

# Western Wastewater Treatment Plant

Annual Resource Consents Report 2023/2024



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# Control Sheet

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**Prepared by:** Craig Shuttleworth

**Reviewed by:** Joemar Cacnio

**Approved by:** Blair Johnson

## Document Control Register

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0	Draft		Draft for review
1	Final	31/07/2024	Approved by Manager Wastewater Contracts

# Executive Summary

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

WGN060283[35255]

This coastal permit allows WCC to continuously discharge disinfected secondary (fully treated) effluent to the Wellington South Coast coastal marine area (Cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall. The map reference for the discharge location is NZMS 260: R27; 504.836.

WGN060283[25227]

This coastal discharge permit allows WCC to occasionally discharge milli-screened (partially treated) effluent to the Wellington South Coast marine area (Cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall during significant wet weather events. The map reference for the discharge location is NZMS 260: R27; 504.836.

WGN060283[35674]

This discharge permit allows WCC to occasionally discharge secondary treated and disinfected wastewater from the Western Wastewater Treatment Plant to Karori Stream during events when the stormwater tank is full and the flow to the plant exceeds 190L/s. The map reference for the discharge location is NZMS 260: R27; 2652332.5987157.

WGN060283[35675]

This discharge permit allows WCC to occasionally discharge milli-screened and settled wastewater from the Western WWTP to Karori stream during events when the stormwater tank is full and the flow to the plant exceeds 390L/s. The map reference for the discharge location is NZMS 260: R27; 2652332.5987157.

WGN060283[25230]

This discharge permit allows WCC to discharge contaminants to air from the operation of the Western WWTP.

The report will cover the period from 1 July 2023 to 30 June 2024.

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# Resource Consent

## WGN060283[35255]

Effluent discharge from the Western WWTP is governed by the resource consent under the Greater Wellington Regional Council consent file number WGN060283 [35255]. In general, the consent allows the continuous discharge disinfected secondary (fully treated) effluent to the Wellington South Coast coastal marine area (Cook Strait in the vicinity of the Karori Stream Mouth) via an existing outfall. The following outlines the conditions of this resource consent required for this report.

## WGN060283[25227]

In addition to the above resource consent, the discharge from the Western WWTP is governed by another resource consent under the Greater Wellington Regional Council consent file number WGN060283 [25227]. In general, the consent allows the occasional discharge of milli-screened (partially treated) effluent to the Wellington South Coast coastal marine area via an existing outfall during significant wet weather events. The following also outlines the conditions of this resource consent required for this report.

## WGN060283[35674]

In addition to the above two (2) resource consents, the discharge from the Western WWTP is governed by another resource consent under the Greater Wellington Regional Council consent file number WGN060283 [35674]. In general, the consent allows the occasional discharge of secondary treated and disinfected wastewater from the Western WWTP to Karori Stream during events when the stormwater tank is full and the flow to the plant exceeds 190L/s. The following also outlines the conditions of this resource consent required for this report.

## WGN060283[35675]

The fourth resource consent that governs the discharge from the Western WWTP is under the Greater Wellington Regional Council consent file number WGN060283 [35675]. In general, the consent allows for the occasional discharge of milli-screened and settled wastewater from the Western WWTP to Karori stream during events when the stormwater tank is full and the flow to the plant exceeds 390L/s. The following also outlines the conditions of this resource consent required for this report.

## WGN060283[25230]

The final resource consent that governs the discharge from the Western WWTP is under the Greater Wellington Regional Council consent file number WGN060283 [25230]. In general, the consent allows the discharge of contaminants to air from the operation of the Western WWTP. The following also outlines the conditions of this resource consent required for this report.

# WGN060283 [35255]

## Condition (2)

The rate of discharge shall not exceed 200 litres per second (L/s) or 17,280 cubic metres per day (m<sup>3</sup>/day).

The daily discharge volume from the WWTP is illustrated in Figure 1.

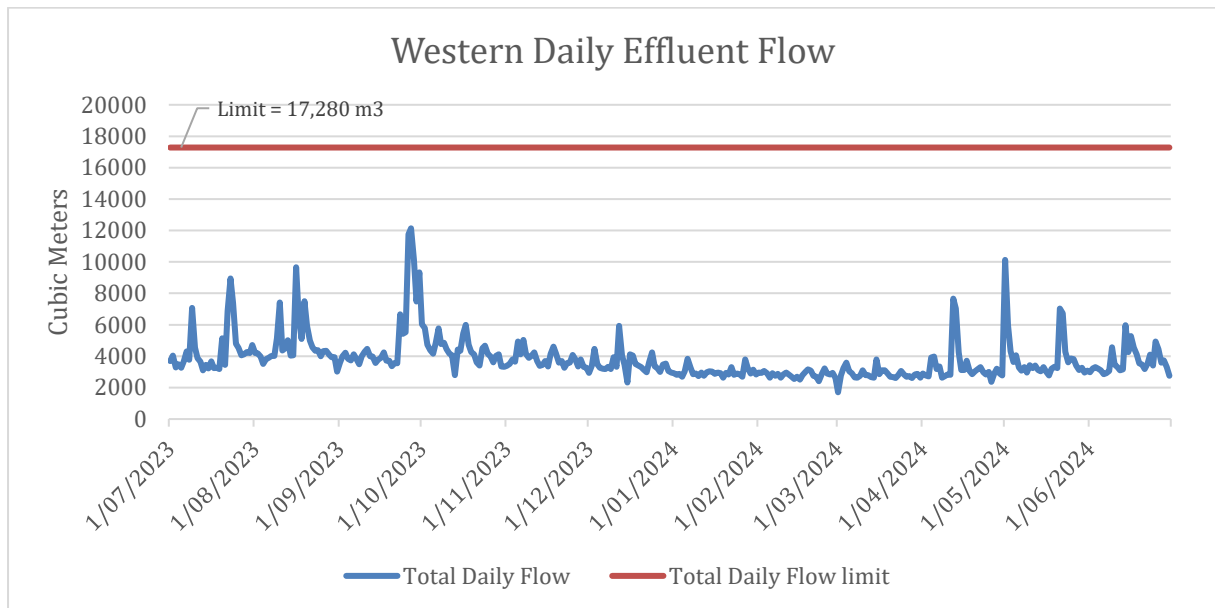


Figure 1: Western WWTP Effluent Flow

Please note that the discharge limit specified in WGN060283 [35255], Condition (2) applies to the discharge from the effluent pipeline to the coastal marine area. Due to the breakage of a section of the outfall pipeline, fully treated wastewater is being discharged to the Karori stream instead of the coastal marine area (CMA). Thus, the flow going into the CMA is unavailable.

## Condition (5)

The permit holder shall establish a community liaison-group (CLG) which shall act as a forum for consultation and liaison with the community and be used as a vehicle to provide information regarding the Western Wastewater Treatment Plant. The permit holder shall invite persons with an interest in participating in the CLG from the following groups:

- representatives of local Tangata Whenua;
- neighbouring and downstream landowners;
- residents of South Karori Road;
- a representative from the Makara-Ohariu Community Board;
- a representative of the West Wellington Environmental Protection Society Inc;
- a representative of the permit holder; and
- a representative of the plant operator.

The permit holder may invite any other parties to attend.

A meeting of the CLG shall be held at least once every calendar year. Minutes of any CLG meetings held shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council and the permit holder shall report in writing to the Manager, Environmental Regulation, Wellington Regional Council, by 31 July each year on any consultation and activities undertaken with regard to the CLG. A copy of this report shall be forwarded to the CLG members.

Note: The permit holder shall not be in breach of this condition if, after taking all reasonable measures, and its best endeavours, it has not been possible to gain the requisite participation.

The Western WWTP community liaison group met on 2nd May 2024. The minutes of the meeting were circulated to the group and shared to the Wellington Water website for public perusal.



## Condition (10)

The wastewater discharged from the Western Wastewater Treatment Plan to the South Coast shall comply with the following effluent quality criteria:

(i) BOD5

The geometric mean of any 90 consecutive daily sample results shall not exceed 20 g/m<sup>3</sup>, and no more than 18 sample results in any 90-day period (or 15 consecutive sample results in any 90-day period) shall exceed 50 g/m<sup>3</sup>.

(ii) Suspended solids

The geometric mean of any 90 consecutive daily sample results shall not exceed 30 g/m<sup>3</sup> and no more than 18 sample results in any 90-day period (or 15 consecutive sample results in any 90-day period) shall exceed 80 g/m<sup>3</sup>.

(iii) Faecal Coliforms

The geometric mean of any 90 consecutive daily sample results shall not exceed 200 colony forming units per 100 ml and no more than 18 sample results in any 90-day period (or 15 consecutive sample results in any 90-day period) shall exceed 2,000 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.

### Section (i)

Figure 2 below presents a graphical summary of the geometric mean and the 80<sup>th</sup> percentile compliance for the Effluent Biological Oxygen Demand (BOD).

The treatment plant was non-compliant for effluent BOD quality requirement of the consent in the financial year 2023/2024 for both parameters. On 15 September the plant breached the 90-Day Geomean limit of 20 mg/L, remaining above the limit for the rest of the financial year. On 20 November the plant breached the 80<sup>th</sup> percentile limit of 50 mg/L before returning to compliance on 27 December 2023. Greater Wellington Regional Council were notified of both breaches and the return to compliance of the 80<sup>th</sup> percentile parameter.

The increases in BOD were likely a direct result of an unexpected high biological load entering the plant from a nearby project to upgrade the Karori Storage Tunnel that took place in September 2023. This made the biological process more difficult to manage with the plant operators having no prior knowledge of the load entering the plant thus not being able to make process adjustments beforehand. In addition to the Tunnel upgrade works the scraper mechanism on one of the two clarifiers failed for a period of 4 days in October and is also believed to have contributed to the elevated levels of BOD in the effluent. At the time of writing this report the plant is scheduled to move back into compliance in August 2024 provided that the daily effluent BOD results stays within the BOD geomean limit

A please explain response regarding the non-compliant effluent quality was given to the regional council on 30 October 2023 and further investigation is still underway to determine cause of persistent non-compliance even after the Karori tunnel and scraper replacement has been completed.

Any non-compliance notices issued by GWRC around this condition are noted in condition 20(c).

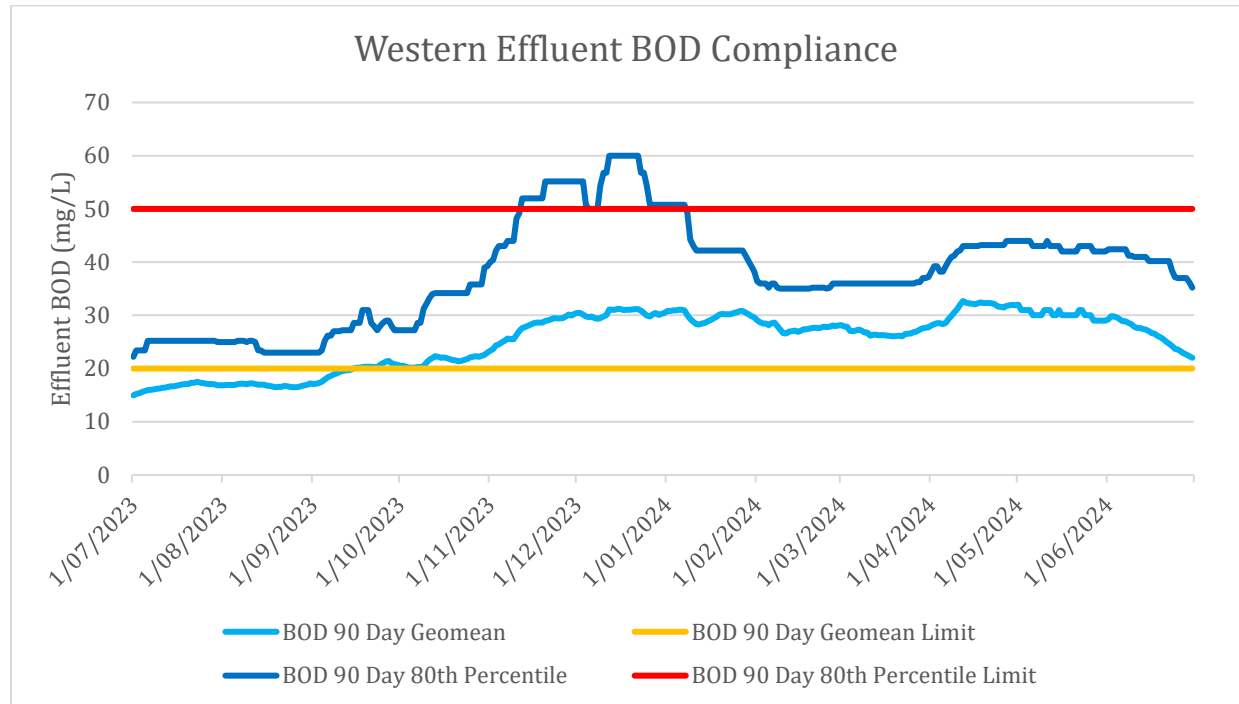


Figure 2: Western WWTP Carbonaceous Biological Oxygen Demand Compliance

### Section (ii)

Figure 3 below presents a graphical summary of the geometric mean and the 80<sup>th</sup> percentile compliance for the Effluent Total Suspended Solids (TSS).

The treatment plant was compliant for the Effluent Total Suspended Solids (TSS) quality requirement of the consent for financial year 2023/2024.

Although the plant was compliant for Effluent Suspended Solids throughout the year, there was a spike in Q2 of the financial year causing the 80<sup>th</sup> percentile to peak at 79 mg/L on 12 November. These spikes were also believed to be the result of the Tunnel project and the clarifier scraper issues identified in section 10(i).

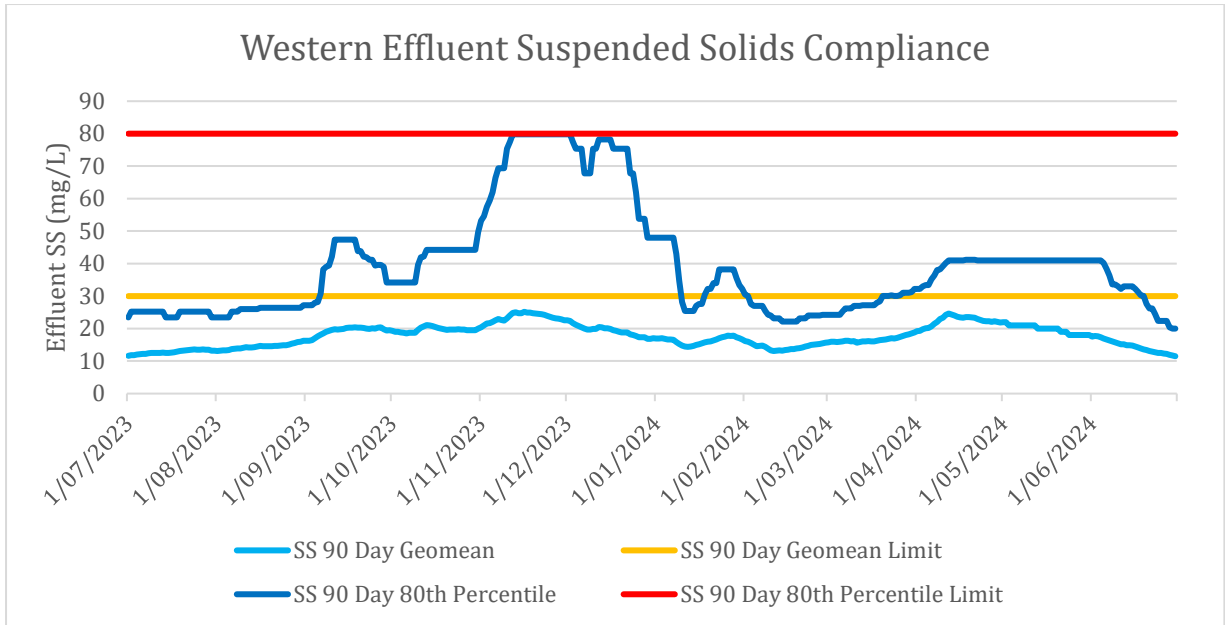


Figure 3: Western WWTP Suspended Solids Compliance

Section (iii)

Figure 4 below presents a graphical summary of the geometric mean and the 80<sup>th</sup> percentile compliance for the Effluent Faecal Coliforms.

The treatment plant was compliant to Effluent Faecal Coliform quality requirement of the consent for financial year 2023/2024.

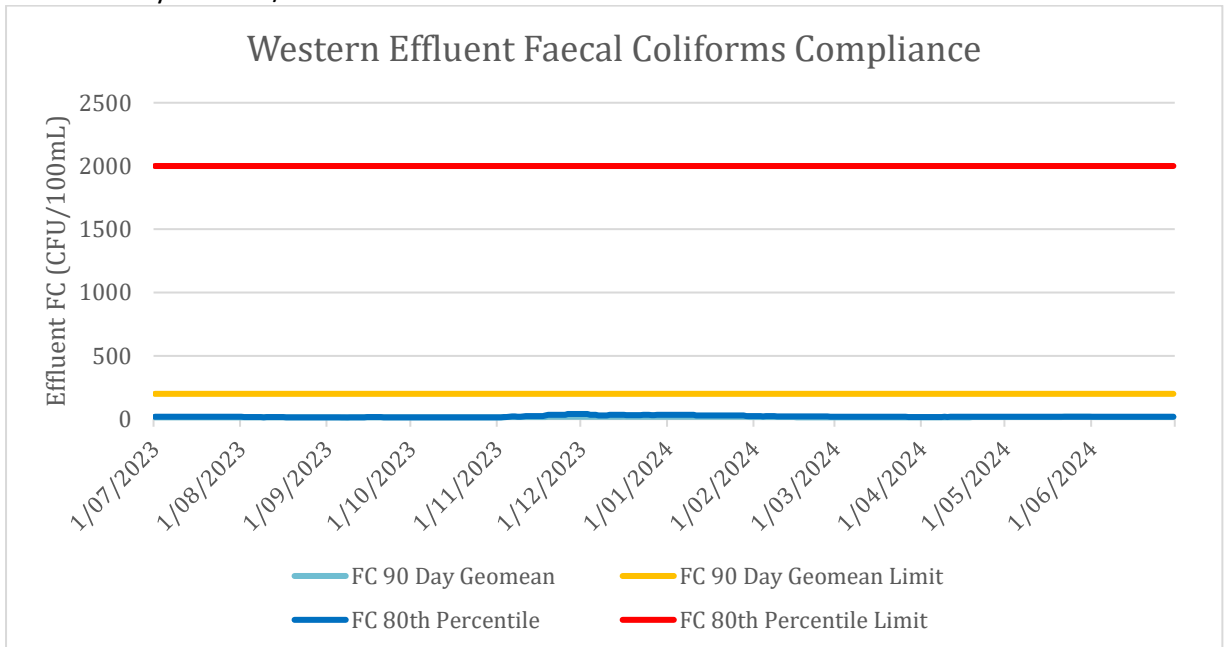


Figure 4: Western WWTP Faecal Coliform Compliance

A graphical representation of the daily effluent results can be found in Appendix I: Daily Effluent Results.

## Condition (16)

The permit holder shall collect representative coastal water samples from knee deep water at the following locations, once each month for five months through November to March inclusive (the bathing season) each year, for the duration of this permit:

- a) 100m SE of the outfall (map reference NZMS 260: R27; 504.835)
- b) 200m SE of the outfall (map reference NZMS 260: R27; 504.834)
- c) The Karori Stream, above the tidal influence
- d) 100m NW of the mouth of the Karori Stream

Sampling shall be undertaken during dry, settled weather where practicable. Each of the water samples shall be analysed for faecal coliform and enterococci bacteria (cfu/100ml). The time of the sample collection, together with the weather and tidal conditions, observations of the sea state, stream colour and location of stream mouth (if at all) shall be recorded and reported with the analytical results.

Water samples taken during the months of January to March inclusive, shall also be analysed for the following parameters:

Ammoniacal nitrogen	g/m <sup>3</sup>
Nitrite nitrogen	g/m <sup>3</sup>
Nitrate nitrogen	g/m <sup>3</sup>
Dissolved reactive phosphorus	g/m <sup>3</sup>

The permit holder shall provide the results to the Manager, Environmental Regulation, Regional Council, by 30 April each year (as part of the quarterly report required by condition (19) of this permit), or on request.

The tables below provide the summary of the analytical results for the November 2023 to March 2024 monthly coastal water samples at the four sites listed a – d.

Date	100m SE of the Outfall								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather
dd/mm/yyyy	cfu/100mL	cfu/100mL	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	--	--	--
22/11/23	10	10	NA	NA	NA	NA	High	Ebb	Clear
15/12/23	10	10	NA	NA	NA	NA	Low	Ebb	Clear
17/01/24	10	10	0.13	0.1	0.1	0.025	Low	Flood	N
28/02/24	10	10	0.31	0.01	0.01	0.050	Mid	Ebb	Cloudy
5/03/24	10	10	0.01	0.1	0.1	0.046	High	Flood	Cloudy

Table 1: 100m SE of the Outfall

Date	200m SE of the Outfall								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather
dd/mm/yyyy	cfu/100mL	cfu/100mL	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	--	--	--
22/11/2023	10	10	NA	NA	NA	NA	High	Ebb	Clear
15/12/2023	10	10	NA	NA	NA	NA	Low	Ebb	Clear
17/01/24	10	10	0.13	0.03	0.1	0.025	Low	Flood	N
28/02/24	10	10	0.31	0.1	0.1	0.10	Mid	Ebb	Cloudy
5/03/24	10	10	0.01	0.1	0.1	0.050	High	Flood	Cloudy

Table 2: 100m SE of the Outfall

Date	The Karori Stream, Above the Tidal Influence								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Colour of Stream	Location of Stream Mouth	Weather
dd/mm/yyyy	cfu/100mL	cfu/100mL	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	--	--	--
22/11/2023	220	4500	NA	NA	NA	NA	High	Ebb	Clear
15/12/2023	90	200	NA	NA	NA	NA	None	Ebb	Clear
17/01/24	150	500	0.02	0.01	2.83	0.387	Low	Flood	NW
28/02/24	390	550	0.14	2.81	0.03	0.386	Mid	Ebb	Cloudy
5/03/24	20	360	0.07	0.02	2.33	0.326	High	Flood	Cloudy

Table 3: The Karori Stream, Above the Tidal Influence

Date	100m NW of the Mouth of the Karori Stream								
	Enterococci	Faecal Coliforms	Ammoniacal Nitrogen	Nitrite Nitrogen	Nitrate Nitrogen	Dissolved Reactive Phosphorus	Sea Conditions	Tide	Weather
dd/mm/yyyy	cfu/100mL	cfu/100mL	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	--	--	--
22/11/2023	10	10	NA	NA	NA	NA	High	Ebb	Clear
15/12/2023	10	10	NA	NA	NA	NA	Low	Ebb	Clear
17/01/24	10	10	0.13	0.1	0.24	0.04	Low	Flood	NW
28/02/24	200	60	0.30	0.1	0.1	0.050	Mid	Ebb	Cloudy
5/03/24	220	100	0.01	0.1	0.22	0.044	High	Flood	Cloudy

Table 4: 100m NW of the Mouth of the Karori Stream

## Condition (19)

A quarterly monitoring report for each three-month period ending 31 March, 30 June, 30 September and 31 December shall be provided to the Manager, Environmental Regulation, Wellington Regional Council within 30 days of the end of each three month period.

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

The results of all monitoring undertaken, as required by conditions (6), (9)(a), (9)(b) and (25) of this permit. These results shall be provided in an electronic format and a hard-copy format; an assessment of compliance with conditions (6), (9)(a), (9)(b) and (15) of this permit; and reasons for any non-compliance and subsequent actions undertaken to remedy any non-compliance.

This annual report also intends to comply with this quarterly report requirement for the period April to June 2024. The required information for the conditions listed above can be found in conditions 2, 10 and 25 of this report.

## 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) Any other issues considered to be important;

### Section (a)

Table 5 summarises the treatment plant data monitored from July 2023 to June 2024. The median, minimum and maximum values are tabulated for each parameter.

<b>Parameter</b>	<b>Units</b>	<b>Geomean Limit</b>	<b>Minimum</b>	<b>Median</b>	<b>80<sup>th</sup> Percentile</b>	<b>Maximum</b>
WWTP Effluent Discharge	m <sup>3</sup>	-	1703	3423	4251	12139
Effluent BOD	g/m <sup>3</sup>	20	3	24	37	340
Effluent Suspended Solids	g/m <sup>3</sup>	30	4	14	32	453

Effluent Faecal Coliform	cfu/100mL	200	10	10	20	3085
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**Table 5: Summary of WWTP Monitoring Data**

The median values of all the daily effluent quality parameters such as BOD, suspended solids and faecal coliform are within the geomean limits.

The median values for the receiving water monitoring for this reporting period are tabulated in Table 6.

Parameter	100m SE of the Outfall	200m SE of the Outfall	The Karori Stream, Above the Tidal Influence	100m NW of the Mouth of the Karori Stream
Enterococci	10	10	150	10
Faecal Coliform	10	10	500	10
Ammoniacal Nitrogen	0.13	0.13	0.07	0.13
Nitrite Nitrogen	0.1	0.1	0.02	0.1
Nitrate Nitrogen	0.1	0.1	2.33	0.22
Dissolve Reactive Phosphorus	0.05	0.05	0.386	0.044

**Table 6: Summary of Receiving Environment Monitoring Data**

The average enterococci and faecal coliform values for both 100m and 200m SE of outfall is well below the bathing season limit which is 35 cfu/100 mL and 150 cfu/100mL respectively.

Elevated bacteriological concentration was observed at the Karori Stream Above the Tidal Influence Sampling site. These levels are incongruous with the effluent faecal coliform results from the treatment plant which has remained compliant for the whole reporting period. This indicates an external source other the treatment plant as the likely cause of the elevated bacteriological levels at this location.

Due to the outfall pipeline failure which resulted in the continuous discharge of fully treated effluent to the Karori stream rather than the CMA, ongoing stream water quality monitoring has been commissioned. An assessment of environmental effects has been undertaken by an independent expert will be conducted done using the data gathered from the stream monitoring. A copy of the report is attached in Appendix V.



## Section (b)

A comparison of data was made between the last five financial years. The following section summarises that comparison.

Due to some missing data in the outfall effluent pipeline daily discharge volumes, WWTP effluent discharge volume is used to establish a trend. The WWTP discharge volume tends to increase during winter season and decreases during summer.

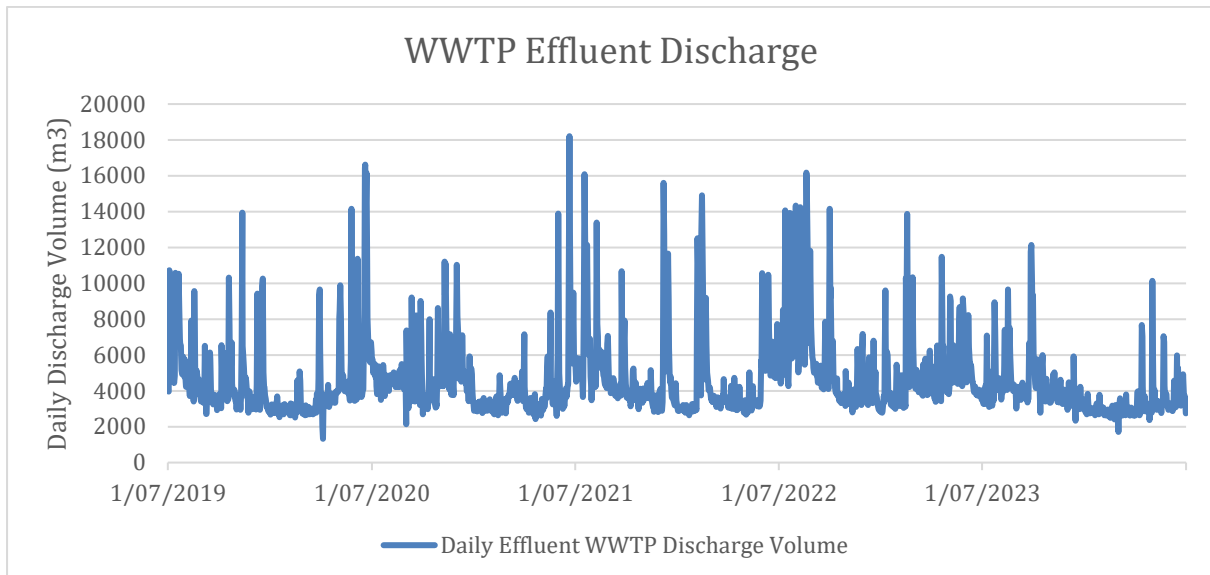


Figure 5: WWTP Effluent Discharge Volume versus Rainfall

## WWTP Effluent BOD<sub>5</sub>:

To establish a trend, all daily effluent BOD in the last five (5) years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent until end of March 2022. The consent does not require daily effluent sampling thus there are some days with missing effluent BOD<sub>5</sub> results in the past years.

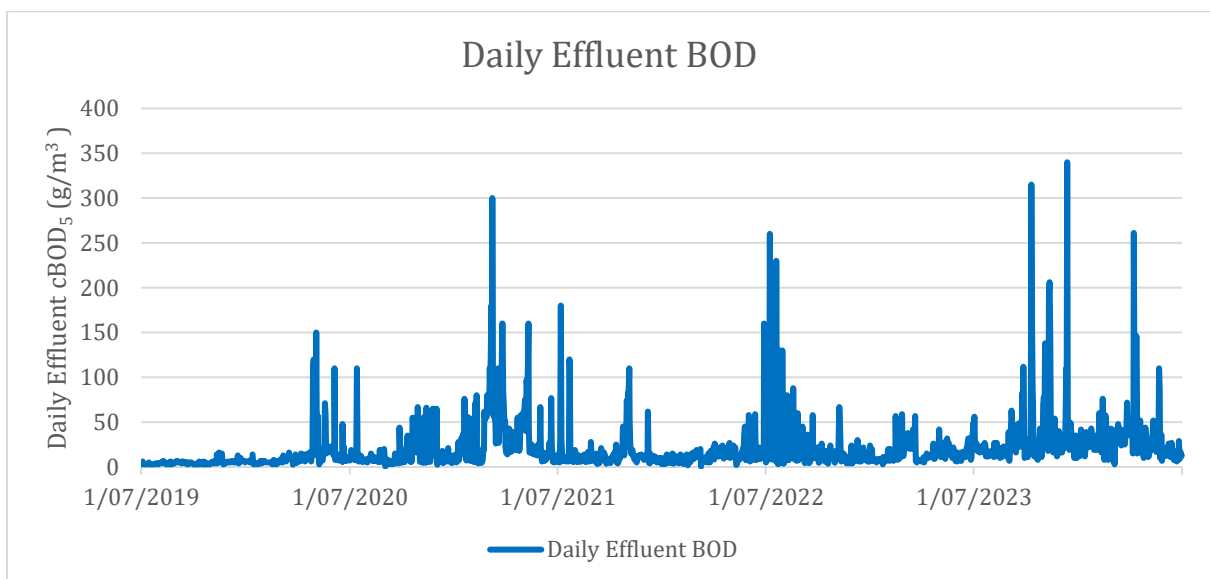


Figure 6: Daily Effluent BOD<sub>5</sub> results

To establish a trend, all daily effluent suspended solids in the last 5 years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent until end of March 2022. The consent does not require daily effluent sampling thus there are some days with missing effluent suspended solids results in the past years.

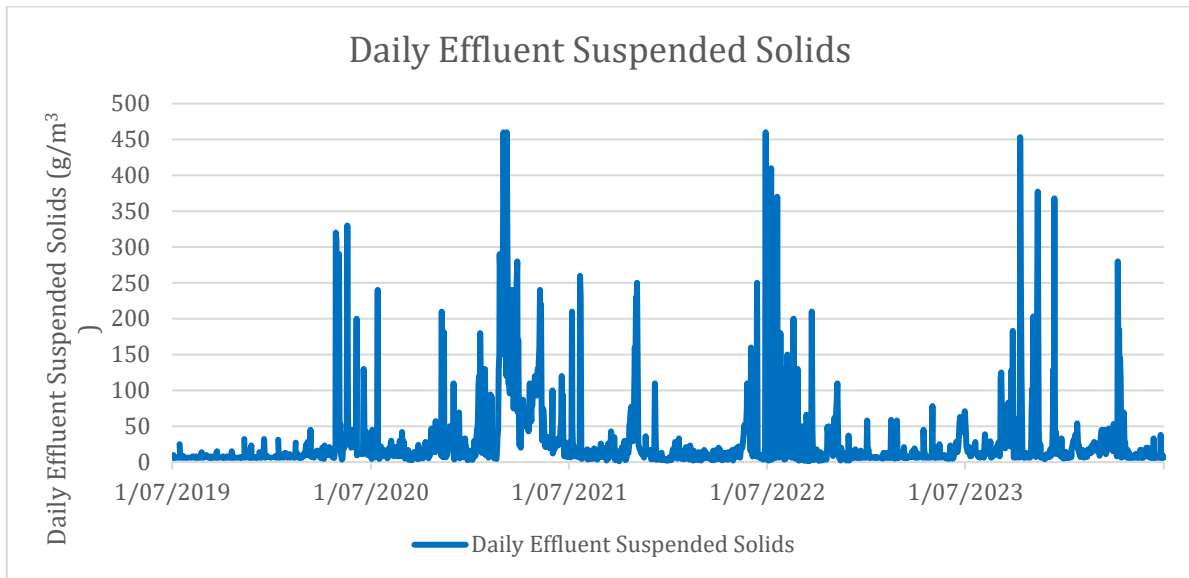
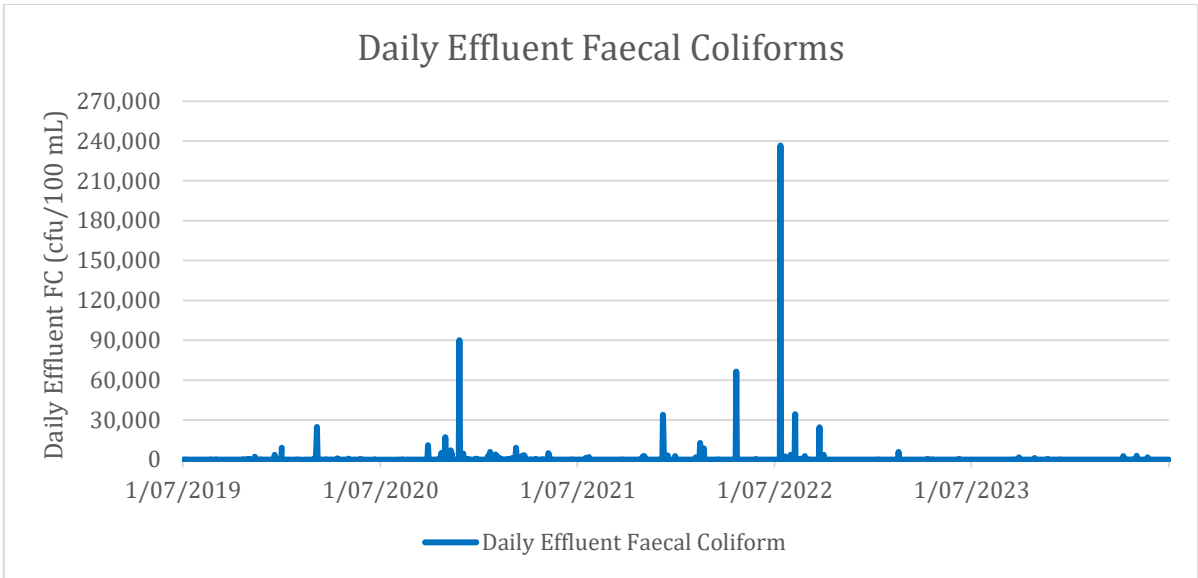


Figure 7: Daily Effluent Suspended Solids Results

**WWTP Effluent Faecal Coliform:**

To establish a trend, all daily effluent suspended solids in the last 5 years have been used. Please note that only the first 20 samples of each calendar month are used to assess compliance as stated in the resource consent. The consent does not require daily effluent sampling thus there are some days with missing effluent suspended solids results in the past years.



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

Results in figures 6, 7 and 8 show different results on previous years for effluent quality. Figure 6 indicates an increase in BOD on previous years, the reasons for this are explained in section (d). Figure 7 is more consistent with previous years with a marginal increase in solids in late 2023, for the same reasons as the BOD increase. The faecal coliform results have been much improved on previous years shown in Figure 8. During summer period, the plant takes one train of biological treatment offline during summer to adapt to the increase in temperature and reduction of hydraulic and organic load going to the plant.

The following is a comparison of the monthly coastal water's samples between the previous and current reporting period:

Parameter	Units	Karori Stream above Tidal Influence					100m North West of Karori Stream Mouth					100m South East of Western Outfall					200m South East of Western Outfall				
		2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Enterococci	cfu/100 mL	19.2	37	160	18	150	5.6	42	7.3	10	10	4.8	33	5.5	10	10	5.6	32	5.5	10	10
Faecal Coliforms	cfu/100 mL	74.8	151	240	90	500	5.6	32	9.1	20	10	4	20	1.8	10	10	8.8	22	3.6	10	10
Ammoniacal Nitrogen	g/ m <sup>3</sup>	0.17	1.6	0.22	0.01	0.07	0.06	0.4	0.4	0.01	0.13	0.04	0.4	0.22	0.01	0.13	0.04	0.4	0.4	0.01	0.13
Nitrite Nitrogen	g/ m <sup>3</sup>	0.4333	0.002	0.0027	0.001	0.002	0.404	0.03	0.023	0.1	0.1	0.404	0.002	0.002	0.1	0.1	0.404	0.03	0.002	0.1	0.1
Nitrate Nitrogen	g/ m <sup>3</sup>	0.2	0.643	0.99	1.78	2.33	0.09	0.15	0.31	0.12	0.22	0.1	0.067	0.12	0.1	0.1	0.1	0.174	0.096	0.1	0.1
Dissolved Reactive Phosphorus	g/ m <sup>3</sup>	0.022	0.0062	0.0047	0.116	0.39	0.0187	0.0062	0.0033	0.0031	0.004	0.0163	0.0051	0.0035	0.0031	0.005	0.0173	0.0023	0.0031	0.0028	0.005

Table 7: Coastal Monitoring

The results were consistent throughout the 5-year period in all locations except the Karori Stream above the Tidal Influence. Elevated bacteriological concentration was observed at the Karori Stream Above the Tidal Influence Sampling site. These levels are incongruous with the effluent faecal coliform results from the treatment plant which has remained compliant for the whole reporting period. This indicates an external source other the treatment plant as the likely cause of the elevated bacteriological levels at this location.

### Section (c)

Western WWTP has been non-compliant for BOD since September 2023 in the reporting period and has been unable to comply with the discharge to CMA requirement of the consent due to the delayed repair of the main outfall pipeline.

The below table details the notices served by GWRC in relation to non-compliance.

Date	Notice	Reason	Comments
September 2023	Formal Warning	Pipeline discharge to Karori Stream	
October 2023	Please Explain	BOD Non-compliance	
November 2023	Please Explain	Undisinfected discharge	See Section (f) for details
January 2024	Abatement notice	Outfall Pipeline repair	Abatement requires completion by August 2024.
May 2024	Infringement notice	BOD Non-compliance	

### Section (d)

An unexpected increase in load to the plant in September 2023 from the nearby Karori Tunnel project and mechanical issues with one of the clarifiers are believed to be the main causing factors in the spikes of BOD at the plant. This has been explained in more detail in condition 10(i).

The main outfall pipeline repair has been delayed throughout 23/24 due to an ongoing dispute with the landowners regarding access. This dispute was resolved in April 2024 and GWRC have issued an abatement noticed requiring the completion of the project by August 2024.

### Section (e)

Aside from the progressing the repair of the outfall pipe, there have been various upgrades within the plant to improve performance. Both clarifiers underwent refurbishment in April 2024 driving improvement in performance as well as replacing one of the plants two step screens. Wellington Water is also continually monitoring the stream quality to track if there are any adverse effects in the stream associated with the current discharge set up.

### Section (f)

On 24 November 2023, there was a discharge of biologically treated but undisinfected wastewater to Karori Stream due to the UV system being offline because of a power cut in the area. GWRC issued a Please Explain letter for this incident and received a response within the required timeframe.

## Condition (23)

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 and members of the CLG, by 31 July each year.

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

- a) details of the location, extent and duration of any leakage or faults, and the timing, nature and success of remedial action taken to remedy the leaks or faults;
- b) details of any other works (including any repairs and replacements) undertaken during the past year; and
- c) any work planned in the next 12 months to repair or replace the pipeline.

The annual inspection of the main outfall pipeline was delayed this year due to uncertainty over funding with the client council. However, the inspection has been scheduled for late July 2024 and the subsequent report will be submitted in September 2024.

## Condition (25)

The permit holder shall collect representative water samples from the Karori Stream at the following locations, once every fortnight for the duration of this permit:

- a) Karori Stream at Friend Street (map reference NZMS 260: R27; 554.901)
- b) Karori Stream at Campbell Street (map reference NZMS 260: R27; 554.900)
- c) Karori Stream at South Karori Road (map reference NZMS 260: R27; 540.880)
- d) Karori Stream approximately 100 metres upstream of the Western Treatment Plant (map reference NZMS 260: R27; 523.872)
- e) Karori Stream 100 metres approximately downstream of the Western Treatment Plant (map reference NZMS 260: R27; 523.871)

The water samples shall be analysed for faecal coliforms (cfu/100mL). The time of the sample collection, together with the weather conditions shall be recorded and reported with the analytical results.

The permit holder shall provide the results of this monitoring to the Manager, Environmental Regulation, Wellington Regional Council, quarterly, in accordance with the requirements of condition (19) of this permit, or on request.

The Karori Stream monitoring records can be found in Appendix IV of this report.

# WGN060283 [25227]

## Condition (2)

This permit shall only be exercised when the sewage inflow to the treatment plant exceeds 190 litres per second (L/s), and the 1000 m<sup>3</sup> storage tank is full.

There were three bypass events that discharged partially treated effluent via an existing outfall that occurred in the 2023/2024 reporting year.

These events had an influent flow rate to the Western WWTP greater than 190L/s and the 1000m<sup>3</sup> storage tank was full. Due to the failure of the section on the Karori Outfall, the discharge location was to the Karori Stream rather than the coastal marine area.

On 24 November 2023, there was a discharge of biologically treated but undisinfected wastewater to Karori Stream due to the UV system being offline because of a power cut in the area. A Please Explain letter was issued by GWRC and a response was provided within the required timeframe.



## Condition (5)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the bypass discharges into the coastal marine area, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring.

The permit holder shall maintain an incident log containing the details of each bypass discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council upon request.

The following is a summary of the bypass events from the Western WWTP for the 2023/2024 reporting period. Please note the wet weather discharges are recorded as non-consented due to the break of the outfall pipeline causing the discharge to convey through the Karori Stream. The main outfall pipeline is scheduled to be completed and back in operation by August 2024.

Date	Start	End	Duration	Average Discharge Flow Rate	Peak Inflow Flow Rate	Total Volume of Bypass	Consented	Cause
dd mmm yyyy			hrs/mins	L/s	L/s	m <sup>3</sup>	Y/N	--
16 Aug 2023	16/08/2023 23:31	17/08/2023 02:15	2hr 44m	32	216	330	N	Wet Weather
27 Sep 2023	27/09/2023 04:38	27/09/2023 11:58	07hr 45m	62	460	1,645	N	Wet Weather
24 Nov 2023	24/11/2023 10:37	24/11/2023 12:08	1hr 31m	67	170	5,364	N	UV offline
02 May 2024	2/05/2024 02:04	2/05/2024 08:50	06hr 46m	25	51	93	N	Wet Weather

**Table 8: Bypass Events from 2023/2024 Reporting Period**

## Condition (6)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded in each hour at Karori Reservoir rain-gauge for each of the 7 days preceding each overflow event in the annual report required by condition (10) of this permit.

Wet weather bypass events occurred on 3 occasions during the reporting period. The following figures are of the hourly rainfall rate for the seven days prior to the overflow events. All rainfall data is obtained from the GWRC Environmental Monitoring and Research website. The current rain gauge used is Karori Stream at Samuel Marsden School. A graphical representation of the plant's hourly inflow versus the hourly rainfall data are shown for all the bypass discharge events. It can be noted that the plant's inflow is greatly affected by inflow and infiltration in the catchment especially during wet weather events.

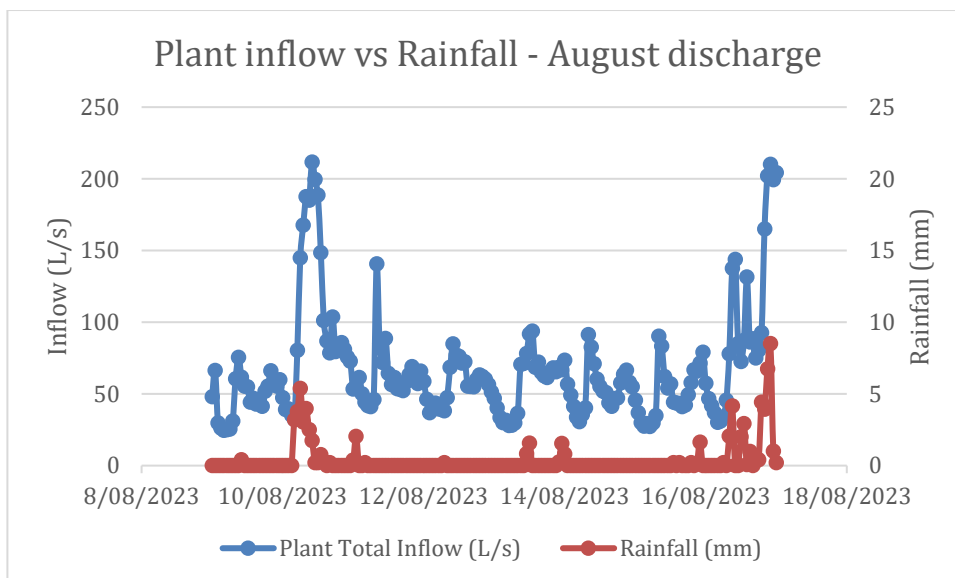
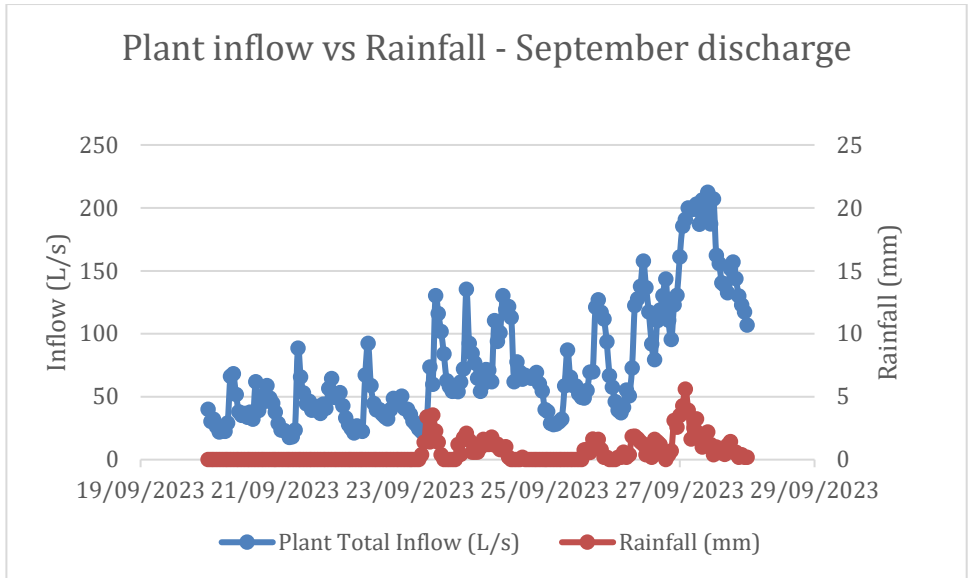
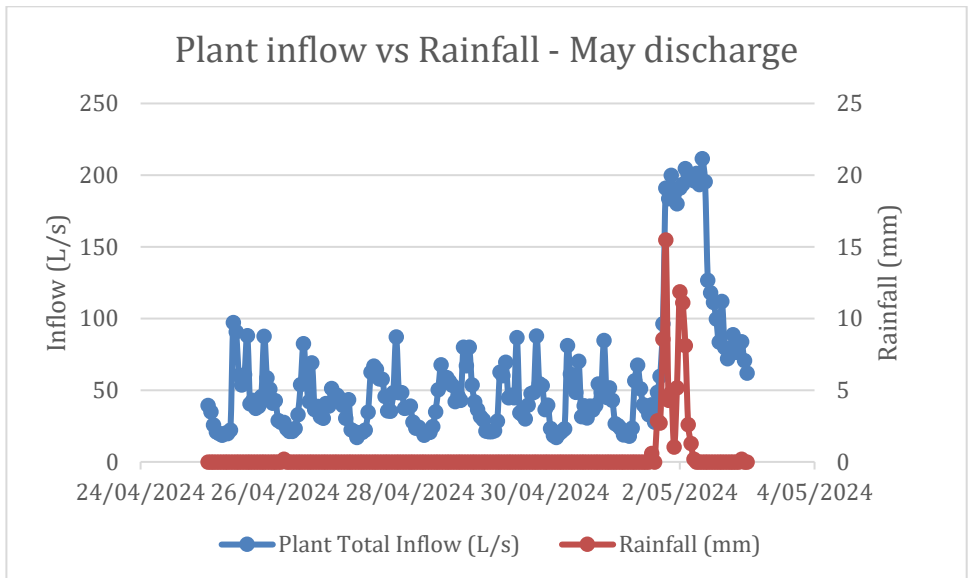


Figure 9: Rainfall and Inflow Data for 7 days prior 16/08/2023 Bypass Event



**Figure 10: Rainfall and Inflow Data for 7 days prior 27/09/2023 Bypass Event**



**Figure 11: Rainfall and Inflow Data for 7 days prior 2/05/2024 Bypass Event**

## Condition (7)

The permit holder shall take one representative grab sample of the settled, milli-screened effluent prior to its entry into the coastal outfall pipe every time the discharge authorised by this permit has occurred for more than two hours. Each sample shall be analysed for the following parameters:

pH

Suspended solids g/m<sup>3</sup>

Total BOD<sub>5</sub> g/m<sup>3</sup>

Faecal coliform cfu/100mL

bacteria oils/grease g/m<sup>3</sup>

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Below is a summary of the results obtained from the sample analysis during bypass events:

Date	pH	Suspended Solids	Total BOD <sub>5</sub>	Faecal Coliform Bacteria	Oils/Grease
	--	g/m <sup>3</sup>	g/m <sup>3</sup>	cfu/100mL	g/m <sup>3</sup>
16/08/2023	7.3	32	21	6000	5
27/09/2023	7	25	19	6000	4
2/05/2024	6.7	26	14	6000	18

**Table 9: Bypass Sample Analysis**

The analytical data sheets for these samples can be made available upon request..

## Condition (8)

When a bypass discharge occurs that lasts for longer than 10 hours the permit holder shall collect two sets of representative water samples from knee deep water at the following locations:

- a) 100m SE of the outfall (map reference NZMS 260: R27; 504.835)
- b) 200m SE of the outfall (map reference NZMS 260: R27; 504.834)
- c) The Karori Stream, above the tidal influence
- d) 100m NW of the mouth of the Karori Stream

The first set of samples shall be taken within 24 hours of the discharge commencing and the second set of samples shall be taken 12- 48 hours after the discharge has ceased.

These samples shall only be taken provided that safe vehicular access is available and weather conditions allow for safe access to the sample locations.

The water samples shall be analysed for enterococci bacteria (cfu/100ml). The time of the sample collection, together with the weather and tidal conditions shall be recorded and reported with the analytical results.

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

None of the bypass discharges in the reporting period 2023/24 occurred for longer than a period of 10 hours, therefore this condition is not applicable.

## Condition (10)

The permit holder shall produce an annual report by 31 July each year that summarises the information collected in accordance with conditions (5), (6), (7), (8), (12) and (13) of this permit.

The report shall also include the influent flow records for the dates on which overflow discharges have occurred during that year.

This report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council and a copy shall be provided to members of the Western Wastewater Treatment Plant Community Liaison Group (which is to be formed in accordance with the conditions applied to coastal permit WGN060283 [25226]).

The summary of records required by this condition has been included in the specific sections for each consent condition.

## Condition (12)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

- a) Details of works that have been undertaken and what these works are expected to achieve;
- b) An indication of when any ongoing works will be completed;
- c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
- d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25226], [25227], [35674] and [25229].

An annual inflow and infiltration report can be found in Appendix III.

## Condition (13)

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

- a) Name and address of the complainant;
- b) Identification of the nature of the complaint;
- c) Date and time of the complaint and of the alleged event;
- d) Weather conditions at the time of the complaint; and
- e) Any measures taken to address the cause of the complaint.

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

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (10) of this permit.

There were no complaints during the 2023/2024 reporting period.

# WGN060283 [35674]

## Condition (2)

This permit shall only be exercised when the sewage inflow to the treatment plant exceeds 190 litres per second (L/s), and the 1000 m<sup>3</sup> storage tank is full.

There were three bypass events that discharged partially treated effluent via an existing outfall that occurred in the 2023/2024 reporting year. These events had an influent flow rate to the Western WWTP greater than 190L/s and the 1000m<sup>3</sup> storage tank was full. Due to the failure of the section on the Karori Outfall, the discharge location was to the Karori Stream rather than the coastal marine area.

On 24 November 2023, there was a discharge of biologically treated but undisinfected wastewater to Karori stream when the UV system was offline due to a power cut in the area. An investigation report has been forwarded to GWRC.



## Condition (6)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the overflow discharges into the Karori Stream, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring.

The permit holder shall maintain an incident log containing the details of each overflow discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council upon request.

The following is a summary of the fully treated discharge events from the Western WWTP for the 2023/2024 reporting period due to wet weather.

Date	Start	End	Duration	Average Flow to Stream Rate	Peak Inflow Flow Rate	Maximum Flow Rate to Stream	Total Volume of Bypass to Stream	Consented	Cause
dd mmm yyyy			hrs/mins	L/s	L/s	L/s	m <sup>3</sup>	Y/N	--
16 Aug 2023	16/08/2023 23:31	17/08/2023 02:15	02hr 44m	6	216	14	44	Y	Wet Weather
27 Sep 2023	27/09/2023 04:38	27/09/2023 11:58	07hr 20m	18	460	70	388	Y	Wet Weather
02 May 2024	2/05/2024 02:04	2/05/2024 08:50	06hr 46m	28	51	68	677	Y	Wet Weather

Table 10: Karori Stream Bypass Events from 2023/24 Reporting Period

## Condition (7)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded in each hour at Karori Reservoir rain-gauge for each of the 7 days preceding each overflow event in the annual report required by condition (11) of this permit.

For all the consented discharges rainfall data please refer to WGN080003 [25227] Condition (6).

## Condition (8)

After an overflow discharge has occurred for more than 2 hours, the permit holder shall collect a representative grab sample of the treated effluent, prior to its entry into Karori Stream. All samples shall be analysed for the following parameters:

Suspended solids	g/m <sup>3</sup>
Ammoniacal nitrogen	g/m <sup>3</sup>
Total BOD <sub>5</sub>	g/m <sup>3</sup>
Faecal coliform	cfu/100mL

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Below is a summary of the results obtained from the sample analysis required by the consent:

Date	Suspended Solids	Ammoniacal Nitrogen	BOD <sub>5</sub>	Faecal Coliforms
	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	cfu/100mL
16/08/2023	28	0.25	10	10
27/09/2023	195	0.26	118	1000
2/05/2023	6	1.4	8	500

**Table 11: Western WWTP Treated Effluent Sample Results**

The analytical data sheets for these samples can be made available upon request..

## Condition (9)

After an overflow discharge has occurred for more than 24 hours, the permit holder shall collect two representative grab samples from the Karori Stream, one from upstream of the discharge point and one no more than 100 metres downstream of the discharge point. This sampling shall be repeated at daily intervals thereafter for the duration of the discharge. A final set of samples shall be taken two hours after the discharge has ceased, or as soon as is practicable thereafter.

All samples shall be analysed for the following parameters:

Suspended solids	g/m <sup>3</sup>
Ammoniacal nitrogen	g/m <sup>3</sup>
Total BOD <sub>5</sub>	g/m <sup>3</sup>
Faecal coliform	cfu/100mL

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Note: No monitoring shall be required during the hours of darkness, or when conditions are too dangerous for the safe procurement of samples.

There were no discharges that occurred for more than 24 hours in the reporting period of 2023/24 therefore this condition is not applicable.

## Condition (11)

The permit holder shall produce an annual report by 31 July each year that summarises the information collected in accordance with conditions (6), (7), (8), (9), (15) and (16) of this permit.

The report shall also include the influent flow records for the dates on which overflow discharges have occurred during that year. This report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council and a copy shall be provided to members of the Western WWTP Community Liaison Group (which is to be formed in accordance with the conditions applied to coastal permit WGN060283 [25226]).

The summary of records required by this condition has been included in the specific sections for each consent conditions.

## Condition (15)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council and the members of the Community Liaison Group with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

- a) Details of works that have been undertaken and what these works are expected to achieve;
- b) An indication of when any ongoing works will be complete;
- c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
- d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25227]-[25229].

An annual inflow and infiltration report can be found in Appendix III.

## Condition (16)

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

- f) Name and address of the complainant;
- g) Identification of the nature of the complaint;
- h) Date and time of the complaint and of the alleged event;
- i) Weather conditions at the time of the complaint; and
- j) Any measures taken to address the cause of the complaint.

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

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (10) of this permit.

There were no complaints during the 2023/2024 reporting period.

# WGN 060283 [35675]

## Condition (2)

This consent shall only be exercised when the sewage inflow to the treatment plant exceeds 390 litres per second (L/s), and the 1000 m<sup>3</sup> storage tank is full.

There were two bypass events where milli-screened and settled wastewater was discharged to the Karori Stream during this reporting period. These events had a maximum influent flow rate to the Western WWTP greater than 390L/s and the 1000m<sup>3</sup> storage tank was full. Due to the discharge coming from a surcharging manhole, flow monitoring of the discharge is not possible.

## Condition (5)

The permit holder shall monitor and record the time, flow rate, duration and total volume of the bypass overflow discharges into the Karori Stream, and shall report the results to the Manager, Environmental Regulation, Wellington Regional Council, within 10 working days of the overflow event occurring. The permit holder shall maintain an incident log containing the details of each bypass overflow discharge and make it available to the public or the Manager, Environmental Regulation, Wellington Regional Council, upon request.

The details of the discharges can be found below.

Date	Maximum Influent Flow Rate	Average Bypass Flowrate	Total Volume of Bypass	Consented	Cause
dd/mm/yyyy	L/s	L/s	m <sup>3</sup>	Y/N	--
27 Sep 2023	460	N/A	N/A	Y	Wet weather in the catchment area.
2 May 2024	444	N/A	N/A	Y	Wet weather in the catchment area.

Table 13: Bypass Event Details

## Condition (6)

The permit holder shall submit to the Manager, Environmental Regulation, Wellington Regional Council the amount of rainfall recorded at the Karori Reservoir rain-gauge in each hour for each of the 7 days preceding each bypass overflow event in the annual report required by condition (9) of this permit.

Rainfall data can be found in WGN060283 [25227] Condition 6 of this report.

## Condition (7)

The permit holder shall take one representative grab sample of the settled, milli-screened effluent prior to its entry into the Karori Stream every time the discharge authorised by this permit has occurred for more than one hour. Each sample shall be analysed for the following parameters:

pH

Suspended solids g/m<sup>3</sup>

Total BOD<sub>5</sub> g/m<sup>3</sup>

Faecal coliform bacteria cfu/100ml

Oils/grease g/m<sup>3</sup>

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the bypass discharge occurring.

Two discharges occurred in the reporting period that were over 1 hour in duration, they are listed below.

Date	pH	Suspended Solids	Total BOD <sub>5</sub>	Faecal Coliform Bacteria	Oils/Grease
	--	g/m <sup>3</sup>	g/m <sup>3</sup>	cfu/100mL	g/m <sup>3</sup>
27/09/2023	7	25	19	6000	4
2/05/2024	6.7	26	14	6000	18

Table 14: Partially Treated Effluent Sample Results

## Condition (8)

After any bypass overflow discharge has occurred for more than one hour, the permit holder shall collect a representative grab samples from the Karori Stream, upstream of the discharge point at the last bridge to the wastewater treatment plant at approximate map reference NZTM 1742609.5425785.

The sample shall be analysed for the following parameters:

Suspended solids g/m<sup>3</sup>

Ammoniacal nitrogen g/m<sup>3</sup>

Total BOD<sub>5</sub> g/m<sup>3</sup>

Faecal coliform bacteria cfu/100ml

The results of the monitoring shall be forwarded to the Manager, Environmental Regulation, Wellington Regional Council within 10 working days of the overflow discharge occurring.

Note: No monitoring shall be required during the hours of darkness, or when conditions are too dangerous for the safe procurement of samples.

Date	Suspended Solids	Ammoniacal Nitrogen	Total BOD <sub>5</sub>	Faecal Coliform Bacteria
	g/m <sup>3</sup>	g/m <sup>3</sup>	g/m <sup>3</sup>	cfu/100mL
27/09/2023	22	0.01	1	800
2/05/2024	10	0.01	2	3800

Table 15: Upstream Discharge Point Samples

## Condition (9)

The permit holder shall produce an annual report by 31 July each year that summarises the information collected in accordance with conditions (5), (6), (7), (8), (12) and (13) of this permit.

The report shall also include the influent flow records for the dates on which overflow discharges have occurred during that year.

This report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council and a copy shall be provided to members of the Western Wastewater Treatment Plant Community Liaison Group (which is to be formed in accordance with the conditions applied to coastal permit WGN060283 [35255])

The summary of records required by this condition has been included in the specific sections for each consent conditions.



## Condition (12)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council and the members of the Community Liaison Group with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

- e) Details of works that have been undertaken and what these works are expected to achieve;
- f) An indication of when any ongoing works will be complete;
- g) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
- h) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [35255], [25227], [35674] and [35675].

An annual inflow and infiltration report can be found in Appendix III.

## Condition (13)

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

- a) Name and address of the complainant;
- b) Identification of the nature of the complaint;
- c) Date and time of the complaint and of the alleged event;
- d) Weather conditions at the time of the complaint; and
- e) Any measures taken to address the cause of the complaint.

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

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (9) of this permit.

There were no complaints during the 2023/2024 reporting period.

# WGN060283 [25230]

## Condition (3)

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 Wellington Regional Council within three months of the granting of this permit.

Should the presence of faecal coliforms or salmonella be measured at any time, the Wellington Regional Council may direct that the permit holder sample at least once every month for six months before returning to the six monthly sampling regime.

The results shall be provided annually to Wellington Regional Council as part of the annual report required by condition 8 of this permit.

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

Location	Faecal Coliforms		Salmonella	
	11/2023	5/2024	11/2023	5/2024
Site 1	Absent	Absent	Absent	Absent
Site 2	Absent	Absent	Absent	Absent
Site 3	Absent	Absent	Absent	Absent

Table 16: Semi-Annual Air Quality Monitoring

## Condition (4)

The permit holder shall undertake a comprehensive assessment of the quality of the biofilter media on an annual basis (or more frequently if appropriate).

The results of this assessment, including a summary of the findings, details of any action(s) to be taken to improve the efficiency of the biofilter, and a timetable for those actions to be undertaken, shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council within one month of the assessment being undertaken.

Actions to be undertaken may include, but are not limited to:

- a) Turning, restructuring and dampening of the bed material,
- b) the addition of supplementary bed material, or
- c) total bed material replacement.

The first assessment shall be undertaken within three months of the granting of this permit. Subsequent assessments shall be undertaken annually thereafter.

The site's biofilter system has been assessed in November 2023. The report can be found in Appendix II.

## Condition (5)

The permit holder shall monitor the following parameters at the frequency noted:

- Weekly visual observations of the state of the biofilter bed, particularly for short circuiting and clogging of the bed;
- weekly monitoring of pressure drop across the biofilter bed;
- weekly monitoring of biofilter bed moisture content; and
- monthly monitoring of biofilter bed pH.

The frequency of (b), (c), and (d) can be altered by agreement in writing by the Manager, Environmental Regulation, Wellington Regional Council.

Monitoring results shall be recorded and be made available to Wellington Regional Council upon request. Information shall be forwarded annually to Wellington Regional Council as part of the annual report required by condition 8 of this permit.

The following graphs summarise the observations for July 2023/24 reporting period:

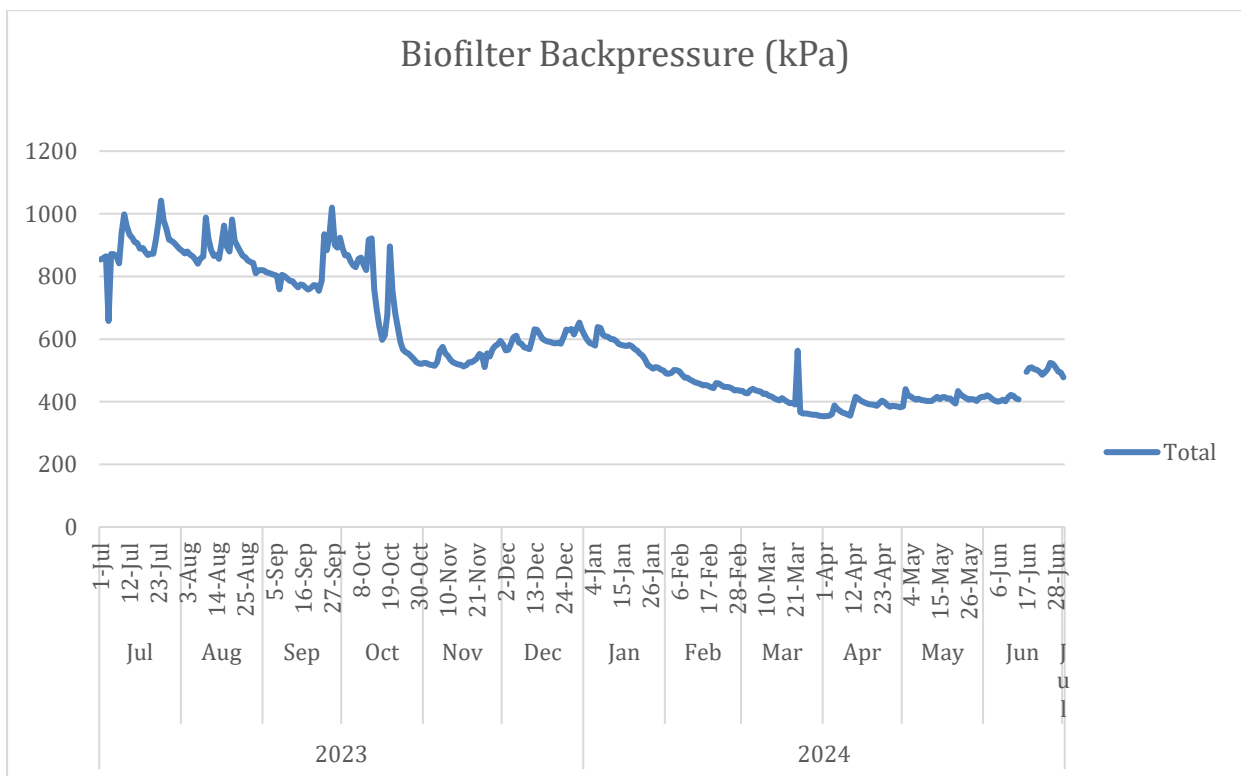
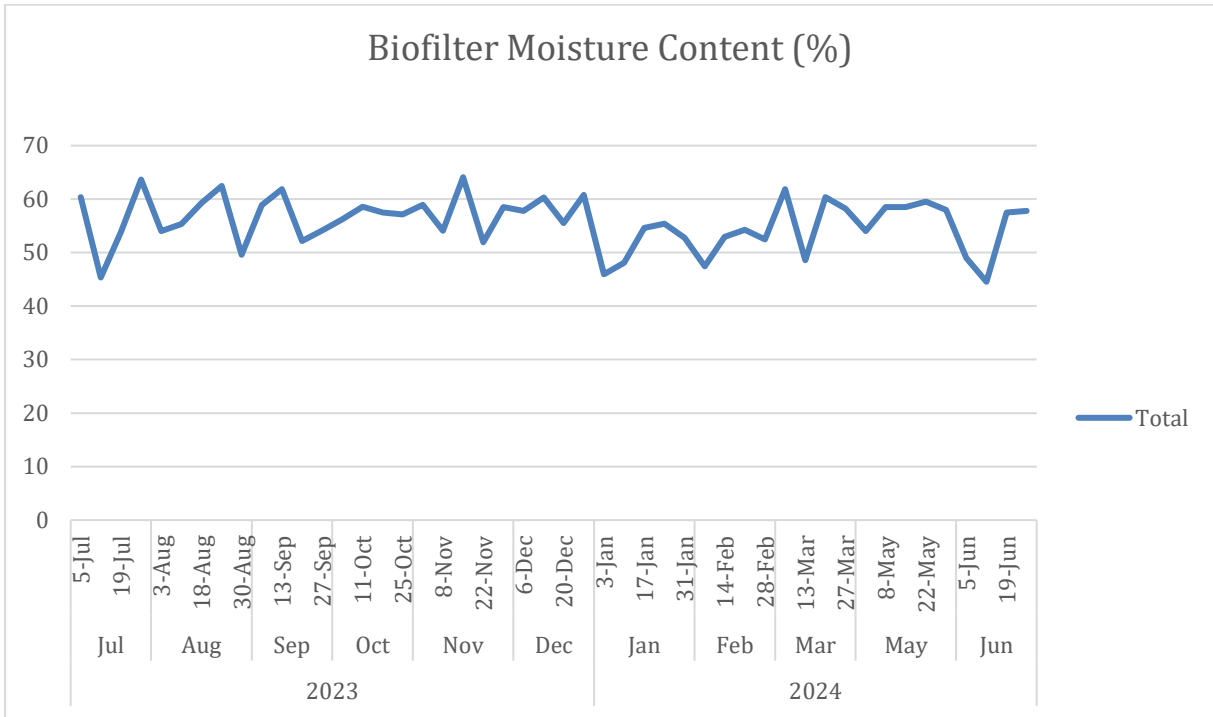
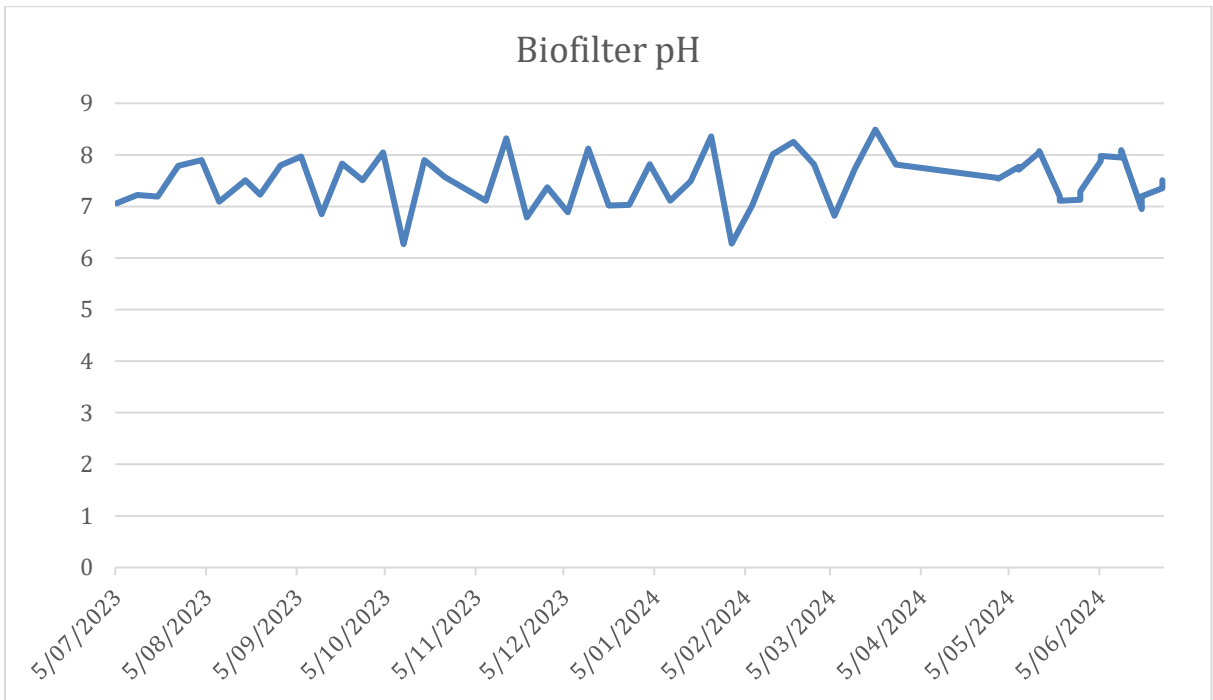


Figure 18: Pressure Readings in Biofilter

The trend shows a steady drop in backpressure since October 2023. The biofilter report indicates that there is some degradation in the media due to potential inconsistent distribution from the plenum underneath the media. More investigations are underway to try and establish other potential causes of the reduction.



**Figure 19: % Moisture Content in Biofilter Media**



**Figure 20: Biofilter Media pH**

## Condition (8)

An annual monitoring report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council on or before 31 July each year. This report shall include the results of the monitoring, assessments and records required under conditions (3), (4), (5) and (10) of this permit and a discussion of the results.

The summary of records required by this condition has been included in the specific sections for each consent conditions.

## Condition (10)

The permit holder shall keep a permanent record of any complaints received alleging adverse effects from the permit holder's operations. The complaints record shall contain the following where practicable:

- a) the name and address of the complainant, if supplied;
- b) identification of the nature of the complaint;
- c) date and time of the complaint and alleged event;
- d) weather conditions at the time of the alleged event;
- e) results of the permit holder's investigations; and
- n) any mitigation measures adopted.

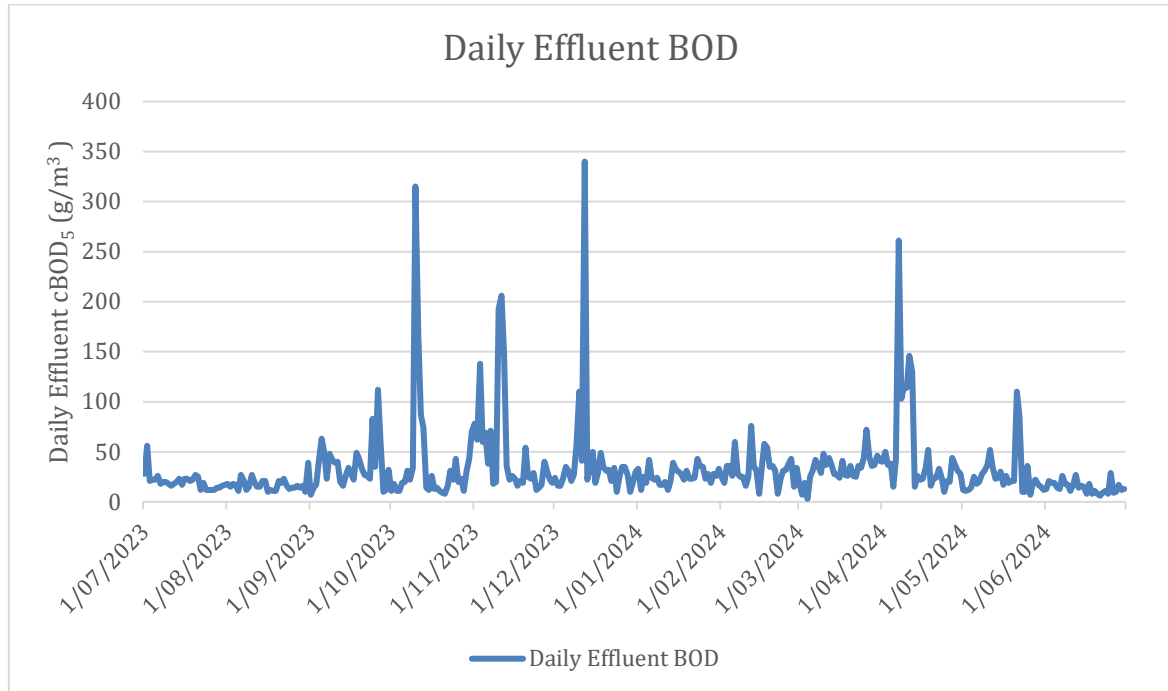
The permit holder shall notify the Manager, Environmental Regulation, Wellington Regional Council of any complaints relating to the exercise of this permit, within twenty-four hours of being received by the permit holder or the next working day.

The permit holder shall forward to the Manager, Environmental Regulation, Wellington Regional Council a copy of any complaints recorded in the annual report required by condition (8) of this permit.

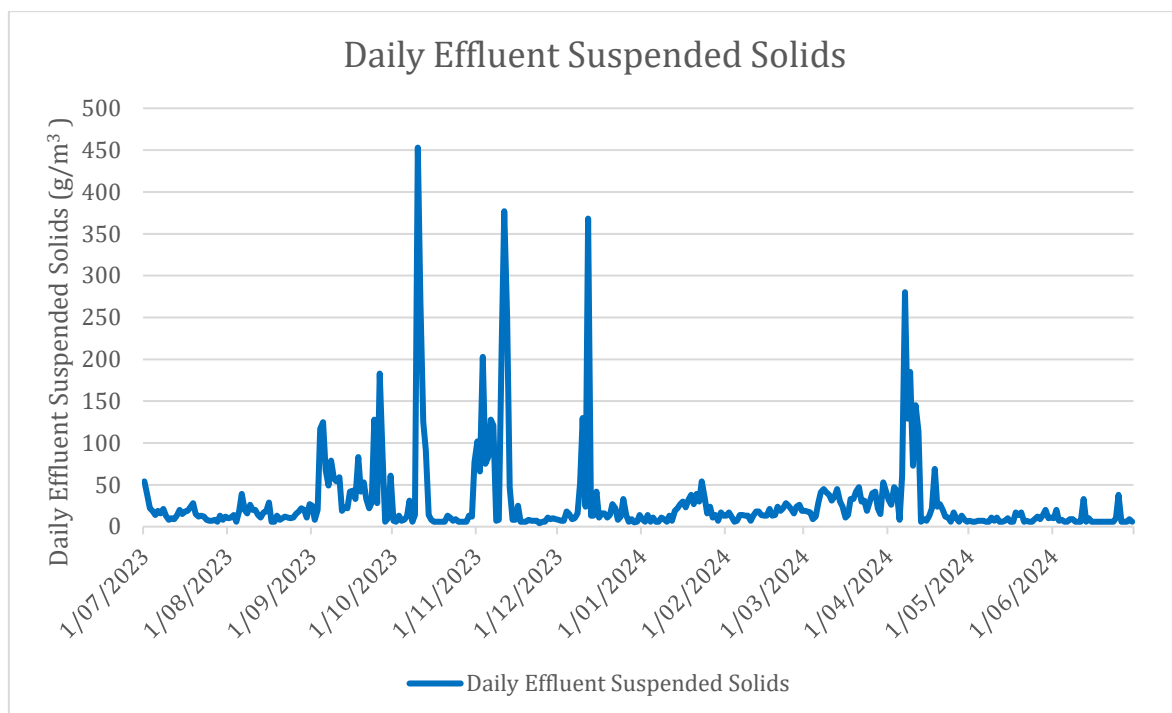
There were no complaints during the 2023/2024 reporting period.

# Appendix I: Effluent Quality Results

## Effluent Biological Oxygen Demand Results

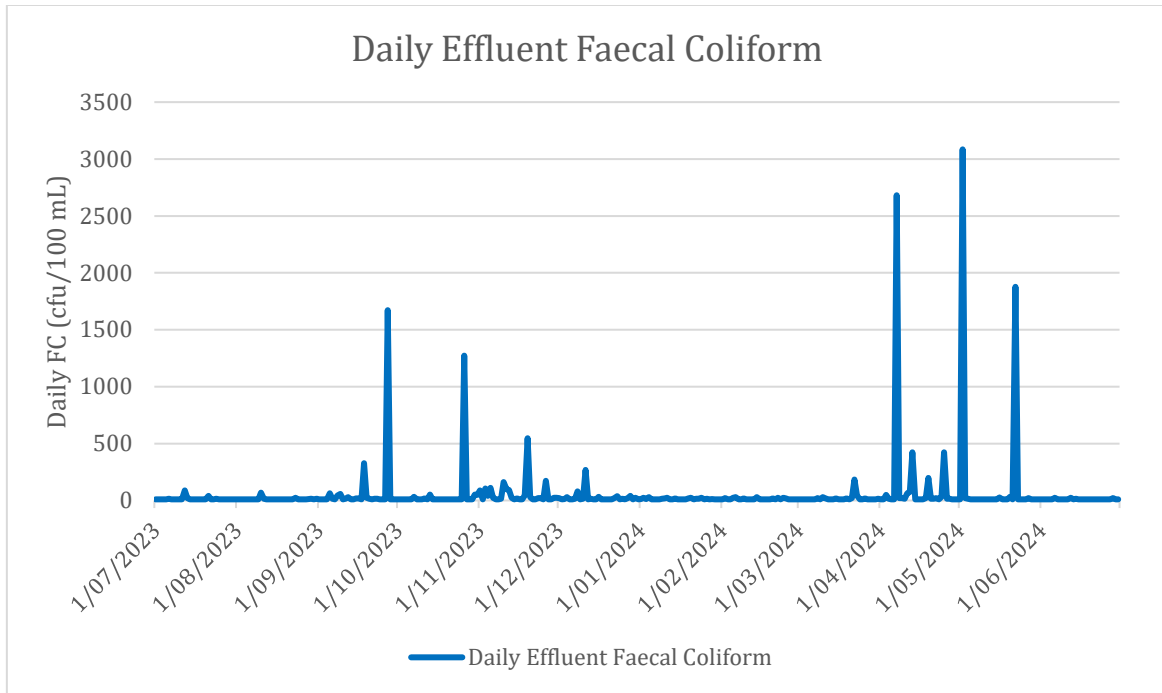


## Effluent Suspended Solids Results





## Effluent Faecal Coliform Results



# **Appendix II: Western WWTP Biofilter Assessment**

# **Appendix III: Western WWTP Inflow and Infiltration Report FY2023/2024**

## Condition (12)

The permit holder shall provide the Manager, Environmental Regulation, Wellington Regional Council with an annual report detailing what steps have and will be taken to reduce infiltration and stormwater ingress into the Karori sewerage network.

The report shall be submitted to the Manager, Environmental Regulation, Wellington Regional Council by 31 July each year and shall include, but not be limited to, the following information:

- a) Details of works that have been undertaken and what these works are expected to achieve;
- b) An indication of when any ongoing works will be completed;
- c) Details of any investigations undertaken with regard to inflow and infiltration in the Karori catchment; and
- d) Details of any works or investigations planned for the next financial year.

Note: One annual inflow and infiltration report may be submitted to the Manager, Environmental Regulation, Wellington Regional Council to meet the requirements in this regard of permits WGN060283 [25226], [25227], [35674] and [25229].

## 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 Western Wastewater Treatment Plant (WWTP) and to also improve waterway health. Sections (a), (b), (c) and (d) of Condition 12 are addressed below by the various activities and work programs contributing to inflow and infiltration reduction.

### Inflow Surveys

Inflow surveys utilise smoke testing and dye testing to identify faults that contribute to I&I. No inflow surveys were completed for 2023-2024 in the Western WWTP Catchment and there are currently none planned. As stated in the previous report, two inflow surveys commenced in 2018-2019 in Karori sub-catchments referred to as 18STH and 400STH as shown in Figure 1 below. These sub-catchments were identified from an initial rainfall derived inflow and infiltration (RDII) assessment utilising short term flow monitoring data.

In 2019-2020 faults were communicated to property owners and subsequent inspections were undertaken to resolve faults with customers. The final re-inspection of non-compliant properties with outstanding faults were undertaken in August 2020 and the project was completed in October 2020. The public faults identified from the inflow surveys and other faults requiring further investigation were completed with maintenance or repairs as required. There were no further inflow surveys completed for 2021-2022 in the Western WWTP Catchment.

A map showing where the recent Inflow Surveys Projects were completed is shown in Figure 1 below. The two Inflow Surveys that were completed are shown in green.

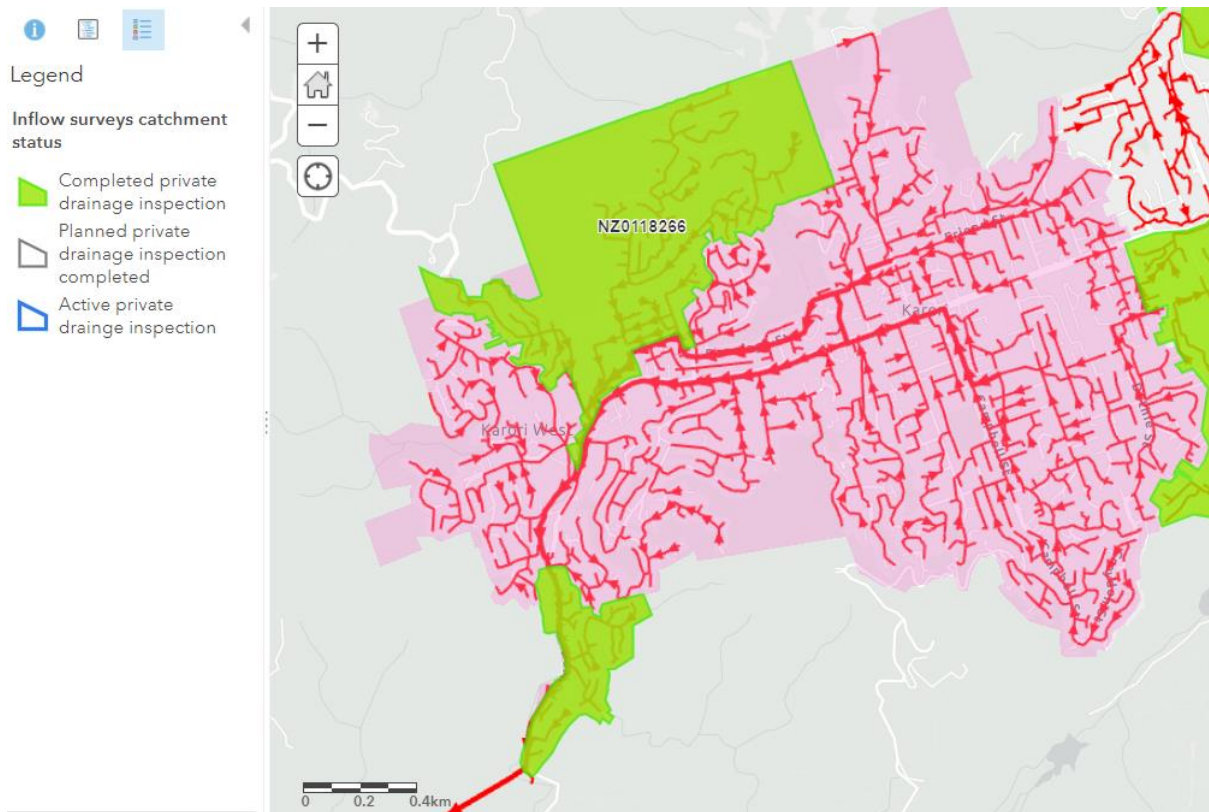


Figure 1-- Inflow Survey summary for Western WWTP catchment

## Flow and overflow monitoring

STH KARORI is a long-term flow monitor located in the main wastewater trunk outside of 105 Hazlewood Avenue. its purpose is to monitor hydraulic performance of the catchment and to assist with inflow and infiltration analysis of this catchment.

There are also two monitored controlled overflow structures at '62 South Karori Road' and '115 South Karori Road'. They notify WWL when overflow occurs and alert, proactively or reactively, of any potential wastewater impacts on the Karori Stream.

The monitors follow a regular calibration programme to ensure confidence and accuracy of the measurement data.

Table 1 and Figure 2 below show the type and location of all flow and overflow monitoring sites in this catchment.

There are currently 1 regional rain gauges located in Karori catchment located at Karori Stream at Samuel Marsden School.

**Table 1 - Monitors of the network**

Sensor ID	Location	Purpose	Type	Photo
STHKARORI	105 Hazlewood Avenue, Karori	Flow monitoring	Flow meter	
115STHKARORI	115 South Karori Road, Karori	Overflow monitoring	Level	
62STHKARORI	62 South Karori Road, Karori	Overflow monitoring	Level	
Karori Stream at Samuel Marsden School	Samuel Marsden School	Rainfall	Rain Gauge	

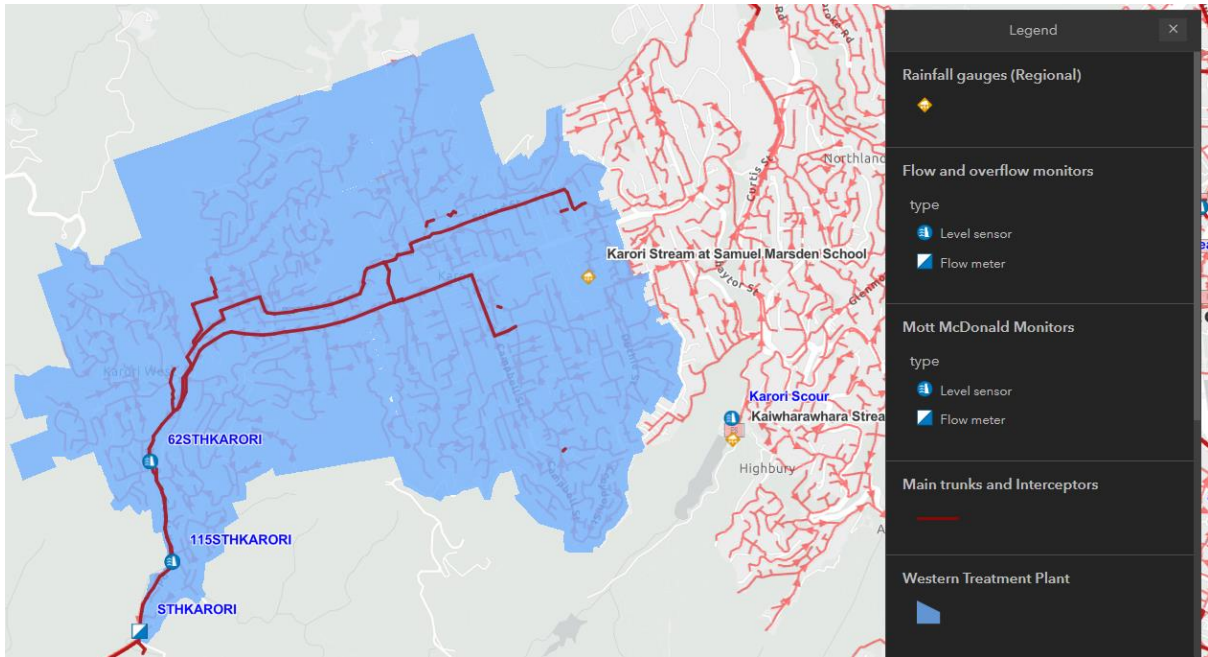


Figure 2-Map of Wastewater and rainfall monitoring sites

## Condition Assessments

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

Condition assessments have been carrying out in the network to identify opportunities in the network to improve reliability of the network and reduction of inflow/infiltration in the catchment.

Over the years approximately 42km of sewers were inspected in the Karori Catchment around 55% of the total lengths of the catchment network, no inspections were carried out in the catchment during the period 2023-2024, due to the focus in Moa Point sewer network.

The data from these condition assessment programs will be analysed and used to inform the repair and renewal programs in upcoming financial years.

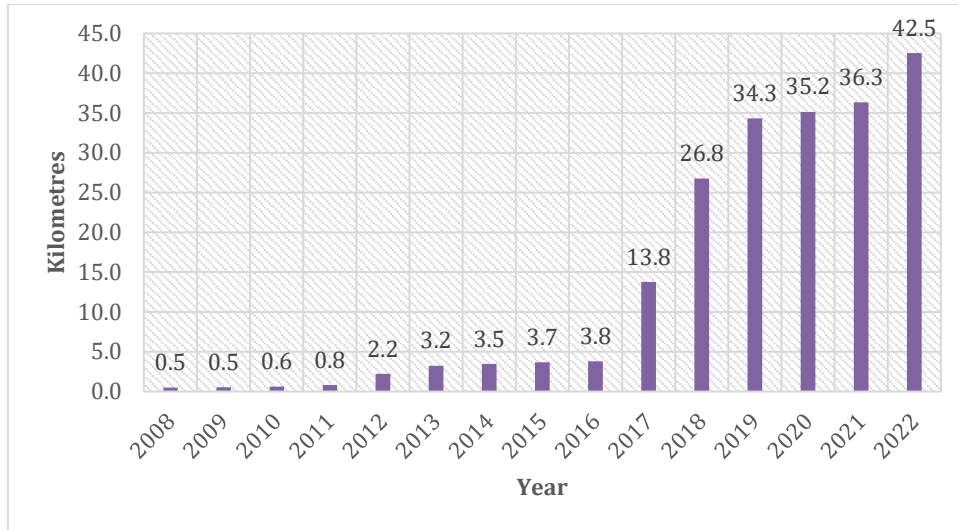


Figure 3- Accumulated Kilometres sewers inspected 2008-2022

### Wastewater Modelling

The Karori wastewater model has been updated and an Options Report was issued in May 2021 summarising options for improving network performance. The recommendations from this report will be incorporated into a Network Improvement Plan to prioritise operational and capital projects to improve the network.

### Stormwater and Wastewater Capital Projects

Table 1 below provides a summary of capital projects for wastewater and stormwater assets that were undertaken in 2022-2023, 7 km of wastewater pipe were rehabilitated and replaced, which were funded by Water reform budgets and WCC budgets. Wellington planned for 2022-2023 to renew 140m of stormwater critical pipes and 400m of wastewater pipelines. The projects are proposed and subject to final approval by council.

Karori wastewater renewals stage 2 involved the relining of the wastewater main on Samuel Parnell Road. Rainfall dependent inflow and infiltration was measured before and after and found a 2% reduction for the upstream sub-catchment from just the rehabilitation of Samuel Parnell Road. Further information can be found in the report: *Karori Post-Rehabilitation Monitoring SAMUEL Final Report January 2023*.

Table 1 - Stormwater and Wastewater Capital Projects in the Western WWTP Catchment

Activity	2023/2024	2024/2025
<b>Karori Stormwater</b>	<ul style="list-style-type: none"> <li>Waikare Street (4-7) Stormwater Renewal</li> <li>Shirley Street (37-39) to Hurman St (2) Stormwater Renewal</li> <li>Karori Rd (357a) Stormwater Renewal</li> </ul>	<ul style="list-style-type: none"> <li>Allington Road Culvert Replacement</li> </ul>
<b>Karori Wastewater</b>	<ul style="list-style-type: none"> <li>Karori Rd (357a) Sewer Renewal</li> </ul>	<ul style="list-style-type: none"> <li>Karori Effluent Pipeline Remediation</li> <li>Karori Storage Tunnel Upgrade</li> </ul>



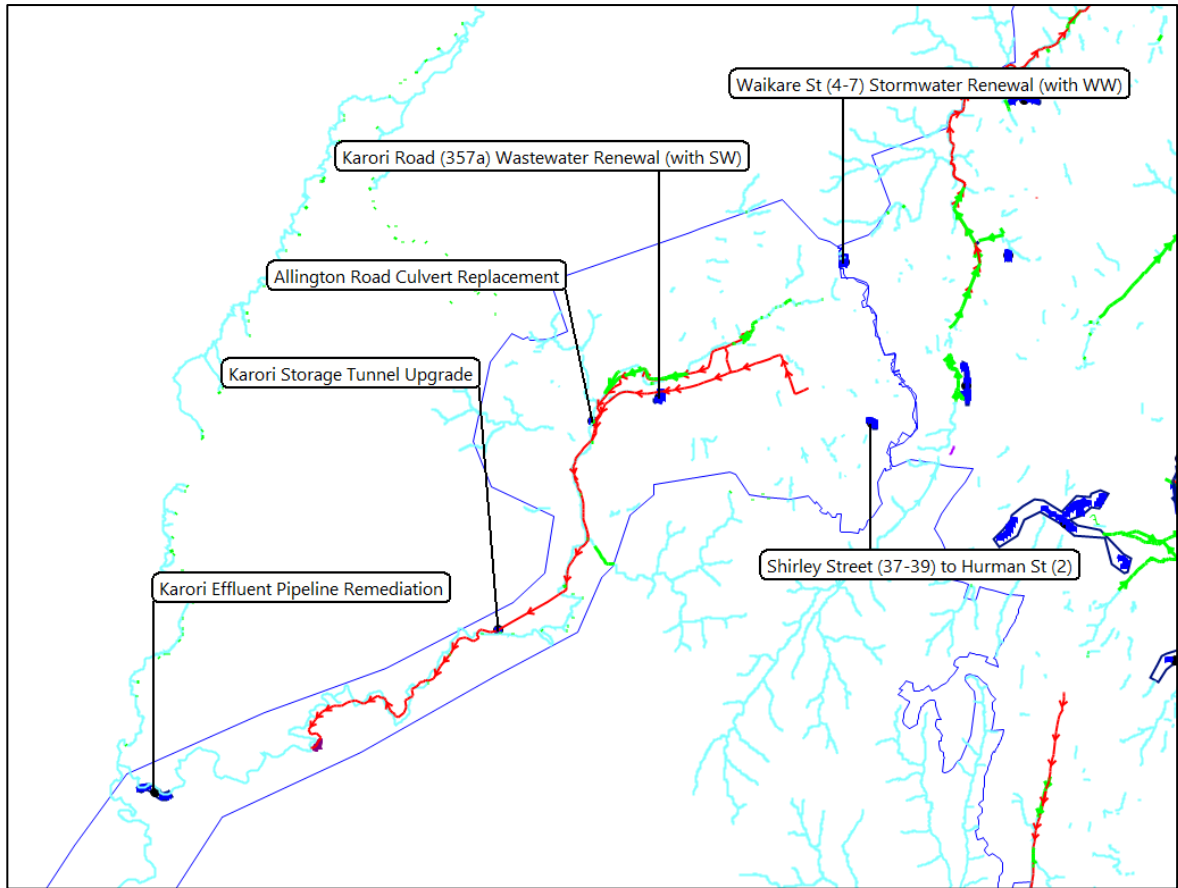


Figure 4- Capital projects programmed.

# **Appendix IV: Western Treatment Plant Karori Stream Monitoring**

## Karori Stream at Friend Street

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
7/07/2023	10:40:00 AM	230	SE	Clear
21/07/2023	10:55:00 AM	390	N	Cloudy
15/08/2023	07:37:00 AM	240	NW	Rain
24/08/2023	08:50:00 AM	2300	N	Clear
8/09/2023	9:15:00 AM	400	N	Clear
22/09/2023	9:00:00 AM	350	NW	Overcast
6/10/2023	13:35	240	S	Cloudy
20/10/2023	14:00	1300	N	Overcast
2/11/2023	09:25	180	NE	Overcast
16/11/2023	09:15	40	S	Clear
01-Dec-23	14:40:00	180	SSE	Rain
15-Dec-23	08:25:00	4000	N	Rain
29-Dec-23	09:25:00	3600	N	Rain
12/01/2024	09:05	450	N	Cloudy
26/01/2024	08:35	2000	NNE	Clear
09/02/2024	11:20	220	SSE	Cloudy
24/02/2024	07:50	200	N	Overcast
08/03/2024	08:00	1500	S	Overcast
21/03/2024	12:49	480	N	Clear
4/04/2024	12:49:00 pm	700	N	overcast
19/04/2024	7:04:00 am	320	N	Clear
3/05/2024	4:40:00 pm	5500	SSE	Clear
16/05/2024	7:00:00 am	5800	N	Overcast
30/05/2024	6:45:00 am	460	SSW	Clear

## Karori Stream at Campbell Street

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
7/07/2023	0:35:00 AM	500	SE	Clear
21/07/2023	10:50:00 AM	2000	N	Cloudy
15/08/2023	07:30:00 AM	1900	NW	Rain
24/08/2023	08:40:00 AM	10	N	Clear
8/09/2023	9:10:00 AM	120	N	Clear
22/09/2023	8:55:00 AM	190	NW	Overcast
6/10/2023	13:30	140	S	Cloudy
20/10/2023	13:55	6000	N	Overcast
2/11/2023	09:20	1000	NE	Overcast
16/11/2023	09:10	140	S	Clear
01-Dec-23	14:45:00	800	SSE	Rain
15-Dec-23	08:20:00	1800	N	Rain
29-Dec-23	09:20:00	6000	N	Rain
12/01/2024	09:12	1000	N	Cloudy
26/01/2024	08:30	1100	NNE	Clear
09/02/2024	11:20	4000	SSE	Cloudy
24/02/2024	07:45	150	N	Overcast
08/03/2024	07:55	1000	S	Overcast
21/03/2024	12:45	240	N	Clear
4/04/2024	12:44:00 pm	1100	N	overcast
19/04/2024	6:58:00 am	200	N	Clear
3/05/2024	4:32:00 pm	220	SSE	Clear
16/05/2024	7:07:00 am	5500	N	Overcast
30/05/2024	6:39:00 am	900	SSW	Clear

## Karori Stream at South Karori Road

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
7/07/2023	10:25:00 AM	220	SE	Clear
21/07/2023	10:35:00 AM	1700	N	Cloudy
15/08/2023	07:21:00 AM	140	NW	Rain
24/08/2023	08:25:00 AM	110	N	Clear
8/09/2023	9:00:00 AM	300	N	Clear
22/09/2023	8:45:00 AM	100	NW	Overcast
6/10/2023	13:20	1300	S	Cloudy
20/10/2023	13:40	6000	N	Overcast
2/11/2023	09:05	170	NE	Overcast
16/11/2023	09:00	280	S	Clear
01-Dec-23	15:00:00	1000	SSE	Rain
15-Dec-23	08:35:00	700	N	Rain
29-Dec-23	09:10:00	1600	N	Rain
12/01/2024	09:20	160	N	Cloudy
26/01/2024	08:20	190	NNE	Clear
09/02/2024	11:20	400	SSE	Cloudy
24/02/2024	07:35	1100	N	Overcast
08/03/2024	07:45	480	S	Overcast
21/03/2024	12:33	140	N	Clear
4/04/2024	12:36:00 pm	130	N	overcast
19/04/2024	6:45:00 am	120	N	Clear
3/05/2024	4:20:00 pm	700	SSE	Clear
16/05/2024	7:13:00 am	3800	N	Overcast
30/05/2024	6:28:00 am	100	SSW	Clear

## Karori Stream at approximately 100 metres upstream of the Western Treatment Plant

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
7/07/2023	10:15:00 AM	40	SE	Clear
21/07/2023	10:25:00 AM	600	N	Cloudy
15/08/2023	07:10:00 AM	210	NW	Rain
24/08/2023	07:58:00 AM	210	N	Clear
8/09/2023	8:50:00 AM	130	N	Clear
22/09/2023	8:35:00 AM	110	NW	Overcast
6/10/2023	13:10	70	S	Cloudy
20/10/2023	13:30	60	N	Overcast
2/11/2023	08:50	160	NE	Overcast
16/11/2023	08:45	6000	S	Clear
01-Dec-23	15:10:00	70	SSE	Rain
15-Dec-23	08:45:00	240	N	Rain
29-Dec-23	08:55:00	4400	N	Rain
12/01/2024	09:35	1000	N	Cloudy
26/01/2024	08:05	150	NNE	Clear
09/02/2024	11:20	290	SSE	Cloudy
24/02/2024	07:15	110	N	Overcast
08/03/2024	07:35	500	S	Overcast
21/03/2024	12:23	60	N	Clear
4/04/2024	12:21:00 pm	60	N	overcast
19/04/2024	6:27:00 am	100	N	Clear
3/05/2024	4:16:00 pm	410	SSE	Clear
16/05/2024	7:28:00 am	4600	N	Overcast
30/05/2024	6:17:00 am	50	SSW	Clear

## Karori Stream at approximately 100 metres downstream of the Western Treatment Plant

Sample Date	Sample Time	Faecal Coliform (cfu/100 mL)	Wind Direction	Weather
7/07/2023	10:10:00 AM	50	SE	Clear
21/07/2023	10:20:00 AM	230	N	Cloudy
15/08/2023	07:05:00 AM	160	NW	Rain
24/08/2023	07:50:00 AM	900	N	Clear
8/09/2023	8:40:00 AM	60	N	Clear
22/09/2023	8:30:00 AM	30	NW	Overcast
6/10/2023	13:00	70	S	Cloudy
20/10/2023	13:25	90	N	Overcast
2/11/2023	08:40	200	NE	Overcast
16/11/2023	08:40	110	S	Clear
01-Dec-23	15:15:00	70	SSE	Rain
15-Dec-23	08:50:00	130	N	Rain
29-Dec-23	08:50:00	2600	N	Rain
12/01/2024	09:42	600	N	Cloudy
26/01/2024	08:10	60	NNE	Clear
09/02/2024	11:20	200	SSE	Cloudy
24/02/2024	07:25	170	N	Overcast
08/03/2024	07:40	280	S	Overcast
21/03/2024	12:15	100	N	Clear
4/04/2024	12:15:00 pm	190	N	overcast
19/04/2024	6:20:00 am	200	N	Clear
3/05/2024	4:10:00 pm	340	SSE	Clear
16/05/2024	7:35:00 am	5500	N	Overcast
30/05/2024	6:21:00 am	60	SSW	Clear

# **Appendix V: Assessment of Environmental Effects**