

11 October 2023

File No: WGN200229

Greater Wellington Regional Council
100 Cuba Street
Te Aro,
Wellington

Attn: [REDACTED]

Dear [REDACTED]

Explanation regarding the discharges of undisinfectd wastewater due to UV System turning off at Porirua Wastewater Treatment Plant

Thank you for the opportunity to explain the unconsented discharge of a mixture of undisinfectd wastewater from the Porirua WWTP into the coastal marine area on 26th September 2023.

The following is our response to the questions asked in the Please Explain letter submitted to Wellington Water on the 27th September 2023.

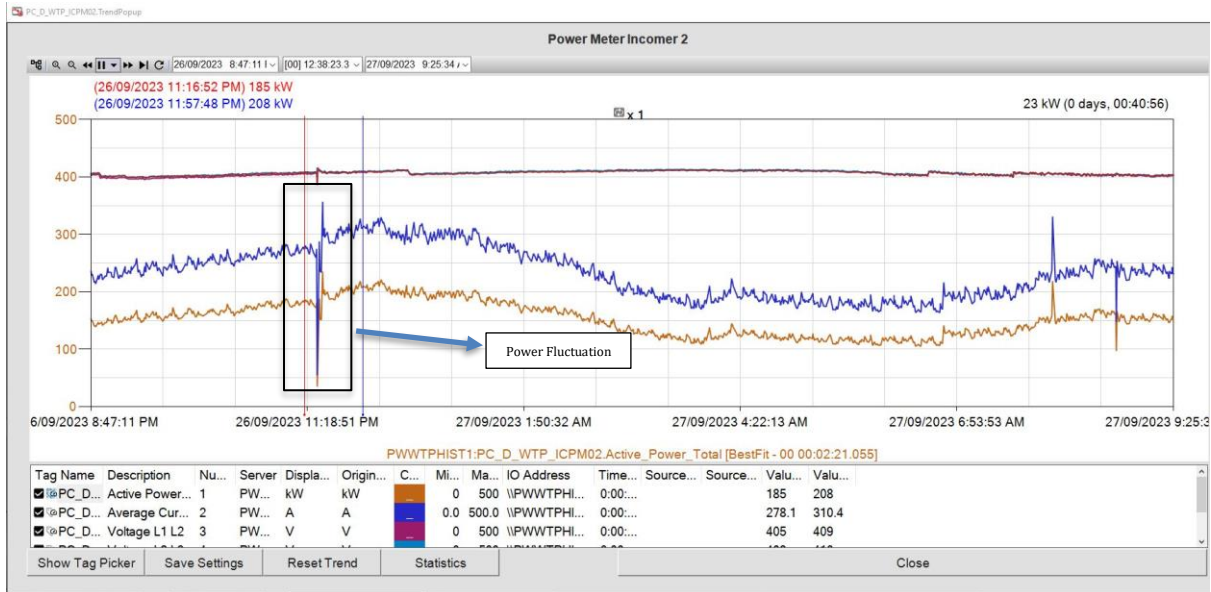
Please find our response to your questions below:

1. What caused the undisinfectd discharge to occur? Please provide pictures/evidence to aide in description.

A power fluctuation (rather than a power surge as initially reported) from the electricity network supplying the Porirua WWTP caused the UV system to turn off at 23:22hrs on 26 September 2023. The power trend at the site is shown in the graphic below shows the power fluctuation. The power trend is shown on amber line while the electrical current trend is shown in blue.

Unfortunately, the alarm paging system for the site failed to send an alarm and therefore the duty operator (remote) was not aware of the incident.

When the operator arrived at the site on 27 September morning by 7:30am, the fault was identified and the system was immediately reset. The UV system operation was re-established by 7:46hrs. The UV system was off for 8h 24min in total.



2. What was the total volume of the undisinfected discharges to the outfall, the start time and end time of each undisinfected discharge and rate of discharge?

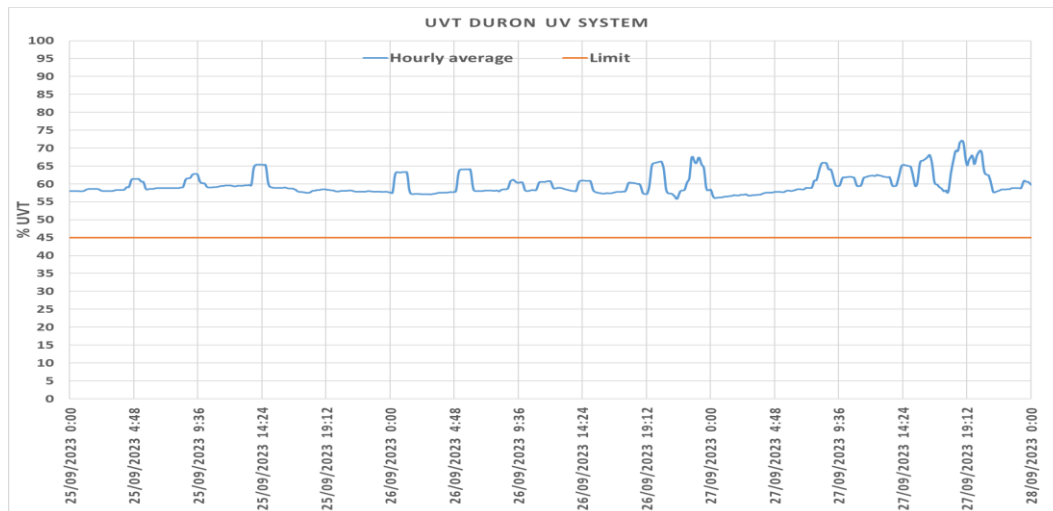
The details of the incident are shown below:

Start time	Finish time	Duration	Average Flow	Peak Flow	Total Volume of Discharge
		hrs:mins	L/s	L/s	m3
26/09/2023 23:22	27/09/2023 07:46	08:24	355	640	10,735

3. What was the UV performance, monitoring and UV transmissivity?

Due to the power fluctuation which took the UV offline, the disinfection process did not occur throughout the duration of the incident.

The UV transmissivity of the treated wastewater remained above 55% as shown in the graph below. The consent requires to have the effluent UVT measurement to be at least 45%.



4. What sampling was carried out during and after the undisinfected discharge and comment how these relate to consent requirements?

Shoreline monitoring was performed as per Condition 16 of Resource consent WGN200229 [36816]. Results can be found on Appendix I of this document.

5. What effect did the undisinfected discharge have on receiving environment? Please use laboratory analysis and supporting photos / field notes.

The release of undisinfected wastewater into the receiving environment will potentially effect the microbial concentration of the receiving environment. Based on the shoreline monitoring results and comparing the results to the 2020 Assessment of Environmental effects (AEE) data for the predicted enterococci concentration in the receiving environment for average discharge flow of 440 L/s (shown in Appendix II), shows that the undisinfected wastewater discharge had a negligible effect on the microbial concentration in the shorelines being monitored. This can be attributed to the level of dilution and dispersion in the receiving environment.

The sampling regime detected an increase in the enterococci level in the 29th September versus the 27th September results. This suggests that the increase in microbial concentration could be attributed to an external factor such as stormwater runoff from wet weather. GWRC's rainfall data at Porirua Elsdon Park recorded a rainfall level of an average of 4.5mm from 27th to 29 September.

The other physicochemical results from the shoreline sampling conducted was also consistent throughout the sampling regime.

The discharge was still compliant with condition 13 of the resource consent WGN200229[36816] as there should be no change in the appearance, odour or physicochemical characteristics of the treated wastewater. A photo taken on the Rukutane outfall on the 27th September showed no visible observable effect on the wastewater discharge and the nearby water.



Photo 1: Rukutane Outfall – Dated 27 September 2023

6. What steps were taken to remedy adverse environmental effects arising from the undisinfected discharge?

WWL and Veolia undertook the sampling and communications requirement as required by the new consent.

7. What on-site and off-site actions could have been taken to reduce the timeframes of undisinfected discharge occurring?

The duty operator (remote) is required to monitor the SCADA around 8pm every day to make sure that the plant is operating normally. This routine check was undertaken on time on 26th September. Due to the alarm failure and timing of the event which occurred after 8 pm, the incident only became evident during their daily review of the process and SCADA at the start of the following day.

The operators are required to be on the treatment plant around 7:30 am during normal business hours. Considering that the UV has been re-established around 7:46 am on the 27th September, we believe that the response time was reasonable, once the outage was identified.

8. How should this discharge be managed under the Operational Management and Contingency Plan (OMCP) and what measures will be put in place (and by what date) to ensure that such incidents do not occur again?

The protocol under the OMCP for sampling, putting up signs and notification were followed for this discharge incident.

Under the OMCP, alarms are set to notify the operators if there are any critical abnormalities in the WWTP. In this case, the failure in the after-hours alarm notification system prevented the alarm being sent to the operator.

To prevent the incident from happening again, the following measures are being investigated:

1. Investigating a more robust alarm system process for Porirua WWTP.
2. Investigate the nature of the power fluctuation and determine if there's any improvement that can be undertaken to make the UV system more resilient to power fluctuations. A Back-up Power Supply Project for the UV system is already underway.

These corrective actions are still being investigated and the timelines and/or outcomes relating to these activities will be shared as soon as when available.

I trust this provides an explanation of the events as requested. Please contact me should you require anything further in relation to that matter.

Yours sincerely



Wellington Water

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Appendix I: Shoreline Monitoring

- 140m generally east of the outfall

Date	Time	Enterococci	pH	Salinity	Dissolved Oxygen	Temp.	Wind Direction	Wind Strength	Tide	Sea Conditions
dd/mm/yyyy	hh:mm	cfu/100mL	-	g/m3	g/m3	C	--	--	--	--
27/09/2023	14:55	40	8	36	10	12.6	S	Moderate	Low	Flood
29/09/2023	12:30	180	7.9	33	8	13	N	Moderate	High	Ebb

Date	Time	Total Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Dissolved Reactive Phosphorus	Total Nitrogen	Total Phosphorus
dd/mm/yyyy	hh:mm	g/m3	g/m3	g/m3	g/m3	g/m3	g/m3
27/09/2023	14:55	0.02	0.1	0.1	0.019	0.25	0.021
29/09/2023	12:30	0.03	0.1	0.1	0.015	0.17	0.043

- 200m generally southwest of the outfall

Date	Time	Enterococci	pH	Salinity	Dissolved Oxygen	Temp.	Wind Direction	Wind Strength	Tide	Sea Conditions
dd/mm/yyyy	hh:mm	cfu/100mL	-	g/m3	g/m3	C	--	--	--	--
27/09/2023	14:25	220	8	35	10	12.4	S	Moderate	Low	Flood
29/09/2023	12:50	700	7.5	33	10	13.2	N	Moderate	High	Ebb

Date	Time	Total Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Dissolved Reactive Phosphorus	Total Nitrogen	Total Phosphorus
dd/mm/yyyy	hh:mm	g/m3	g/m3	g/m3	g/m3	g/m3	g/m3
27/09/2023	14:25	0.01	0.1	0.1	0.022	0.2	0.046
29/09/2023	12:50	0.02	0.1	0.1	0.063	0.4	0.063

- Titahi Bay Beach At Toms Road - Surf Club

Date	Time	Enterococci	pH	Salinity	Dissolved Oxygen	Temp.	Wind Direction	Wind Strength	Tide	Sea Conditions
dd/mm/yyyy	hh:mm	cfu/100mL	-	g/m3	g/m3	C	--	--	--	--
27/09/2023	15:15	60	8.0	35	10	13.5	S	Moderate	Low	Flood
29/09/2023	12:20	340	8.1	34	8	13.0	N	Moderate	High	Ebb

Control

Date	Time	Enterococci	pH	Salinity	Dissolved Oxygen	Temp.	Wind Direction	Wind Strength	Tide	Sea Conditions
dd/mm/yyyy	hh:mm	cfu/100mL	-	g/m3	g/m3	C	--	--	--	--
27/09/2023	15:35	10	7.9	36	9	13.2	S	Moderate	Low	Flood
29/09/2023	12:00	300	8.0	33	10	13.6	N	Moderate	High	Ebb

Date	Time	Total Ammonia Nitrogen	Nitrate Nitrogen	Nitrite Nitrogen	Dissolved Reactive Phosphorus	Total Nitrogen	Total Phosphorus
dd/mm/yyyy	hh:mm	g/m3	g/m3	g/m3	g/m3	g/m3	g/m3
27/09/2023	15:35	0.01	0.1	0.1	0.007	0.079	0.022
29/09/2023	12:00	0.06	0.1	0.1	0.005	0.439	0.015

Appendix II: Assessment of Environment Effects Report 202: Predicted discharge plume enterococci based on 95%ile source concentrations as shown below:

Site	2018 ADF; 306 L/s, 10%ile Diln	2018 PWWF; 1,100 L/s, average Diln	2043 ADF 440 L/s, 10%ile Diln	2043 PWWF; 1,500 L/s average Diln	PNRP 95 th ile Enterococci Target (cfu/100ml)
	1000 (cfu/100ml)	15,000 (cfu/100ml)	1,000 (cfu/100ml)	1,000 (cfu/100ml)	
Ti Korohiwa Rocks	31	536	48	56	<500
200m SW	143	4167	200	357	
200m E	71	1899	100	161	
Titahi Beach south	26	652	38	63	
Titahi Beach	14	188	24	18	
Mount Cooper	2	10	3	1	