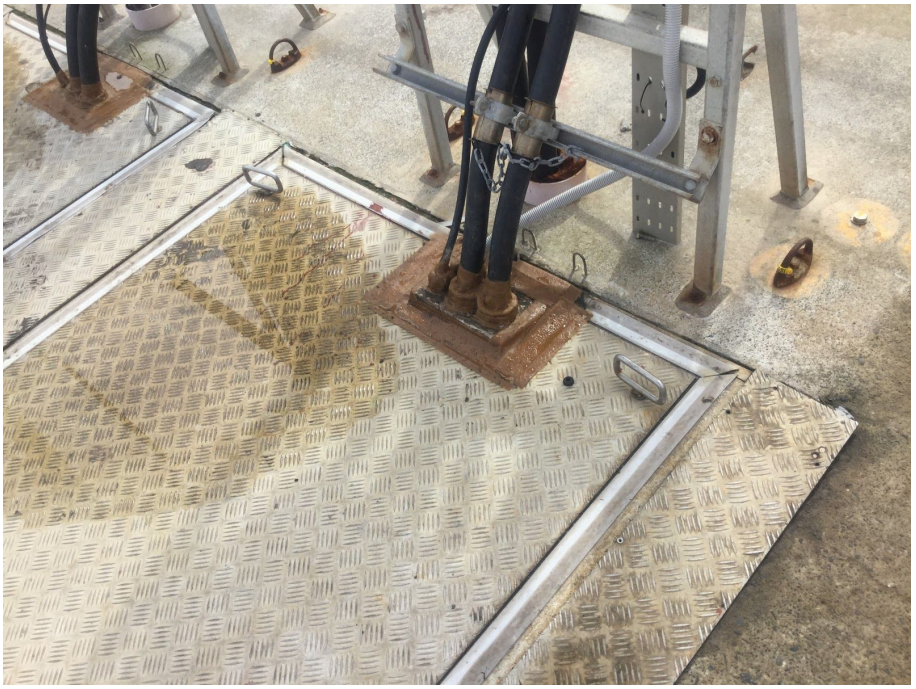
With no indication of smoke escaping, the smoke testing of the IPS site was brought to a

close. The following photographs show the test undertaken:

*Smoke discharging from the IPS stack*

*Typical seal around level sensor access hatch*

*IPS Pump Hatches*



*Seal around IPS Pump Cables*

*IPS Dry Well*

*Smoke escaping from the inspection hatch once the temporary cover is removed.*

## Moa Point Primary tanks

Smoke testing of the primary tank roof integrity and the ventilation system was conducted on the 4 November 2020.

*Smoke machine starting to saturate the Primary Tank area*


*Smoke starting to build up under Primary Tank Roof*

The smoke generator was set up inside the Primary tank room, and as in previous years, relocated from time to time to ensure an even distribution of smoke throughout the room.

The actions of the foul air extraction system meant that the generator was mainly located towards the western end of the room, as the drift of the smoke towards the extract grills at the eastern wall evened out the density of the cloud.
The smoke generator was run until sufficient smoke had accumulated to form a smoke cloud on the underside of the roof rafters. Then an external inspection of the roof was carried out and with no smoke leakage observed, no further action was taken.

The following photographs show the test undertaken:

*Smoke being drawn into the extract grills*

*View from the step screen area*

*Primary Tank Roof looking North*

*Primary Tank Roof looking west*

*The other door into the Primary tank*

*View of the primary tank area after 30minutes we turned off the machine*

## Moving Bed Bio Reactors (MBBR's) Tanks

Following the primary tank smoke test, the smoke generator was piped into the primary tank effluent sample point flooding the common feed channel and the downstream MBBR tanks with smoke.

Full smoke saturation was achieved with evidence noted through examination of the access hatch. Following full smoke saturation of the tank system an inspection of all the sealing joints on the MBBR

covers was conducted with no indication of smoke escaping, no remedial action was necessary, therefore the smoke test was brought to a finish.

During the testing of the Primary tanks and the MBBR tanks no smoke was observed exiting from the Moa scrubber stack.

The following photographs show the test undertaken:

*Sample hatch in MBBR common channel*

*Smoke saturation in MBBR Tank*

*Seal between MBBR Covers*

*MBBR Covers*

*Moa Scrubber stack*

# Appendix iv: Moa Point WWTP Complaints

| Date | Investigation |
|---|---|
| 13 / 03 /2021 | The Moa Point WWTP received an odour complaint on 13th March 2021 at 20:31 that has been categorized incorrectly. This odour complaint should be directed to the landfill. Details of the complaint: Caller advised that they live on Ashton Fitchett Drive, outside our house and up and down the street on the south side of the street there is a strong rubbish dump smell.<br>The breeze is coming from the south, directly from the rubbish dump.<br>They walked from Ashton Fitchett Drive to the windmill and beyond on the way to the radar dome. The smell stopped being detectable once we passed the windmill. When they returned they could start smelling the strong rubbish dump smell all the way back to the south side of Ashton Fitchett Drive. They would conclude from these observations that the sewage is not being covered at the rubbish dump again. |
| 8/03/2021 | The Moa Point WWTP received an odour complaint on 8th March 2021 at 9:03 that we believe has been miscategorized. This odour complaint should be directed to the landfill. Details of the complaint: Caller advised there is a very strong smell coming from the landfill area (described as smelling like a portaloo on a hot day); it's giving him a headache and making his eyes water, and he can almost taste it. He lives at 541 Southernthread Road, but said it could be smelled as far away as Ashton Fitchett Drive and the Wind Turbine |

# Appendix v: Discharge Event Letters

27/11/2020

Manager, Consents Management
c/o Joshua Knowles
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Joshua,

**Overflow Discharge from the Moa Point Treatment Plant**

Condition 8 of Resource Consent WGN080003 [35407] states that notification is required to update Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the recent consented overflow discharge from the Moa Point Treatment Plant. The discharge was due to the heavy rainfall.

The following is a summary of the parameters monitored during the overflow discharge:

| Parameter | Units | Result |
|---|---|---|
| Start | - | 8/11/2020 9:32 |
| End | - | 8/11/2020 14:12 |
| Duration | - | 4:40:00 |
| Mean Bypass Flow | litres per second | 237 |
| Maximum Bypass Flow | litres per second | 846 |
| Treated Volume | cubic metres | 46327 |
| Partially Treated Volume | cubic metres | 2928 |
| Dilution Ratio | - | 16:1 |

**Table 1: Discharge Monitoring Parameters**

Condition 10 of Resource Consent WGN080003 [35674] requires grabs samples one, two, and three days after the discharge from three (3) coastal water locations and analysed for faecal coliforms and enterococci.

The following are the analytical results from the sample:

**Veolia Water Ltd.**
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

| Site | Faecal Coliforms | Enterococci |
|---|---|---|
| **Day 1 – 08/11/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 9.1 | 20 |
| Dorrie Leslie Park at Boat Ramp | 110 | 33 |
| Dorrie Leslie Park South Side | 200 | 62 |
| Dorrie Leslie Park West Side | 80 | 29 |
| Hougton Bay Westside | 620 | 24 |
| Hue te Taka Peninsula | 220 | 34 |
| Hue te Taka Peninsula West | 5.5 | 44 |
| Island Bay Marine Centre Eastside | 420 | 46 |
| Island Bay Westside | 180 | 27 |
| Lyall Bay Beach Eastern Side | 130 | 29 |
| Peninsula at Queens Drive | 3.6 | 36 |
| Tarakena Bay Beach at Boat Ramp | 50 | 36 |
| Tarakena Bay Western Side | 48 | 48 |

**Table 2: Coastal Samples (Day 1)**

| Site | Faecal Coliforms | Enterococci |
|---|---|---|
| **Day 2 – 09/11/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 44 | 24 |
| Dorrie Leslie Park at Boat Ramp | 66 | 88 |
| Dorrie Leslie Park South Side | 38 | 110 |
| Dorrie Leslie Park West Side | 3.6 | 110 |
| Hougton Bay Westside | 9.1 | 460 |
| Hue te Taka Peninsula | 29 | 120 |
| Hue te Taka Peninsula West | 5.5 | 16 |
| Island Bay Marine Centre Eastside | 5.5 | 420 |
| Island Bay Westside | 7.3 | 160 |
| Lyall Bay Beach Eastern Side | 16 | 120 |
| Peninsula at Queens Drive | 72 | 15 |
| Tarakena Bay Beach at Boat Ramp | 22 | 74 |
| Tarakena Bay Western Side | 24 | 72 |

**Table 3: Coastal Samples (Day 2)**

| Site | Faecal Coliforms | Enterococci |
|---|---|---|
| **Day 3 – 10/11/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 48 | 64 |
| Dorrie Leslie Park at Boat Ramp | 42 | 110 |
| Dorrie Leslie Park South Side | 120 | 58 |
| Dorrie Leslie Park West Side | 48 | 5.5 |
| Hougton Bay Westside | 44 | 11 |
| Hue te Taka Peninsula | 42 | 60 |
| Hue te Taka Peninsula West | 25 | 27 |
| Island Bay Marine Centre Eastside | 70 | 13 |
| Island Bay Westside | 96 | 7.3 |
| Lyall Bay Beach Eastern Side | 20 | 20 |
| Peninsula at Queens Drive | 42 | 190 |
| Tarakena Bay Beach at Boat Ramp | 58 | 25 |
| Tarakena Bay Western Side | 74 | 16 |

**Table 4: Coastal Samples (Day 3)**

Condition 15 of Resource Consent WGN080003 [26181] requires samples of paua and/or kina at Hue Te Take Peninsula during and or immediately after the bypass discharge, these samples were not taken due to health and safety concerns.

Condition 16 requires extra samples be taken from the bypass discharge and the secondary treated wastewater during the first two (2) hours of a bypass event occurring during normal working hours or as soon as practicable.

The following table outlines the results:

| Analytical Parameter | Units | Bypass Discharge | Effluent Discharge | Cmixed |
|---|---|---|---|---|
| Ammonia Nitrogen | $g/m^3$ | 9.4 | 6.6 | 7 |
| $CBOD_5$ | $g/m^3$ | 100 | 140 | 138 |
| Faecal Coliforms | cfu/100mL | 1900000 | 61000 | 170,321 |
| Oil and Grease | $g/m^3$ | 17.4 | 10.8 | 11 |
| pH | -- | 7 | 6.8 | 6.8 |
| Suspended Solids | $g/m^3$ | 240 | 300 | 296 |
| Cadmium* | $g/m^3$ | 0.00011 | 0.00018 | 0.00018 |
| Chromium* | $g/m^3$ | 0.0049 | 0.0045 | 0.005 |
| Copper* | $g/m^3$ | 0.046 | 0.099 | 0.096 |
| Lead* | $g/m^3$ | 0.014 | 0.0098 | 0.010 |
| Nickel* | $g/m^3$ | 0.004 | 0.0031 | 0.003 |
| Zinc* | $g/m^3$ | 0.15 | 0.15 | 0.150 |

**Table 5: Bypass and Effluent Discharge Samples**

*Note: These indicator contaminants are only analysed for at least one (1) bypass event each year.

Condition 17 of Resource Consent WGN080003 [35674] has been satisfied and is no longer exercised.

If there are any questions please feel free to contact me.

Regards,

**Edward Yong**
Safety, Risk, and Compliance Officer

14 December 2020

Manager, Consents Management
c/o Joshua Knowles
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Joshua,

**Overflow Discharge from the Moa Point Treatment Plant**

Condition 8 of Resource Consent WGN080003 [35407] states that notification is required to update Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the recent consented overflow discharge from the Moa Point Treatment Plant. The discharge was due to the heavy rainfall.

The following is a summary of the parameters monitored during the overflow discharge:

| Parameter | Units | Result |
|---|---|---|
| Start | - | 30/11/2020 19:44 |
| End | - | 1/12/2020 0:15 |
| Duration | - | 4:31:00 |
| Mean Bypass Flow | litres per second | 185 |
| Maximum Bypass Flow | litres per second | 746 |
| Treated Volume | cubic metres | 54181 |
| Partially Treated Volume | cubic metres | 3199 |
| Dilution Ratio | - | 17:1 |

**Table 1: Discharge Monitoring Parameters**

Condition 10 of Resource Consent WGN080003 [35674] requires grabs samples one, two, and three days after the discharge from three (3) coastal water locations and analysed for faecal coliforms and enterococci.

The following are the analytical results from the sample:

**Veolia Water Ltd.**
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 1 – 01/12/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 4 | 15 |
| Dorrie Leslie Park at Boat Ramp | 2 | 9 |
| Dorrie Leslie Park South Side | 2 | 15 |
| Dorrie Leslie Park West Side | 18 | 25 |
| Hougton Bay Westside | 4 | 4 |
| Hue te Taka Peninsula | 9 | 20 |
| Hue te Taka Peninsula West | 20 | 18 |
| Island Bay Marine Centre Eastside | 31 | 6 |
| Island Bay Westside | 40 | 11 |
| Lyall Bay Beach Eastern Side | 4 | 2 |
| Peninsula at Queens Drive | 6 | 6 |
| Tarakena Bay Beach at Boat Ramp | 2 | 2 |
| Tarakena Bay Western Side | 82 | 78 |

**Table 2: Coastal Samples (Day 1)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 2 – 02/12/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 2 | 2 |
| Dorrie Leslie Park at Boat Ramp | 15 | 9 |
| Dorrie Leslie Park South Side | 2 | 9 |
| Dorrie Leslie Park West Side | 15 | 2 |
| Hougton Bay Westside | 4 | 6 |
| Hue te Taka Peninsula | 16 | 9 |
| Hue te Taka Peninsula West | 16 | 13 |
| Island Bay Marine Centre Eastside | 9 | 6 |
| Island Bay Westside | 16 | 11 |
| Lyall Bay Beach Eastern Side | 15 | 40 |
| Peninsula at Queens Drive | 4 | 4 |
| Tarakena Bay Beach at Boat Ramp | 9 | 6 |
| Tarakena Bay Western Side | 20 | 18 |

**Table 3: Coastal Samples (Day 2)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 3 – 03/12/2020** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 2 | 2 |
| Dorrie Leslie Park at Boat Ramp | 7 | 6 |
| Dorrie Leslie Park South Side | 35 | 20 |
| Dorrie Leslie Park West Side | 2 | 4 |
| Hougton Bay Westside | 6 | 11 |
| Hue te Taka Peninsula | 2 | 6 |
| Hue te Taka Peninsula West | 35 | 18 |
| Island Bay Marine Centre Eastside | 4 | 4 |
| Island Bay Westside | 7 | 13 |
| Lyall Bay Beach Eastern Side | 9 | 2 |
| Peninsula at Queens Drive | 4 | 2 |
| Tarakena Bay Beach at Boat Ramp | 4 | 13 |
| Tarakena Bay Western Side | 7 | 6 |

**Table 4: Coastal Samples (Day 3)**

Condition 15 of Resource Consent WGN080003 [26181] requires samples of paua and/or kina at Hue Te Take Peninsula during and or immediately after the bypass discharge, these samples were not taken due to health and safety concerns.

Condition 16 requires extra samples be taken from the bypass discharge and the secondary treated wastewater during the first two (2) hours of a bypass event occurring during normal working hours or as soon as practicable.

The following table outlines the results:

| Analytical Parameter | Units | Bypass Discharge | Effluent Discharge | Cmixed |
|---|---|---|---|---|
| Ammonia Nitrogen | $g/m^3$ | 15 | 4.14 | 5 |
| $CBOD_5$ | $g/m^3$ | 56 | 2.5 | 5 |
| Faecal Coliforms | cfu/100mL | 4,000,000 | 3.6 | 223008 |
| Oil and Grease | $g/m^3$ | 13 | 6.6 | 7 |
| pH | -- | 7.4 | 6.9 | 7 |
| Suspended Solids | $g/m^3$ | 120 | 6.4 | 13 |
| Cadmium* | $g/m^3$ | 0.0001 | 0.00005 | 0.0001 |
| Chromium* | $g/m^3$ | 0.0019 | 0.0015 | 0.002 |
| Copper* | $g/m^3$ | 0.029 | 0.0054 | 0.007 |
| Lead* | $g/m^3$ | 0.004 | 0.00058 | 0.0008 |
| Nickel* | $g/m^3$ | 0.0021 | 0.0012 | 0.001 |
| Zinc* | $g/m^3$ | 0.067 | 0.025 | 0.027 |

**Table 5: Bypass and Effluent Discharge Samples**

*Note: These indicator contaminants are only analysed for at least one (1) bypass event each year.

Condition 17 of Resource Consent WGN080003 [35674] has been satisfied and is no longer exercised.

If there are any questions please feel free to contact me.

Regards,

**Edward Yong**
Safety, Risk, and Compliance Officer

15 April 2021

Manager, Consents Management
c/o Joshua Knowles
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Joshua,

**Overflow Discharge from the Moa Point Treatment Plant**

Condition 8 of Resource Consent WGN080003 [35407] states that notification is required to update Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the recent consented overflow discharge from the Moa Point Treatment Plant. The discharge was due to the heavy rainfall.

The following is a summary of the parameters monitored during the overflow discharge:

| Parameter | Units | Result |
|---|---|---|
| Start | - | 1/4/2021 00:55 |
| End | - | 1/3/2021 01:50 |
| Duration | - | 55min |
| Mean Bypass Flow | litres per second | 183 |
| Maximum Bypass Flow | litres per second | 3341 |
| Treated Volume | cubic metres | 10,132 |
| Partially Treated Volume | cubic metres | 296 |
| Dilution Ratio | - | 34:1 |

**Table 1: Discharge Monitoring Parameters**

Condition 10 of Resource Consent WGN080003 [35674] requires grabs samples one, two, and three days after the discharge from three (3) coastal water locations and analysed for faecal coliforms and enterococci.

The following are the analytical results from the sample:

**Veolia Water Ltd.**
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 1 – 1/4/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 20 | 13 |
| Dorrie Leslie Park at Boat Ramp | 6 | 5.5 |
| Dorrie Leslie Park South Side | 36 | 1.8 |
| Dorrie Leslie Park West Side | 10 | 3.6 |
| Hougton Bay Westside | 60 | 42 |
| Hue te Taka Peninsula | 72 | 60 |
| Hue te Taka Peninsula West | 40 | 11 |
| Island Bay Marine Centre Eastside | 10 | 7.3 |
| Island Bay Westside | 14 | 24 |
| Lyall Bay Beach Eastern Side | 16 | 33.1 |
| Peninsula at Queens Drive | 10 | 1.8 |
| Tarakena Bay Beach at Boat Ramp | 18 | 26.8 |
| Tarakena Bay Western Side | 2 | 11 |

**Table 2: Coastal Samples (Day 1)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 2 – 2/4/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 20 | 7.3 |
| Dorrie Leslie Park at Boat Ramp | 48 | 40 |
| Dorrie Leslie Park South Side | 8 | 3.6 |
| Dorrie Leslie Park West Side | 50 | 54 |
| Hougton Bay Westside | 28 | 9.1 |
| Hue te Taka Peninsula | 38 | 10.9 |
| Hue te Taka Peninsula West | 12 | 3.6 |
| Island Bay Marine Centre Eastside | 54 | 16 |
| Island Bay Westside | 38 | 15 |
| Lyall Bay Beach Eastern Side | 44 | 26 |
| Peninsula at Queens Drive | 46 | 36 |
| Tarakena Bay Beach at Boat Ramp | 56 | 49 |
| Tarakena Bay Western Side | 6 | 22 |

**Table 3: Coastal Samples (Day 2)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 3 – 3/4/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 6 | 4 |
| Dorrie Leslie Park at Boat Ramp | 4 | 6 |
| Dorrie Leslie Park South Side | 90 | 12 |
| Dorrie Leslie Park West Side | 2 | 2 |
| Hougton Bay Westside | 14 | 2 |
| Hue te Taka Peninsula | 32 | 20 |
| Hue te Taka Peninsula West | 18 | 14 |
| Island Bay Marine Centre Eastside | 32 | 42 |
| Island Bay Westside | 38 | 22 |
| Lyall Bay Beach Eastern Side | 80 | 42 |
| Peninsula at Queens Drive | 8 | 4 |
| Tarakena Bay Beach at Boat Ramp | 16 | 10 |
| Tarakena Bay Western Side | 16 | 16 |

**Table 4: Coastal Samples (Day 3)**

Condition 15 of Resource Consent WGN080003 [26181] requires samples of paua and/or kina at Hue Te Take Peninsula during and or immediately after the bypass discharge, these samples were not taken due to health and safety concerns.

Condition 16 requires extra samples be taken from the bypass discharge and the secondary treated wastewater during the first two (2) hours of a bypass event occurring during normal working hours or as soon as practicable.

The following table outlines the results:

| Analytical Parameter | Units | Bypass Discharge | Effluent Discharge | Cmixed |
|---|---|---|---|---|
| Ammonia Nitrogen | $g/m^3$ | 23.2 | 2.35 | 3 |
| $CBOD_5$ | $g/m^3$ | 130 | 6.7 | 10 |
| Faecal Coliforms | cfu/100mL | 5,100,000 | 46 | 144,876 |
| Oil and Grease | $g/m^3$ | 11.2 | 5.4 | 6 |
| pH | -- | 7.5 | 6.7 | 7 |
| Suspended Solids | $g/m^3$ | 150 | 13 | 17 |
| Cadmium* | $g/m^3$ | 0.0005 | 0.0005 | 0.0005 |
| Chromium* | $g/m^3$ | 0.005 | 0.005 | 0.005 |
| Copper* | $g/m^3$ | 0.047 | 0.0048 | 0.006 |
| Lead* | $g/m^3$ | 0.0045 | 0.001 | 0.0011 |
| Nickel* | $g/m^3$ | 0.001 | 0.001 | 0.001 |
| Zinc* | $g/m^3$ | 0.079 | 0.016 | 0.018 |

**Table 5: Bypass and Effluent Discharge Samples**

*Note: These indicator contaminants are only analysed for at least one (1) bypass event each year.

Condition 17 of Resource Consent WGN080003 [35674] has been satisfied and is no longer exercised.

If there are any questions please feel free to contact me.

Regards,

**Edward Yong**
Safety, Risk, and Compliance Officer

21/06/2021

Manager, Consents Management
c/o Joshua Knowles
Greater Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Joshua,

**Overflow Discharge from the Moa Point Treatment Plant**

Condition 8 of Resource Consent WGN080003 [35407] states that notification is required to update Manger, Environmental Regulation, Wellington Regional Council about any overflow discharges. This letter serves as notification of the recent consented overflow discharge from the Moa Point Treatment Plant. The discharge was due to the heavy rainfall.

The following is a summary of the parameters monitored during the overflow discharge:

| Parameter | Units | Result |
|---|---|---|
| Start | - | 31/05/2021 13:30 |
| End | - | 31/05/2021 16:07 |
| Duration | - | 2 hours 37 minutes |
| Mean Bypass Flow | litres per second | 288 |
| Maximum Bypass Flow | litres per second | 587 |
| Treated Volume | cubic metres | 28,014 |
| Partially Treated Volume | cubic metres | 2,177 |
| Dilution Ratio | - | 13:1 |

**Table 1: Discharge Monitoring Parameters**

Condition 10 of Resource Consent WGN080003 [35674] requires grabs samples one, two, and three days after the discharge from three (3) coastal water locations and analysed for faecal coliforms and enterococci.

The following are the analytical results from the sample:

**Veolia Water Ltd.**
A: 127 Stewart Duff Drive, Rongotai, Wellington, New Zealand, 6003
T: 0800-928-371 W: **www.veolia.com.au**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 1 – 1/6/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 42 | 31 |
| Dorrie Leslie Park at Boat Ramp | 38 | 25 |
| Dorrie Leslie Park South Side | 500 | 90 |
| Dorrie Leslie Park West Side | 25 | 25 |
| Hougton Bay Westside | 480 | 110 |
| Hue te Taka Peninsula | 98 | 38 |
| Hue te Taka Peninsula West | 36 | 31 |
| Island Bay Marine Centre Eastside | 500 | 76 |
| Island Bay Westside | 54 | 18 |
| Lyall Bay Beach Eastern Side | 820 | 80 |
| Peninsula at Queens Drive | 760 | 76 |
| Tarakena Bay Beach at Boat Ramp | 31 | 44 |
| Tarakena Bay Western Side | 33 | 18 |

**Table 2: Coastal Samples (Day 1)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 2 – 2/6/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 1.8 | 7.3 |
| Dorrie Leslie Park at Boat Ramp | 27 | 5.5 |
| Dorrie Leslie Park South Side | 42 | 52 |
| Dorrie Leslie Park West Side | 120 | 52 |
| Hougton Bay Westside | 11 | 3.6 |
| Hue te Taka Peninsula | 72 | 40 |
| Hue te Taka Peninsula West | 36 | 15 |
| Island Bay Marine Centre Eastside | 11 | 3.6 |
| Island Bay Westside | 7.3 | 3.6 |
| Lyall Bay Beach Eastern Side | 110 | 48 |
| Peninsula at Queens Drive | 7.3 | 7.3 |
| Tarakena Bay Beach at Boat Ramp | 9.1 | 5.5 |
| Tarakena Bay Western Side | 11 | 1.8 |

**Table 3: Coastal Samples (Day 2)**

| Site | Enterococci | Faecal Coliforms |
|---|---|---|
| **Day 3 – 3/6/2021** | **cfu/100mL** | **cfu/100mL** |
| 49 Moa Point Rd | 5.5 | 1.8 |
| Dorrie Leslie Park at Boat Ramp | 27 | 11 |
| Dorrie Leslie Park South Side | 15 | 16 |
| Dorrie Leslie Park West Side | 24 | 5.5 |
| Hougton Bay Westside | 5.5 | 11 |
| Hue te Taka Peninsula | 24 | 3.6 |
| Hue te Taka Peninsula West | 7.3 | 1.8 |
| Island Bay Marine Centre Eastside | 50 | 11 |
| Island Bay Westside | 62 | 20 |
| Lyall Bay Beach Eastern Side | 78 | 25 |
| Peninsula at Queens Drive | 7.3 | 5.5 |
| Tarakena Bay Beach at Boat Ramp | 18 | 15 |
| Tarakena Bay Western Side | 16 | 15 |

**Table 4: Coastal Samples (Day 3)**

Condition 15 of Resource Consent WGN080003 [26181] requires samples of paua and/or kina at Hue Te Take Peninsula during and or immediately after the bypass discharge, these samples were not taken due to health and safety concerns.

Condition 16 requires extra samples be taken from the bypass discharge and the secondary treated wastewater during the first two (2) hours of a bypass event occurring during normal working hours or as soon as practicable.

The following table outlines the results:

| Analytical Parameter | Units | Bypass Discharge | Effluent Discharge | Cmixed |
|---|---|---|---|---|
| Ammonia Nitrogen | $g/m^3$ | 8.8 | 13.9 | 14 |
| $CBOD_5$ | $g/m^3$ | 110 | 110 | 110 |
| Faecal Coliforms | cfu/100mL | 700,000 | 27,000 | 75,530 |
| Oil and Grease | $g/m^3$ | 19.3 | 12.6 | 13 |
| pH | -- | 6.8 | 6.8 | 7 |
| Suspended Solids | $g/m^3$ | 220 | 210 | 211 |
| Cadmium* | $g/m^3$ | 0.00018 | 0.00025 | 0.0002 |
| Chromium* | $g/m^3$ | 0.0067 | 0.0026 | 0.003 |
| Copper* | $g/m^3$ | 0.054 | 0.067 | 0.066 |
| Lead* | $g/m^3$ | 0.028 | 0.0061 | 0.0077 |
| Nickel* | $g/m^3$ | 0.0052 | 0.0027 | 0.003 |
| Zinc* | $g/m^3$ | 0.18 | 0.11 | 0.115 |

**Table 5: Bypass and Effluent Discharge Samples**

*Note: These indicator contaminants are only analysed for at least one (1) bypass event each year.

Condition 17 of Resource Consent WGN080003 [35674] has been satisfied and is no longer exercised.

If there are any questions please feel free to contact me.

Regards,

**Edward Yong**
Safety, Risk, and Compliance Officer

# Appendix vi: Inflow and Infiltration Report

# Condition (13)

The annual report required by condition 19 of this permit shall detail what steps have been taken in the reporting year and what steps are proposed to be undertaken in the future to reduce infiltration and stormwater ingress into the Wellington City sewerage network.

This information shall include, but not be limited to, the following information:

a) Details on the adoption of a policy to identify, and to repair or replace, defective private sewer drains in the Wellington City catchment. If such a policy is adopted, detail on its implementation made within the previous year
b) Details of additional works that have been undertaken and what these works are expected to achieve
c) An indication of when any on-going works will be completed
d) Details of any investigations undertaken with regard to inflow and infiltration in the Wellington City catchment
e) Details of any works or investigations planned for the next financial year

# Inflow and Infiltration Report

A variety of mitigation measures have been undertaken to reduce Inflow and Infiltration (I&I) and to contain wastewater within the reticulated wastewater network. This work aims to reduce the wet weather flows at Moa Point WWTP and to also improve the health of waterways. Sections (a), (b), (c), (d) and (e) of Condition 13 are addressed below through the various activities and work programs that contribute to reducing I&I.

## Section (a)

Wellington City Council (WCC) have updated the ownership arrangement for wastewater laterals, which came into effect on 1 July 2021. The section of wastewater lateral located in the legal road was previously a private asset and is now council owned.

Detection of faulty laterals contributing to infiltration and inflow from stormwater to wastewater cross connections continue to be identified through ongoing operations and maintenance work and targeted inspections. Property owners are advised to repair faults within their property and faults within the legal road from 1 July are repaired or replaced by Wellington Water.

## Section (b), (c), (d) and (e)

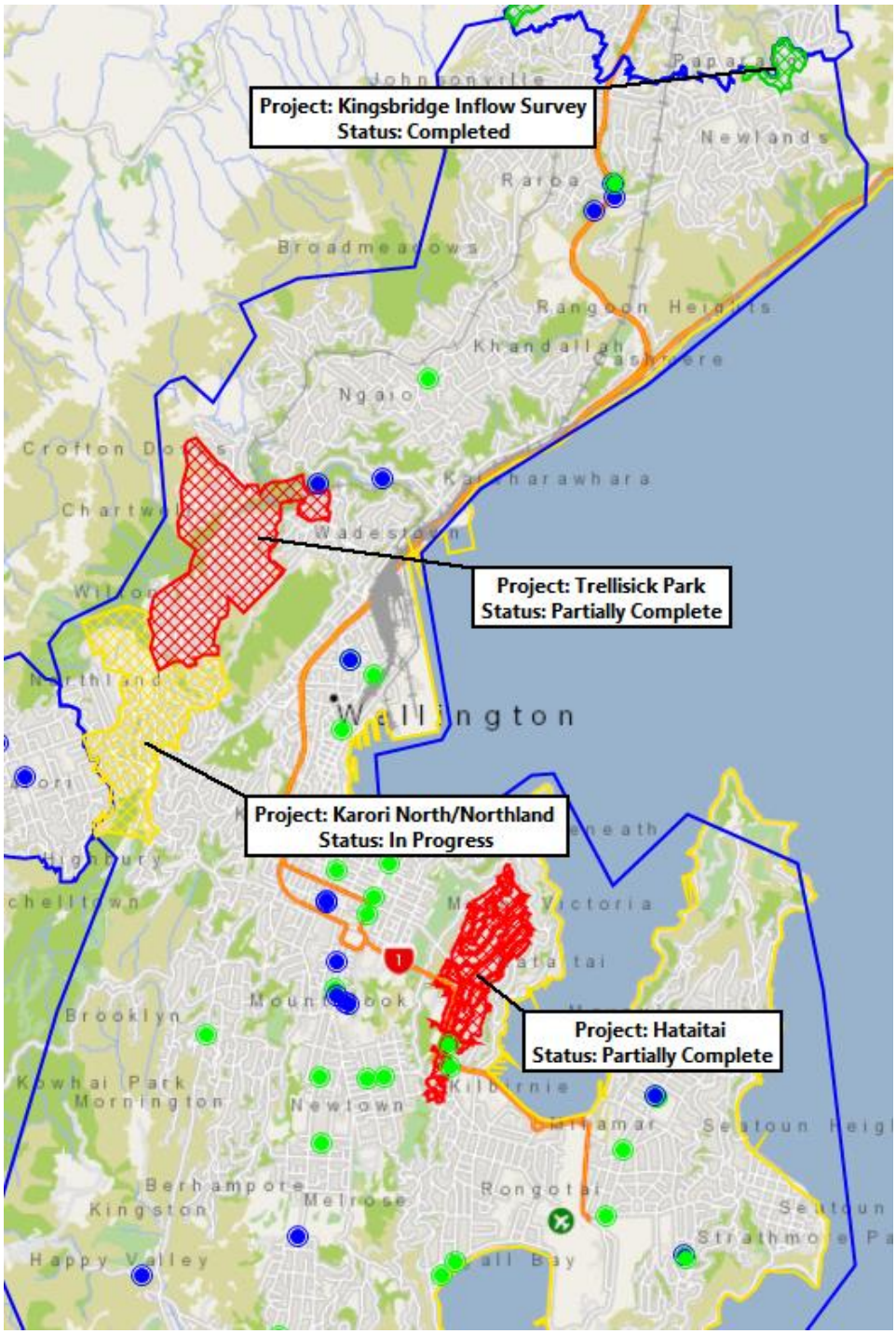
The following work programs and activities described below provide information relating to Condition 13, sections (b) to (e).

### Inflow Surveys

Inflow surveys have been undertaken in 2020-2021 financial year in the Moa Point WWTP Catchment. A map showing where the recent inflow surveys projects have commenced is provided in Figure 1. Kingsbridge inflow survey was recently completed and is shown below in green. Karori North/Northland Inflow Survey is currently in progress and is shown below in yellow. Two inflow survey projects commenced in 2017-2018 and were only partially completed, which are shown in red

in Figure 1. These two catchments; Hataitai and Trelissick Park, will be the focus for any new projects that are able to commence in the 2021-2022 financial year.

*Figure 1 - Inflow Survey Project Locations*




The final inspections for the Kingsbridge Inflow Survey were completed in December 2020. This catchment was selected for an inflow survey due to significant peak wet weather flows. Two properties in this catchment were found to have their stormwater and wastewater pipes cross-connected which have since been resolved. Post-rehabilitation flow monitoring has not been undertaken, however an affected customer advised since the inflow survey works were completed, there has been no wastewater surcharges in wet weather at their affected property.

The Karori North / Northland Inflow Survey is partially complete with re-inspections planned for the 2021-2022 financial year. This project detected multiple public faults which inhibited the completion of smoke testing. During 2020-2021 the public faults were repaired by the Customer Operations Group (COG) to enable the completion of property inspections. Re-inspections are planned for August and October 2021, with completion of the project scheduled for December 2021.

## Condition Assessments

Condition Assessment using closed circuit television (CCTV) footage of wastewater networks is used to identify faults, determine the condition of assets and inform repair and renewal programs. In 2020-2021 CCTV was completed in the four areas below;

- Kingsbridge, Woodridge
- Wakely Road, Newlands
- Tyres Stream
- Ngauranga

The data from this CCTV will be analysed and can be used to inform the repair and renewal programs in 2021-2022 financial year. Planned condition assessments of lower criticality assets in 2021-2022 using CCTV, will be confirmed once budgets are awarded in July 2021.

In the last year, the health assessment of all Very High Critical Assets (VHCA) has also been completed with CCTV and other condition assessment programs underway to further increase the confidence rating of this assessment.

## Wastewater Modelling

The Moa Point WWTP Catchment has four wastewater network models including; Evans Bay, Island Bay, CBD Model and Western hills model. Recently work has been carried out to integrate all models into the one model to reflect the entire Moa Point WWTP Catchment.

## Flow Monitoring and Rain Gauge Monitoring

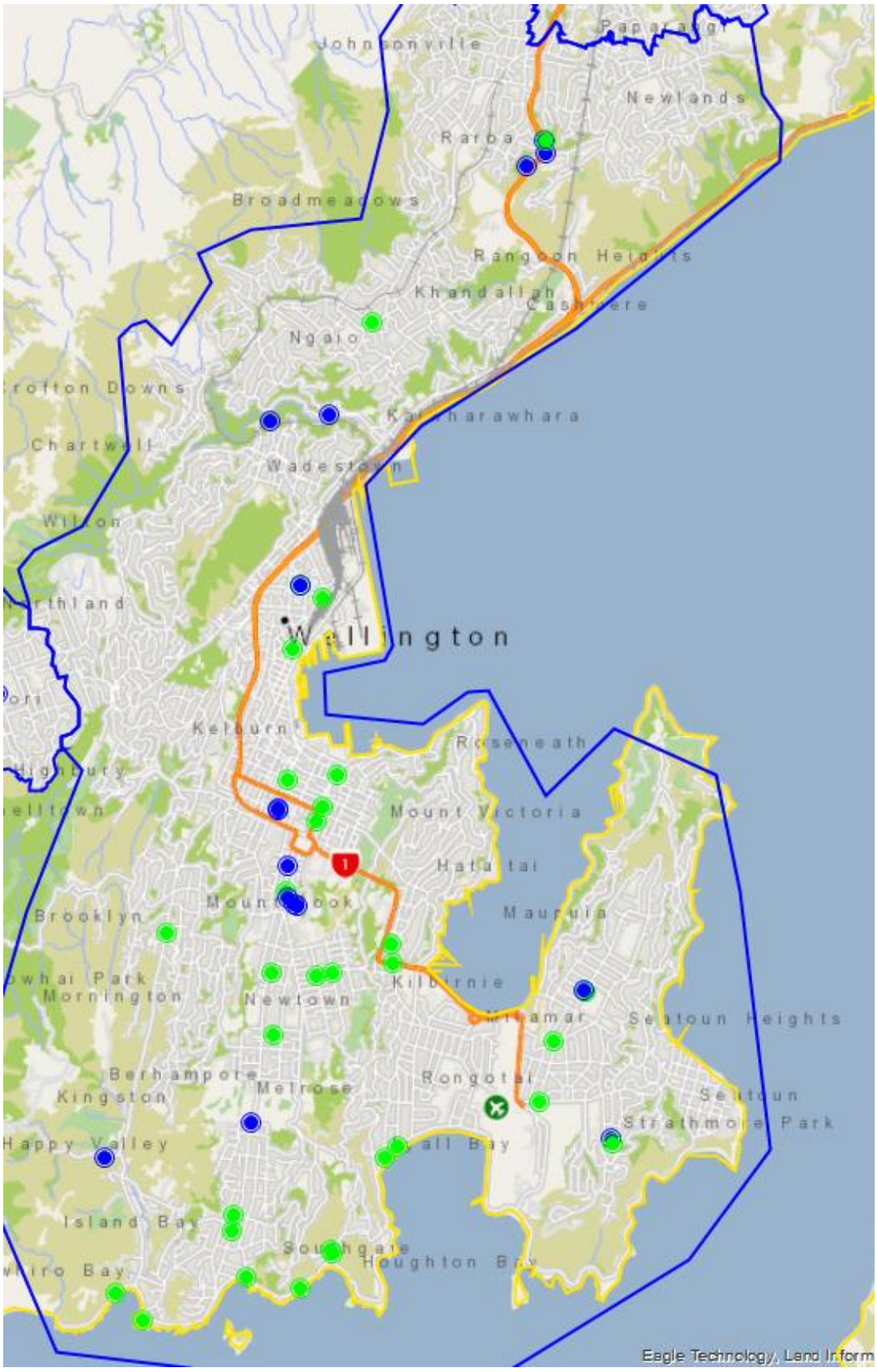
There are currently 17 wastewater flow and 35 overflow monitoring sites within the Moa Point WWTP Catchment. These monitoring sites are shown below in Figure 2, with green indicating an overflow monitoring site and blue for flow monitoring sites.

These monitoring sites are part of the long term monitoring contract that is an ongoing program. A new regional contract will commence in July 2021 and some updates to the monitoring locations are planned. This data is used to understand network performance and the extent of inflow and infiltration in various catchments. This data also enables investigation of network issues and maintenance of hydraulic models. In addition to the above flow meters, there are 11 magnetic flow meters at wastewater pumps stations (PS23, PS24, PS10, PS14, PS15, PS17, PS18, PS22, PS39, PS45, and PS46).

There are currently six rain gauges monitoring stations in the Moa Point catchment. This data is used in conjunction with flow monitoring data to understand the extent of I&I for catchments. The rain gauges sites are listed below;

- Miramar at Miramar Bowling Club
- Berhampore at Nusery
- Newtown at Mansfield Street
- Hataitai at Old Post Office
- Wellington at Te Papa
- Khandallah at Library

*Figure 2 - Map of Wastewater Flow and Overflow Monitoring Sites*



## Stormwater and Wastewater Capital Projects

Table 1 below provides a summary of planned capital projects for wastewater and stormwater assets that were undertaken in 2020-2021 or scheduled for 2021-2022. Ongoing operational work such as investigations, reactive maintenance and renewals are also carried out in addition to the planned work listed below. Some projects in the table below are noted in both columns as the project is delivered over multiple years or ongoing programmes of work.

*Table 1 - Stormwater and Wastewater Capital Projects in the Moa Point WWTP Catchment*

| Activity | 2020/2021 | 2021/2022 |
|---|---|---|
| **Stormwater** | • 9 Queen St Mt Vic SW Renewal<br>• Woodman Drive (55-59) Flood Mitigation<br>• Agra Crescent (5-10A) SW Renewal<br>• Kent Tce (54 – Buckle St) SW Culvert Renewal and Strengthening (with WW)<br>• Shirley St(37-39) - Hurman St<br>• Stirling St (10-14) to Adelaide<br>• Wallace Street Corridor Stormwater Network Renewal (6 Rolleston St - 36 Wallace St)<br>• Jervois Quay Stormwater Reactive Renewal | • Tawa Beauchamp-Collins Stormwater upgrade<br>• Agra Crescent (5-10A) Stormwater Renewal<br>• Karori Road (357a) Stormwater Renewal (with WW)<br>• Wakefield Street (142-150) Stormwater Renewal<br>• Waikare Street (4-7) Stormwater Renewal<br>• Hawkestone Street (6-27) and Molesworth Street (79-83) Stormwater Renewal |
| **Wastewater** | • Broadway and Cavendish Square Wastewater Renewals - Stage 2<br>• Mortimer Terrace Stage 3 (Relining)<br>• Queen Street (9) Wastewater Renewal (with SW)<br>• Elphinstone Ave (5-22) - Tannadyce St (5) Wastewater Renewal<br>• McColl Street (22) - Mills Road (18-42) with Whaui Street (to 19), Mana Street (to 28) and Fortunatus Street Wastewater Renewal<br>• Whitmore Street (17) - Bowen Street (38) Rising Main Renewal | • CBD Wastewater Pump Stations and Rising Main Renewals<br>• Featherston St (Whitmore St to Waring Taylor St) Rising Main Renewal<br>• Part 1 Torrens Terrace(2-48), Arlington Street (6-14, 24-31) and Hopper Street (20-70) Wastewater Renewal<br>• Buller Street (27) - Vivian Sreet (175) Wastewater Renewal<br>• Yule Stoke Tainui and Broomhedge Wastewater Renewals<br>• Hania Street (3-18) - 60 Kent Terrace Wastewater Renewal<br>• Hawkestone Street (6-27) and Molesworth Street (79-83) Wastewater Renewal<br>• Waikare St (4-7) Wastewater Renewal<br>• Whitmore Street (17) - Bowen Street (38) Rising Main Renewal<br>• Maida Vale Road Wastewater Pipe Renewals |