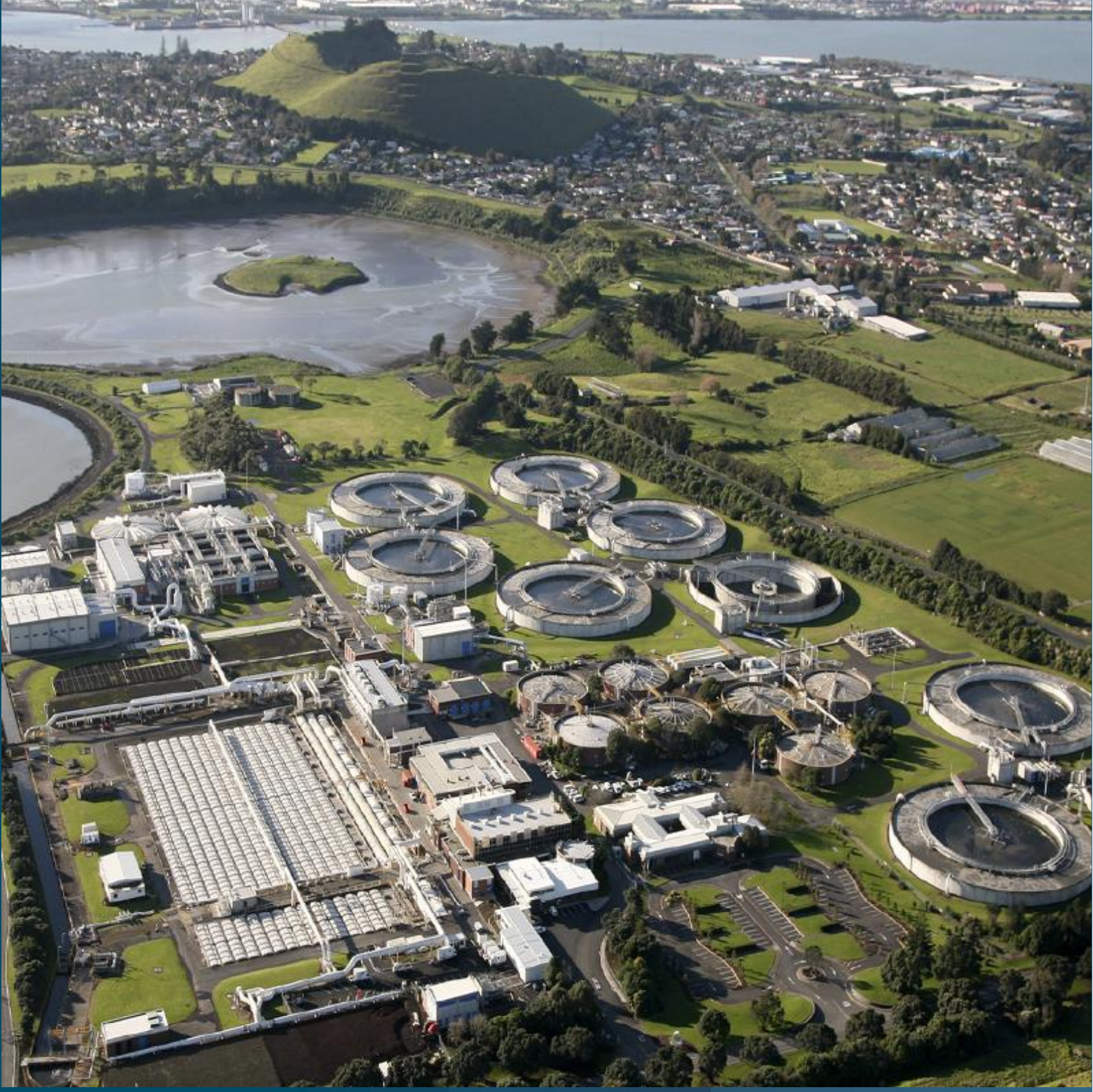


Quarterly Summary

Māngere Wastewater Treatment Plant

Reporting period: September – November 2025

Issue Date: 9 December 2025

Watercare

Executive Summary

Māngere Wastewater Treatment Plant (WWTP) achieved compliance with all effluent quality consent limits throughout the quarterly reporting period (September – October 2025). Process, influent, and biosolids monitoring was consistent with previous reporting periods.

No UV triggers for reactive shellfish monitoring were breached during this quarter. No complaints or comments in relation to plant operations were received by Watercare.

Midge control via chain dragging increased to weekly frequencies from September in accordance with the summer schedule. Weekly entomologist monitoring continued throughout and noted a moderate increase in midges over recent weeks, particularly around the intertidal storage basin, in response to calmer/warmer weather; however, overall numbers are still low in comparison to previous years.

Weekly onsite, and monthly community odour monitoring did not detect any significant odours.

37,039 tonnes of biosolids material was placed at the Puketutu Biosolids Facility during this quarter. The total storage capacity is estimated at four million tonnes, and the facility is currently at approximately 57% of capacity.

Table of Contents

1 COMPLIANCE REPORT

M-15 final effluent quality results

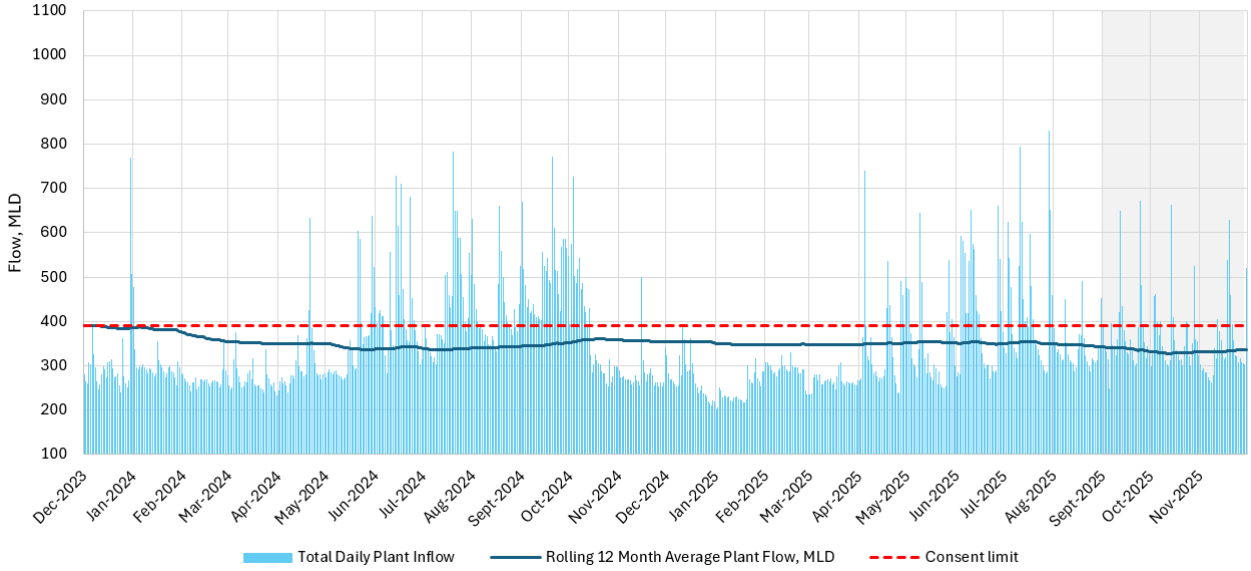
Table 1-1: Quarterly final effluent quality summary in relation to requirements of Consent 30083.

PARAMETER	SEPT-25	OCT-25	NOV-25		COMPLIANCE
					MONTHLY MEAN
BOD (g/m^3)	2.7	2.1	2.6	<	15
NFR (g/m^3)	7.3	4.8	4.8	<	15
Total Petroleum Hydrocarbon (g/m^3)	0.3	0.3	0.3	<	0.5
Ammoniacal Nitrogen (g/m^3)	0.8	0.3	0.9	<	5[(a)]
Total Nitrogen (g/m^3)	8.1	7.4	7.8	<	35[(b)]
Reactive Phosphorus (g/m^3)	1.4	1.8	1.9	<	9
Dissolved Oxygen, %saturation	94.9	96.9	99.1	>	80%
					MONTHLY MAXIMUM
BOD (g/m^3)	9.6	3.5	9.3	<	50
pH	7.6	7.5	7.6	<	9
Ammoniacal Nitrogen (g/m^3)	3.6	1.5	6.8	<	15[(a)]
					MONTHLY MINIMUM
pH	7.1	7.1	7.1	>	6.5
					95%TILE OVER THREE DISCRETE MONTHS
BOD (g/m^3)	3.5			<	30
NFR (g/m^3)	10.0			<	30
					MONTHLY % UV MEASUREMENT
UV Dose Applied % Measurement	100.00	99.86	99.49	>	99.00

(a) Ammoniacal Nitrogen limits for the period of April-November inclusive. For December-March inclusive, the limits are 3 g/m^3 for monthly mean and 6 g/m^3 for monthly maximum.

(b) Total Nitrogen limit for the period of April-November inclusive. For December-March inclusive, the limit is 9.5 g/m^3.

Rolling 12 months average daily plant inflow

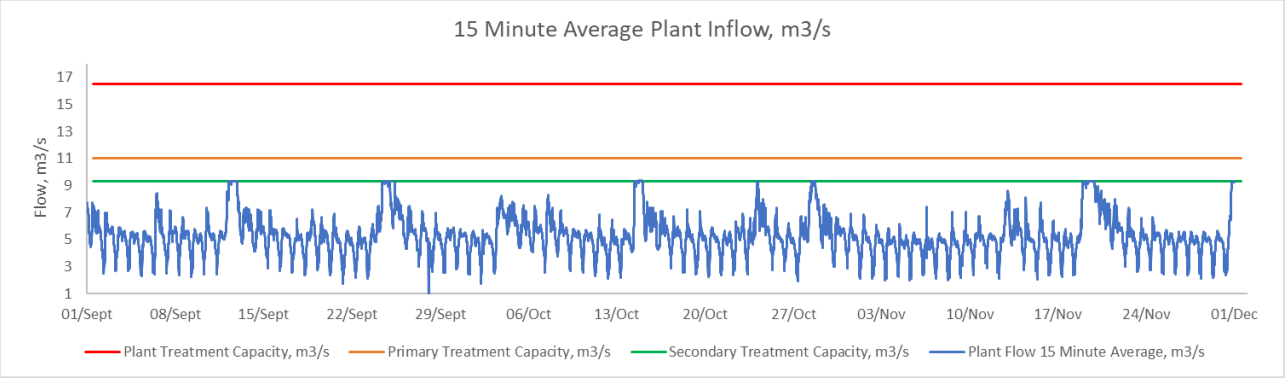


2 OPERATIONS REPORT

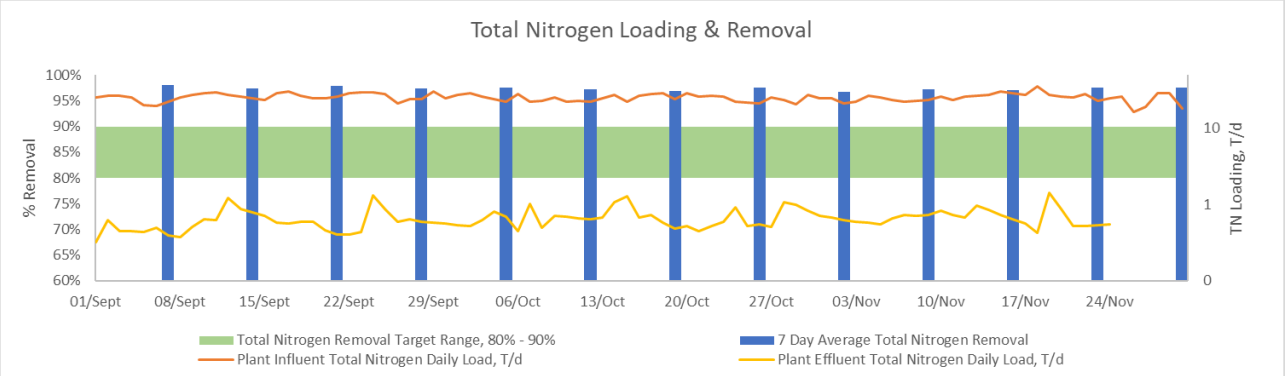
Liquid Process

15-minute interval plant flow

There were seven RC Filter bypass events during this quarter. Please refer to the detailed information in the high flow diversion table. Secondary Treatment Capacity set point was 9.3 – 9.34 m^3/s in this quarter.

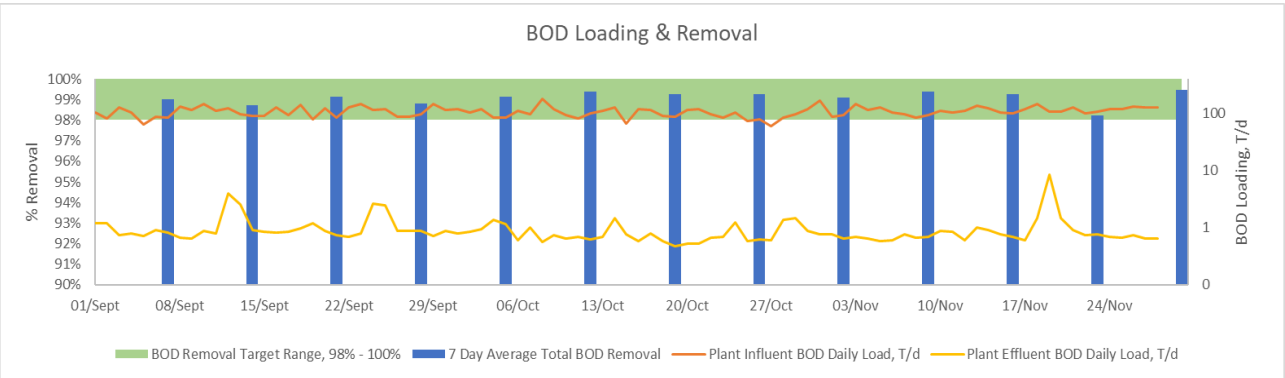


Total Nitrogen removal and loading



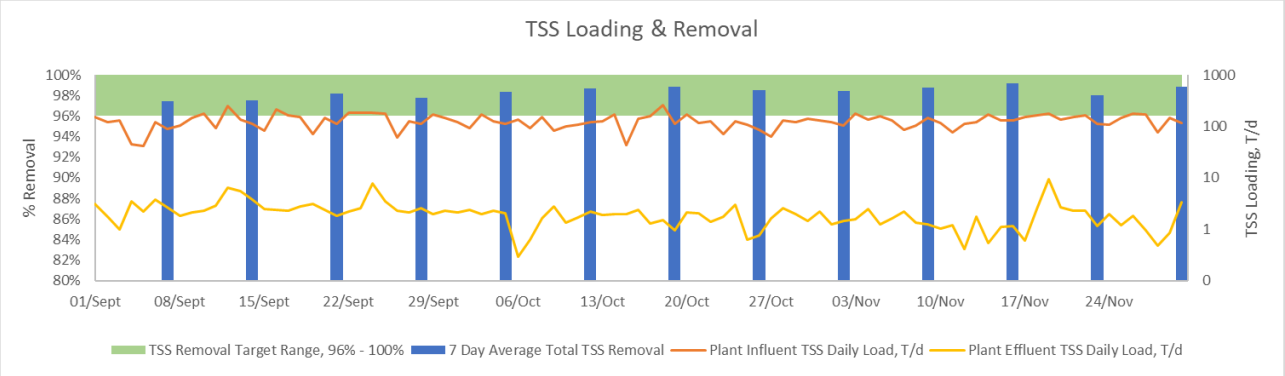
Please note logaritmic scale on secondary vertical axis (Loading, T/d).

BOD removal and loading



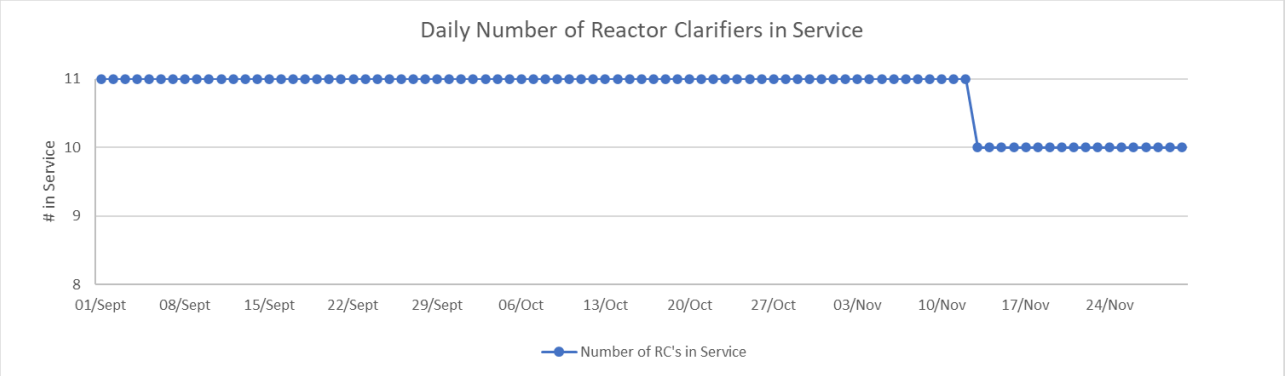
Please note logaritmic scale on secondary vertical axis (Loading, T/d).

TSS removal and loading



Please note logaritmic scale on secondary vertical axis (Loading, T/d).

Number of Reactor Clarifiers in service



Reactor-Clarifier 1 was taken out of service for overhaul on 13 November.

UV based virus monitoring

Monitoring of enterovirus in shellfish samples is required in accordance with Special Condition 25(6) of Consent 30083 if one of the following conditions are triggered:

- Two consecutive exceedances of 80 cfu/100 mL for enterococci indicator bacteria (i.e., when no high flow diversion is occurring), measured twice daily in the UV effluent;
- Maximum UV dose is being applied to high flow diversion flows (> 9 m^3/s) in accordance with required levels, but the applied UV dose is less than 35 mWs/cm^2 for more than 2 hours in non-high flow diversion channels; or
- In the event that effluent from the WWTP has not been subjected to the appropriate UV dose.

No reactive shellfish monitoring conditions were triggered during the reported quarter.

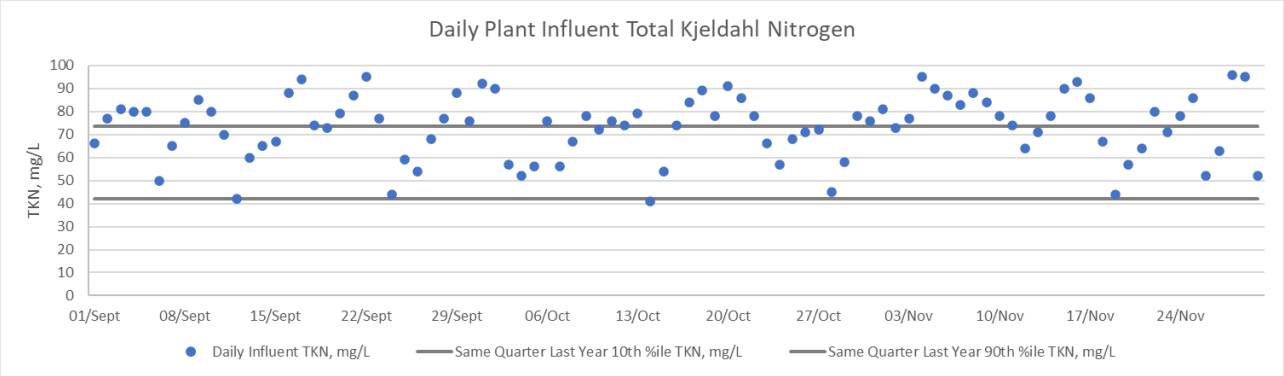
RC Filter High Flow Diversion event summary

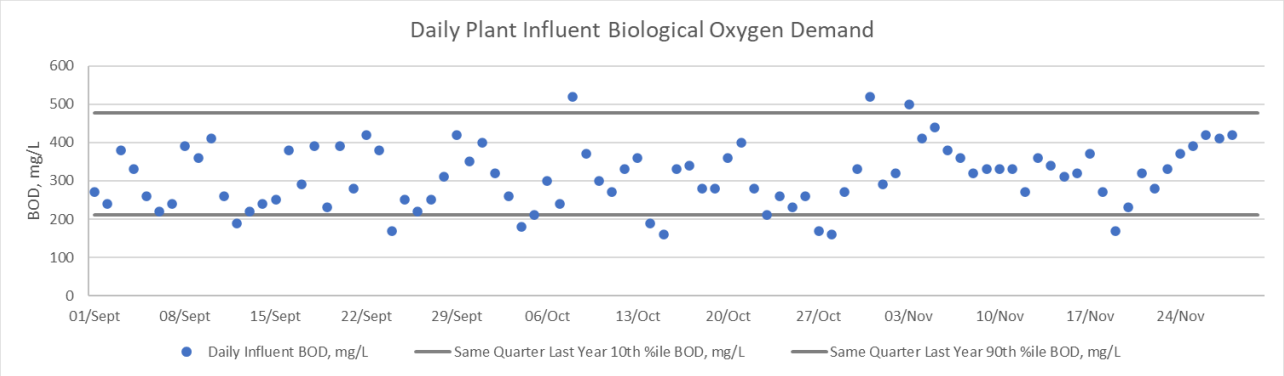
Event Number	Start Date & Time	End Date & Time	Duration	Diverted Volume (m^3)	Secondary treated volume above 9m^3/s (m^3)
#2023-09	29/12/2023 15:49	30/12/2023 17:35	23 hrs 32 mins	38,075	Data not available*
#2023-10	20/04/2024 13:09	20/04/2024 22:50	9 hrs 41 mins	67,178	Data not available*
#2023-11	20/05/2024 23:23	21/05/2024 22:50	23 hrs 27 mins	136,240	Data not available*
#2023-12	14/06/2024 4:33	15/06/2024 8:23	27 hrs 50 mins	162,264	Data not available*
#2023-13	16/06/2024 23:36	17/06/2024 19:01	19 hrs 25 mins	92,356	Data not available*
#2023-14	23/06/2024 6:18	24/06/2024 2:29	18 hrs 11 mins	98,975	Data not available*
#2024-01	20/07/2024 1:53	21/07/2024 14:35	1 d 12 hrs 42 mins	55,118	Data not available*
#2024-02	17/08/2024 19:17	18/08/2024 0:10	4hrs 54 mins	19,872	Data not available*
#2024-03	1/09/2024 4:24	1/09/2024 16:37	12hrs 17 mins	83,052	4,773
#2024-04	20/09/2024 14:39	21/09/2024 0:35	9 hrs 54 mins	58,334	47,431
#2024-05	3/10/2024 1:39	3/10/2024 15:30	13 hrs 54 mins	66,096	21,690
#2024-06	15/11/2024 14:35	15/11/2024 21:35	7 hrs	49,233	13,374
#2025-07	4/04/2025 9:06	5/04/2025 2:31	12 hrs 52 mins	87,460	32,087
#2025-08	19/04/2025 3:43	19/04/2025 17:24	12 hrs 9 mins	113,349	16,283
#2025-09	28/04/2025 3:42	28/04/2025 12:20	2 hrs 32 mins	13,055	1,398
#2025-10	30/04/2025 11:13	30/04/2025 12:08	35 mins	2,632	1,406
#2025-11	2/05/2025 15:05	2/05/2025 19:08	3 hrs 17 mins	15,217	4,527
#2025-12	9/05/2025 16:47	10/05/2025 16:53	18 hrs 5 mins	151,573	20,225
#2025-13	27/05/2025 8:24	27/05/2025 14:48	6 hrs 24 mins	36,498	21,989
#2025-14	29/05/2025 23:18	30/05/2025 2:03	2 hrs 48 mins	4,951	4,552
#2025-15	5/06/2025 22:23	6/06/2025 13:41	15 hrs 24 mins	91,585	61,405
#2025-16	9/06/2025 10:05	9/06/2025 15:05	5 hrs	15,133	13,320
#2025-17	10/06/2025 20:53	11/06/2025 21:59	1 day 1 hr 5 mins	205,387	58,992
#2025-18	12/06/2025 9:43	12/06/2025 19:01	9 hrs 18 mins	58,763	4,626
#2025-19	27/06/2025 11:06	28/06/2025 19:30	24 hrs 24 mins	189,565	13,984
#2025-01	3/07/2025 17:00	4/07/2025 13:54	21 hrs 6 mins	136,046	14,455
#2025-02	5/07/2025 0:00	5/07/2025 15:17	15 hrs 17 mins	10,903	5,133
#2025-03	11/07/2025 14:15	12/07/2025 21:03	1 d 7 hrs 12 mins	258,196	124,158
#2025-04	17/07/2025 10:28	17/07/2025 21:00	10 hrs 33 mins	79,571	41,842
#2025-05	29/07/2025 14:28	30/07/2025 16:00	1 d 2 hrs 24 mins	201,295	173,984
#2025-06	19/08/2025 10:12	19/08/2025 10:18	6 mins	411	312
#2025-07	12/09/2025 6:11	12/09/2025 21:19	13 hours 15 mins	95,427	14,058
#2025-08	24/09/2025 10:03	24/09/2025 23:47	11 hours 58 mins	76,053	12,924
#2025-09	14/10/2025 9:56	14/10/2025 23:38	12 hours 42 mins	99,177	15,545
#2025-10	24/10/2025 4:05	24/10/2025 4:18	13 mins	1,010	265
#2025-11	28/10/2025 11:13	28/10/2025 15:38	3 hours 3 mins	13,330	3,733
#2025-12	18/11/2025 22:51	19/11/2025 21:44	19 hours 56 mins	171,480	21,528
#2025-13	30/11/2025 18:16	1/12/2025 1:38	6 hours 10 mins	52,285	6,660

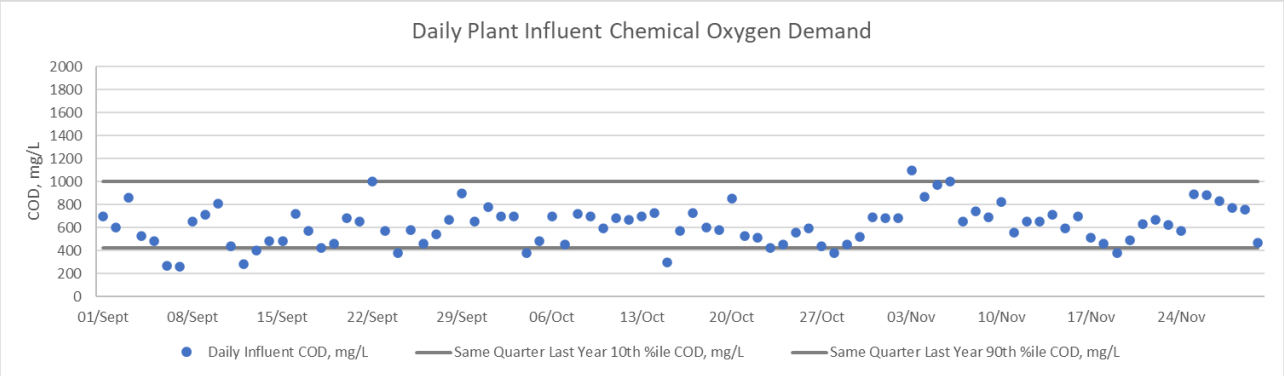
Note: High Flow Diversion event number convention follows the financial year, rather than calendar year.

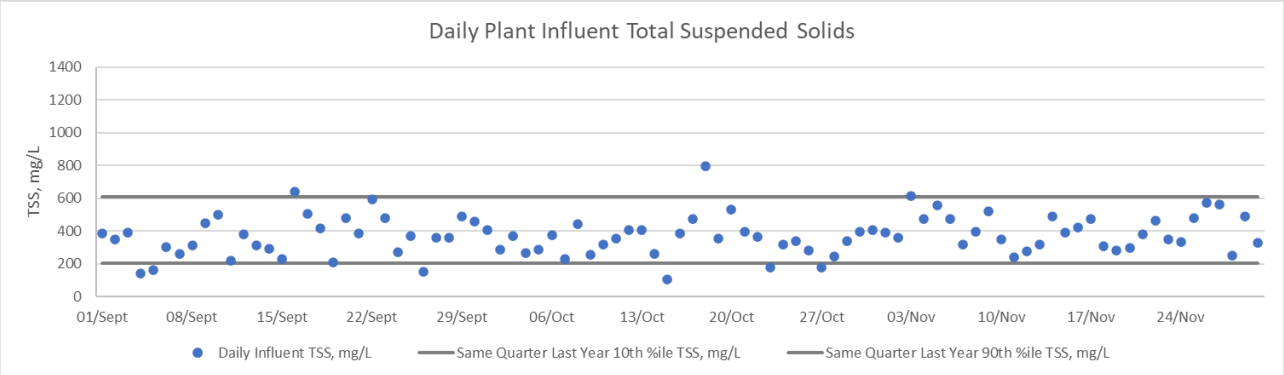
*Volume treated through secondary treatment above the required 9m^3/s started being reported from September 2024.

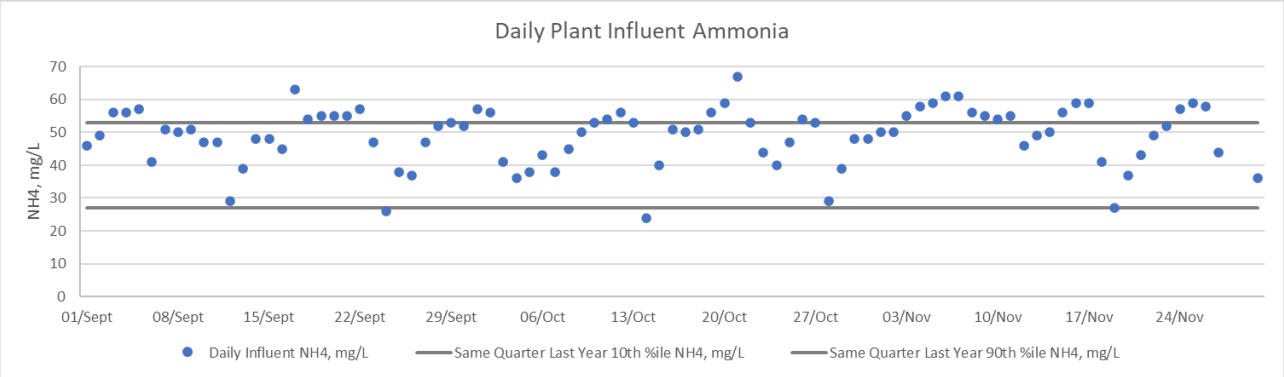
Influent chemistry monitoring

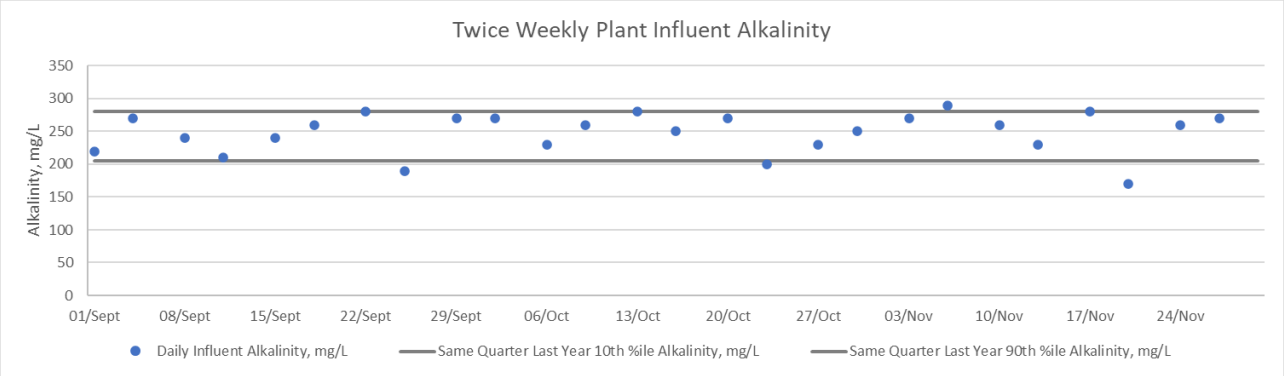


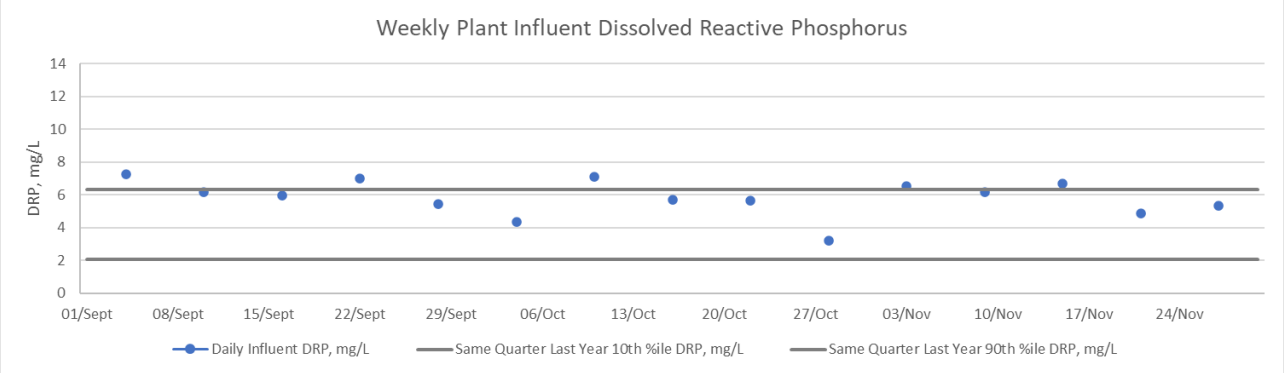






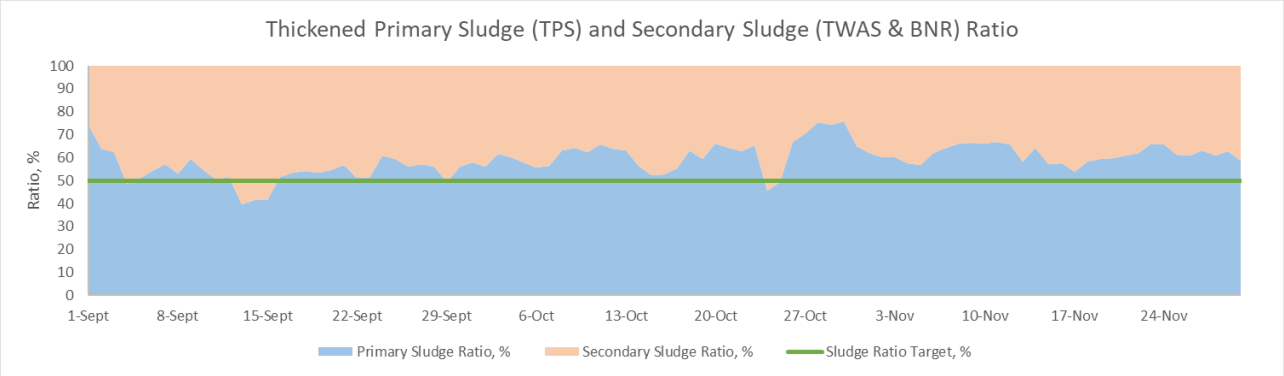

Daily Plant Influent Ammonia
NH4, mg/L
70
60
50
40
30
20
10
0
01/Sept
08/Sept
15/Sept
22/Sept
29/Sept
06/Oct
13/Oct
20/Oct
27/Oct
03/Nov
10/Nov
17/Nov
24/Nov
Daily Influent NH4, mg/L
Same Quarter Last Year 10th %ile NH4, mg/L
Same Quarter Last Year 90th %ile NH4, mg/L


Twice Weekly Plant Influent Alkalinity
Alkalinity, mg/L
350
300
250
200
150
100
50
0
01/Sept
08/Sept
15/Sept
22/Sept
29/Sept
06/Oct
13/Oct
20/Oct
27/Oct
03/Nov
10/Nov
17/Nov
24/Nov
Daily Influent Alkalinity, mg/L
Same Quarter Last Year 10th %ile Alkalinity, mg/L
Same Quarter Last Year 90th %ile Alkalinity, mg/L

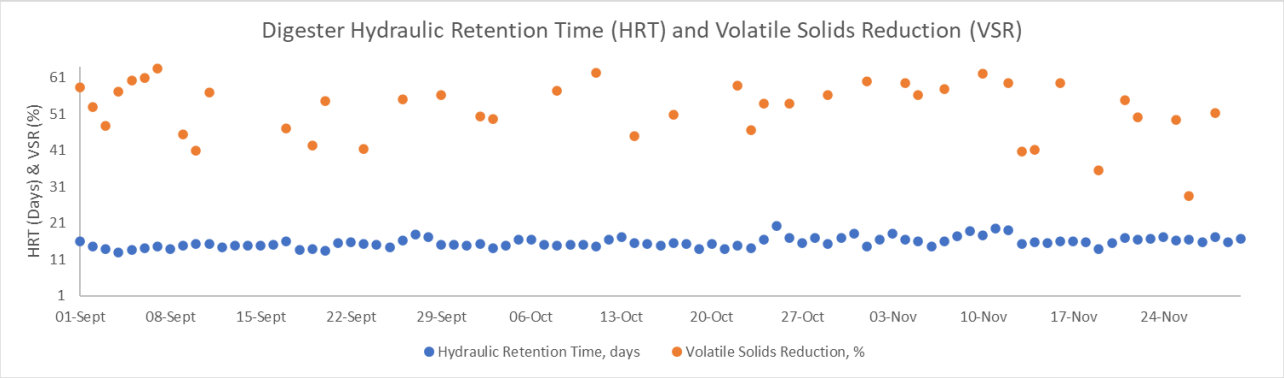

Weekly Plant Influent Dissolved Reactive Phosphorus
DRP, mg/L
14
12
10
8
6
4
2
0
01/Sept
08/Sept
15/Sept
22/Sept
29/Sept
06/Oct
13/Oct
20/Oct
27/Oct
03/Nov
10/Nov
17/Nov
24/Nov
Daily Influent DRP, mg/L
Same Quarter Last Year 10th %ile DRP, mg/L
Same Quarter Last Year 90th %ile DRP, mg/L

Solids Process

Primary and Secondary sludge ratio

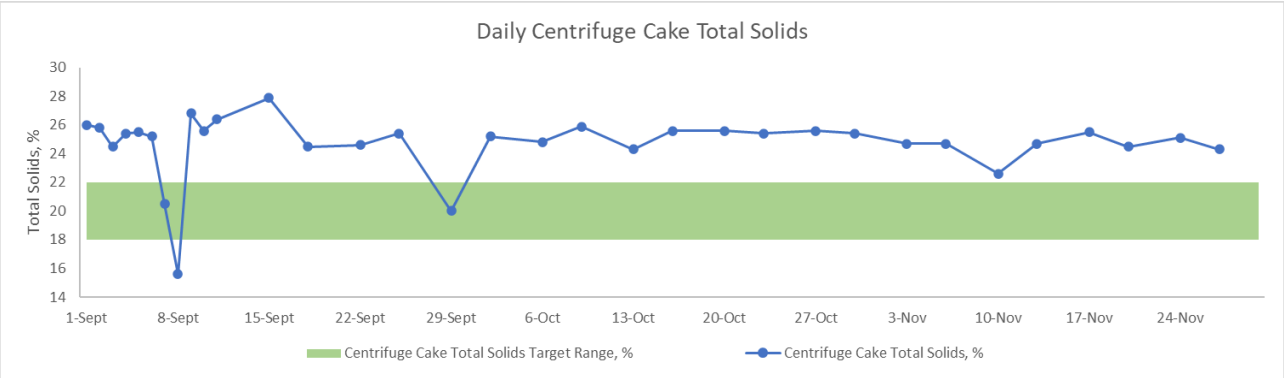


Digester performance



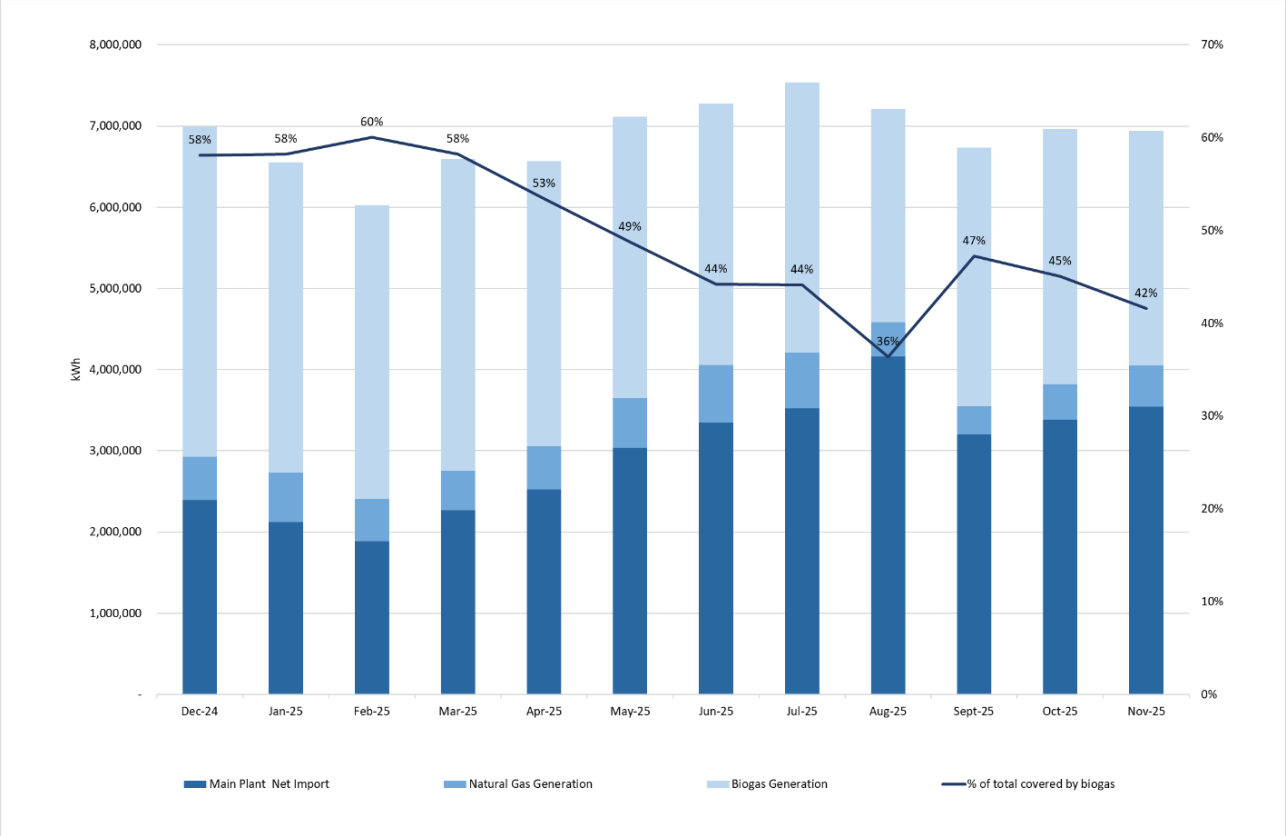
Lower volatile solids results from the digester feed sludge on 19 and 26 November resulted in lower calculated volatile solids reduction.

Dewatering performance



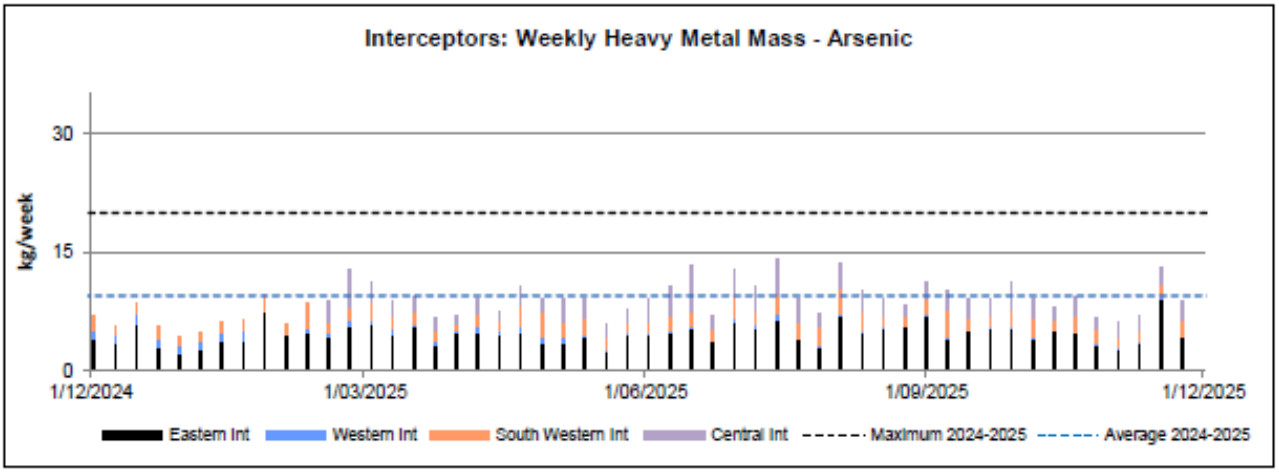
One-off low centrifuge cake solids percentage on 8 September, potentially caused by the timing of sampling.

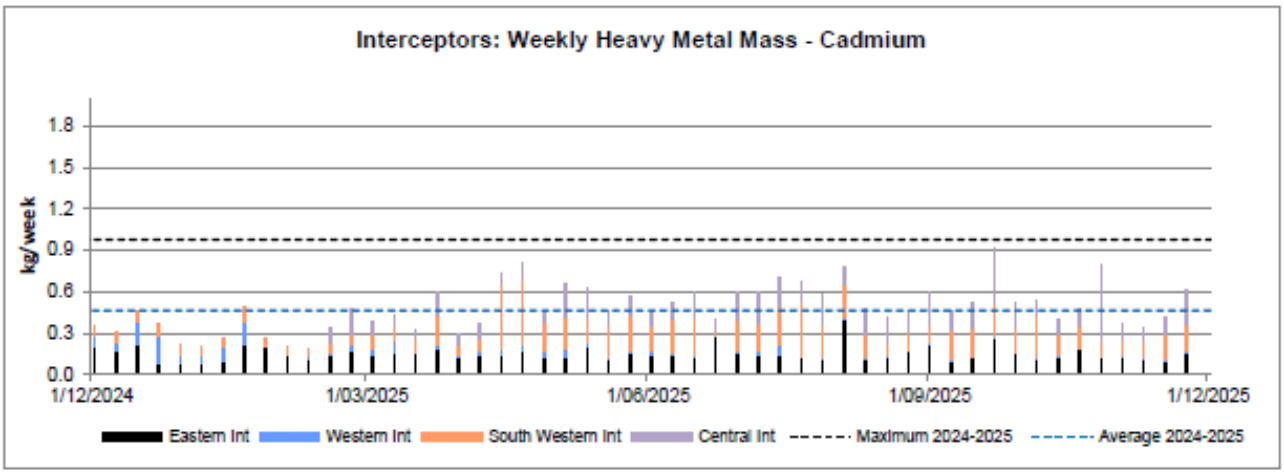
Imported Energy vs Biogas Generated Energy

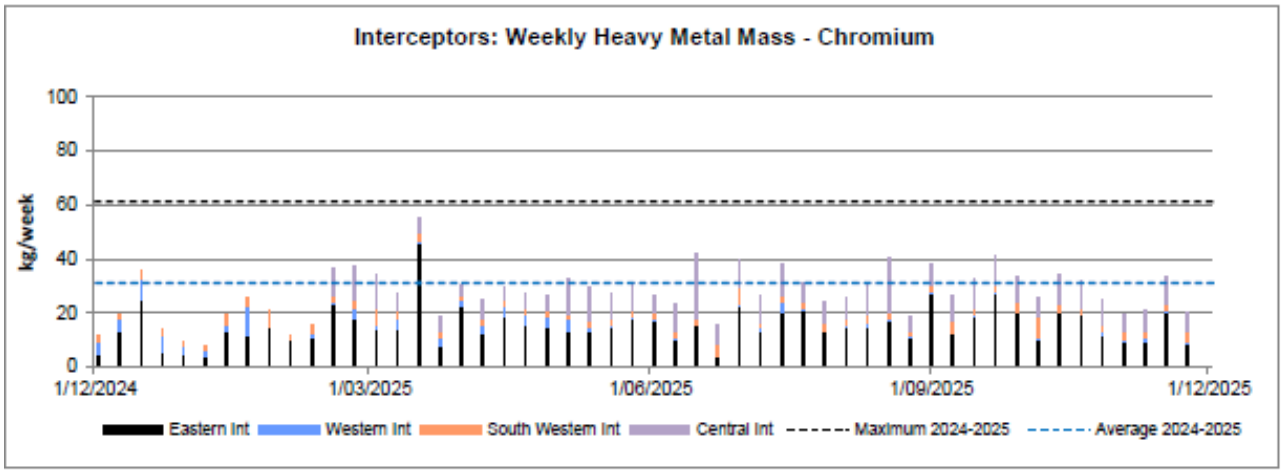


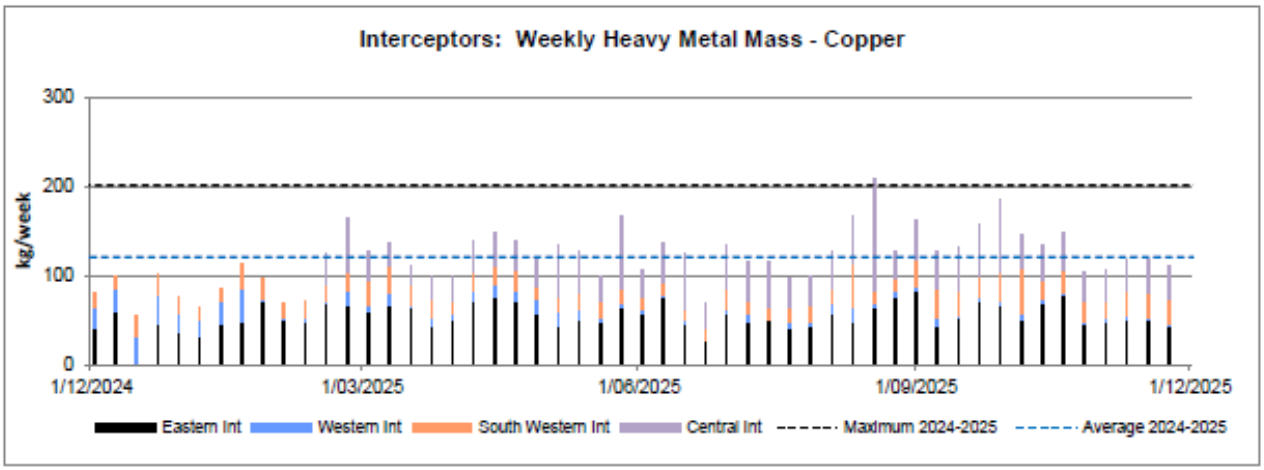
3 INFLUENT & BIOSOLIDS MONITORING

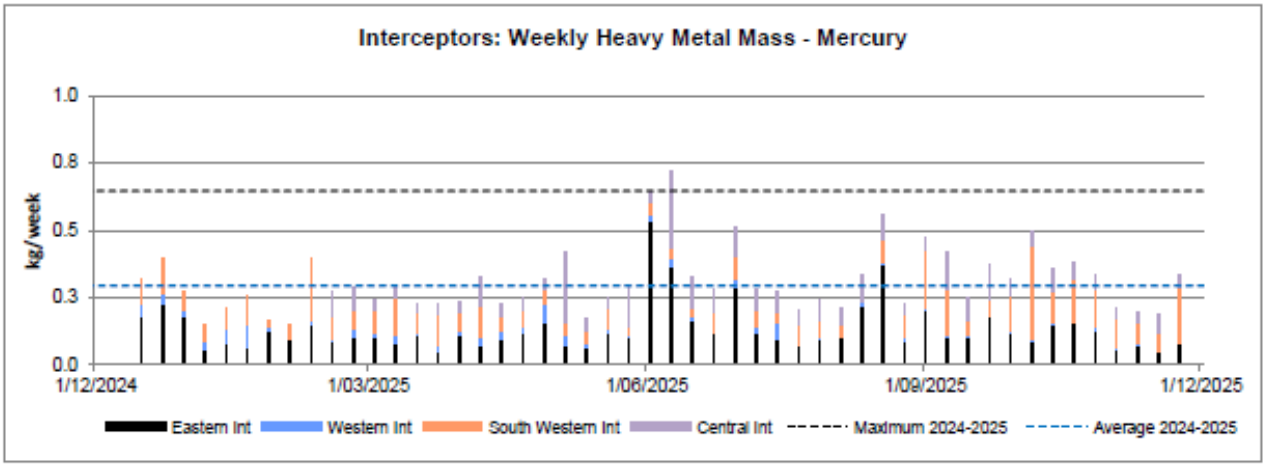
Heavy Metals – Interceptors

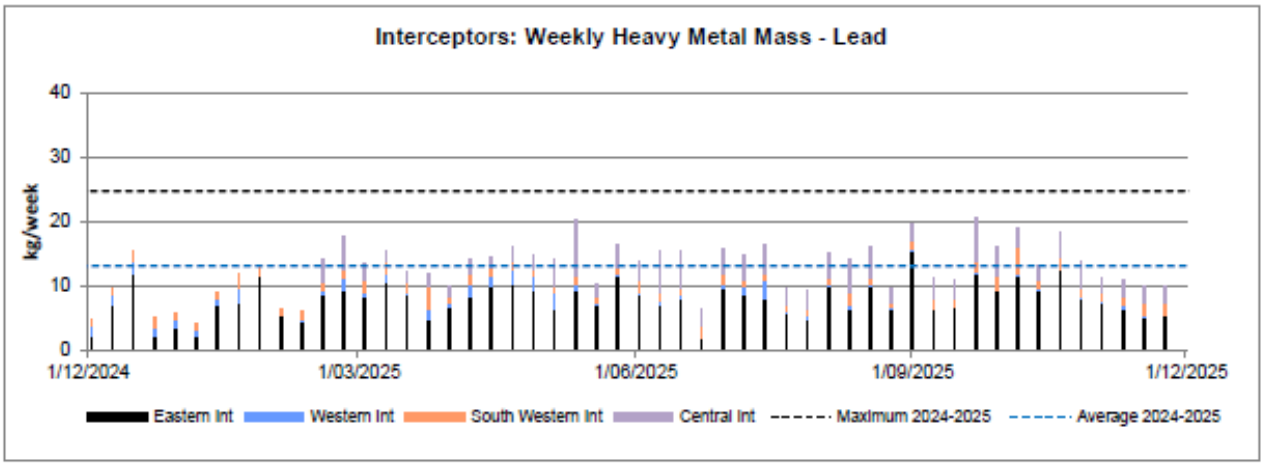


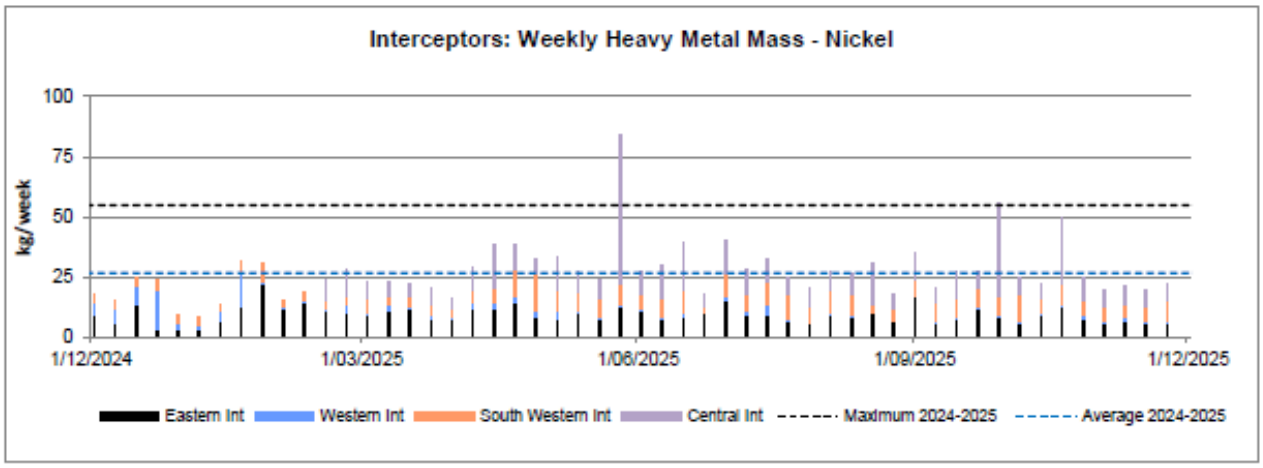


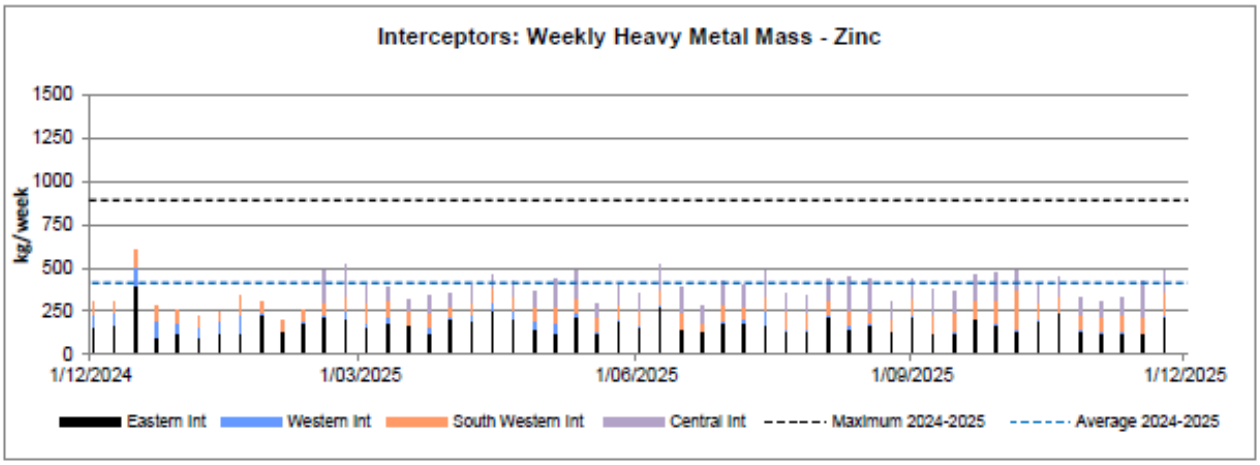



Interceptors: Weekly Heavy Metal Mass - Copper
kg/week
300
200
100
0
1/12/2024
1/03/2025
1/06/2025
1/09/2025
1/12/2025
Eastern Int
Western Int
South Western Int
Central Int
Maximum 2024-2025
Average 2024-2025

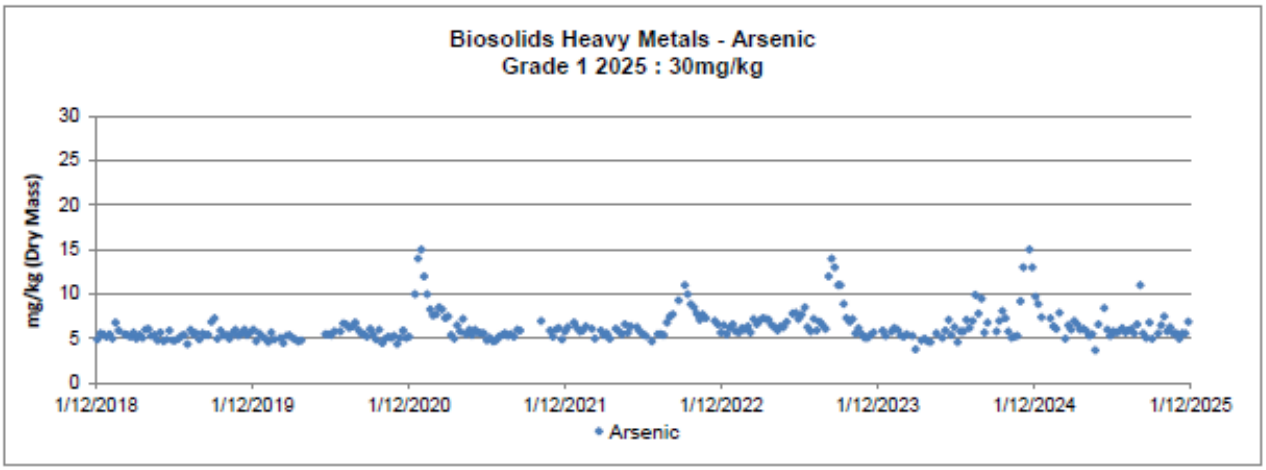

Interceptors: Weekly Heavy Metal Mass - Mercury
kg/week
1.0
0.8
0.5
0.3
0.0
1/12/2024
1/03/2025
1/06/2025
1/09/2025
1/12/2025
Eastern Int
Western Int
South Western Int
Central Int
Maximum 2024-2025
Average 2024-2025

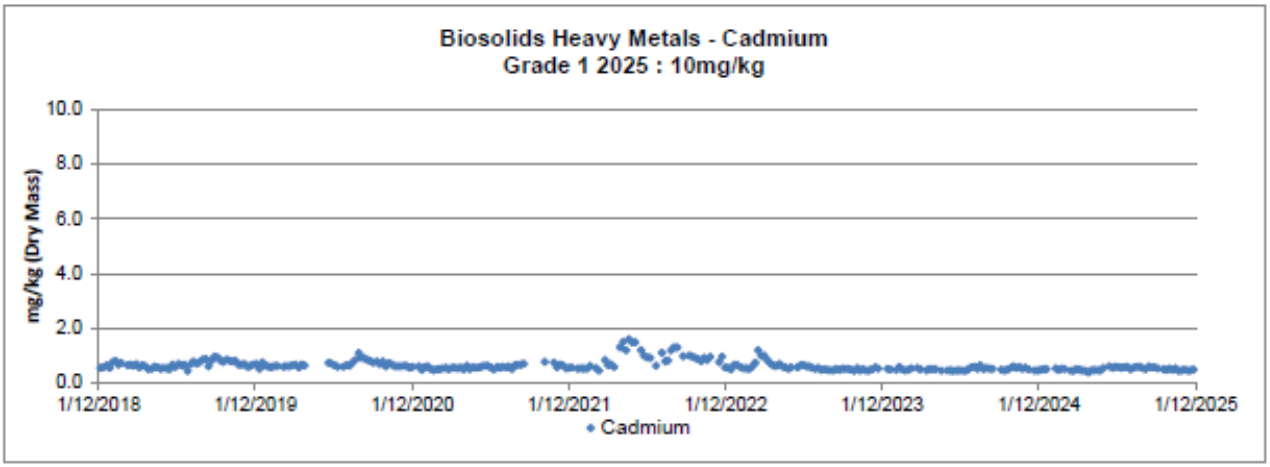

Interceptors: Weekly Heavy Metal Mass - Lead
kg/week
40
30
20
10
0
1/12/2024
1/03/2025
1/06/2025
1/09/2025
1/12/2025
Eastern Int
Western Int
South Western Int
Central Int
Maximum 2024-2025
Average 2024-2025

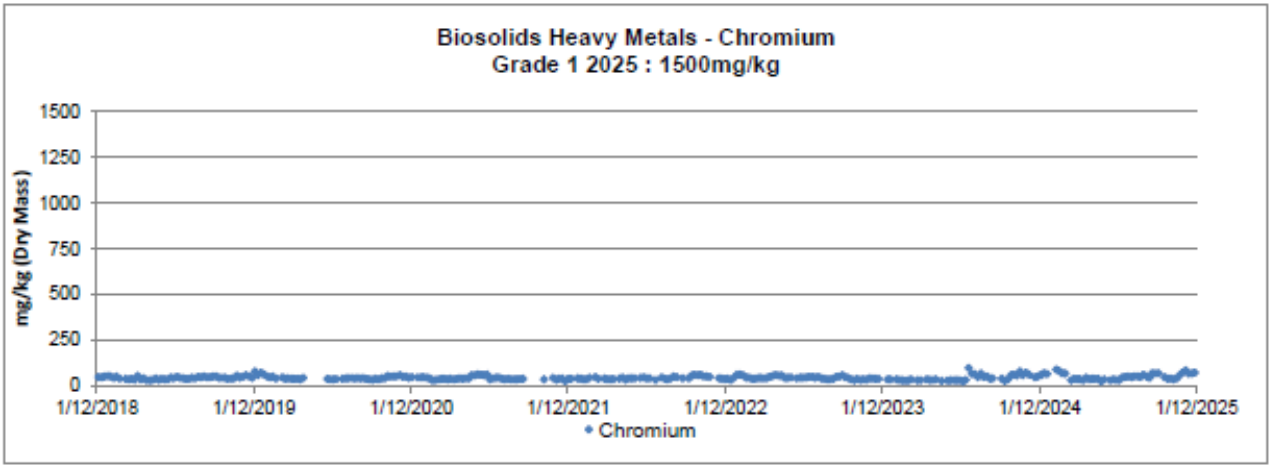

Interceptors: Weekly Heavy Metal Mass - Nickel
kg/week
100
75
50
25
0
1/12/2024
1/03/2025
1/06/2025
1/09/2025
1/12/2025
Eastern Int
Western Int
South Western Int
Central Int
Maximum 2024-2025
Average 2024-2025

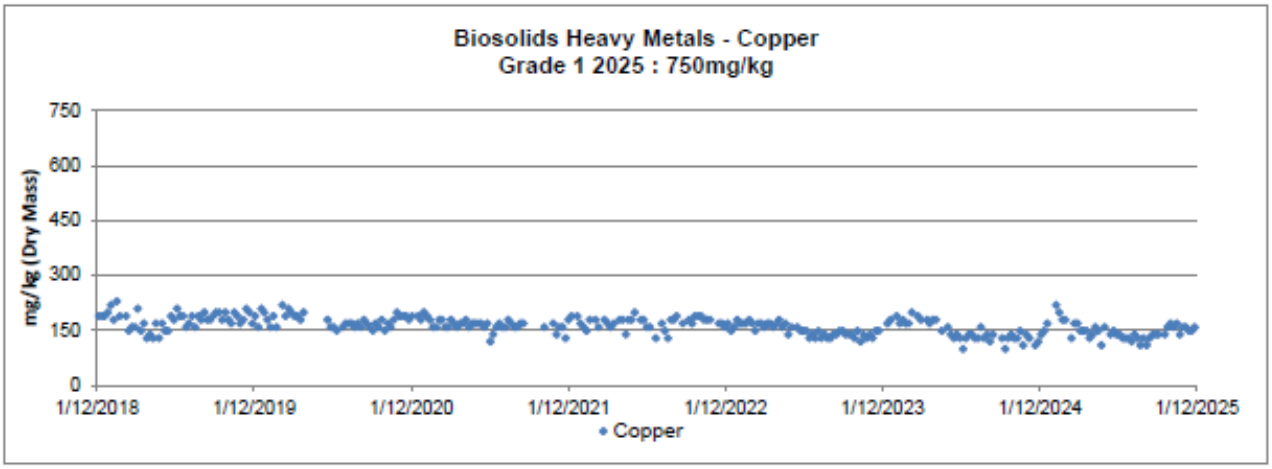

Interceptors: Weekly Heavy Metal Mass - Zinc
kg/week
1500
1250
1000
750
500
250
0
1/12/2024
1/03/2025
1/06/2025
1/09/2025
1/12/2025
Eastern Int
Western Int
South Western Int
Central Int
Maximum 2024-2025
Average 2024-2025

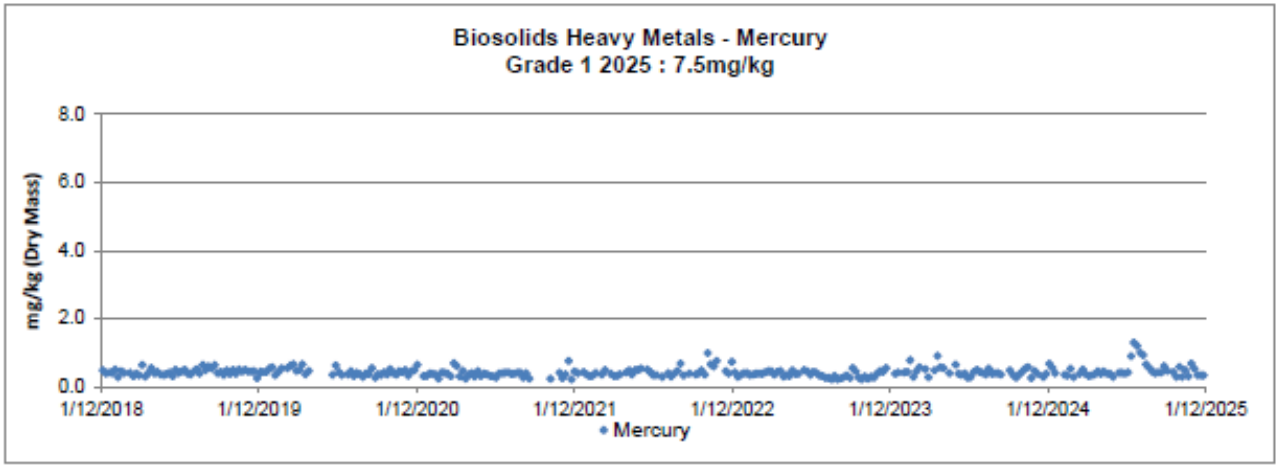
Heavy Metals – Long-term trend in Biosolids

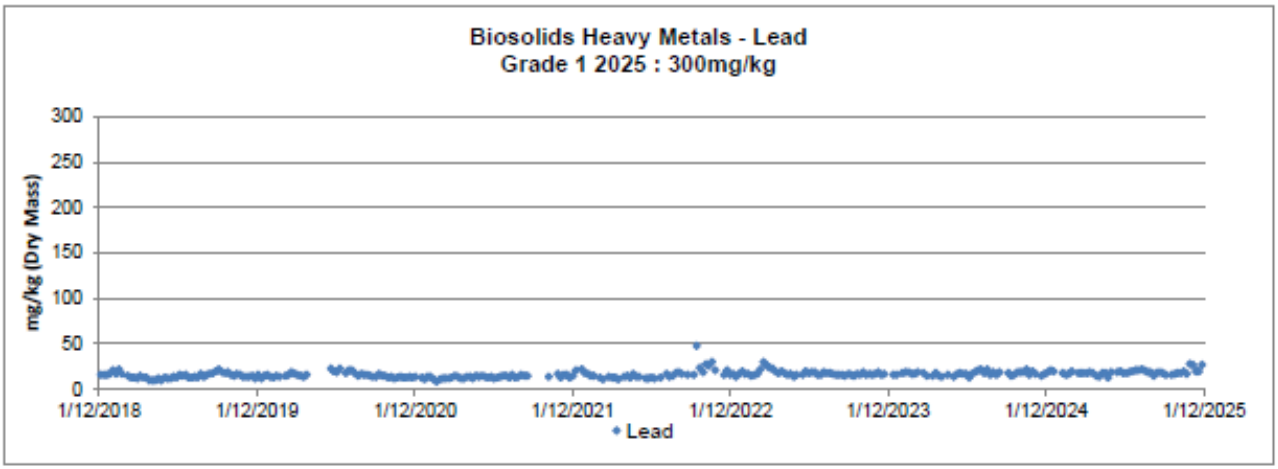


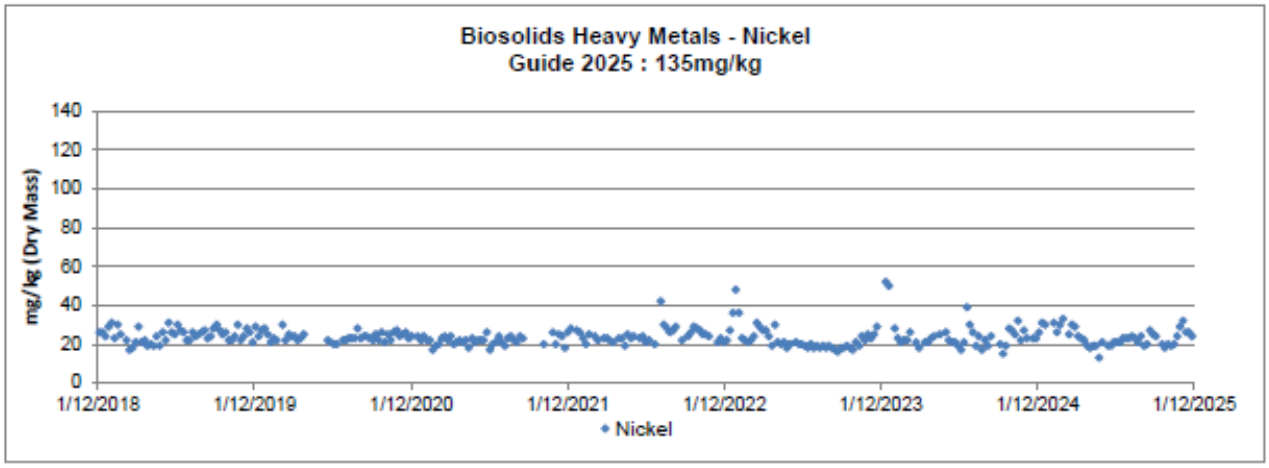


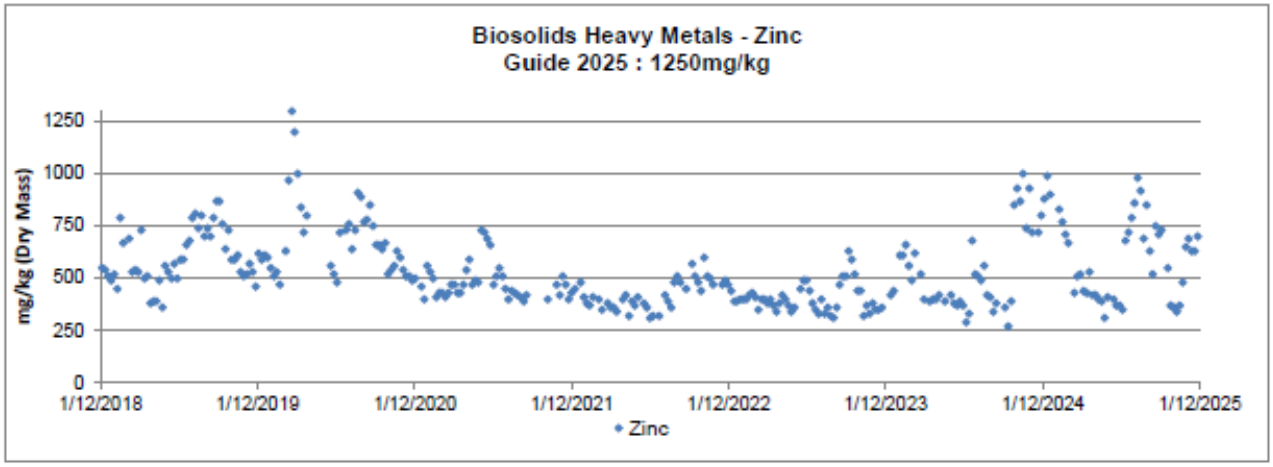



Biosolids Heavy Metals - Copper
Grade 1 2025 : 750mg/kg
mg/kg (Dry Mass)
750
600
450
300
150
0
1/12/2018
1/12/2019
1/12/2020
1/12/2021
1/12/2022
1/12/2023
1/12/2024
1/12/2025
Copper


Biosolids Heavy Metals - Mercury
Grade 1 2025 : 7.5mg/kg
mg/kg (Dry Mass)
8.0
6.0
4.0
2.0
0.0
1/12/2018
1/12/2019
1/12/2020
1/12/2021
1/12/2022
1/12/2023
1/12/2024
1/12/2025
Mercury


Biosolids Heavy Metals - Lead
Grade 1 2025 : 300mg/kg
mg/kg (Dry Mass)
300
250
200
150
100
50
0
1/12/2018
1/12/2019
1/12/2020
1/12/2021
1/12/2022
1/12/2023
1/12/2024
1/12/2025
Lead


Biosolids Heavy Metals - Nickel
Guide 2025 : 135mg/kg
mg/kg (Dry Mass)
140
120
100
80
60
40
20
0
1/12/2018
1/12/2019
1/12/2020
1/12/2021
1/12/2022
1/12/2023
1/12/2024
1/12/2025
Nickel


Biosolids Heavy Metals - Zinc
Guide 2025 : 1250mg/kg
mg/kg (Dry Mass)
1250
1000
750
500
250
0
1/12/2018
1/12/2019
1/12/2020
1/12/2021
1/12/2022
1/12/2023
1/12/2024
1/12/2025
Zinc

4 MIDGE CONTROL REPORT

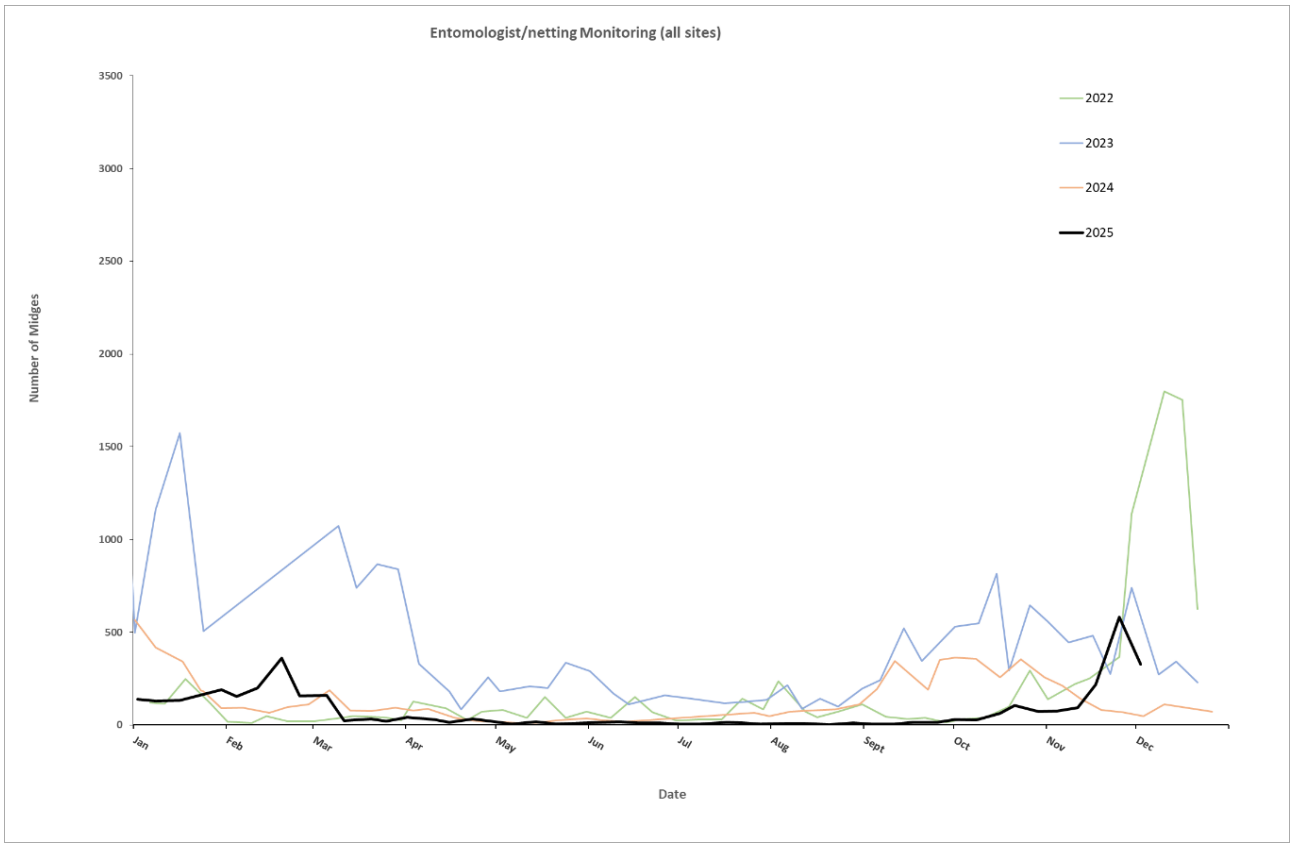
Situation

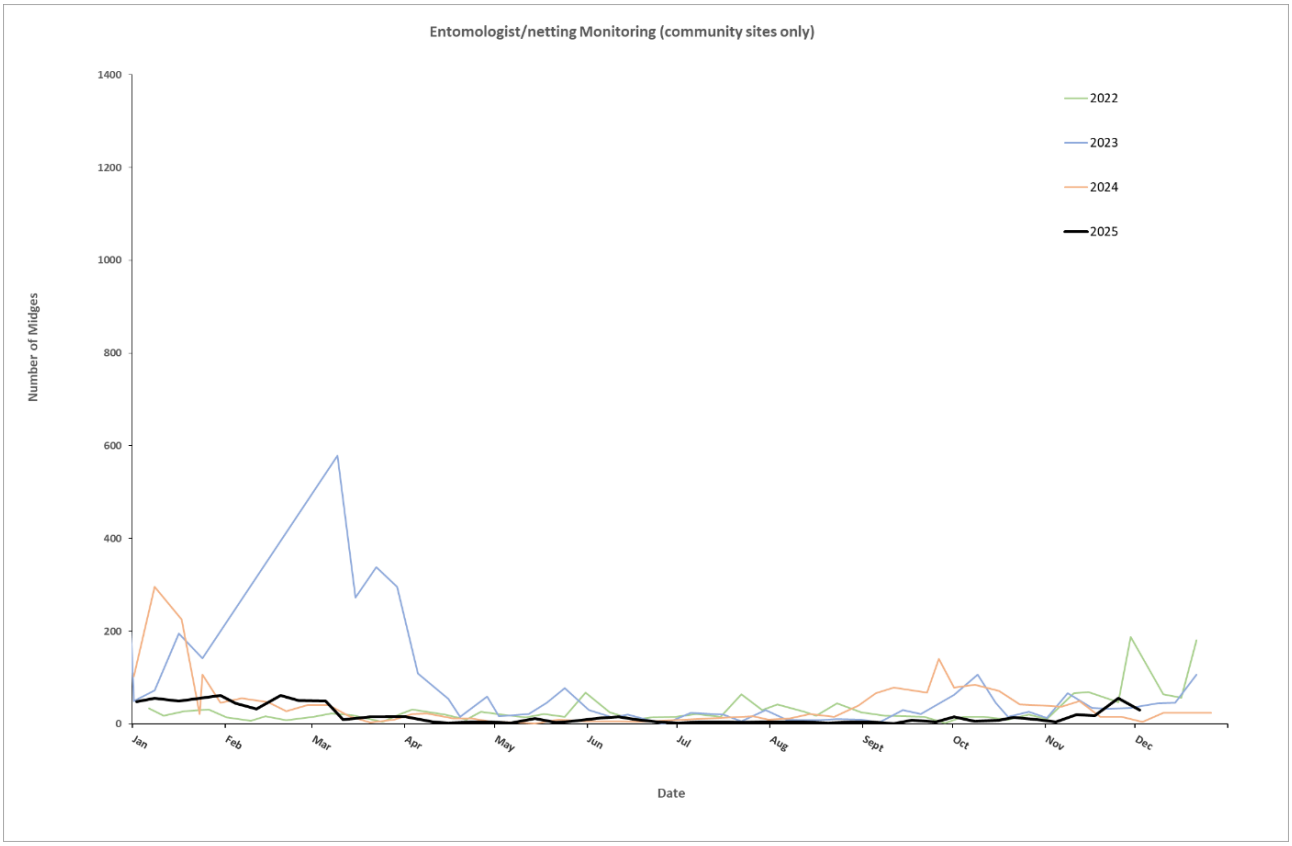
- Midge numbers across all sites are low, which is a normal trend for this time of year due to low water temperatures. The regular winter treatment schedule has been followed during this period.
- The net monitoring done by an entomologist has been the most reliable source for accurate midge counts over the past few years. The numbers for the current quarter are generally lower than in previous years. The current regimen of midge control appears to be working well.
- The Audit Group has approved for monitoring via emergence traps to be discontinued. This is subject to the current treatment working well as demonstrated by the entomologist monitoring, light trap monitoring and complaint recording. If these monitoring methods demonstrate an ongoing midge nuisance issue in the future, then the Audit Group may request the emergence trap monitoring to be reinstated.
- Light trap monitoring was paused for a period in 2024 while emergence and light traps efficacy was being discussed and was resumed from October 2024.

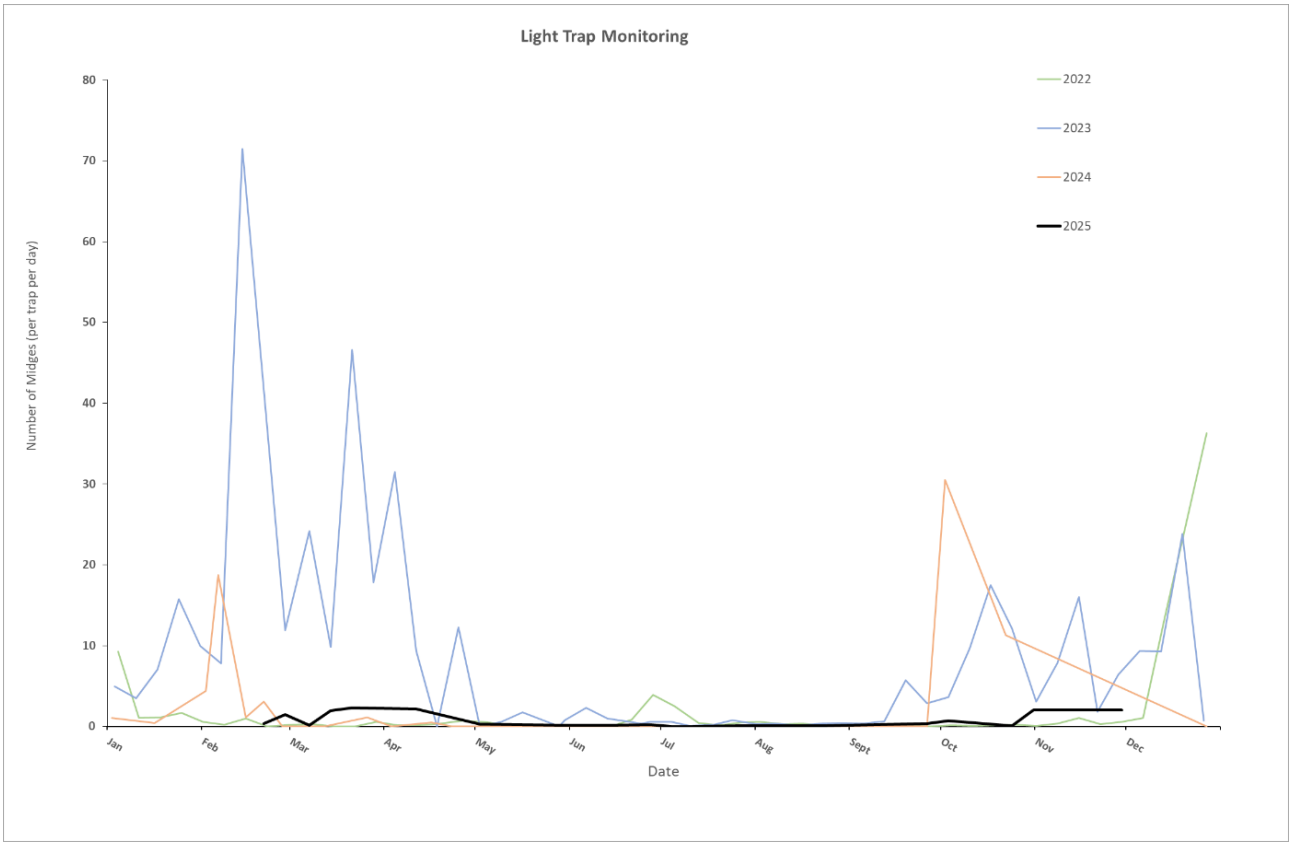
Treatment Schedule

Chain Dragging:	September – March:	Weekly
	April – August:	Fortnightly (to be increased to weekly if required).
Contact Insecticide:	August – April:	Every 3 weeks (to be increased to fortnightly if required).

Results




Entomologist/netting Monitoring (community sites only)
Number of Midges
1400
1200
1000
800
600
400
200
0
2022
2023
2024
2025
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
Date


Light Trap Monitoring
Number of Midges (per trap per day)
80
70
60
50
40
30
20
10
0
2022
2023
2024
2025
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
Date

5 ODOUR REPORT

Weekly walkover odour offensiveness scores (inside Māngere WWTP)

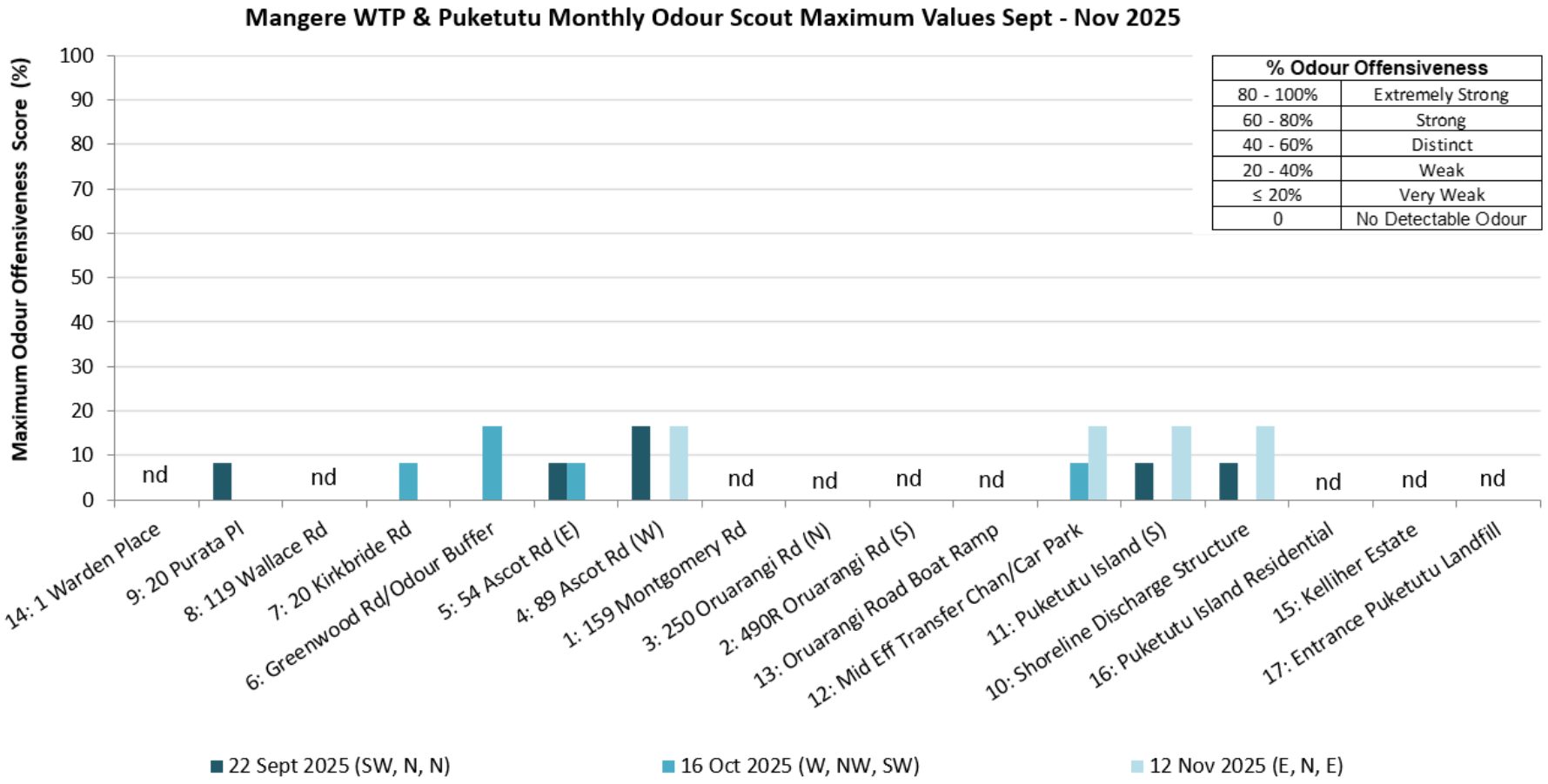
Location	2 Sept 25	9 Sept 25	16 Sept 25	26 Sept 25	2 Oct 25	13 Oct 25	20 Oct 25	30 Oct 25	4 Nov 25	11 Nov 25	18 Nov 25	27 Nov 25	Avg. quarter
Digester Area	8	17	17	8	8	8	17	8	8	8	8	8	10
DAF's/DSFT	8	38	17	NA	17	17	17	4	8	8	8	17	13
GTB Biofilter	8	4	8	8	4	8	4	4	4	8	4	4	6
GBT Biofilter	8	0	4	8	0	8	4	17	4	0	8	0	5
CPB Biofilters	8	8	17	17	17	8	17	17	17	17	8	8	13
ASU Biofilters	4	17	17	8	17	4	17	17	8	17	4	17	12
BST Biofilters	8	17	17	8	4	17	8	4	4	8	NA	8	9
GT/GBT Building (old)	0	0	0	8	0	0	0	0	8	0	0	0	1
GT/GBT Building (new)	0	0	0	0	0	0	0	8	8	8	17	0	3
Centrif. ASU/Biosol. Bldg.	38	38	17	38	17	8	17	17	8	17	8	0	18
Blended Sludge Tank	8	17	8	8	8	17	8	17	8	8	17	17	12
EF3	17	4	8	8	4	8	4	8	8	8	0	4	7
EF4	4	17	4	4	8	4	17	4	4	8	4	4	7
EF5	4	4	4	4	4	4	4	8	0	4	4	4	4
Splitter Box Biofilter 1	8	8	8	4	8	4	8	8	8	4	8	8	7
Splitter Box Biofilter 2	8	8	8	4	8	8	8	4	8	8	17	17	9
Splitter Box Biofilter 3	8	8	17	17	17	8	8	17	17	17	17	17	14
Splitter Box Biofilter 4	4	4	4	17	8	4	4	8	8	8	4	8	7
IPS2	4	4	4	4	8	8	4	8	0	8	4	8	6
Primary (PSTs)	17	17	8	8	17	17	8	8	0	0	8	8	10
Screens Building	17	8	17	17	17	17	17	17	8	8	8	38	16
Tertiary (Filter & UV Plant)	4	4	4	4	4	8	4	4	4	4	4	4	5
RC1, RC2, RC4	8	8	17	8	8	8	8	8	8	8	8	8	9
RC3, RC5, RC6	8	8	8	8	8	8	8	8	8	8	8	8	8
RC7, RC8, RC9	8	8	8	8	8	8	8	8	8	8	8	8	8

Notes:

N/A = Location not accessible due to ongoing construction or maintenance.

Key - Odour offensiveness score		
Extremely Strong	80 - 100	
Strong	60 - 80	
Distinct	40 - 60	
Weak	20 - 40	
Very Weak	≤ 20	

Monthly walkover results (WWTP, Puketutu Island, and surrounding areas)



% Odour Offensiveness	
80 - 100%	Extremely Strong
60 - 80%	Strong
40 - 60%	Distinct
20 - 40%	Weak
≤ 20%	Very Weak
0	No Detectable Odour

Notes:

- Three odour runs are completed per monitoring day (am, midday, pm). Maximum offensiveness score is the most distinct odour detected across the three runs.
- nd = No detectable odour at community location during any of the monthly monitoring rounds.
- Odour scout locations on x-axis listed clockwise from northern-most position as per Figure 5-1 below.

Monthly walkover map

Figure 5-1: Monthly Community Odour Scouting Locations.

6 CUSTOMER FEEDBACK REPORT

No feedback in relation to the Māngere WWTP performance was received during this quarter.

7 PUKETUTU ISLAND REPORT

Placement of biosolids

37,039 tonnes of biosolids material was placed at the Puketutu Biosolids Facility during this quarter. Since the commencement of operations on 1 December 2014, Watercare has placed 2,272,000 tonnes of combined biosolids and cover/construction material. The total storage capacity is estimated at four million tonnes; therefore, the facility is currently at approximately 57% of capacity.

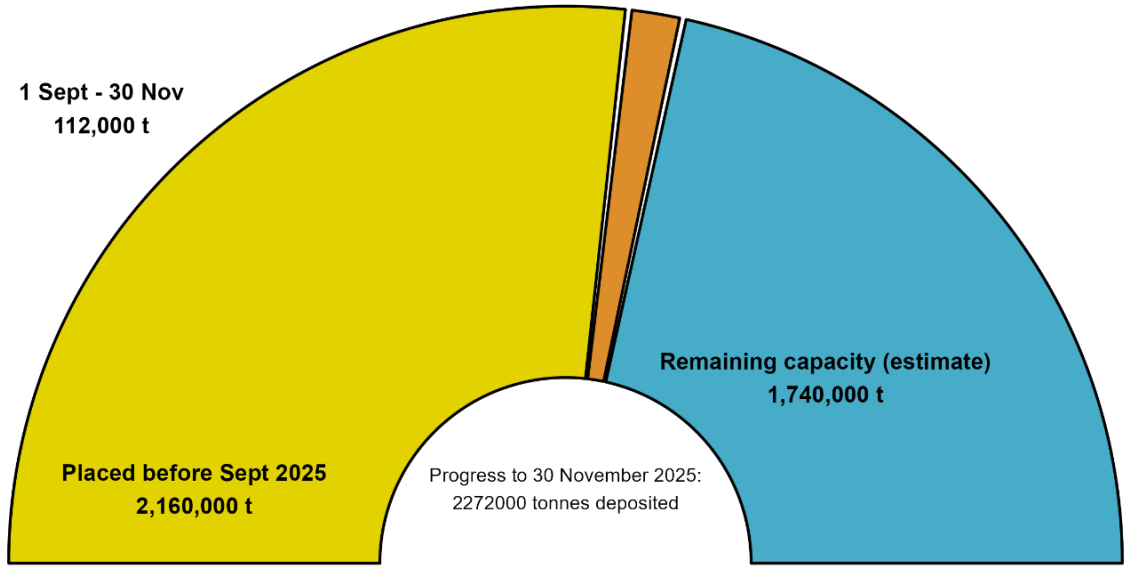


Figure 7-1: Material placement (biosolids and cover/construction) at Puketutu Biosolids Facility to date.

Biosolids truck movements were comparble to the previous quarter. Cover and construction material deliveries to the site have been high over the last two quarters to faciltate road and cell wall construction. Currently, Biosolids are deposited along the phase 5 embankment; this location doesn't allow the installation of long cells and forces the construction of multiple smaller cells. This has led to an increase in the number of cell walls to be built and subsequently more material required to be brought to the island.

Other matters

- No complaints were received at the Puketutu Biosolids Facility during the monitoring period.

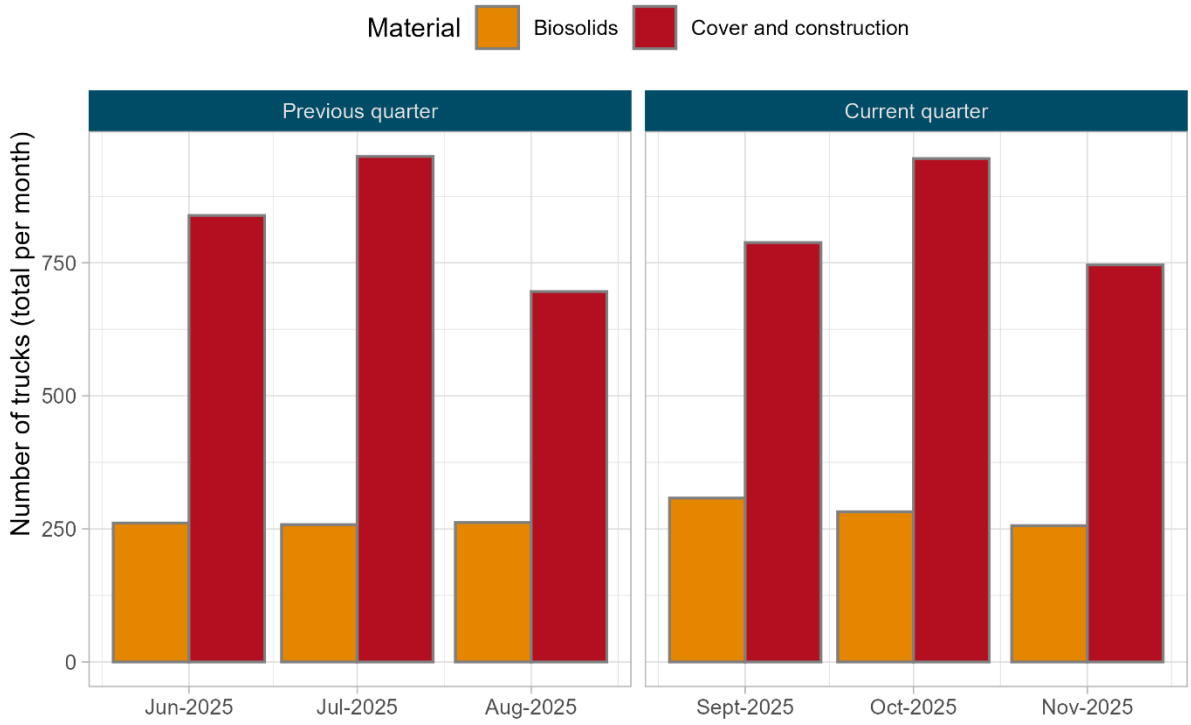


Figure 7-2: Monthly truck deliveries to Puketutu Biosolids Facility

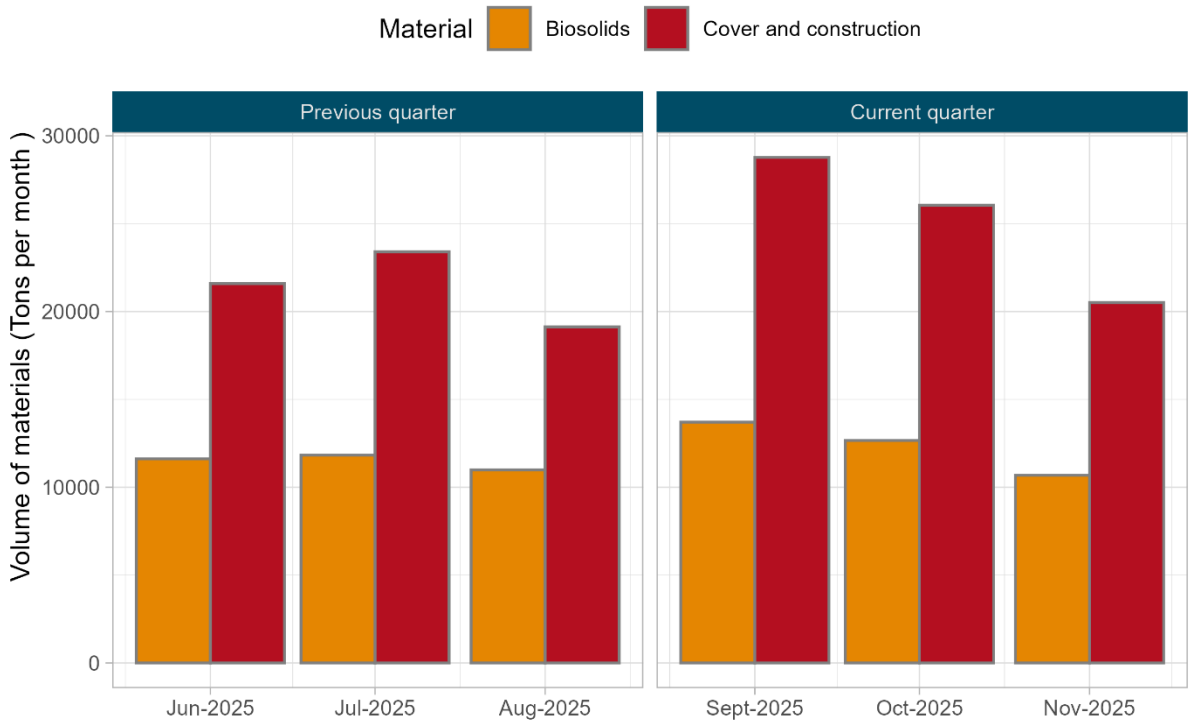


Figure 7-3: Monthly tonnages received at Puketutu Biosolids Facility