Wellington Water

Seaview Wastewater Treatment Plant

Annual Resource Consents Report 2022/2023

Our water, our future.

This report has been prepared solely for the benefit of **Greater Wellington Regional Council**.

No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Control Sheet

Document Title: Seaview Wastewater Treatment Plant Annual Resource Consents Report 2022/2023

Prepared by: Joemar Cacnio

Reviewed by: Blair Johnson

Approved by: Blair Johnson

Document Control Register

Version	Status	Date	Details of Revision
0	Draft		Initial draft for review
1	Final		Approved, Manager Wastewater Contracts

Executive Summary

This report has been prepared on behalf of the Hutt City Council (HCC) for compliance with several resource consents. The resource consents have been divided into the following categories:

- Plant Discharge
    - WGN050359 [24539]
- Wet Weather Discharge
    - WGN 120142 [33406]
- Maintenance Discharge
    - WGN 120142 [33407]
    - WGN 120142 [33408]
    - WGN 120142 [31740]
- Discharge to Air
    - WGN 950162 (01)
    - WGN 930193 (01)
    - WGN 930193 (02)
- Others
    - WGN 930194

This annual report will cover the period from 1 July 2022 to 30 June 2023.

Table of Contents

2021/2022

Control Sheet 2

Executive Summary 3

Resource Consents 6

WGN050359 [24539] 9

Condition (2) 9

Condition (9) 9

Condition (10) 12

Condition (11) 12

Condition (13) 15

Condition (14) 16

Condition (18) 17

Section (a) 17

Section (b) 18

Section (c) 23

Section (d) 23

Section (e) 23

Condition (19) 24

Condition (20) 25

Condition (22) 26

Section (a) 26

Section (b) 26

WGN120142 [33406] 27

Condition (4) 27

Condition (9) 28

Condition (10) 30

Condition (11) 31

Condition (12) 32

Condition (14) 33

Condition (15) 34

Condition (16) 35

Condition (20) 36

Condition (23) 37

Condition (25) 38

WGN 120142 [33407] 39

Condition 30..... 39

WGN120142 [33408] 40

Condition 35..... 40

WGN950162 (01) 41

Condition (16) 41

Appendix i: Daily Effluent Quality Results..... 48

Appendix ii: Inflow and Infiltration Report 53

Appendix iii. Trade Waste Report..... 63

Appendix iv: Assessment of effects of Discharge to Waiwhetu Stream 64

Resource Consents

WGN050359 [24539]

Effluent discharge from the Seaview WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN050359 [24539]. In general, this coastal permit allows the discharge of treated and disinfected wastewater to the coastal marine area through an existing outfall at Bluff Point. The outfall is located at map location NZMS 260: R27; 649.808.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN120142 [33406]

In addition to the above resource consent, the discharge from the Seaview WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN120142 [33406]. This discharge permit allows the temporary discharge of treated wastewater to the Waiwhetu Stream during and/or immediately after heavy rain events when flows exceed the capacity of the main outfall pipeline and the storm tank system is fully utilized. The location of the discharge is at map reference NZTM 1759407.5433210.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN120142 [33407]

Another resource consent that governs the discharge from the Seaview WWTP is under the Greater Wellington Regional Council consent file number WGN120142 [33407]. This discharge permit allows the temporary discharge of treated wastewater from Seaview Wastewater Treatment Plant to the coastal marine area, and onto the land where it may enter streams or coastal marine area from:

- Planned repairs
- Unplanned repairs
- Leaks associated with temporary repairs, and
- Minor leaks

in relation to the main outfall pipeline from Seaview Wastewater Treatment Plant to Pencarrow Head.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN120142 [33408]

Another resource consent that governs the discharge from the Seaview WWTP is under the Greater Wellington Regional Council consent file number WGN120142 [33408]. This discharge permit allows the temporary discharge of treated wastewater from Seaview Wastewater Treatment Plant to the Waiwhetu Stream when the main outfall pipeline is being repaired. The location of the discharge is at map reference NZTM 1759407.5433210.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN120142 [31740]

The coastal permit under the Greater Wellington Regional Council consent file number WGN120142 [31740] allows the construction of a temporary channel on the foreshore to direct treated wastewater discharged from the scour valves on the main outfall pipeline into the sea to allow pipeline repair to be undertaken. The locations for these discharges are between map locations NZTM 1759804.5433065 and NZTM 1754999.5420657.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN950162 (01)

The discharge to air resource consent permits the Seaview WWTP to discharge contaminants to the air from operation. The plant can discharge up to $7m^3/s$ of combustion products and up to $53m^3/s$ of air from the facility.

The following report will outline the conditions in this resource consent that are required for that annual report.

WGN930193 (1)

The coastal permit allows the Seaview WWTP to continuously discharge contaminants to the air from the outfall venting structures and vents. The discharge location is at map reference NZMS 260 R27:650.808.

This resource consent does not contain any conditions that require annual reporting.

WGN930193 (2)

The coastal permit allows the Seaview WWTP to continuously discharge contaminants to the air from the sewage outfall structure and the sewage effluent. The discharge location is at map reference NZMS 260 R27:650.808.

This resource consent does not contain any conditions that require annual reporting.

WGN930194

The coastal permit allows the HCC to occupy the foreshore and seabed of the coastal marine area for the purposes of continued use of the existing sewage pipeline and outfall structure. The location is at map reference NZMS 260 R27:650.808.

This resource consent does not contain any conditions that require annual reporting.

WGN050359 [24539]

Condition (2)

The rate of discharge shall not exceed: 3,100L/s or 268,000 m3/day (peak wet weather flow)

Figure 1 below is a summary of the effluent flow for FY2022/2023. The flows are well below the consent limit of 268,000 cubic metres/day.

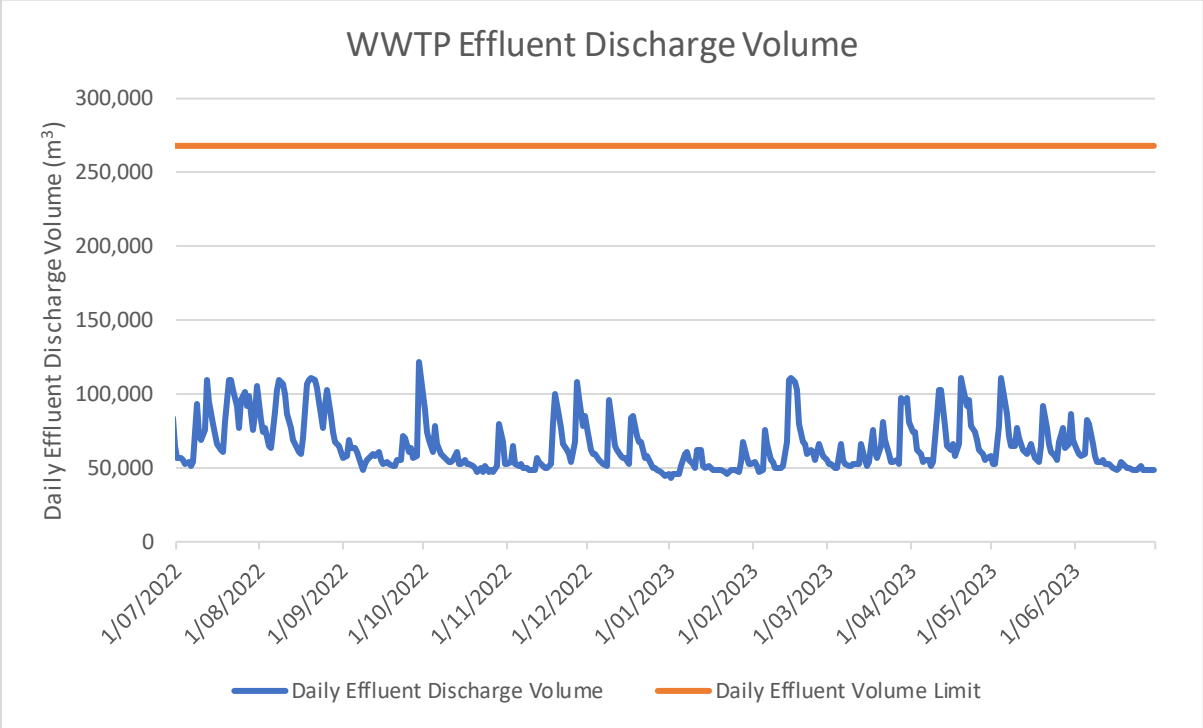


Figure 1: WWTP Effluent Flow Summary

Condition (9)

The following effluent standards shall apply at all times: Carbonaceous Biochemical Oxygen Demand (cBOD5) Compliance is based on daily 24 hour flow proportioned composite sampling, with a running geometric mean and eighty-percentile calculated each day using 90 consecutive daily test results. The geometric mean of 90 consecutive daily cBOD5 values shall not exceed 50g/m3 and more than 20% of 90 consecutive daily values shall exceed 85g/m3. Suspended solids

Compliance is based on daily 24 hour flow proportioned composite sampling, with a running geometric mean and eighty-percentile calculated each day using 90 consecutive daily test results.

The geometric mean of 90 consecutive daily suspended solids values shall not exceed 50g/m3 and more than 20% of 90 consecutive daily values shall exceed 85g/m3.

Faecal Coliforms

Compliance is based on daily grab samples to be taken between the hours of 10am and 4pm with a running geometric mean and eighty percentile calculated each day using 90 consecutive daily test results.

The geometric mean of 90 consecutive daily faecal coliform values shall not exceed 1000 per 100mL and no more than 20% of 90 consecutive daily values shall exceed 5000 per 100mL.

Figure 2 below is a summary of the 90-day geometric mean and 90-day 80th percentile for the effluent Carbonaceous Biochemical Oxygen Demand (cBOD5). The facility has been compliant to cBOD5 requirements this FY2022/2023.

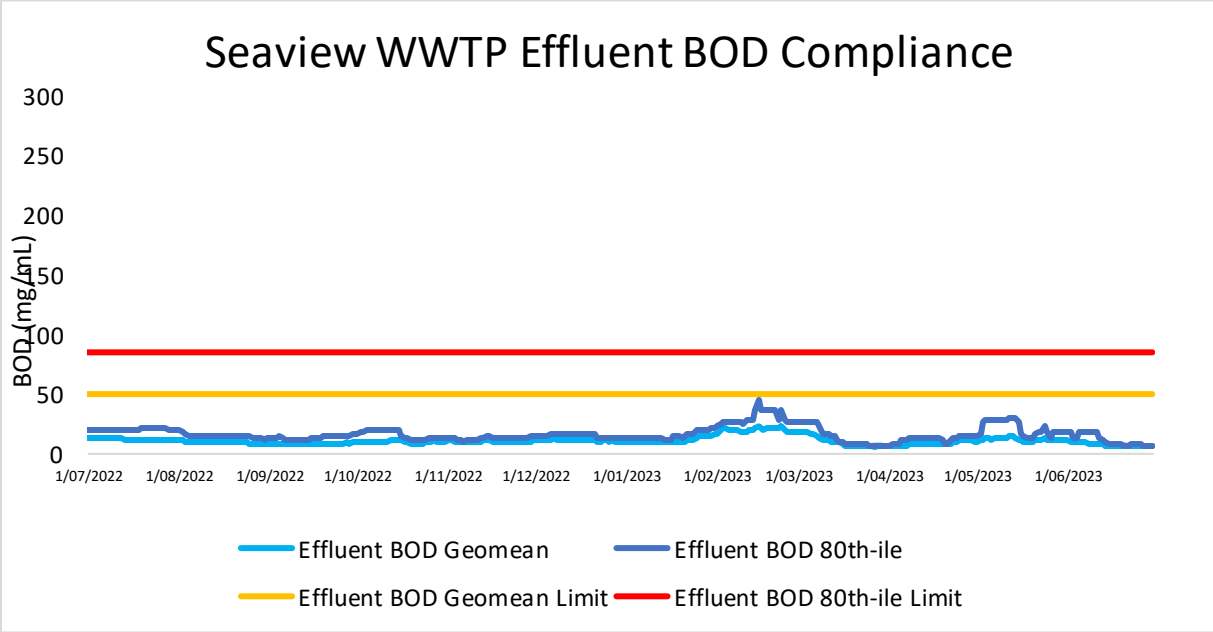


Figure 2: Effluent CBOD5 Summary

Figure 3 below is a summary of the 90-day geometric mean and 90-day 80th percentile for the effluent total suspended solids. The facility has been compliant to the effluent suspended solids requirements this FY2022/2023.

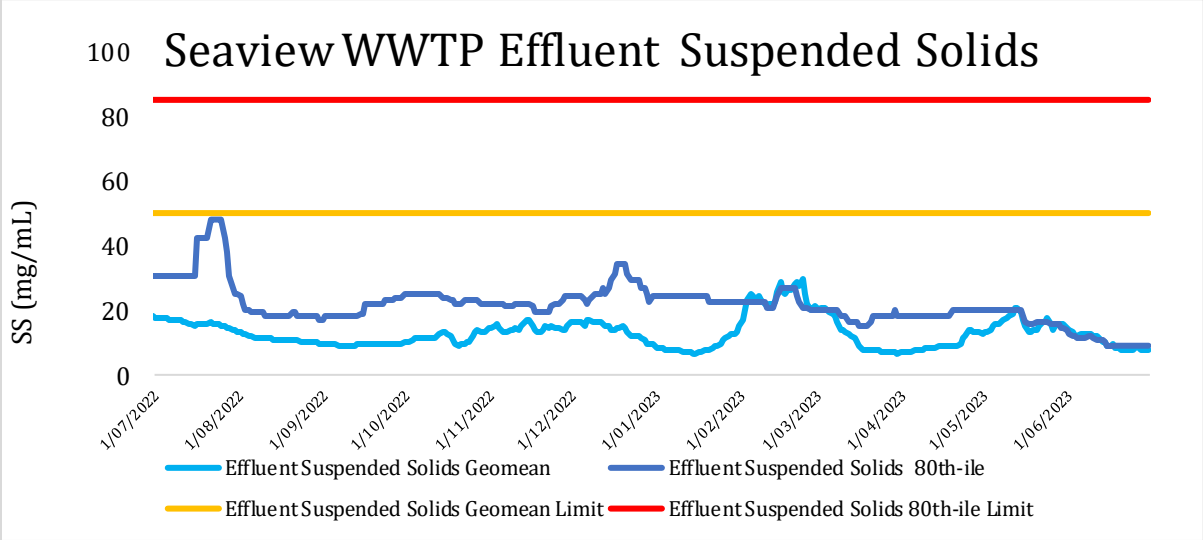


Figure 3: Effluent TSS Summary

Figure 4 below is a summary of the 90-day geometric mean and 90-day 80th percentile for effluent faecal coliform.

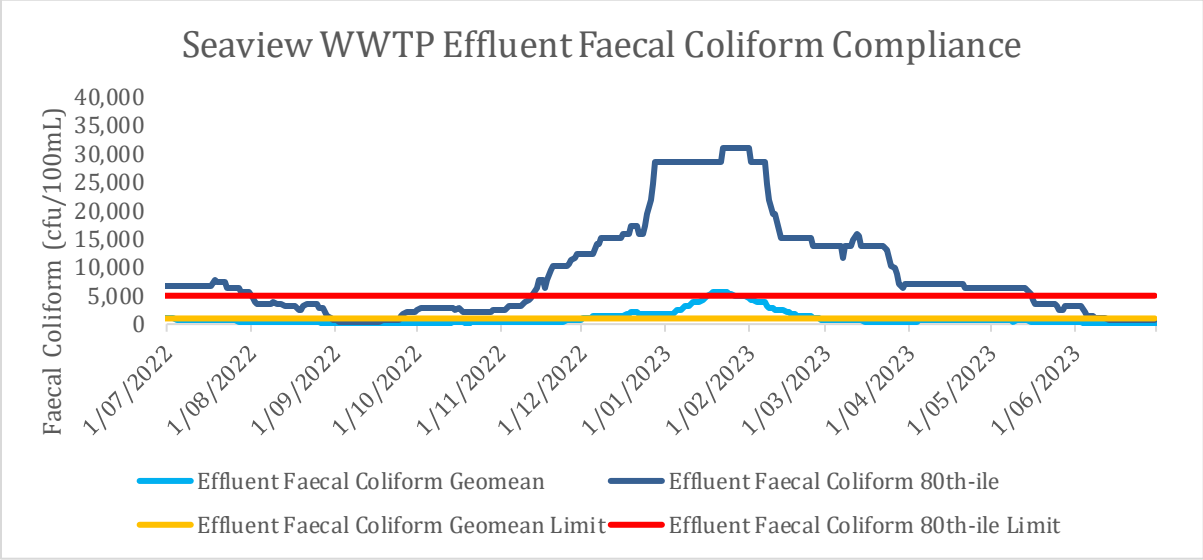


Figure 4: Effluent Faecal Coliform Summary

The plant was non-compliant for the faecal coliform requirements during this consent period.

Condition (10)

The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council immediately in the event that a running geometric mean and/or 80 percentile calculated daily from the monitoring programme exceeds the values stipulated in condition 9 for more than three consecutive days. Such a report shall include the likely reason for exceedance, and measures to be undertaken by the permit holder to remedy the situation. The permit holder shall also immediately notify the Medical Officer of Health of any such event.

The plant was non-compliant for the faecal coliform requirements during this consent period. Beginning the year non-compliant, it moved back into compliance on the 1st August 2022 but became non-compliant again on 13th November 2022. The plant then remained non-compliant for faecal coliforms until the 16th May 2023. GWRC approved a S127 application in February 2023 to dose chlorine in the clarifiers to mitigate the algae build up and improve the faecal coliform results. This dosing ceased on 30th April 2023.

All parties were notified when the geometric mean and/or 80th percentile limits were exceeded.

The non-compliance was caused by reduction of UV disinfection effectiveness due to the following reasons:

- Failure of a post-UV weir gate drive early in the FY22/23 that affected accurate level control and hindering the disinfection effectiveness of the UV system
- Supply chain issues delayed procurement of replacement parts to allow the post-UV weir gate to be repaired early 2023
- A failed ballast was identified in the UV system and replaced in December 2022
- Significant wet weather events elevate faecal coliform levels
- In November 2022, a large petrochemical contamination entered the plant from the catchment and negatively impacted the treatment process, especially the UV system
- Algae build up around UV lamps

Condition (11)

Based on 24 hour flow-proportioned composite samples collected and analyzed once each month in accordance with conditions 6, 7 and 8 and Schedule 1 of this permit, all wastewater discharged through the outfall shall meet the following standards:

Analyte	Units	Standard: Over each 12-month period, from 1 July to 30 June, no more than 2 sample results shall exceed:
Dissolved Arsenic	mg/L	0.115
Dissolved	mg/L	0.035
Cadmium	mg/L	0.220
Dissolved	mg/L	0.065
Chromium	mg/L	0.350
Dissolved Copper	mg/L	0.220
Dissolved Nickel	mg/L	0.750
Dissolved Lead	mg/L	0.005
Dissolved Zinc	mg/L	0.200
Dissolved Mercury	mg/L	0.500
Cyanide		
Phenol		

Note:

1. Two exceedances out of 12 samples is permitted to meet a 95-percentile discharge compliance standard, based on a discharger's risk of no more than

10% (from 'New Zealand Municipal Wastewater Monitoring Guidelines' NZWERF/MfE 2002)

2. The treated wastewater standards above are based on the ANZECC (2000) marine water trigger levels for 'slightly to moderately disturbed ecosystems' multiplied by a factor of 50 to allow for reasonable mixing (the 50:1 dilution contour extends approximately 400 meters from the outfall).

Table 1 below summarises the monthly heavy metal analysis for the effluent. While there were some slight fluctuations, all parameters were below their consent limits.

Analyte	Limit	Unit	Geomean	Min	Max	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Oil and Grease	n/a	n/a	5	4	9	5.00	5.00	5.00	8.20	9.00	5.00	4.00	5.00	4.00	5.00	4.00	4.00
Cyanide	0.2	mg/L	0.0115	0.005	0.034	0.005	0.005	0.005	0.005	0.005	0.012	0.010	0.015	0.013	0.034	0.017	0.012
Dissolved Arsenic	0.115	mg/L	0.00175	0.001	0.0024	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.002
Dissolved Cadmium	0.035	mg/L	0.00014	0.0000	0.0002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dissolved Chromium	0.22	mg/L	0.00162	0.00078	0.0056	0.001	0.001	0.001	0.002	0.006	0.001	0.001	0.002	0.001	0.002	0.001	0.001
Dissolved Copper	0.065	mg/L	0.00295	0.0005	0.0051	0.003	0.003	0.002	0.003	0.003	0.003	0.004	0.005	0.002	0.003	0.004	0.001
Dissolved Lead	0.22	mg/L	0.00035	0.00011	0.0005	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Dissolved Mercury	0.005	mg/L	0.00031	0.0000	0.0005	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Dissolved Nickel	0.35	mg/L	0.00165	0.0008	0.0052	0.003	0.001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Dissolved Zinc	0.75	mg/L	0.01405	0.007	0.025	0.025	0.014	0.011	0.017	0.008	0.008	0.012	0.012	0.007	0.019	0.025	0.011
Phenol	0.5	mg/L	0.009	0.002	0.02	0.002	0.010	0.020	0.002	0.004	0.010	0.010	0.010	0.010	0.010	0.010	0.010
pH	n/a		7.55833	6.8	8	7.60	7.70	7.60	7.60	7.50	8.00	8.00	7.50	7.50	7.80	7.10	6.80
Conductivity	n/a	mS/m	147.683	83.4	265	133	83.4	97.4	96.5	192	223	265	146	206	98.1	141	90.8
Nitrate-Nitrogen	n/a	mg/L	2.89333	0.01	5.21	4.78	3.05	4.62	5.16	3.50	4.00	0.03	2.24	2.06	5.21	0.01	0.06
Dissolved Reactive Phosphoru	n/a	mg/L	2.89	0.01	5.21	4.78	3.05	4.62	5.16	3.50	1.36	2.63	2.24	2.06	5.21	0.01	0.06
Ammonia Nitrogen	n/a	mg/L	19.0833	13.7	24.7	14.30	16.60	15.90	15.90	21.70	24.00	24.70	20.00	23.00	13.70	20.70	18.50
Total Phosphorus	n/a	mg/L	1.6945	0.76	3.95	0.90	1.12	1.29	0.76	3.95	1.76	2.87	1.56	1.15	1.65	1.45	1.87

Table 1: Effluent Heavy Metal and other compounds analysis

Condition (13)

The permit holder shall collect representative coastal water samples from knee deep water at the following locations, once each month for six months through November to April inclusive each year, for the duration of this permit:

Fitzroy Bay 400 m SE of outfall (R27:651.807)
Fitzroy Bay 100 m SE of outfall (R27:650.808)
Fitzroy Bay 100 m NW of outfall (R27:648.808)
Fitzroy Bay 400 m NW of outfall (R27:647.810)
Pencarrow Head at Lighthouse (R27:647.816)
Inconstant Point (R27:650.825)
Hinds Point (R27:655.839)

The water samples shall be analyzed for faecal coliform and enterococci bacteria.

Table 2 summarises the coastal water sampling from November 2022 to April 2023. In January 2023 the key fob to Burdens Gate was changed by HCC without notifying Wellington Water or Veolia and by the time the new key fob was obtained no samples were able to be obtained in that period.

	Fitzroy Bay 400m SE of Outfall		Fitzroy Bay 100m SE of outfall		Fitzroy Bay 100m NW of outfall		Fitzroy Bay 400m NW of outfall		Pencarrow Head at Lighthouse		Inconstant Point		Hinds Point	
Date	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms	Enterococci	Faecal Coliforms
	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
3/11/2022	1.8	1.8	1.8	3.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	9.1
29/12/2022	10	10	10	10	10	10	10	10	10	10	10	10	27	20
*****	The samples for January 2023 were not collected due to no access to the sites. The key for the gate to access Pencarrow was changed and Veolia was not provided with a key until 2 February 2023.													
9/02/2023	10	10	18	10	10	10	10	10	10	10	10	10	10	10
15/03/2023	10	10	20	100	10	10	10	10	10	10	10	10	10	10
27/04/2023	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Table 2: Coastal Water Sampling

Condition (14)

The permit holder shall collect three replicate composite samples of the green-lipped mussel (Perna canaliculus) from the near shore waters at each of the following location during February or March of every second year, for the duration of this permit: Fitzroy Bay 100 m NW of outfall (R27:648.808) Fitzroy Bay 400 m NW of outfall (R27:647.810) Pencarrow Head at Lighthouse (R27:647.816) The flesh of the mussel samples shall be analysed for arsenic and trace metal (cadmium, chromium, copper, mercury, lead, nickel and zinc) concentrations.

No green-lipped mussels were collected in this reporting period and no mussel species have been found in the locations stated by the consent.

In June 2023, Stantec published a report of their findings in relation to this condition concluding that mussel monitoring was no longer justified in their view. On 18th July 2023 GWRC advised Wellington Water that this condition could be removed via a S127 application. This is expected to be completed in the second half of 2023. A copy of Stantec's mussel report has been provided in Appendix VI.

Condition (18)

The permit holder shall provide to the Wellington Regional Council an annual monitoring report by 31 July each year summarising compliance with the conditions of this permit. This report shall include as a minimum:

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) Any reasons for non-compliance or difficulties in achieving compliance with the conditions of this permit;
d) Any measures that have been undertaken, to improve the environmental performance of the wastewater treatment and disposal system; and
e) Any other issues considered to be important;

Section (a)

Table 3 summarises the treatment plant data monitored from July 2022 to June 2023. The median, minimum and maximum values are tabulated for each parameter.

Parameter	Units	Geomean Limit	Minimum	Median	80th Percentile
WWTP Effluent Discharge	m^3	268,000	42,831	59,170	77,633
Daily Effluent BOD	g/m^3	50	3	8	15
Daily Effluent Suspended Solids	g/m^3	50	2	8	19
Daily Effluent Faecal Coliform	cfu/100mL	1,000	2	283	5,127

Table 3: Summary of Monitoring Results

Effluent BOD and suspended solids are expected to have less than minor effect in the receiving environment as these parameters were compliant for the whole reporting period.

In 2004, Cawthron Institute conducted an effluent dilution and dispersion study at the WWTP's main outfall at Bluff Point. They have concluded that 50:1 dilution can be achieved in receiving waters. Although the plant was not able to meet the required consent thresholds for faecal coliform for the majority of FY22/23, the effect to the environment would have been mitigated by the high dilution capability of the receiving waters. Using the 80th percentile value for faecal coliform of 5,127 cfu/100 mL and a background concentration of 1.8 cfu/100 mL, the expected receiving water faecal coliform concentration would be 103 cfu/100 mL for a 50:1 dilution scenario. This is lower than the beach bathing guideline limits for faecal coliform of 150 cfu/100 mL.

Section (b)

Below is the comparison of the effluent flow rates for the last five financial years.

WWTP Effluent Discharge Volume:

WWTP effluent discharge volume is used to establish a trend. In figure 5, it can be noted that the plant's effluent discharge volume is affected during wet weather.

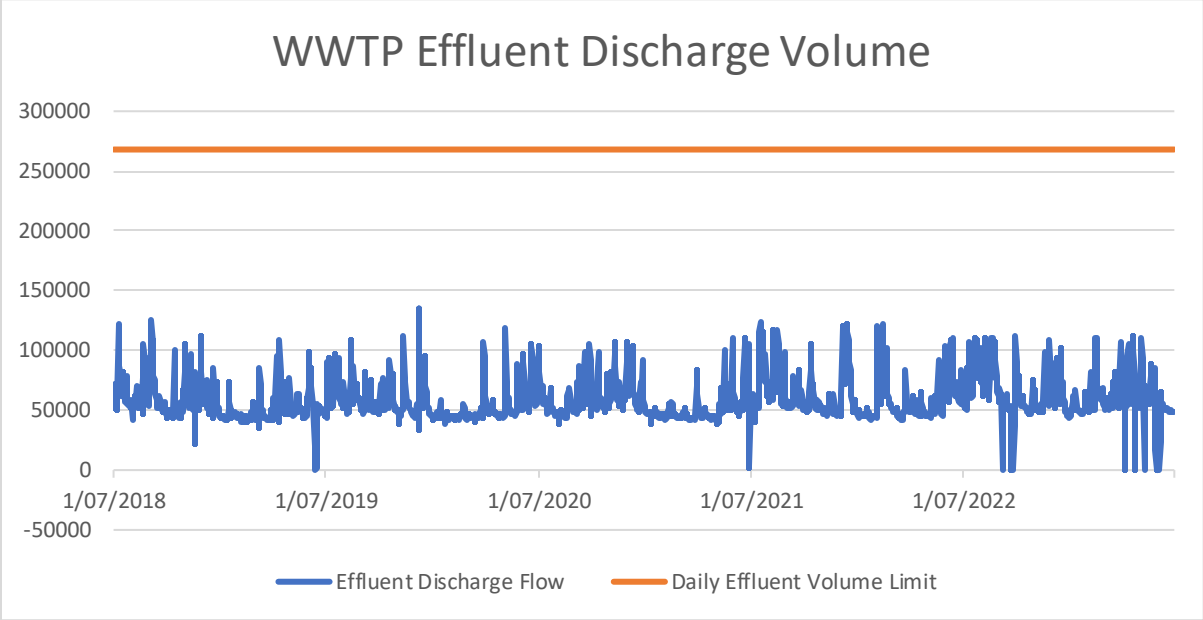


Figure 5: Effluent Discharge Flow

WWTP Effluent BOD_5:

To establish a trend, effluent BOD_5 90-day rolling geometrical mean and 80th percentile in the last five financial years has been used. The plant is below the compliance limits.

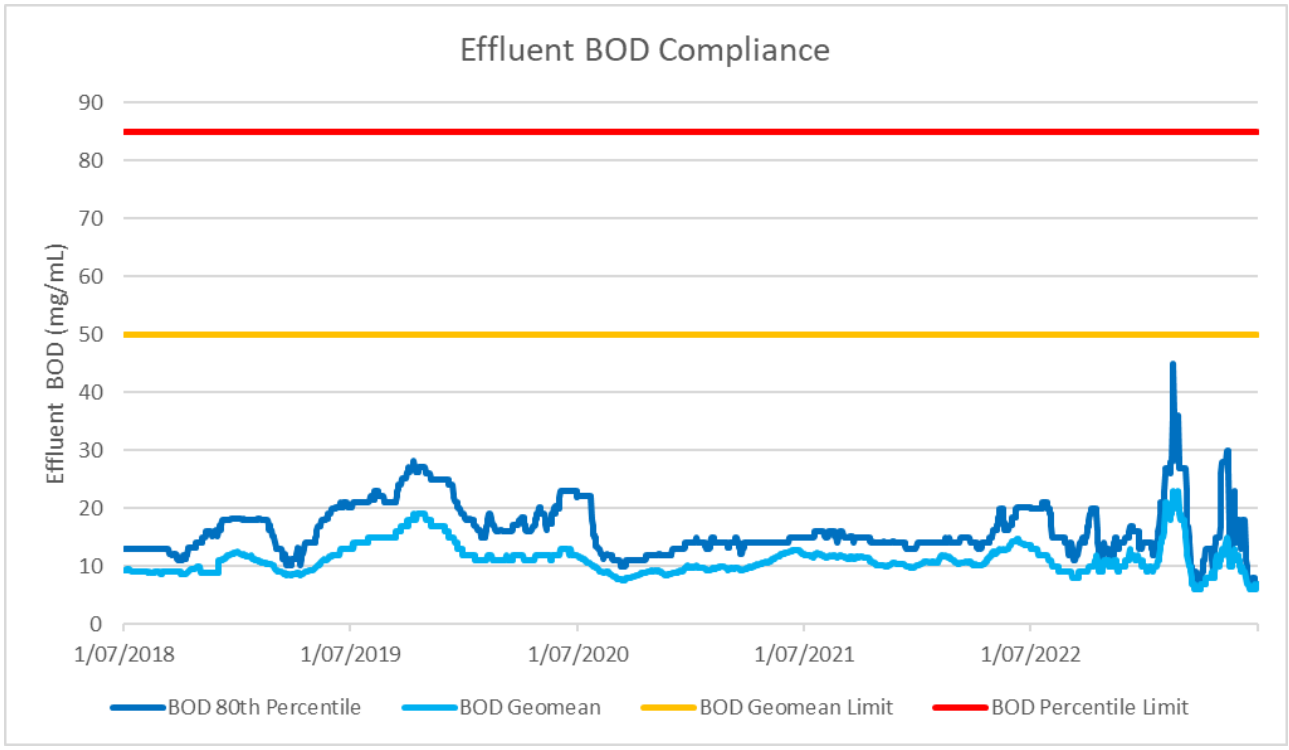


Figure 5: Effluent cBOD5 Compliance

WWTP Effluent Suspended Solids:

To establish a trend, effluent suspended solids 90-day rolling geometrical mean and 80th percentile in the last five financial years has been used. The plant is below the compliance limits.

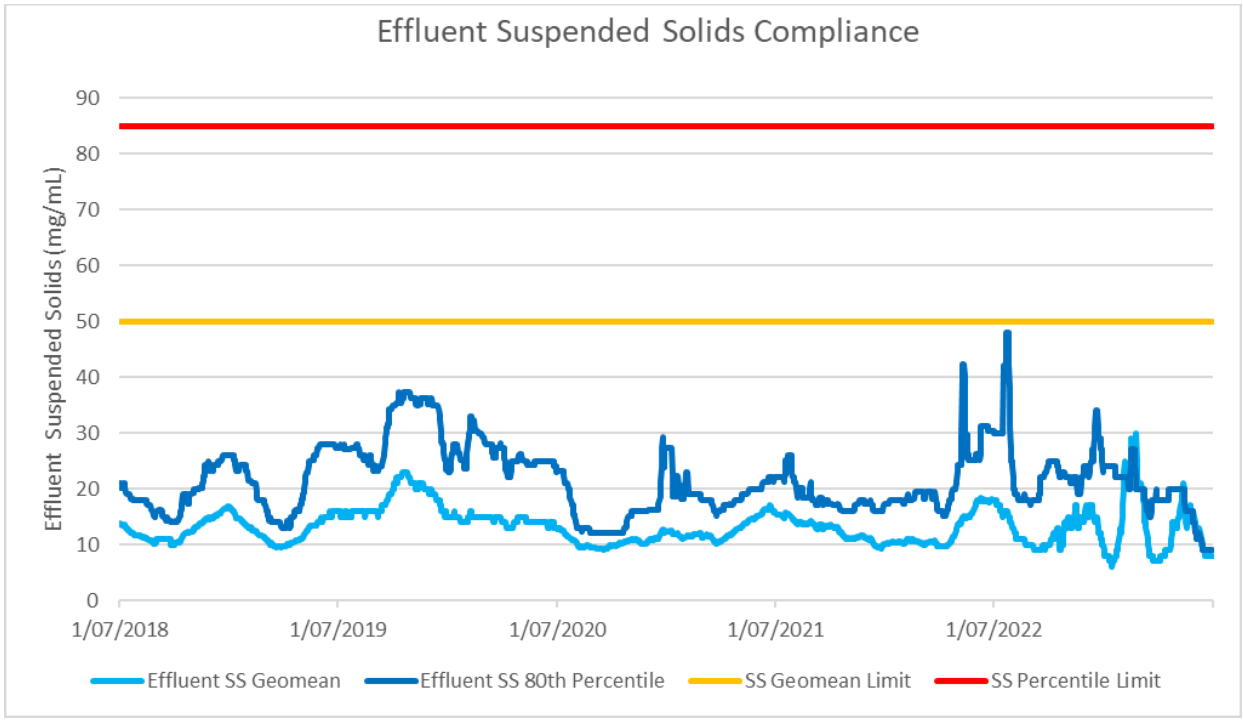


Figure 6: Effluent Suspended Solids Compliance

To establish a trend, effluent faecal coliform 90-day rolling geometrical mean and 80th percentile in the last five financial years has been used. The plant experienced exceedances in the last three summer periods. The exceedances in FY2020/21 were due to inefficiencies in the UV system due to aging UV lamps, while exceedances in FY2021/22 were due to algae fouling of the UV lamps in the UV system. A similar issue was experienced during the summer of FY2022/23, although at a reduced level.

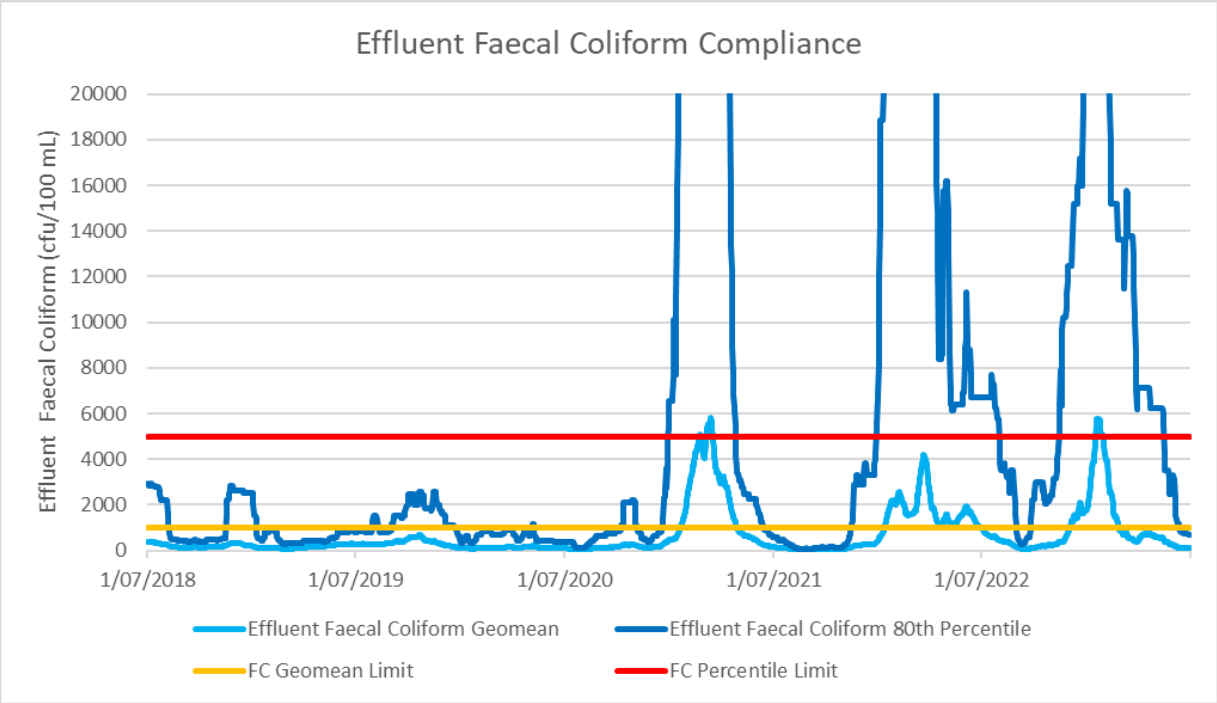


Figure 7: Effluent Faecal Coliform Compliance

On November 17th 2022, the plant operators notified Wellington Water of a strong petrochemical odour detected within the drier room of the plant, resulting in a precautionary temporary shutdown. This petrochemical contamination had a significantly negative impact the performance of the treatment process, especially the UV system. The HCC Trade Waste Team traced the contamination to a nearby industrial site. This issue contributed to the delay in the treatment moving back into compliance limits for faecal coliforms which did not occur until 16 May 2023.

Table 4 below shows the statistical analysis of the analyte monitoring requirements as stated in schedule 11. The values are well below the limits throughout FY2022/2023.

Analyte	Limit	Unit	Geomean	Min	Max
Oil and Grease	n/a	n/a	5	4	9.00
Cyanide	0.2	mg/L	0.0115	0.005	0.034
Dissolved Arsenic	0.115	mg/L	0.00175	0.001	0.0024
Dissolved Cadmium	0.035	mg/L	0.00014	0.0000	0.0002
Dissolved Chromium	0.22	mg/L	0.00162	0.00078	0.0056
Dissolved Copper	0.065	mg/L	0.00295	0.0005	0.0051
Dissolved Lead	0.22	mg/L	0.00035	0.00011	0.0005
Dissolved Mercury	0.005	mg/L	0.00031	0.0000	0.0005
Dissolved Nickel	0.35	mg/L	0.00165	0.0008	0.0052
Dissolved Zinc	0.75	mg/L	0.01405	0.007	0.025
Phenol	0.5	mg/L	0.009	0.002	0.02
pH	n/a		7.55833	6.8	8
Conductivity	n/a	mS/m	147.683	83.4	265
Nitrate-Nitrogen	n/a	mg/L	2.89333	0.01	5.21
Dissolved Reactive Phosphorus	n/a	mg/L	2.89	0.01	5.21
Ammonia Nitrogen	n/a	mg/L	19.0833	13.7	24.7
Total Phosphorus	n/a	mg/L	1.6945	0.76	3.95

Table 4: Heavy metals and other monitoring compounds statistical analysis.

Table 5 below is the statistical analysis of the analyte monitoring requirements for coastal water sampling. The results are consistent throughout FY2022/2023.

Location	Analyte	Unit	Geomean	Min	Max
Fitzroy Bay 400m SE of Outfall	Enterococci	cfu/100ml	8.36	1.8	10
Fitzroy Bay 400m SE of Outfall	Faecal Coliforms	cfu/100ml	8.36	1.8	10
Fitzroy Bay 100m SE of outfall	Enterococci	cfu/100ml	11.96	1.8	20
Fitzroy Bay 100m SE of outfall	Faecal Coliforms	cfu/100ml	26.72	3.6	100
Fitzroy Bay 100m NW of outfall	Enterococci	cfu/100ml	8.36	1.8	10
Fitzroy Bay 100m NW of outfall	Faecal Coliforms	cfu/100ml	8.36	1.8	10
Fitzroy Bay 400m NW of outfall	Enterococci	cfu/100ml	8.36	1.8	10
Fitzroy Bay 400m NW of outfall	Faecal Coliforms	cfu/100ml	8.36	1.8	10
Pencarrow Head at Lighthouse	Enterococci	cfu/100ml	8.36	1.8	10
Pencarrow Head at Lighthouse	Faecal Coliforms	cfu/100ml	8.36	1.8	10
Inconstant Point	Enterococci	cfu/100ml	8.36	1.8	10
Inconstant Point	Faecal Coliforms	cfu/100ml	8.36	1.8	10
Hinds Point	Enterococci	cfu/100ml	11.76	1.8	27
Hinds Point	Faecal Coliforms	cfu/100ml	11.82	9.1	20

Table 5: Coastal Water Monitoring statistical analysis

Section (c)

The plant was non-compliant for the faecal coliform requirements during this consent period.

In summary the non-compliance was caused by reduction of UV disinfection effectiveness due to the following reasons:

- Failure of a post-UV weir gate drive early in the FY22/23 that affected accurate level control and hindering the disinfection effectiveness of the UV system
- Supply chain issues delayed procurement of replacement parts to allow the post-UV weir gate to be repaired early 2023
- A failed ballast was identified in the UV system and replaced in December 2022
- Significant wet weather events elevate faecal coliform levels
- In November 2022, a large petrochemical contamination entered the plant from the catchment and negatively impacted the treatment process, especially the UV system
- Algae build up around UV lamps

Section (d)

Veolia/Stantec/Wellington Water held a series of process workshops prior to and during the summer period to optimise the treatment process and mitigate any potential algae issues from the previous summer periods.

GWRC approved a S127 application in February 2023 to dose chlorine in the clarifiers to mitigate the algae build up and improve the faecal coliform results. This chlorine dosing ceased on 30th April 2023. The plant moved back into full compliance for faecal coliform parameters on 16 May 2023.

Section (e)

A record of non-compliance notices received for FY2022/23 is recorded below.

Month Issued	Facility	Non-compliance Notice	Description
September 2022	Seaview WWTP	Abatement Notice 1026	Non-compliant effluent quality (RMA Section 15 (1)(a)); Non-compliant effluent quality. Separate notices were given to Veolia, HCC and UHCC
September 2022	Seaview WWTP	Infringement Notice IN	Non-compliant effluent quality (RMA Section 15 (1)(a)); Non-compliant effluent quality (Abatement Notice A1026). Separate notices were given to Veolia, HCC and UHCC

April 2023	Seaview WWTP	Infringement Notice IN902	Non-compliant effluent quality (RMA Section 15 (1)(a)); Non-compliant effluent quality (Abatement Notice A1026). Separate notices were given to Veolia, HCC and UHCC
April 2023	Seaview WWTP	Infringement Notice IN903	Non-compliant effluent quality (Abatement Notice A1026). Separate notices were given to Veolia, HCC and UHCC
April 2023	Seaview WWTP	Infringement Notice IN910	Unauthorised Odour (RMA Section 15(1)(c)). Separate notices were given to Veolia, HCC and UHCC
April 2023	Seaview WWTP	Infringement Notice IN911	Unauthorised Odour (Abatement Notice A956). Separate notices were given to Veolia, HCC and UHCC

Table 6: List of non-compliance notices

Condition (19)

The permit holder shall take reasonable steps to investigate ways and means of minimizing infiltration and stormwater ingress into the sewerage system and provide the Manager, Environmental Regulation, Wellington Regional Council, with an annual report by 31 July on progress.

A report for inflow and infiltration can be found in Appendix II: Inflow and Infiltration Report.

Condition (20)

The permit holder shall take reasonable steps to monitor and manage trade waste inflows into the sewerage system so as to minimize the risk of disruption to the wastewater treatment process. The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council, with an annual report on trade waste which summarises issues arising and actions taken by 31 July.

A report regarding the trade waste can be found in Appendix III: HCC Trade Waste Report 2022 – 2023.

Condition (22)

The permit holder shall submit an annual report for the main outfall pipeline, which addresses activities undertaken during the previous year, to the Manager, Environmental Regulation, Wellington Regional Council, by 31 July each year. This report shall include, but not be limited to, the following elements:

(a) Details of works (including any repairs and replacements) undertaken during the past year; and

(b) Collation and assessment of the results of any environmental monitoring undertaken during the year.

Section (a)

The record of outfall maintenance and repair can be found in the table below:

Start date	End date	Type of repair	Shutdown required ?	Location of the Leak Repair
22/9/22 08:00am	28/9/22 10:00pm	Unplanned/Permanent	Yes	256 Muritai Road, Eastbourne
15/12/22 08:00am	15/12/22 17:00pm	*Unplanned/Temporary	No	MH25, 1km south of Burdans Gate
29/5/23 08:00am	7/6/23 13:00pm	Planned/Permanent	Yes	MH25, 1km south of Burdans Gate

Table 7: Outfall Maintenance

*The leak on 15/12/22 was minor and the decision was made to carry out a temporary repair that didn't require a outfall pipeline shut down. A drainage trench was dug to soak the minor leakage which proved very successful. The temporary repair ensured public use of the surrounding waterbody during peak-time summer continued as the Christmas period approached. The planned works for the repair were carried out between May/June 2023, as per the consent. This permanent repair required the pipeline to be shut down, with confined space entry by the contractor to install new AMEX rubber seals on the leaking joint.

PLANNED WORKS ON MOP FOR 2023/24

There are no planned repair works scheduled for the 2023/24 period as at the time of this report being written.

Section (b)

A complete list of all the analytical results can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream. Note this is DRAFT as at 31 July 2023 and expected to be confirmed FINAL in the first week of August 2023.

WGN120142 [33406]

Condition (4)

The consent holder shall establish a consultation group by 1 March 2013 of within a longer timefr ame approved by the Manager, Environmental Regulation, Wellington Regional Council. As a minimum the group shall be made up of those individuals/community groups that submitted on this consent who wish to participate and interested persons put forward by those submitters who wish to participate.

The functions of the consultation group is to provide:

- Comment on the Public Notification Strategy required by condition 5 of this consent
- Comment on the Overflow Contingency Plan required by condition 22 of this consent
- Comment on the option assessment report required by condition 26 of this consent directly to Wellington Regional Council, and
- Be a line of communication between the consent holder, the submitters, and the wider community for the duration of the consent

The consent holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of the establishment of consultation group by 1 March 2013.

Note 1: The consultation group is considered "established" when the consent holder has collated contact details for all submitters/interested persons joining the group, and the group has been provided with a plan of how the consultation process will be facilitated.

Note 2: The consultation group is not a decision making group, but is a forum for the dissemination of information from the consent holder and provides and opportunity for the group to comment on consent compliance and the development of specific plans.

Note 3: The consultation group is expected to provide comments to the consent holder within two weeks of being sent information/plans to review.

Note 4: The need for and the frequency of the meetings shall be determined by the consultation group following the receipt of the reports/plans received in accordance with this condition.

The Seaview WWTP CLG meeting took place on 28th March 2023 at the Wellington Water Head Office in Petone. The presentation on the evening was also provided to the community members along with the minutes to all attendees and to those that were unable to attend.

Condition (9)

The consent holder shall monitor the flow rate, duration and total volume of all overflows discharged from the treatment plant into the Waiwhetu Stream and shall report the results to Wellington Regional Council in accordance with condition 25 of this consent, or upon request.

The flow monitoring devices shall be capable of measuring wastewater flows of magnitudes up to and beyond peak instantaneous flow rates, and calibrated and maintained to ensure that the measurement error is no more than +/- 10%.

The following Table 8 is a summary of the flow rates, duration, and total volume of overflow discharges from the Seaview WWTP to the Waiwhetu Stream:

Date	Duration	Volume	Mean Flow	Peak Flow	Consented	Comments
	hrs/mins	m^3	L/s	L/s		
08 Jul 2022	84hr 09m	66,514	468	12,145	Y	Wet Weather
12 Jul 2022	44hr 06m	47,470	632	1,364	Y	Wet Weather
17 Jul 2022	00hr 36m	1,178	545	1,511	N	Dry weather. Instrumentation failure within the plant
19 Jul 2022	93hr 14m	123,690	4,575	2,396	Y	Wet Weather
25 Jul 2022	20hr 49m	11,257	385	918	Y	Wet Weather
31 Jul 2022	16hr 37m	27,104	584	2,325	Y	Wet Weather
08 Aug 2022	65hr 34m	93,142	565	2,069	Y	Wet Weather
18 Aug 2022	104hr 25m	157,273	781	1,970	Y	Wet Weather
26 Aug 2022	20hr 36m	10,623	387	673	Y	Wet Weather

22 Sep 2022	163hr 22m	370,536	682	1,703	Y	Dry weather. Main outfall maintenance due to a leak at 256 Muritai Road, Eastbourne.
29 Sep 2022	24hr 10m	38,789	511	1,372	Y	Wet Weather
03 Nov 2022	03hr 19m	6,133	511	699	N	Discharge of undisinfected effluent to CMA due to power surge. Please note there was no discharge to the Waiwhetu Stream.
19 Nov 2022	66hr 37m	33,204	480	1,441	Y	Wet Weather
27 Nov 2022	41hr 01m	88,938	638	1,868	Y	Wet Weather
09 Dec 2022	25hr 28m	21,606	533	1,225	Y	Wet Weather
18 Dec 2022	17hr 17m	9,852	303	697	Y	Wet Weather
14 Feb 2023	84hr 09m	150,199	609	1,372	Y	Wet Weather
23 Feb 2023	00hr 11m	263	365	406	N	Dry weather. a power outage at Seaview WWTP by 14:30. UV system went off and undisinfected effluent was discharged into the Waiwhetu stream
02 Mar 2023	00hr 08m	29	96	170	N	Dry weather. Electrical failure within the plant
14 Mar 2023	00hr 07m	20	42	182	N	Dry weather. Power outage
28 Mar 2023	28hr 32m	18,409	320	1,059	Y	Wet Weather
30 Mar 2023	05hr 14m	1,818	365	822	Y	Wet Weather
10 Apr 2023	55hr 58m	11,650	58	3,001	Y	Wet Weather
19 Apr 2023	39hr 47m	66,924	467	3,000	Y	Wet Weather
04 May 2023	44hr 40m	52,089	584	1,124	Y	Wet Weather
29 May 2023	229hr 55m	578,486	761	1,881	Y	Permanent repair to Main Outfall Pipeline undertaken.

Table 8: Discharges to the Waiwhetu Stream

Condition (10)

The consent holder shall install, commission and operate a flow sensor as close as practicable to the discharge point in the Waiwhetu Stream by 1 August 2013 to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council that is capable of continuously monitoring and logging flow in the stream during a discharge event. Note: It is recommended that the design, specification and operation of the flow sensor are discussed with Greater Wellington Flood Protection and Environmental Monitoring and Investigation Departments prior to installation.

The Waiwhetu River flow rates were submitted to GWRC as trends in the discharge notifications. The average, minimum, and maximum flow rates of the Waiwhetu Stream are included in every discharge report.

Condition (11)

The consent holder shall take a grab sample of treated wastewater as it leaves the treatment plant prior to entering the overflow pipe each day that a discharge occurs for more than one hour. The sample shall be analyzed for parameters specified in condition 14.

A complete list of all the analytical results can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

Condition (12)

Each day a discharge occurs and one day after the cease of a discharge the consent holder shall take representative grab samples of Waiwhetu Stream water at ~~two levels in the water column, namely 0.5 centimetres and~~ 15 centimetres below the surface. The samples shall be collected from the true left bank of the Waiwhetu Stream at locations specified in Table 1.1:

Table 1.1 Water quality monitoring locations

Site	NZTM	
	Easting	Northing
Immediately upstream of the port Road Bridge	1759345	5433136
Adjacent to the Waiwhetu Pa site and downstream of the public walkway	1759539	5433352
Immediately downstream of the Bell Road Bridge	1760431	5433523

The consent holder shall record the date, time (NZ standard time), weather (in particular wind direction and strength) and tidal conditions (low/medium/high and ebb/flood tide) at the stream mouth when the samples are taken. Where practicable, the sampling should be undertaken at least three house after any ebb tide starts.

Note: This condition does not apply to overflows with a duration of less than one hour.

An assessment was performed on the overflow discharges of treated wastewater from the Seaview treatment plant to the Waiwhetu Stream during wet weather events. The report contains a map of the sampling sites and all the environmental conditions at the time of sampling. A copy of the report can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

Condition (14)

The samples collected in accordance with conditions 11 and 12 shall be analyzed for:

- Faecal Coliforms (cfu/100mL)
- Carbonaceous Biochemical Oxygen Demand (g/m^3)
- Enterococci(no./100mL)
- Escherichia coli (no./100mL)
- Dissolved Reactive Phosphorus (g/m^3)
- Ammoniacal Nitrogen (g/m^3)
- Nitrate Nitrogen (g/m^3)
- Nitrite Nitrogen (g/m^3)

In addition, on each sampling occasion at the three locations along the Waiwhetu Stream as described in condition 12 the consent holder shall ensure the following in-situ measurements are recorded:

- Water temperature
- pH
- Salinity, and
- Dissolved oxygen.

An assessment of the above results shall be provided in the annual report required by condition 25. Copies of the water quality monitoring results shall be provided in both electronic and hardcopy format to the Manager, Environmental Regulation, Wellington Regional Council upon request.

A complete list of all the analytical results can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

Condition (15)

(a) The discharge shall not result in any of the following effects on the water of the Waiwhetu Stream beyond the reasonable mixing zone boundary defined as 100m downstream of the Waiwhetu Stream outfall (i.e. immediately upstream of Port Road Bridge) and 100m upstream the Waiwhetu Stream outfall (i.e. adjacent to Lot 2 DP 421395):

1) The product of any conspicuous oil or grease or grease films, scums or foams or floatable or suspended materials, or
2) Any conspicuous change in colour or clarity
3) Any emission of objectionable odour, or
4) Any significant adverse effects on aquatic life

(b) During each sampling event required by condition 12, the consent holder shall take photographs of the point of discharge and immediate receiving waters around the point of discharge to shower the presence of any of effects (1-4) listed in condition 15 (a) and any obvious undesirable biological growths or visible die-offs. The consent holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of the photographs in the annual report required by condition 25 of this consent or upon request.

All photographs were submitted to GWRC as part of the quarterly resource consent compliance reports. Please refer to the following documents:

Wastewater Project – Resource Consent Compliance Report: July – September 2022/2023
Wastewater Project – Resource Consent Compliance Report: October – December 2022/2023
Wastewater Project – Resource Consent Compliance Report: January – March 2022/2023

Appendix V: Photographs of Discharge to Waiwhetu Stream April, May, June (2023)
(please note due to file size these were sent as a separate attachment in the email)

Condition (16)

The consent holder shall keep a record of any complaints received. The record shall contain the following details, where practicable:

- Name and address of complaint (if provided)
- Identification of the nature of the complaint
- Date and time of the complaint and of the alleged event
- Weather conditions at the time of alleged event, and
- Any measures taken to address the cause of the complaint

The consent holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this consent, within 24 hours of being received by the consent holder or the next working day.

Notification can be sent to the Manger, Environmental Regulation, Wellington Regional Council at notifications@gw.govt.nz. Please include the consent reference WGN120142 [31523] and the name and phone number of a contact person responsible for the discharge. The consent holder shall forward to the Manger, Environmental Regulation, Wellington Regional Council a copy of the complaints record, in the annual report required by condition 25 of this consent.

There were no complaints recorded related to the effluent discharge of Seaview WWTP.

Condition (20)

The results of the monitoring required by the TWVMP, shall be reported to the Manager, Environmental Regulation, Wellington Regional Council, on an annual basis, by 1 August, once the TWVMP has been approved. The assessment of the monitoring results shall be undertaken by a suitably qualified person that is to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

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

- The results of all monitoring undertaken under the TWVMP
- A discussion of the likely impact the discharges are having/had on the cultural values of the waterbody including cumulative effects, if possible
- A comparison of these results with any previous monitoring undertaken in accordance with the TWVMP
- Any recommendations for changes to the TWVMP (e.g. indicator species, monitoring sites), and why
- Any recommendations for mitigation and minimizing the impact of the discharges on cultural values of the waterbody, if possible
- Copies of any comments on the monitoring results that have been received from the organisations included in condition 18, and
- Any other relevant information

The report shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

A copy of the TWVM report shall be provided to the Te Runanganui o Taranaki Whanui kit e Upoko o te Ika Maui, Port Nicholson Block Settlement Trust and the Wellington Regional Council.

Development of the TWVMP has been delayed. GWRC needs to provide further information for this to proceed.

Condition (23)

The consent holder shall investigate and implement ways and means of reducing stormwater infiltration and inflow (I&I) into the sewerage system with the aim of minimising overflow discharges. Investigations shall include but no be limited to:

- CCTV and pressure testing monitoring to identify faulty mains requiring replacement, and
- Flow monitoring and system assessment to identify the sources of inflow and infiltration, system performance and options to reduce the infiltration and inflow

The investigations and works undertaken to redue I&I shall be reported on in the annual report required by condition 25.

An update regarding infiltration and inflow can be found in Appendix II: Inflow and Infiltration Report.

Condition (25)

The consent holder shall prepare and submit comprehensive annual report to the Manager, Environmental Regulation, Wellington Regional Council, Regional Public Health and members of the consolation group as required by condition 4 of this consent by 1 August each year (covering the year 1 July to 30 June). The annual report shall include as a minimum:

- A summary of overflow events (including dates, volumes discharged, duration and cause)
- A summary of consolation group involvement
- The flow monitoring results (carried out under conditions 9 and 10 of this consent)
- The treated wastewater and water quality monitoring results (carried out under conditions 11 and 12 of this consent)
- A critical evaluation by an appropriately qualified and experienced scientist of the previous years monitoring results, in particular the environmental effects of each overflow discharge event. This evaluation shall utilize the treated wastewater and stream quality and flow monitoring data for each overflow event comparing the data against relevant environmental guidelines
- Photographs from the visual inspections undertaken under condition 15(b) of this consent
- Complaints record as required by condition 16
- Summary of II investigations, and work undertaken to reduce I&I into the sewerage network as required by condition 23
- Summary of investigations undertaken, a list of investigations scheduled for the upcoming year (required by condition 24), and timeframes for implementation of any upgrades and/or consent applications, and
- Any other matters the consent holder considers relevant.

The report shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

An assessment was performed on the overflow discharges of treated wastewater from the Seaview Treatment Plant to the Waiwhetu Stream. The majority of the reporting requirements are contained within that report. A copy of the report can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

Other reporting requirements not found in the Stantec report can be found under the various conditions of resource consent WGN 120142 [33406].

WGN 120142 [33407]

The permit allows the temporary discharge of treated wastewater to the coastal marine area, and onto land where it may enter streams or the coastal marine area from:

- Planned repairs
- Unplanned repairs
- Leaks associated with temporary repairs and
- Minor leaks

In relation to the main outfall pipeline from Seaview WWTP to Pencarrow Head.

Please see Table 7 for the records of outfall maintenance.

Condition 30

The consent holder shall prepare and submit a comprehensive annual report to the Manager, Environmental Regulation, Wellington Regional Council and Regional Public Health and members of the consultation group as required by condition 10 of this consent by 1 August each year (covering the year 1 July to 30 June). The annual report shall include as a minimum:

•A detailed summary of repairs undertaken on the pipeline in the last twelve months (i.e. planned and unplanned repair work) including detail on the length and location of repairs and any associated monitoring
•Repair work planned for the upcoming year
•The condition of temporary repairs made on the pipeline and programme for permanent repair
•A critical evaluation by an appropriately qualified and experienced scientist of the previous years monitoring results, in particular the environmental effects of each discharge event. This evaluation shall utilise the treated wastewater and water quality data, comparing the data against relevant environmental guidelines
•Summary of consultation group involvement
•Photographs of scour valves (required by condition 17 (b)) accompanied by field observations or comments as appropriate
•The complaints record (required by condition 22)
• Summary of investigations undertaken, a list of investigations scheduled for the upcoming year (required by condition 28), and timeframes for implementation of any upgrades and/or consent applications, and
•Any other matters the consent holder considers relevant

The report shall be to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

A copy of assessment of the discharges due to outfall maintenance can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

WGN120142 [33408]

To temporarily discharge treated wastewater from the Seaview WWTP to the Waiwhetu Stream when the main outfall pipeline is being repaired.

Please see table 7 for the records of outfall maintenance for FY2022/2023.

Condition 35

The consent holder shall prepare and submit a comprehensive annual report to the Manager, Environmental Regulation, Wellington Regional Council, Regional Public Health and the consultation group as required by condition 7 of this consent by 1 August each year (covering the year 1 July to 30 June). The annual report shall include as a minimum:

- A summary of overflow events (including dates, volume discharged, tidal conditions during discharges, the discharge duration and cause)
- Flow monitoring results (carried out under conditions 12 and 13 of this consent);
- Treated wastewater and water quality monitoring results (carried out under conditions 14 and 15 of this consent)
- Summary of consultation group involvement
- A critical evaluation by an appropriately qualified and experienced scientist of the previous years monitoring results, in particular the environmental effects of each overflow discharge event. This evaluation shall utilise the treated wastewater and stream water quality and flow monitoring data for each discharge event comparing the data against relevant environmental guidelines
- Photographs from the visual inspections undertaken under condition 18 (b) of this consent

The overflow flow rate, duration, and total volume can be found in Table 8: Seaview WWTP Discharge Events to Waiwhetu Stream under WGN120142 [33406], Condition (9).

A copy of assessment of the discharges due to outfall maintenance can be found in Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

WGN950162 (01)

Condition (16)

The consent holder shall keep a record of any complaints received. The complaints shall be forwarded to the Manager, Consents Management within twenty-four hours of being received by the consent holder. The consent holder shall endeavour to record the complainants name, time of incident that caused the complaint, wind direction and speed and plant operating conditions at the time of the complaint. Any incident that could have caused or has caused adverse effects on the environment at or beyond the boundary of the site shall be notified to the Wellington Regional Council within twenty-four hour. This includes any incidents that result in complaints.

On 23 December 2022, GWRC sent a 'Please Explain' request to Wellington Water for odour complaints in November and December. A response was provided via email on 23 January 2023.

Table 9 below summarises odour complaints received by the plant for this reporting period.

Date	Notifier	*Wind speed/Direction (km/h)	Details	Actions Taken
6/07/2022	Member of the community	15/SE	Call received by Veolia's operations manager via phone call Wellington Water on 6/07/2022	An odour assessment was undertaken by Veolia staff. No odor was detected at Seaview rd, Gough St, nor Waterman St
29/08/2022	Member of the community	13/S-SE	Strong smell from Southern landfill on Hawkins Road, from the wind turbine to the Southern thread Rd intersection	Veolia informed and investigated, plant under normal operating conditions.
24/09/2022	Member of the community	30/S	I drove toward the treatment plant from Morea Direction to Eastbourne. I detected the smell of the dried material initially at the large seaview roundabout and even stronger at the smaller roundabout. I was in my car so didn't check wind conditions. The smell lasted in my car right down seaview road. I am very familiar with the drier smell having investigated and subsequently abated the SWWTP for O & O odours in response to when the drier did load outs onto the concrete beneath the drier. This is corroborated by the notification the EPRO inbox received at approx. 10.24 am (though call received at 10am) by a nearby business owner in Gough Street who notified that the WWTP was a very strong smell (could almost be tasted – refer Transaction 23035.	Veolia informed and investigated, plant under normal operating conditions.
26/09/2022	Member of the community	7/S	I was driving from Eastbourne towards Moera and detected the smell into my car at approximately the waste transfer station on Seaview Road. At the roundabout between Seaview Road and Parkside road, the odour was really strong and again, the drier smell. It took me turning into Bell Road until to get the odour out of my car.	Veolia informed and investigated, plant under normal operating conditions.

24/09/2022	Member of the community	30/S	Odour complaint: Treatment plant close to this business the odour is excessive and his clients feel like they can taste the sewerage in their mouths. He has had many customers come in to use the toilets cause of this odour.	Veolia informed and investigated, plant under normal operating conditions.
17/10/2022	GWRC	30/N	Veolia notified through GWRC. Compliance officer performed odour assessment and noted odour beyond the boundary.	Odour survey completed by Veolia operator around the boundary of the site
22/11/2022	Member of the community	32/ NW	Just letting you know that at 8:50am today we received a notification of offensive odour from a concerned citizen sitting outside and having a coffee at Miss Fortunes café. I am currently the GWRC officer on duty but was not able to attend immediately. I arrived on site and did an odour assessment at 9:45pm and though I did not smell any strong odour I did get some faint whiffs when the wind blew right.	Veolia informed and investigated, plant under normal operating conditions.
9/12/2022	Member of the community	15/NE	Very strong sewage smell that has worsened with the rain, they've been noticing it all	Veolia informed and investigated, plant under normal operating conditions.
19/12/2022	Veolia	28/SE	Veolia received an odor complaint on 19/12/2022 morning. The odor complaint details were not forwarded to Veolia, so the time and location of the complaint are unknown. An initial fishy smell was noticed by the main entrance just for a couple of seconds, but it is odd for this area. As we walked around Seaview rd, some odor could be noticed by the Seaview road @ Gough st roundabout. It seems that the odor blaster was dragging some odor from the plant.	Veolia received an odor complaint on 19/12/2022 morning. The odor complaint details were not forwarded to Veolia, so the time and location of the complaint are unknown. An initial fishy smell was noticed by the main entrance just for a couple of seconds, but it is odd for this area. As we walked around Seaview rd, some odor could be noticed by the Seaview road @ Gough st roundabout. It seems that the odor blaster was dragging some odor from the plant. No odor was detected by the Southern end of the plant.

22/12/2022	Wellington Water	15/S	The caller mentioned that the smell was coming from 8 Waterman Street, Seaview, Lower Hutt 5010 (sewer treatment plant, seaview). They described the smell as 6/6, making people want to feel sick.	Veolia informed and investigated, plant under normal operating conditions.
17/01/2023	Wellington Water	32/N	The caller mentioned that they noticed a very strong smell about 15 mins ago (at 11:15am) coming from the wastewater treatment plant on port road Seaview.	Veolia informed and investigated, plant under normal operating conditions.
18/01/2023	GWRC	22/SW	Client is complaining about the smell emanating from the seaview sewerage plant	Veolia informed and investigated, plant under normal operating conditions.
19/01/2023	GWRC	6/SE	Odour complaint coming from Seaview Waste Water Treatment Plant Which one of these does it smell like the most? Faeces/sewage On a scale of 1 to 6 how bad is it? 6 When did you first start smelling it and for how long? 19/01/2023 - 2 hours ago. If there is a southerly wind, the smell comes at the same time every night Where are you/were you when you smelt it? At her property (Bell Road, Waiwhetu, Lower Hutt 5010) Where do you think it's coming from? Seaview Waste Water Treatment Plant Is there anything that would make it unsafe for a duty officer to visit?	Veolia informed and investigated, plant under normal operating conditions.
20/01/2023	Member of the community	37/N	Hi. The wastewater treatment stinks. It's smells right through Gracefield and Moera. This has been complained about for years and nothing is being done fix the problem. What is being done to fix this shit-uation? Why do rate payers of Lower Hutt have to put up with this. Is there a plan to sort this out? Asking us to complain when you know there is a problem is stupid. The problem Is well known and should just be fixed. I feel like nothing is being done to fix this issue. I'm guessing nothing will get done because it doesn't involve cycle	Veolia informed and investigated, plant under normal operating conditions.

			lanes and ev chargers. Which seems to be your top priority Chris 021 068 5792	
31/01/2023	Member of the community	11/S-SW	"Seaview treatment plant smell 5/6""	Veolia informed and investigated, plant under normal operating conditions.
9/02/2023	GWRC	26/S-SE	objectionable and offensive odour was occurring beyond the boundary	Veolia informed and investigated, plant under normal operating conditions.
4/03/2023	Veolia	15/S	No further information given	Odour survey completed by Veolia operator around the boundary of the site
5/03/2023	Veolia	17/S-SE	No further information given	Odour survey completed by Veolia operator around the boundary of the site
10/03/2023	GWRC	17/N	Hi Letting you know I received an odour notification about the Seaview WWTP on 10 March. The notification came in at 6:20pm but due to technical difficulties we didn't receive it until 5pm on 11 March. Described as sewage smell, 5/6.	Complaint came in day later so no odour survey done. Plant under normal operating conditions at time.
23/03/2023	Wellington Water	20/SW	Email from Blair to Nico: Hi Nico, We've had an odour complaint for Seaview. It was yesterday, no time given, but located at Seaview Roundabout.	Veolia informed and investigated, plant under normal operating conditions.

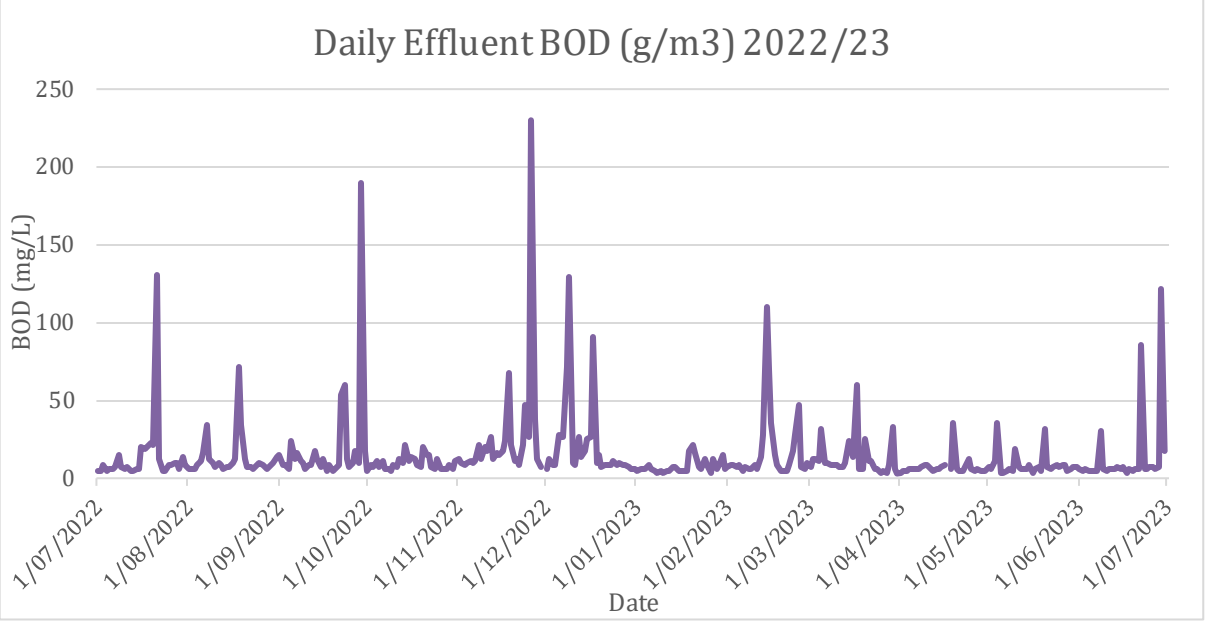
			Was there anything unusual occurring at the plant yesterday that might explain the source of the “stench”?	
1/05/2023	Wellington Water	6/S	Disgusting smell in Gracefield/Waiwhetu today. Could be smelt all down Bell Road and at Gracefield School. It is unacceptable and coming from the sewerage plant in Seaview. Not sure how long we have to keep reporting this for action to be taken, spraying chemicals to cover the smell is not working and is a health hazard. Please contact to confirm next steps.	Hi Joemar,The Seaview plant is operating normally and the Dryer is not operating today. I have completed an odour assessment on Gough Street and Seaview Road and did not detect any odour, Down at the end of Bell road I could smell a muddy sewage smell from the project by the Bell Road Bridge. The digger was busy excavating on site at that time, even then it was not a particularly strong odour.(Nico)
2/05/2023	Wellington Water	24/N-NE	Customer called into Wellington Customer Hub - 11 Wareham Place, GRACEFIELD - odour from seaview treatment plant.	I visited 11 Wareham Place and spoke to the Manager of MF King Industries. At time of arrival there was no odour, but a strong Northerly, the Manager stated it absolutely reeked of sewer and then 2 minutes later stated it has now gone. He mentioned it is a constant smell day in and day out. Please find attached the odour assessment form and a map of the areas I took odour measurements.
3/06/2023	Veolia	13/SE	Veolia received an odour complaint at Seaview today (3/06/2023) at 5:07 direct to the Shift Engineers phone. Douglas from Bell road was complaining of a strong sewage smell at Bell road and would like to be contacted - Douglas 021 067 XXXX no address given (Full phone number available on request)	Duty Manager conducted an odour survey around Bell road and no odour was detected, Contacted Douglas who agreed there was no Odour present anymore and thanked the duty manager for coming out and investigating. Shift Engineer conducted an odour survey on the site boundary and no odour was detected

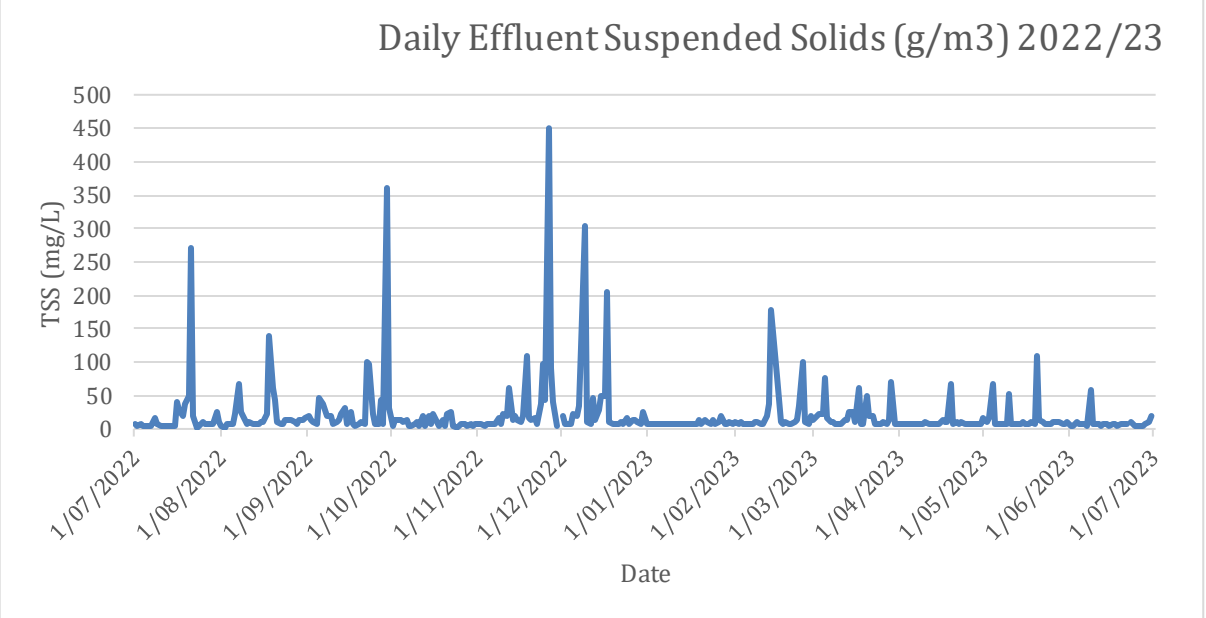
				Odour forms attached
6/06/2023	Wellington Water	43/S-SE	Bad smells from around the Seaview WWTP	There were no issues on 6/06/2023 at the Seaview WWTP. The plant was running normally, and the odour blaster was operating constantly. The dryer was running with all doors shut. The only thing to note is that starting up the dryer may be odorous at first, but not for a long period. The wind yesterday was Southerly through the day, so we wouldn't expect odour complaints coming from Wareham place. The dryer was started up by 10:15. This may align with the complaint times if known. We did not have any issues yesterday at the Seaview WWTP. The plant was running normally, and the odour blaster was operating constantly. The dryer was running yesterday with all doors shut. The only thing to note is that starting up the dryer may be odorous at first, but not for a long period.

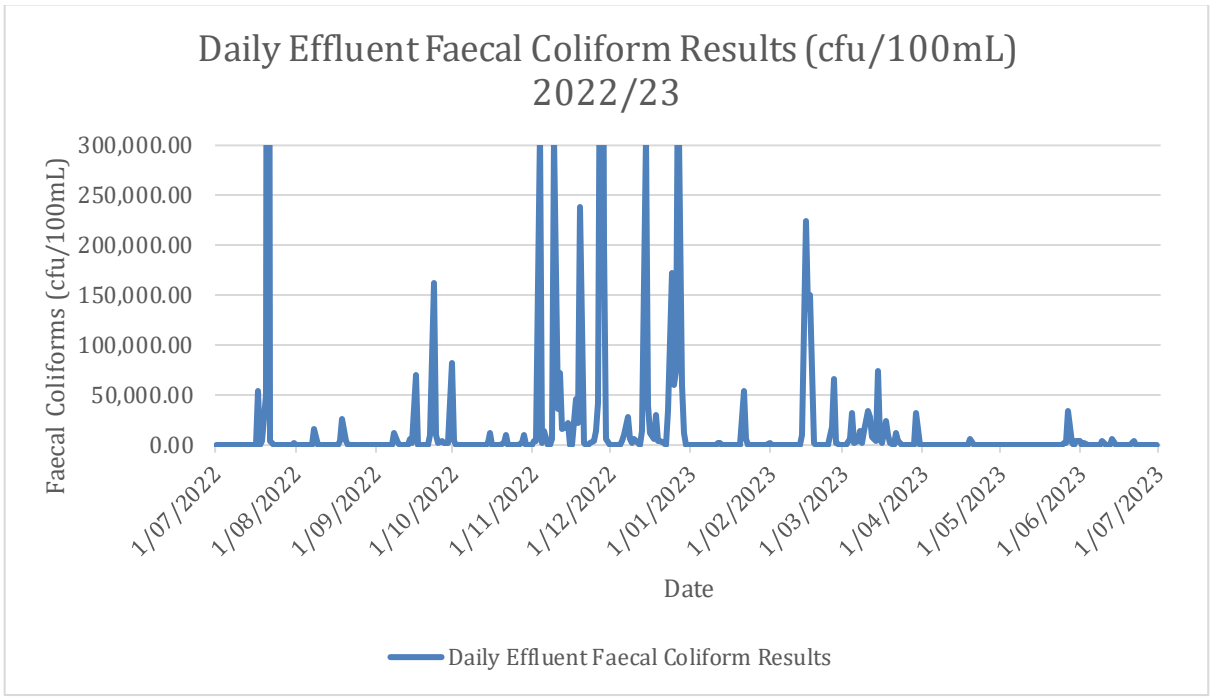
Table 9: Odour Complaints

*Wind speed/direction figures are taken from https://www.timeanddate.com/weather/

Appendix I: Daily Effluent Quality Results






Daily Effluent Faecal Coliform Results (cfu/100mL) 2022/23
Faecal Coliforms (cfu/100mL)
300,000.00
250,000.00
200,000.00
150,000.00
100,000.00
50,000.00
0.00
1/07/2022
1/08/2022
1/09/2022
1/10/2022
1/11/2022
1/12/2022
1/01/2023
1/02/2023
1/03/2023
1/04/2023
1/05/2023
1/06/2023
1/07/2023
Date
Daily Effluent Faecal Coliform Results

BOD

Day	April 2023			May 2023			June 2023		
	Results	90-Day Geometric Mean	90-Day 80th Percentile	Results	90-Day Geometric Mean	90-Day 80th Percentile	Results	90-Day Geometric Mean	90-Day 80th Percentile
	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³
1	4	9	14	7	9	12	6	8	10
2	5	9	14	6	9	12	5	8	9
3	5	9	14	11	9	12	6	7	9
4	6	9	14	35	9	13	5	7	9
5	6	9	14	4	9	13	5	7	9
6	6	9	14	4	9	13	5	7	9
7	6	9	14	5	9	13	5	7	9
8	7	9	14	6	9	13	30	7	9
9	8	9	14	5	9	13	6	7	9
10	8	9	14	19	9	14	5	7	9
11	6	9	14	7	9	14	6	7	9
12	5	9	14	6	9	14	6	7	9
13	6	9	14	6	9	13	6	7	8
14	6	9	14	6	9	12	7	7	8
15	7	9	14	9	8	12	6	7	8
16	9	9	14	4	8	11	7	7	8
17	5	9	14	6	8	11	4	7	8
18	6	9	14	7	8	11	6	7	7
19	36	9	14	5	8	11	5	7	7
20	6	9	14	32	8	11	6	7	7
21	5	9	13	7	8	11	6	7	7
22	5	9	14	6	8	11	85	7	7
23	7	9	14	7	8	11	6	7	7
24	12	9	14	9	8	11	6	7	7
25	6	9	14	7	8	11	7	7	7
26	5	9	14	9	8	10	7	7	7
27	6	9	14	5	8	11	6	7	7
28	5	9	14	5	8	11	7	7	7
29	5	9	14	6	8	11	122	7	7
30	5	9	13	7	8	11	18	7	7
31				7	8	10			
Limits	**N/A**	**50**	**85**	**N/A**	**50**	**85**	**N/A**	**50**	**85**

Suspended Solids

Day	April 2023			May 2023			June 2023		
	Results	90-Day Geometric Mean	90-Day 80th Percentile	Results	90-Day Geometric Mean	90-Day 80th Percentile	Results	90-Day Geometric Mean	90-Day 80th Percentile
	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³	g/m³
1	6	11	18	16	11	20	5	10	12
2	6	11	18	9	11	20	5	10	12
3	6	11	18	16	11	20	9	9	12
4	8	11	18	68	12	20	8	9	11
5	7	11	18	6	12	20	6	9	11
6	6	11	18	6	12	20	6	9	11
7	6	11	18	6	12	20	5	9	11
8	6	11	18	6	12	20	58	9	12
9	6	11	18	6	11	20	6	9	12
10	11	11	18	52	12	20	6	9	11
11	6	11	18	8	12	20	8	9	11
12	6	11	18	7	12	20	5	9	11
13	6	11	18	6	11	20	7	9	11
14	6	11	18	7	11	20	7	9	11
15	8	11	18	9	11	18	5	9	9
16	12	11	18	6	11	16	6	9	9
17	9	11	18	8	10	16	6	9	9
18	9	12	18	9	10	16	5	8	9
19	67	12	20	7	10	16	6	8	9
20	6	12	20	110	11	16	7	8	9
21	9	12	20	12	11	16	6	8	9
22	6	12	20	11	11	16	6	8	9
23	9	12	20	7	11	16	9	8	9
24	6	12	20	8	11	16	5	8	9
25	6	12	20	6	10	16	5	8	9
26	6	12	20	11	10	16	5	8	9
27	7	11	20	10	10	16	5	8	9
28	6	11	20	9	10	16	7	8	9
29	6	11	20	6	10	15	9	8	9
30	6	11	20	7	10	15	19	8	9
31				9	10	14			
Limits	**N/A**	**50**	**85**	**N/A**	**50**	**85**	**N/A**	**50**	**85**

Faecal coliforms

Day	April 2023			May 2023			June 2023		
	Results	Geometric Mean	90-Day 80th Percentile	Results	Geometric Mean	90-Day 80th Percentile	Results	Geometric Mean	90-Day 80th Percentile
	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL	cfu/100mL
1	57	574	6797	17	336	6105	841	264	3287
2	15	556	6797	10	326	6105	1423	255	3029
3	10	552	6797	10	316	6105	370	250	3029
4	10	535	6797	283	319	6105	105	240	1986
5	24	521	6797	100	318	6105	695	232	1486
6	10	497	6797	70	325	6105	100	224	1379
7	46	486	6797	152	326	6105	153	214	1269
8	10	466	6797	127	330	6105	363	203	1209
9	10	456	6797	265	330	6105	4035	199	1209
10	10	445	6797	727	346	6105	231	191	1135
11	458	437	6797	208	344	6105	401	187	1089
12	70	423	6797	262	354	6105	283	175	927
13	144	421	6797	69	362	6105	5299	175	927
14	100	416	6797	10	335	6000	552	172	850
15	22	400	6797	10	300	5267	1008	166	850
16	10	385	6797	14	271	3942	1067	162	850
17	10	385	6797	159	251	3481	33	156	750
18	10	381	6797	330	245	3481	10	149	750
19	6525	399	6822	77	243	3481	59	141	727
20	221	395	6822	888	255	3481	170	136	711
21	100	368	6500	224	259	3481	4177	140	727
22	48	349	6105	160	265	3481	152	143	727
23	17	347	6105	183	266	3481	168	141	727
24	100	351	6105	727	266	3481	168	142	727
25	100	357	6105	1368	258	3066	47	142	727
26	46	356	6105	1244	247	2329	63	138	727
27	16	358	6105	33677	255	3066	10	126	701
28	34	361	6105	1200	256	3066	163	126	701
29	100	371	6105	1082	258	3066	200	126	701
30	10	353	6105	3250	262	3287	357	129	701
31				4266	270	3481			
Limits	**N/A**	**1000**	**5000**	**N/A**	**1000**	**5000**	**N/A**	**1000**	**5000**

Appendix II: Inflow and Infiltration Report

Condition (19)

> The permit holder shall take reasonable steps to investigate ways and means of minimizing infiltration and stormwater ingress into the sewerage system and provide the Manager, Environmental Regulation, Wellington Regional Council, with an annual report by 31 July on progress.

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 demand on the Seaview Wastewater Treatment Plant (WWTP) and to also improve waterway health. The catchment for Seaview WWTP includes both Hutt City Council (HCC) and Upper Hutt City Council (UHCC) areas. Details of works undertaken have been provided below for each council area.

Hutt City Council

Inflow Surveys

Inflow Survey work in HCC area is undertaken by the HCC Drainage Team with various catchments completed over many years. Figure 1 below shows the catchments in progress in blue and the catchment planned for commencement in 2023-2024 in purple.

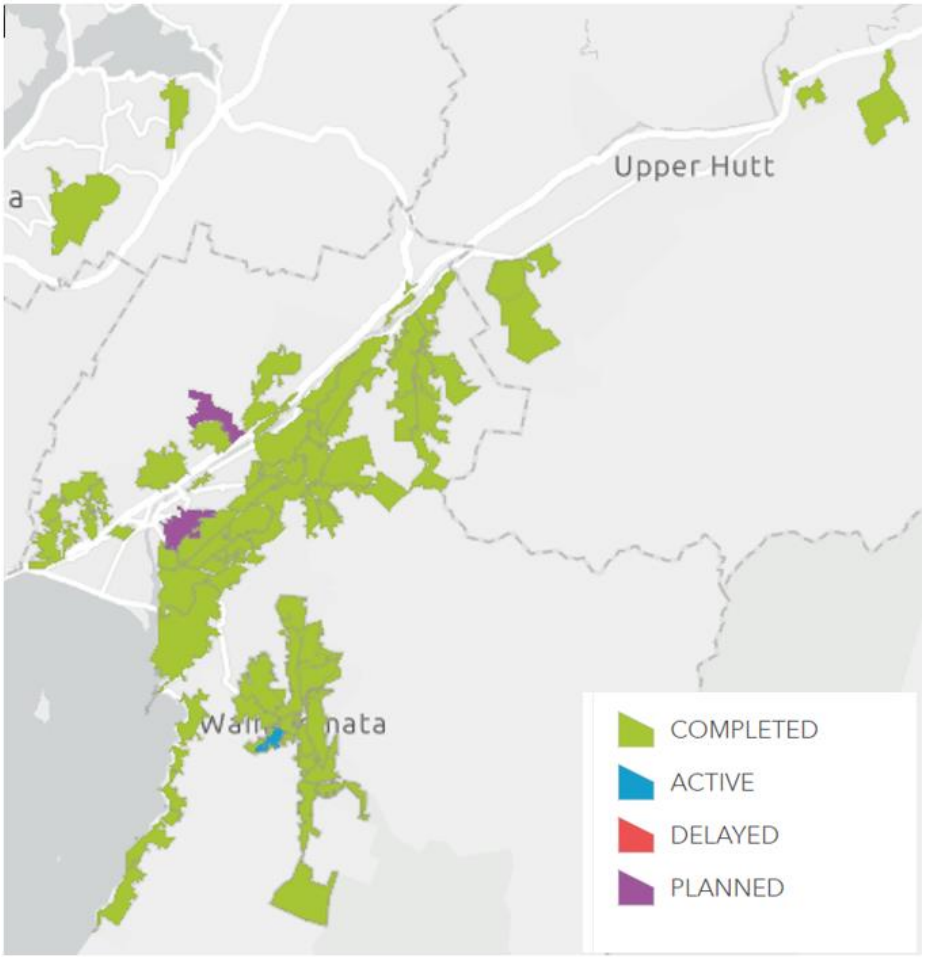


Figure 1 - Inflow Survey Project Locations

The Maungaraki catchment (sub-catchment 08.01) commenced in 2021-2022 and is currently in progress. The catchment shown in purple, Hutt Central (sub-catchment 07.09) is planned for commencement of an inflow survey in 2022-2023 financial year. The various catchments shown in green have all previously had an inflow survey completed over the last 20 years by HCC.

In addition to works completed by HCC, the Drainage Investigation Team at Wellington Water also completed smoke/dye testing and CCTV inspections for both wastewater and stormwater assets. The investigations were able to identify private and public faults. The inspections completed for HCC areas were:

- Wainuiomata (smoke/dye: 174 assets, CCTV: 154 assets)
- Harcourt Werry Drive at Percy Cameron Street (smoke/dye: 42 assets, CCTV: 0 assets)
- Waiwhetu stream at Tilbury (smoke/dye: 92 assets, CCTV: 92 assets)

Flow Monitoring and Rain Gauge Monitoring

There are three flow and five overflow monitoring sites and one site which measures both within HCC catchment area. Figure 2 below shows the monitoring sites managed under the long-term monitoring contract. All monitoring sites are located in Wainuiomata except for one site at Rossiter Avenue which monitors flow through a siphon and a constructed overflow point.

There are also three monitoring sites that are part of the SCADA Network which are not shown on the map below. Monitoring data is used to understand network performance and the extent of inflow and infiltration in various catchments where possible. This data also enables investigation of network issues and maintenance of hydraulic models.

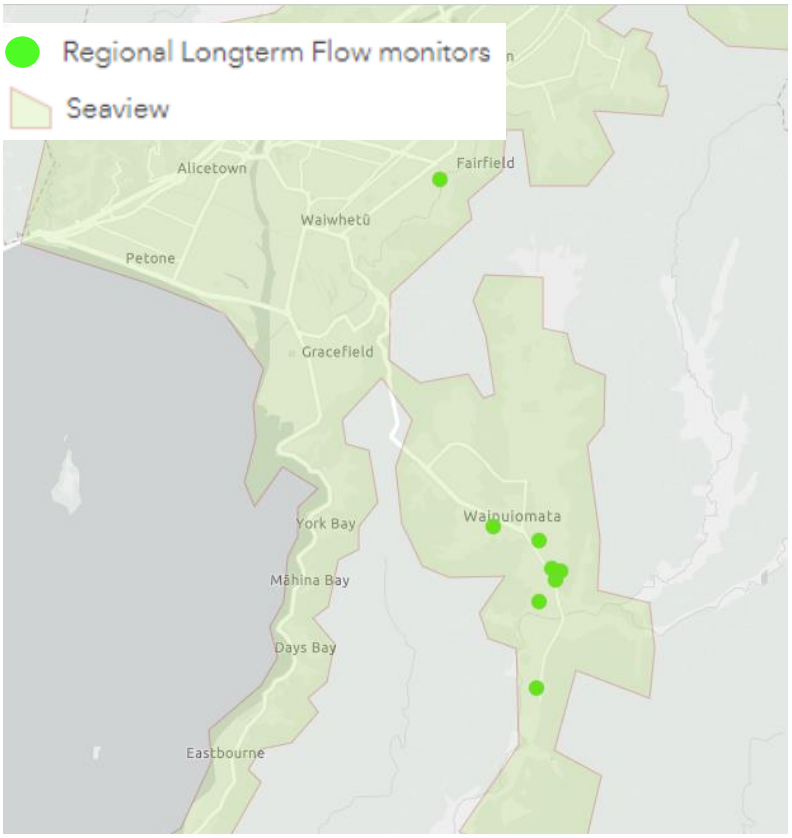


Figure 2 - Map of Wastewater Flow and Overflow Monitoring Sites for Seaview WWTP Catchment within HCC boundary

There are currently ten rain gauges installed and operating in the HCC area. This data is used in conjunction with wastewater flow monitoring data to understand the extent of inflow and infiltration. The rain gauge sites are listed below;

- Wainuiomata River at Wainui Reservoir
- Hutt River at Mabey Road Depot
- Hutt River at Birch Lane
- Hutt River at Shandon Golf Club
- Hutt River at Regent Street
- Pinehaven Stream at Pinehaven Reservoir
- Hutt River at Savage Park
- Hutt River at Haywards Hill Reservoir
- Hutt River at Riverstone Terrace
- Mangaroa River at Maymorn Pump Station
- Akatarawa River at Cemetery.

Condition Assessments

Condition Assessment involves the use of closed circuit television (CCTV) footage or other inspection techniques of pipe networks to identify faults, determine the condition of assets, and inform repair and renewal programs.

Condition assessments completed as of June 2023 are shown in Figure 3 below. The primary inspection techniques were CCTV and laser profiling for wastewater pipes and CCTV for stormwater pipe assets. For the inspections represented in the below map, approximately 10km of pipelines were inspected in 2022-2023 financial year. For Seaview wastewater treatment plant catchment area, the data from this CCTV will be analysed and can be used to inform the repair and renewal programs for the upcoming financial year.

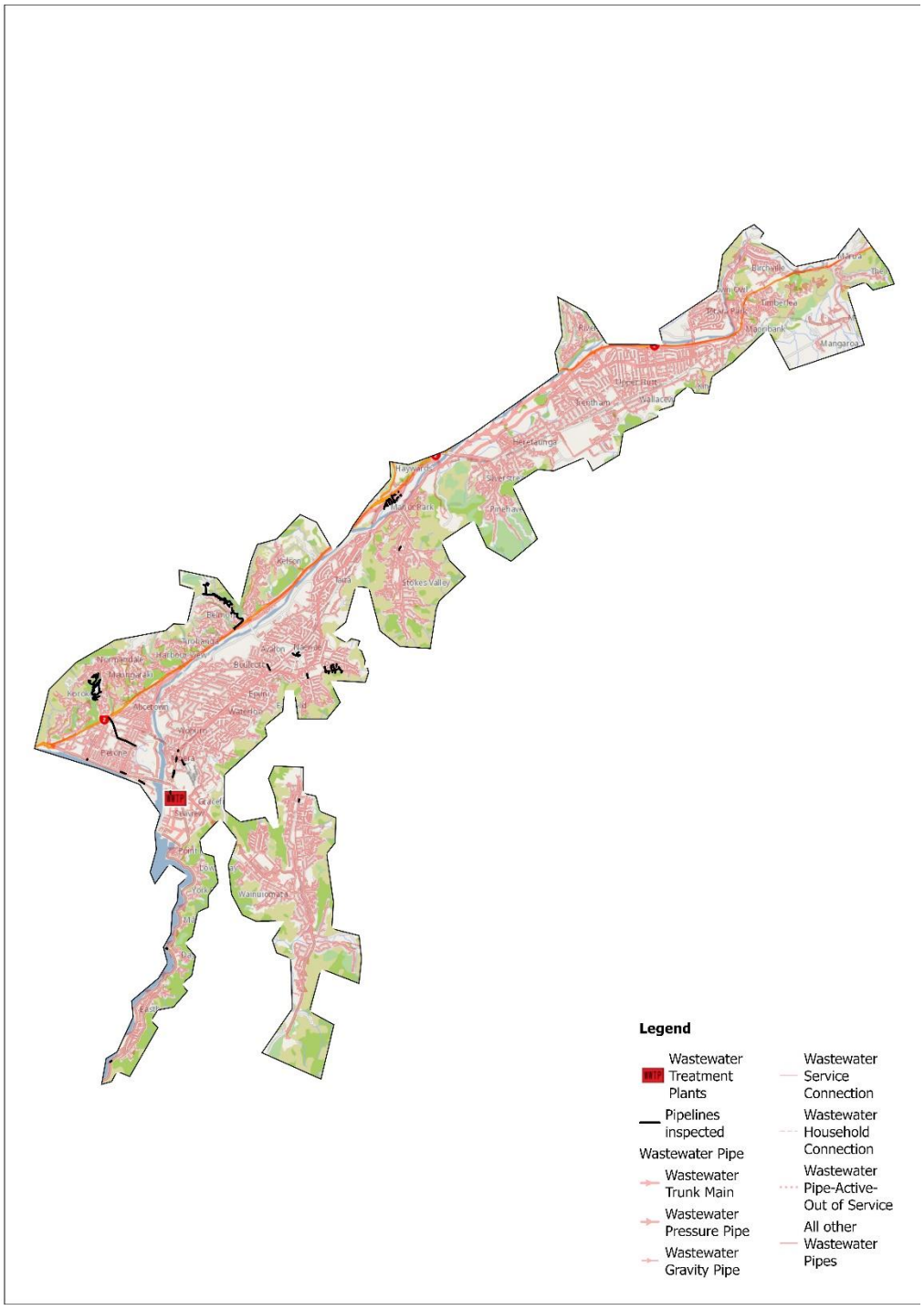


Figure 3 - Map of CCTV of UHCC and HCC Wastewater and Stormwater Mains undertaken as of June 2023

Wastewater Modelling

The Hutt Valley model was recently calibrated and is in the final stages of system performance. The Wainuiomata Catchment Model was also updated in 2020. The integrated trunk model which incorporates both HCC and UHCC Trunk Networks has also recently been updated.

Stormwater and Wastewater Capital Projects

The following table provides a summary of planned capital projects for wastewater and stormwater assets that were undertaken in 2021-2022 or are scheduled for 2022-2023. The projects are proposed and subject to approval by council. Ongoing operational work such as investigations and 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 - HCC Capital Projects for Stormwater and Wastewater

Council / Activity	2022/2023	2023/2024
HCC Stormwater	• Dowse Dr Stormwater Improvement	
HCC Local Wastewater	• Wood St Renewals Stage 3 • Rahui Grove sewer Renewals • White line East Renewal • Naenae Sewer Renewals 3 • Avalon WW Renewals Programme 21-22	• Naenae Sewer Renewals • Naenae Sewer Renewals 2 • Epuni and Woburn WW Network Upgrades • Laery Street Sewer Renewal • Rahui Grove sewer Renewals • White line East Renewal • HCC bell road works • Naenae Sewer Main Renewals

Upper Hutt City Council

Inflow Surveys

Inflow Surveys (smoke testing of wastewater catchments) that have previously been completed are shown below in Figure 4, highlighted in green. There were no Inflow Surveys completed in UHCC in the 2021-2022 financial year.

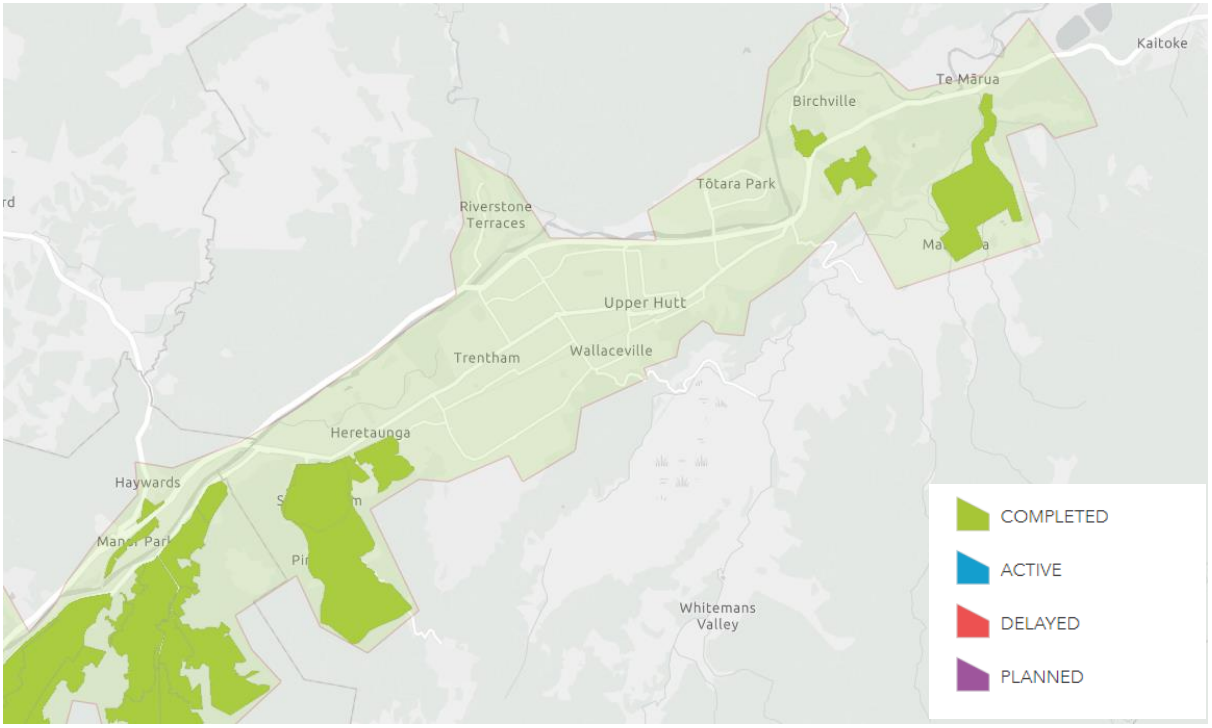


Figure 4 - Inflow Survey Project Locations in UHCC

The majority of faults have now been resolved from the Heretaunge Inflow Survey which concluded in the 2020-2021 financial year. The proposed catchment for inspection in the 2022-2023 financial year will be confirmed following review of monitoring data.

Flow Monitoring and Rain Gauge Monitoring

There are currently three wastewater flow monitoring sites in the UHCC area which are delivered under the long-term monitoring contract. There are also three monitoring sites that are part of the SCADA Network. A short-term flow monitoring project was completed in 2021-2022 financial year in the Silverstream and Pinehaven catchment. 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. Figure 5 below shows the location of the three long-term flow monitoring sites.

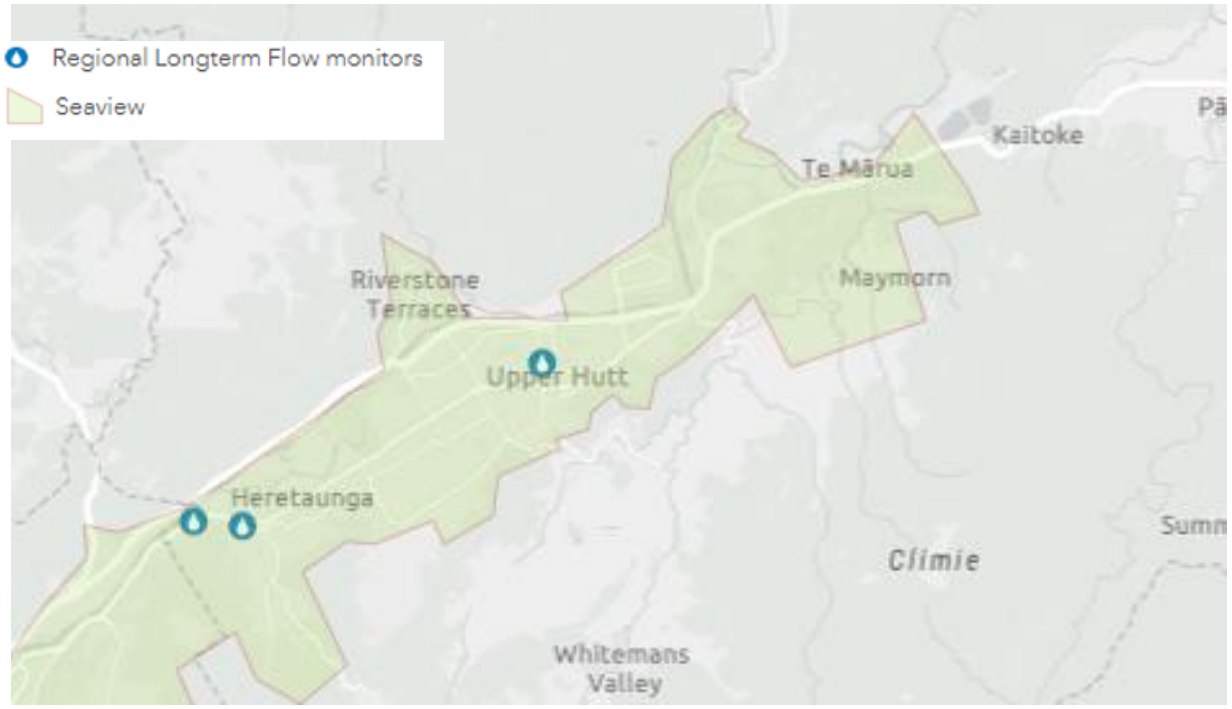


Figure 5 - Map of Wastewater Flow and Overflow Monitoring Sites for Seaview WWTP catchment within UHCC boundary.

There are currently 10 rain gauges installed and operating in the UHCC area. This data is used in conjunction with wastewater flow monitoring data to understand the extent of inflow and infiltration. The rain gauges sites are listed below;

- Mangaroa River at Tasman Vaccine limited
- Pinehaven Stream at Pinehaven Reservoir
- Hutt River at Riverstone Terrace
- Hutt River at Savage Park
- Akatarawa River at Cemetery
- Mangaroa River at Maymorn Pump Station
- Hutt River at Te Marua
- Pakuratahi River at Centre Ridge
- Hutt River at Kaitoke Headworks
- Whakatikei River at Blue Gum Spur

Wastewater Modelling

A wastewater model has been developed for the UHCC wastewater reticulation. As noted above the integrated trunk model which incorporates both HCC and UHCC Trunk Networks has also been updated.

Condition Assessments

Condition Assessment using closed circuit television (CCTV) footage and other inspection techniques of wastewater networks is used to identify faults, determine the condition of assets, and inform repair and renewal programs.

Condition assessments completed as of June 2023 are shown in Figure 6 below. The primary inspection techniques were CCTV. For the inspections represented in the below map carried out in Chatworth and Pinehaven.

The data from this CCTV will be analysed and used to inform the future repair and renewal programs.

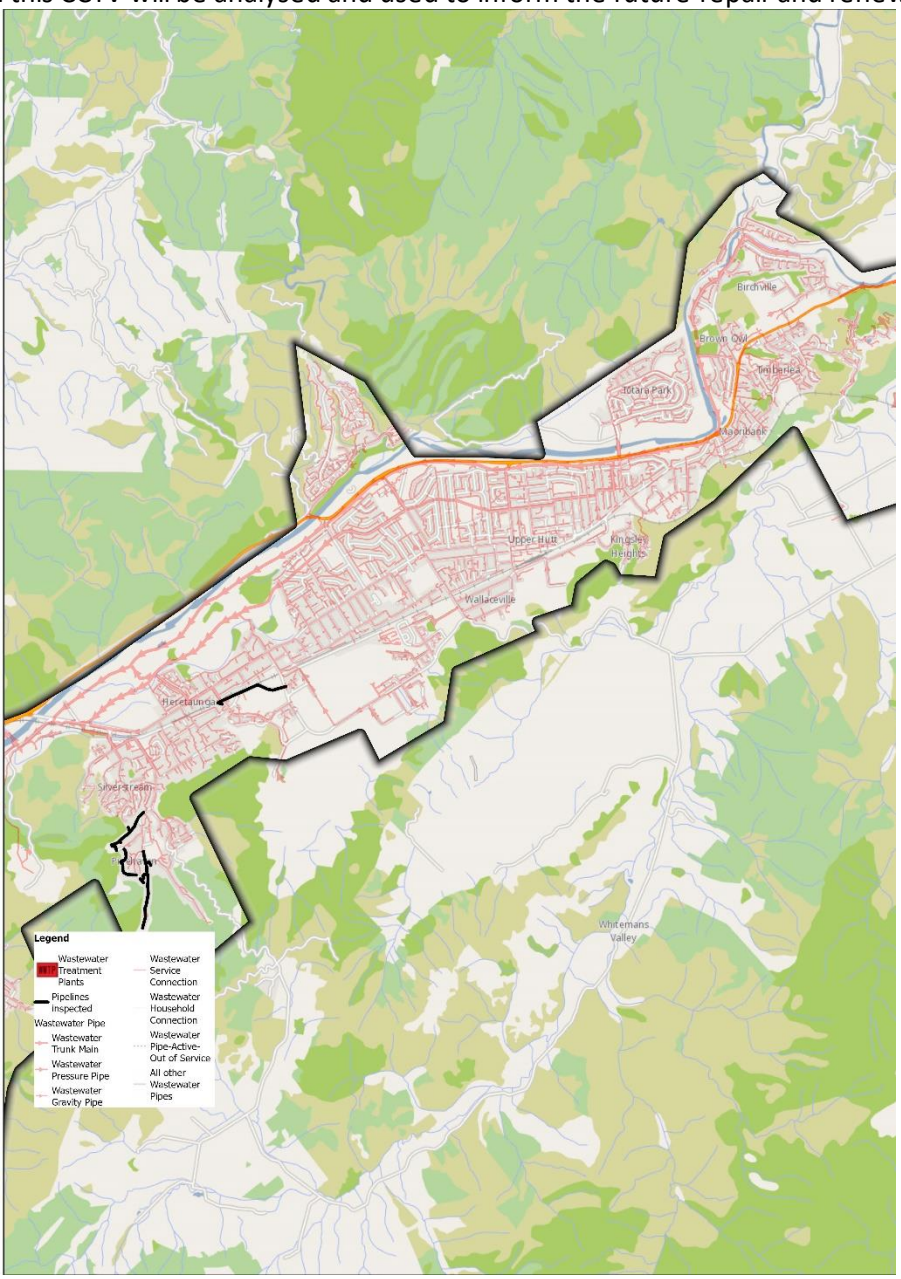


Figure 6 - Map of CCTV of UHCC Wastewater and Stormwater Mains undertaken as of June 2022

Stormwater and Wastewater Capital Projects

The following table provides a summary of planned capital projects for wastewater and stormwater assets that were undertaken in 2022-2023 or are scheduled for 2022-2024. Ongoing operational work such as investigations and 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. The projects are proposed and subject to final approval by council.

Table 2 - UHCC Capital Projects for Stormwater and Wastewater

Council / Activity	2022/2023	2023/2024
UHCC Stormwater	• Stormwater Manhole Cover Safety Improvements	• Pinehaven Stream Stormwater Upgrade Work • Stormwater Manhole Cover Safety Improvements
UHCC Local Wastewater	• Wastewater Manhole Cover Improvements	• Martin St WW Renewal • Cole Grove WW Renewal • UHCC Wastewater Pump Stations PLANNED Renewals • Wastewater Manhole Cover Safety Improvements

Hutt Valley Joint Venture (HVJV) Trunk Network

The following table provides a summary of planned capital projects for the HVJV Trunk Assets that were undertaken in 2022-2023 or are scheduled for 2023-2024. The projects are proposed and subject to final approval by council.

Table 3 - Projects for JV Trunk Wastewater Network

Council / Activity	2022/2023	2023/2024
HVJV Wastewater	• Barber Grove to WWTP Duplication	• Trunk Type B Network Development - Barber Grove to Wastewater Treatment Plant Duplication • Trunk Type B Network Development - Petone Collecting Wastewater Upgrade • Seaview WWTP Wastewater Storage • Hutt and Upper Hutt WWJV-VHCA Pipe Renewal Programme • Ava Pump Station • Barber Grove Pump Station • Point Arthur Pump Station

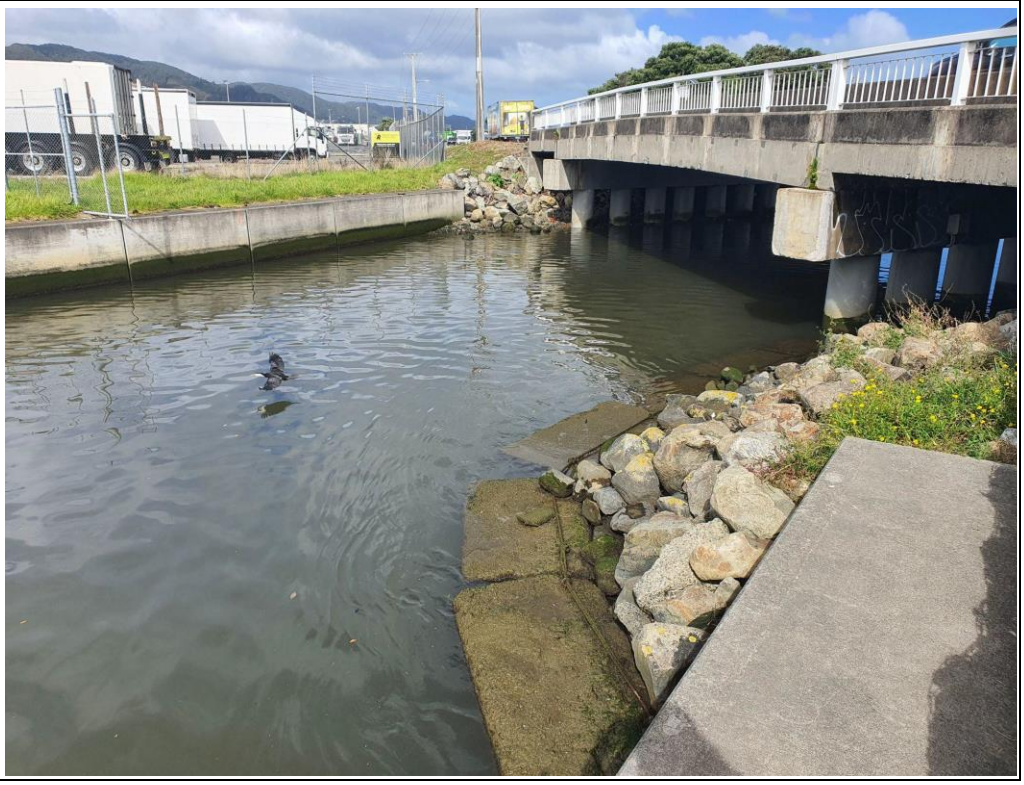
Appendix III. Trade Waste Report

Appendix IV: Seaview Wastewater Treatment Plant Assessment of Effects of Overflow Discharges to Waiwhetu Stream.

Appendix V: Photographs of Discharge to Waiwhetu Stream April, May, June (2023)

APRIL 2023

Upstream of Port Road Bridge

Date	Upstream of Port Road Bridge
11-Apr-23 13:36:00	

12-Apr-23 13:45:00	
13-Apr-23 13:46:00	

14-Apr-23 02:00:00	

15-Apr-23 11:48:00	
19-Apr-23 13:30:00	

21-Apr-23 12:45:00	
22-Apr-23 13:00:00	

23-Apr-23 12:40:00	
24-Apr-23 02:00:00	

Waiwhetu Pa Site

Date	Waiwhetu Pa Site
11-Apr-23 13:10:00	
12-Apr-23 12:27:00	

13-Apr-23 12:15:00	
14-Apr-23 12:15:00	

15-Apr-23 13:11:00	
19-Apr-23 13:03:00	

21-Apr-23 12:31:00	
22-Apr-23 12:45:00	

23-Apr-23 12:30:00	
24-Apr-23 02:00:00	

Downstream of Bell Road Bridge

Date	Downstream of Bell Road Bridge
11-Apr-23 14:40:00	
12-Apr-23 13:30:00	

13-Apr-23 11:44:00	
14-Apr-23 12:45:00	

15-Apr-23 11:59:00	
19-Apr-23 12:46:00	

21-Apr-23 12:18:00	
22-Apr-23 11:57:00	

23-Apr-23 09:44:00	
24-Apr-23 02:00:00	

May 2023

Upstream of Port Road Bridge

Date	Upstream of Port Road Bridge
04-May-23 13:34:00	
05-May-23 13:55:00	

06-May-23 12:55:00	
07-May-23 13:40:00	

08-May-23 13:10:00	
09-May-23 14:38:00	

Waiwhetu Pa Site

Date	Waiwhetu Pa Site
04-May-23 13:22:00	
05-May-23 13:42:00	

06-May-23 13:33:00	
07-May-23 13:30:00	

08-May-23 12:57:00	
09-May-23 14:22:00	

Downstream of Bell Road Bridge

Date	Downstream of Bell Road Bridge
04-May-23 12:29:00	
05-May-23 13:05:00	

06-May-23 13:08:00	
07-May-23 12:47:00	

08-May-23 12:16:00	
09-May-23 13:47:00	

June 2023

Upstream of Port Road Bridge

Date	Upstream of Port Road Bridge
29-May-23 13:35:00	
30-May-23 13:35:00	
31-May-23 13:16:00	

01-Jun-23 14:14:00	
02-Jun-23 12:17:00	

03-Jun-23 02:00:00	
04-Jun-23 12:23:00	
05-Jun-23 13:00:00	

06-Jun-23 12:45:00	
07-Jun-23 13:05:00	
08-Jun-23 14:05:00	

09-Jun-23 13:55:00	

Waiwhetu Pa Site

Date	Waiwhetu Pa Site
29-May-23 13:35:00	
30-May-23 13:35:00	

31-May-23 13:16:00	
01-Jun-23 14:14:00	
02-Jun-23 12:17:00	

03-Jun-23 02:00:00	
04-Jun-23 12:23:00	
05-Jun-23 13:00:00	

06-Jun-23 12:45:00	
07-Jun-23 13:05:00	
08-Jun-23 14:05:00	

09-Jun-23 13:55:00	

Downstream of Bell Road Bridge

Date	Bell Road Bridge
29-May-23 13:35:00	
30-May-23 13:35:00	

31-May-23 13:16:00	
01-Jun-23 14:14:00	
02-Jun-23 12:17:00	

03-Jun-23 02:00:00	
04-Jun-23 12:23:00	
05-Jun-23 13:00:00	

06-Jun-23 12:45:00	
07-Jun-23 13:05:00	
08-Jun-23 14:05:00	

09-Jun-23 13:55:00	

Hutt River - 50m Upstream of the Waiwhetu Stream Mouth

Date	50m Upstream of the Waiwhetu Stream Mouth
29-May-23 13:35:00	
30-May-23 13:35:00	

31-May-23 13:16:00	
01-Jun-23 14:14:00	
02-Jun-23 12:17:00	

03-Jun-23 02:00:00	
04-Jun-23 12:23:00	
05-Jun-23 13:00:00	

06-Jun-23 12:45:00	
07-Jun-23 13:05:00	
08-Jun-23 14:05:00	

09-Jun-23 13:55:00	

Hutt River - 50m Downstream of the Waiwhetu Stream Mouth

Date	50m Downstream of the Waiwhetu Stream Mouth
29-May-23 13:35:00	
30-May-23 13:35:00	

31-May-23 13:16:00	
01-Jun-23 14:14:00	
02-Jun-23 12:17:00	

03-Jun-23 02:00:00	
04-Jun-23 12:23:00	
05-Jun-23 13:00:00	

06-Jun-23 12:45:00	
07-Jun-23 13:05:00	
08-Jun-23 14:05:00	

09-Jun-23 13:55:00