



Quarterly Summary

Māngere Wastewater Treatment Plant

Reporting period: June - August 2026

Issue Date: 25 September 2026

Quarterly Operations Executive Summary

This quarterly summary provides operational and consent-required data for Māngere Wastewater Treatment Plant (WWTP) for the period of June to August 2026.

Compliance was achieved with all influent and effluent volume limits as well as effluent quality limits this quarter with the exception of applied UV dose rate in August, which achieved a dose rate above 35 mWs/cm² for 98.67% of measurements; below the 99% requirement of Condition 25(2). This is primarily a result of the impact of the wet weather event of 29 and 30 August.

Three low-UV and/or plant bypass incidents triggered reactive shellfish monitoring in accordance with Special Condition 25(6) of Consent 30083 across the quarter; one in each of June, July, and August. All incidents occurred during wet weather events. Additionally, during the wet weather event on 29 August, a power dip to the plant tripped multiple site pumps and lead to a full plant bypass for 57 minutes, with a volume of approximately 411 m³ overtopping the confluence chamber overflow weir to the bypass channel. Shellfish results have been received for the June and July events with all samples less than detection limit for both enterovirus or adenovirus. Results are yet to be received for the 29 August incident.

Liquid and solids process monitoring was within target range for plant operations throughout the quarter, with variances generally limited to isolated occurrences linked to wet weather events. The maintenance and repairs to Digester 3 continued through the quarter with an estimated return to service date of mid-October.

There were no non-compliances with Trade Waste Agreements or other contaminant issues identified through the trade waste monitoring programme over this quarter that impacted on operations at Māngere WWTP, or that otherwise lead to adverse effects on the Manukau Harbour. Some interceptor results showed higher than average concentrations, however, results were within the range of variability observed historically.

Midge control via chain dragging continued fortnightly throughout the quarter. Weekly entomologist monitoring continues to show very low midge numbers.

No complaints or other community feedback was received this quarter.

30,412 tonnes of biosolids material was placed at the Puketutu Biosolids Facility during this quarter. The total storage capacity is four million tonnes, and the facility is approximately 64% of capacity.

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1 COMPLIANCE REPORT

M-15 final effluent quality results

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

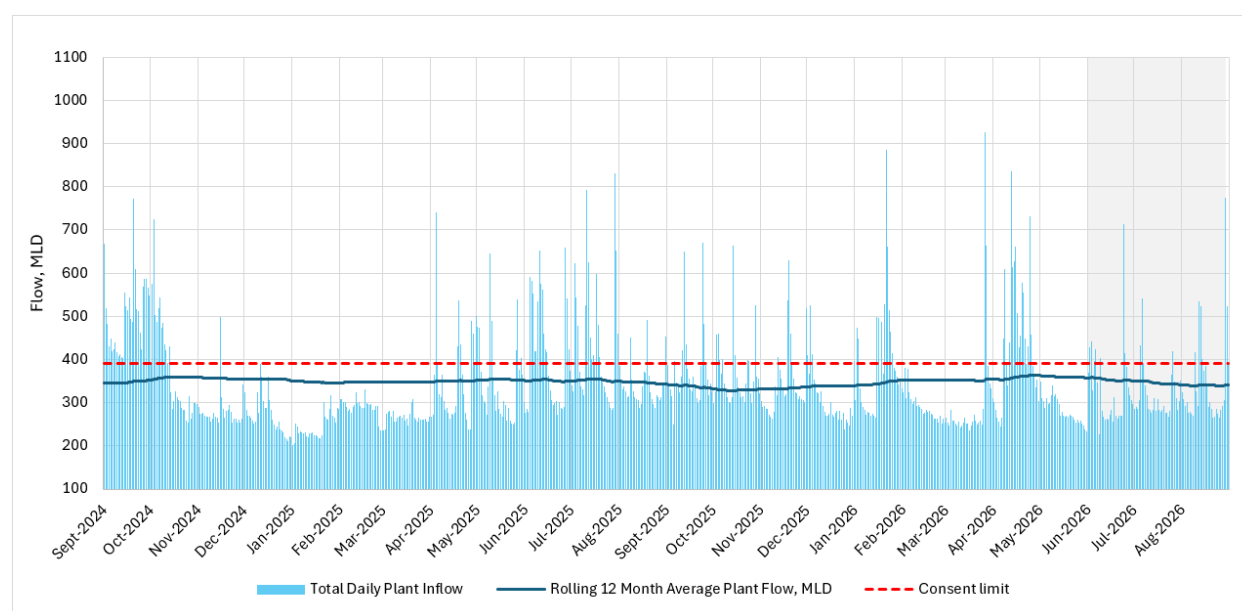
PARAMETER	Jun-26	Jul-26	Aug-26		COMPLIANCE
					MONTHLY MEAN
BOD (g/m ³)	2.8	2.9	4.0	<	15
NFR (g/m ³)	6.0	4.6	6.4	<	15
Total Petroleum Hydrocarbon (g/m ³)	0.3	0.3	0.3	<	0.5
Ammoniacal Nitrogen (g/m ³)	1.0	0.9	1.0	<	3 / 5 ^(a)
Total Nitrogen (g/m ³)	8.6	8.3	8.2	<	9.5 / 35 ^(b)
Reactive Phosphorus (g/m ³)	2.6	2.0	1.9	<	9
Dissolved Oxygen, %saturation	98%	94%	96%	>	80%
					MONTHLY MAXIMUM
BOD (g/m ³)	8.6	18.0	32.0	<	50
pH	7.9	7.5	7.7	<	9
Ammoniacal Nitrogen (g/m ³)	9.3	4.5	4.0	<	6 / 15 ^(a)
					MONTHLY MINIMUM
pH	7.0	7.0	7.0	>	6.5
					95%TILE OVER THREE DISCRETE MONTHS
BOD (g/m ³)	6.5			<	30
NFR (g/m ³)	10.7			<	30
					MONTHLY % UV MEASUREMENT
UV Dose Applied % Measurement	99.68%	100.00%	98.67%	>	99.00

Note: The low applied UV dose for August is primarily a result of the wet weather event of 29 August; further details are provided in Section 2.

(a) Ammoniacal Nitrogen limits for the period of April-November is 5 g/m³ for monthly mean and 15 g/m³ for monthly maximum. For December-March the limit is 3 g/m³ for monthly mean and 6 g/m³ for monthly maximum.

(b) Total Nitrogen limit for the period of April-November is 35 g/m³. For December-March the limit is 9.5 g/m³.

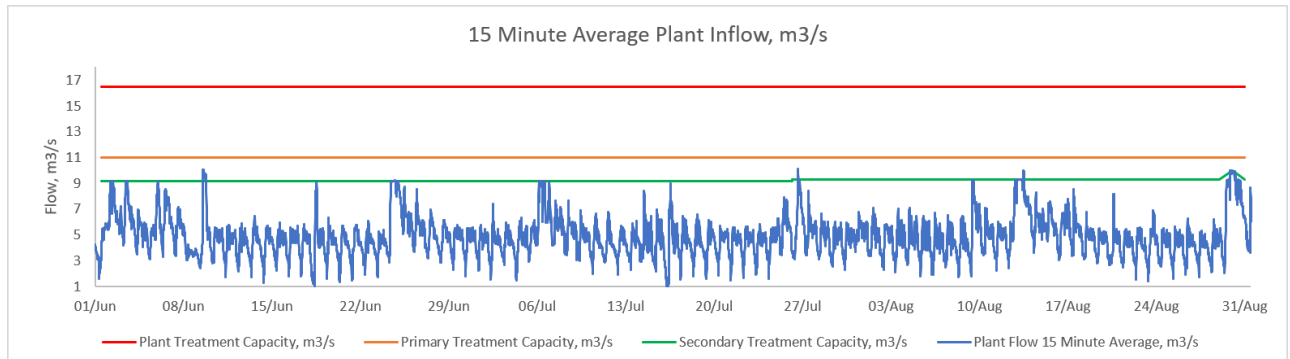
Rolling 12 months average daily plant inflow



2 OPERATIONS REPORT

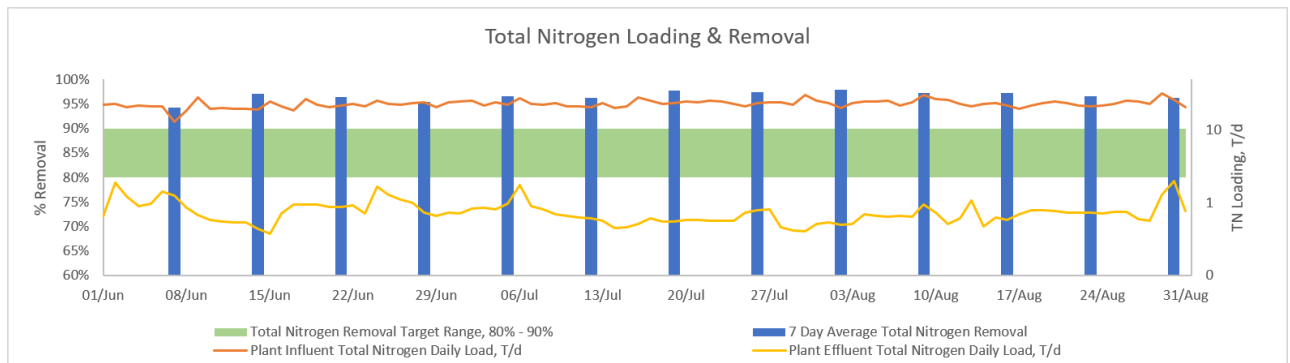
Liquid Process

15-minute interval plant flow



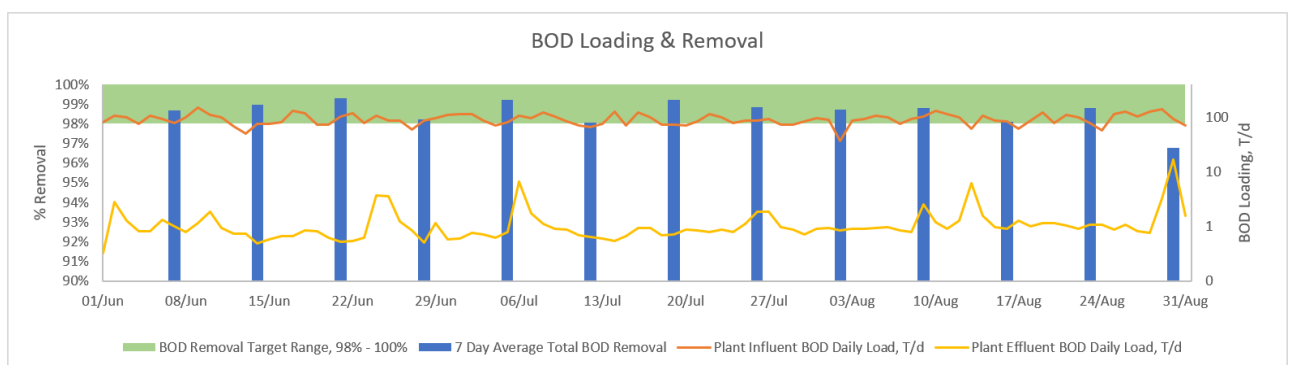
Secondary Treatment Capacity set point varied between 9.2 - 10 m³/s this quarter. Nine RC Filter bypass events occurred.

Total Nitrogen removal and loading



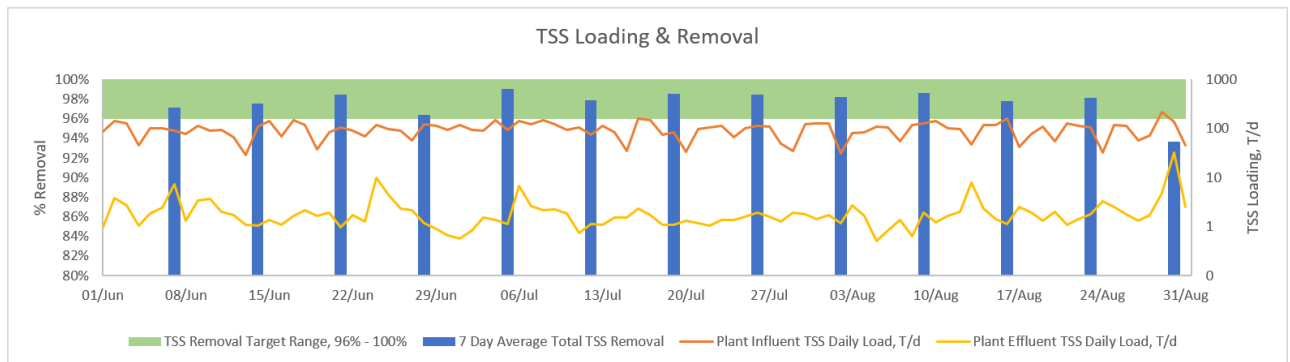
Please note logarithmic scale on secondary vertical axis (TN Loading, T/d).

BOD removal and loading



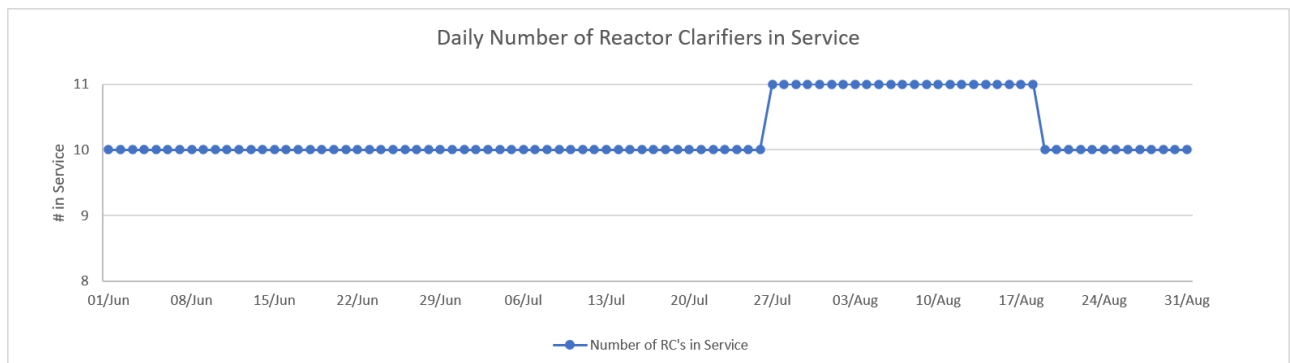
Please note logarithmic scale on secondary vertical axis (BOD Loading, T/d). The lower BOD removal rate for the last week of August was a result of the wet weather event and associated RC Filter bypass on 29 and 30 August.

TSS removal and loading



Please note logarithmic scale on secondary vertical axis (TSS Loading, T/d). The lower TSS removal rate for the last week of August was a result of the wet weather event and associated RC Filter bypass on 29 and 30 August.

Number of Reactor Clarifiers in service



RC7 was out of service for overhaul since April and returned to service on 28 July. RC1 was then taken out of service for mixer repairs from 19 August for the remainder of the quarter.

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 ($> 9 \text{ m}^3/\text{s}$) in accordance with required levels, but the applied UV dose is less than $35 \text{ mWs}/\text{cm}^2$ 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.

Three such incidents occurred throughout this quarterly reporting period; these are explained in Table 2-1.

Table 2-1: Shellfish sampling triggered by Special Condition 25(6) for this quarterly reporting period.

Date of Event	Trigger for shellfish collection/ Cause of event	Day Two Shellfish Sampling results	Week Two Shellfish Sampling results
24-Jun-26	UV applied dose rate at the Māngere WWTP was below the consent limit of $35 \text{ mWs}/\text{cm}^2$ in three non-bypass channels (Channels 2, 7, and 8) for greater than 2 hours between approximately 10:30 am and 1:30 pm. A sudden increase in flow at the UV plant resulted in reduced UV exposure time and therefore dose rate. Some operational teething issues related to Central Interceptor and Māngere Pump Station control settings exacerbated the higher flows associated with the rain event. UV Channel 11 was out of service for maintenance at the time, restricting the number of treatment channels available.	26 Jun 2026 (Lab ref # 260629-110) Entero - all $<1.0 \text{ pfu}/10\text{g ww}$ Adeno - all $<4.0 \text{ MPN}/100\text{g ww}$	N/A
6-Jul-26	High plant inflow over a 9 minute period during the rain event resulted in a portion of the flow going through the plant bypass. Flows were exacerbated by ongoing operational teething issues relating to CI. The plant bypassed volume was 39 m^3 and bypass return pumps were operated; therefore, it is unlikely any untreated effluent entered the effluent channel. Quality results over this period were compliant with consent limits.	9 Jul 2026 (Lab ref # 260709-131) Entero - all $<0.8 \text{ pfu}/10\text{g ww}$ Adeno - all $<4.0 \text{ MPN}/100\text{g ww}$	N/A
29-Aug-26	Following the rain event over the weekend, there was a plant bypass for 57 minutes, between 19:58- 20:54 on 29 September. The bypass was a result of a power disruption which tripped multiple site pumps. Plant bypass volume during this period was 441 m^3 . Bypass return pumps were operated for 15 minutes during this period, however, due to the high level in the confluence chamber, all bypassed volume could not be returned. In addition, due to the high flow rate through the UV plant and solids carry over in the secondary treated effluent, the applied UV dose rate was below the consented limit of $35 \text{ mWs}/\text{cm}^2$ across non-bypass channels for greater than 2 hours overnight between the 29th and 30th.	1 Sept 2026 (Lab ref # 260901-139) Entero - all $<0.8 \text{ pfu}/10\text{g ww}$ Adeno - all $<4.0 \text{ MPN}/100\text{g ww}$	N/A

Temporary warning signage was placed at the seven locations, as indicated on Figure 2-1 below, following each event. In addition, a warning flag was posted on the Safeswim website, as per Figure 2-2. The signs remained in place until test results were received confirming no virus was detected in the shellfish samples. Note, one of the shellfish signs (the sign midway along the effluent channel) was stolen/removed whilst it was in place following the 6 July event; therefore, only 6 signs could be placed out following the 29 August event. A replacement sign is being sourced. Signs remain in place following the 29 August event whilst we await results.



Figure 2-1: Example and locations of shellfish warning signage put out in response to plant UV incidents (yellow dots); the red dot indicates the permanent signage near the discharge.

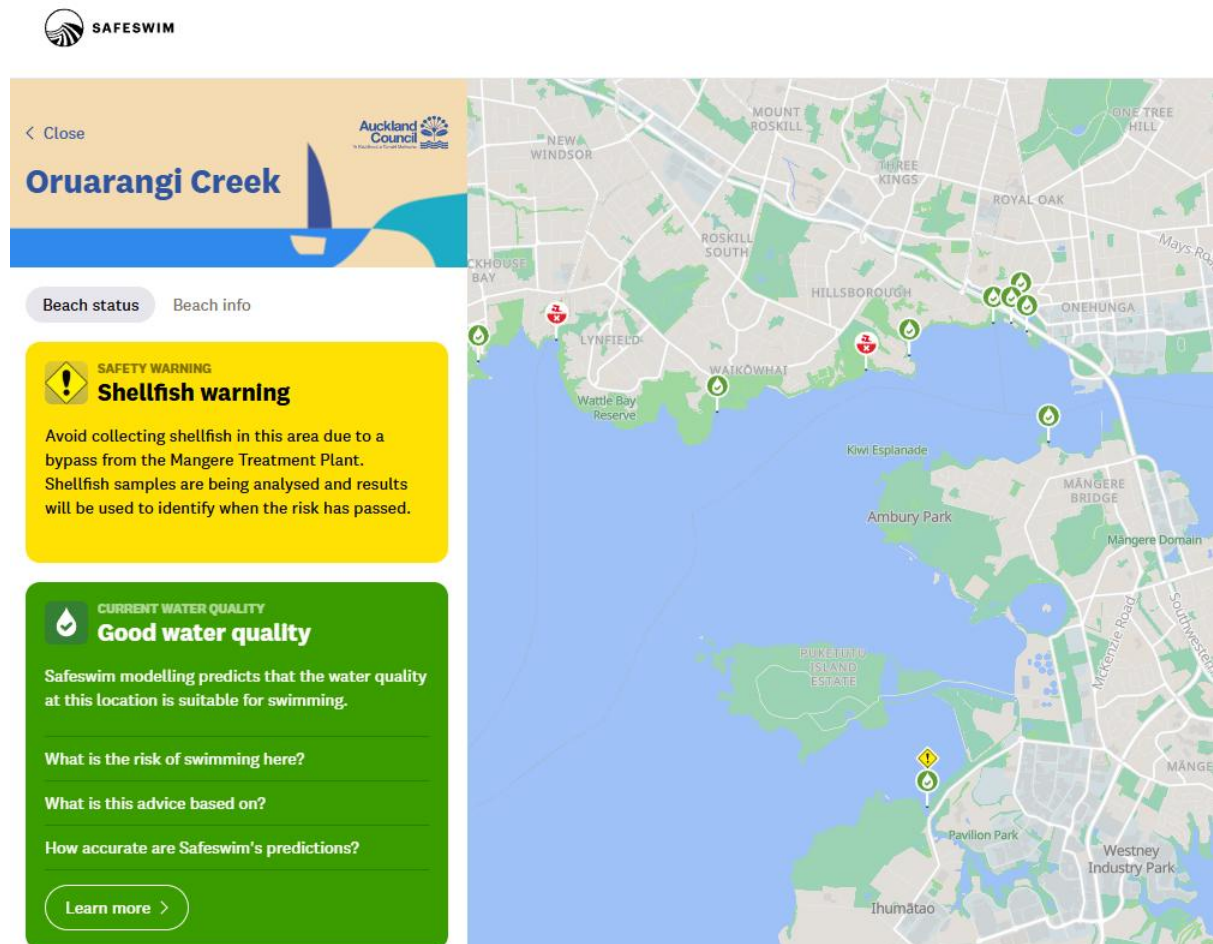


Figure 2-2: Example screenshot from the Safeswim website displaying the shellfish warning message.

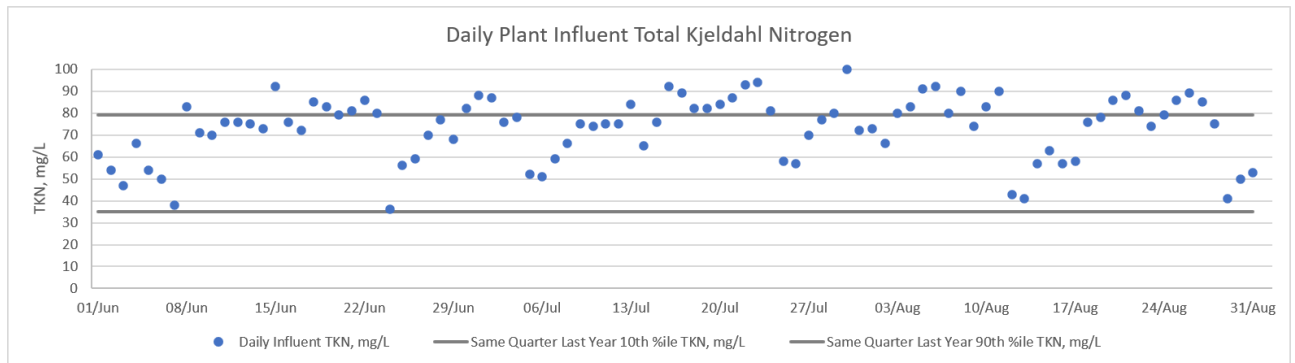
RC Filter High Flow Diversion event summary

Event Number	Start Date & Time	End Date & Time	Duration	Diverted Volume (m ³)	Secondary treated volume above 9m ³ /s (m ³)
#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
#2026-01	3/07/2025 17:00	4/07/2025 13:54	21 hrs 6 mins	136,046	14,455
#2026-02	5/07/2025 0:00	5/07/2025 15:17	15 hrs 17 mins	10,903	5,133
#2026-03	11/07/2025 14:15	12/07/2025 21:03	1 d 7 hrs 12 mins	258,196	124,158
#2026-04	17/07/2025 10:28	17/07/2025 21:00	10 hrs 33 mins	79,571	41,842
#2026-05	29/07/2025 14:28	30/07/2025 16:00	1 d 2 hrs 24 mins	201,295	173,984
#2026-06	19/08/2025 10:12	19/08/2025 10:18	6 mins	411	312
#2026-07	12/09/2025 6:11	12/09/2025 21:19	13 hrs 15 mins	95,427	14,058
#2026-08	24/09/2025 10:03	24/09/2025 23:47	11 hrs 58 mins	76,053	12,924
#2026-09	14/10/2025 9:56	14/10/2025 23:38	12 hrs 42 mins	99,177	15,545
#2026-10	24/10/2025 4:05	24/10/2025 4:18	13 mins	1,010	265
#2026-11	28/10/2025 11:13	28/10/2025 15:38	3 hrs 3 mins	13,330	3,733
#2026-12	18/11/2025 22:51	19/11/2025 21:44	19 hrs 56 mins	171,480	21,528
#2026-13	30/11/2025 18:16	1/12/2025 1:38	6 hrs 10 mins	52,285	6,660
#2026-14	3/12/2025 18:48	4/12/2025 1:31	2 hrs 54 mins	16,194	3,132
#2026-15	31/12/2025 20:57	31/12/2025 21:23	26 mins	1,932	468
#2026-16	2/01/2026 22:47	3/01/2026 4:06	5 hrs 19 mins	31,830	5,742
#2026-17	16/01/2026 0:25	16/01/2026 12:26	11 hrs 17 mins	75,031	12,181
#2026-18	18/01/2026 10:09	18/01/2026 13:54	1 hr 58 mins	8,517	2,124
#2026-19	20/01/2026 16:51	20/01/2026 21:09	1 hr 50 mins	8,401	1,980
#2026-20	21/01/2026 9:45	23/01/2026 2:45	35 hrs 43 mins	385,667	38,574
#2026-21	26/03/2026 9:19	27/03/2026 23:00	35 hrs 38 mins	488,655	0*
#2026-22	8/04/2026 8:03	8/04/2026 19:36	8 hrs 44 mins	126,237	0*
#2026-23	9/04/2026 12:41	9/04/2026 13:16	35 mins	5,401	273
#2026-24	12/04/2026 3:38	13/04/2026 11:14	23 hrs 36 mins	257,545	49,276
#2026-25	14/04/2026 0:27	14/04/2026 1:53	34 mins	3,799	1,183
#2026-26	14/04/2026 14:25	14/04/2026 21:10	8 hrs 16 mins	30,245	17,261
#2026-27	15/04/2026 9:48	15/04/2026 21:45	8 hrs 28 mins	56,844	17,678
#2026-28	19/04/2026 19:47	19/04/2026 21:15	28 mins	3,032	974
#2026-29	20/04/2026 20:21	20/04/2026 21:12	15 mins	1,696	522
#2026-30	24/04/2026 7:30	25/04/2026 4:00	20 hrs 22 mins	180,298	0*
#2026-31	2/06/2026 5:15	2/06/2026 10:37	3 hrs 48 mins	59,417	0*
#2026-32	3/06/2026 10:13	3/06/2026 10:33	21 mins	1,340	252
#2026-33	9/06/2026 13:06	9/06/2026 13:14	8 mins	801	499
#2026-34	24/06/2026 9:59	25/06/2026 0:27	12 hrs 42 mins	132,562	1,397
#2026-35	6/07/2026 4:03	6/07/2026 13:27	8 hrs 52 mins	97,229	3,192
#2026-36	26/07/2026 16:29	26/07/2026 18:22	1 hr 24 mins	5,830	1,058
#2026-37	9/08/2026 11:00	9/08/2026 12:14	57 mins	4,978	787
#2026-38	12/08/2026 23:41	13/08/2026 12:06	11 hrs 23 mins	70,163	11,884
#2026-39	29/08/2026 14:02	30/08/2026 11:23	15 hrs 58 mins	202,232	31,642

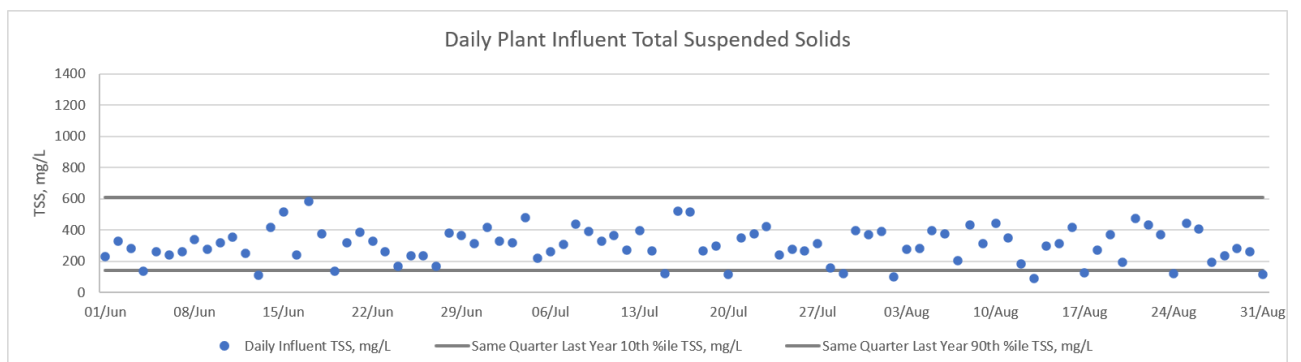
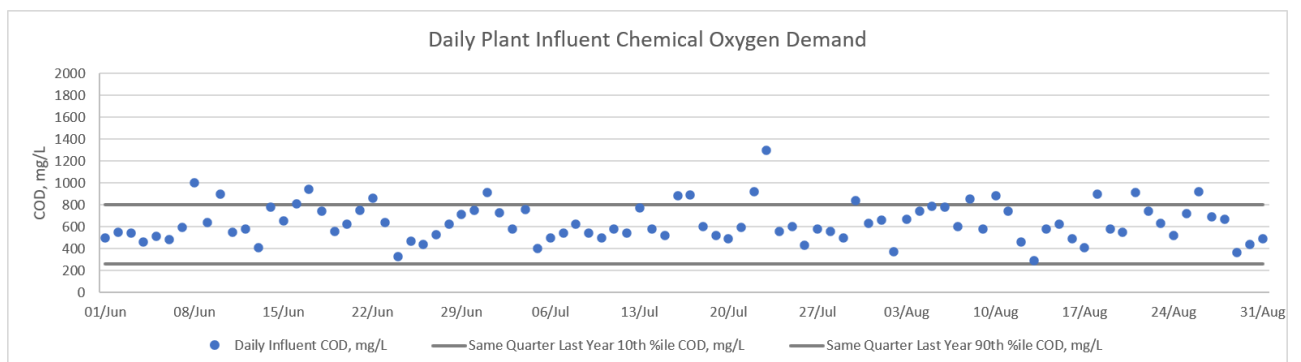
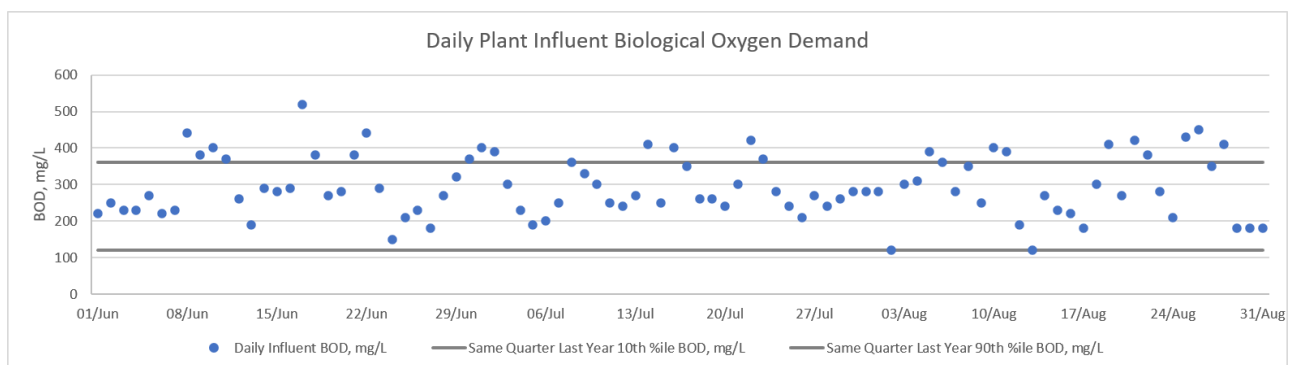
Note: High Flow Diversion event number convention follows the financial year, rather than calendar year. Grey shaded are the events from this quarter.

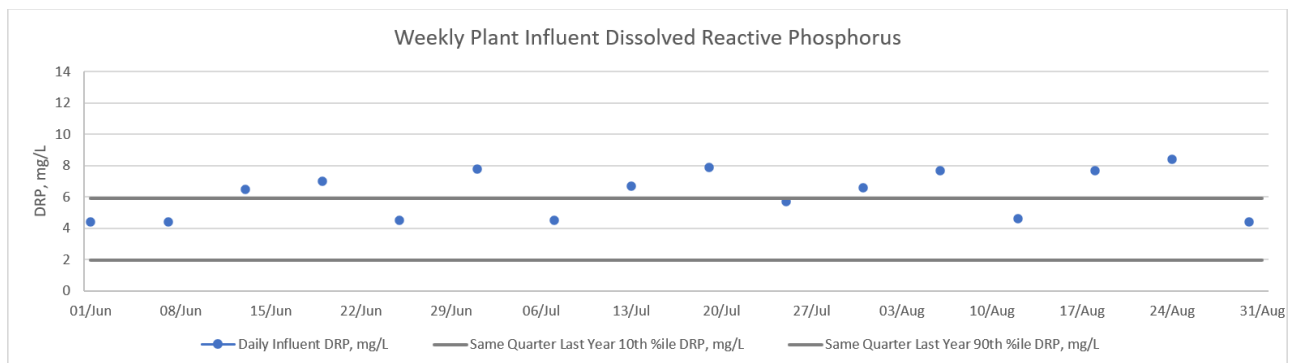
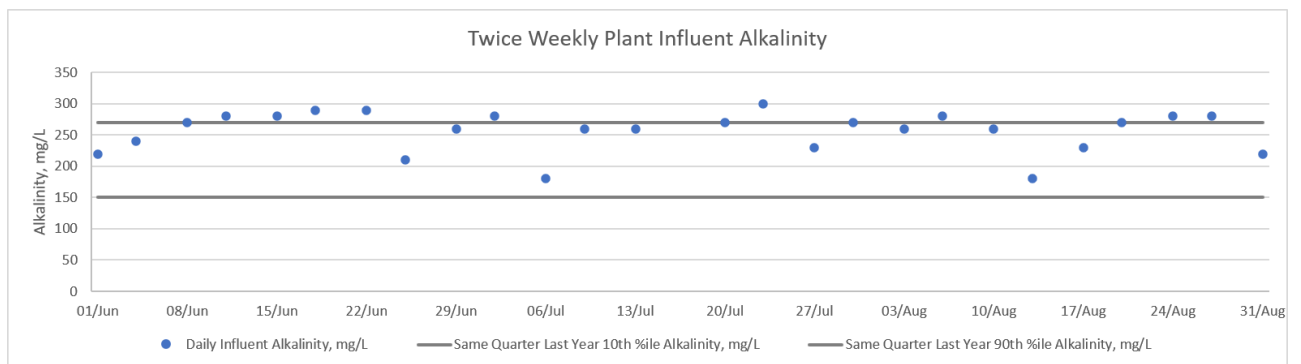
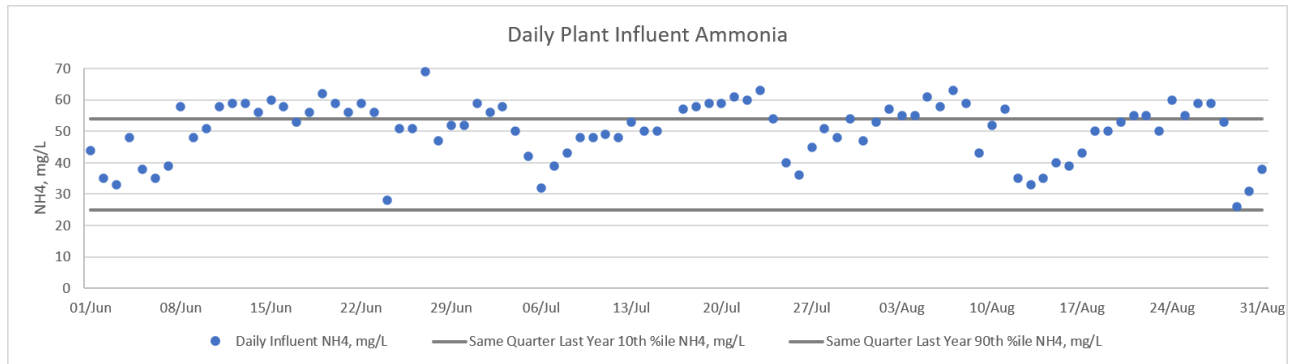
*Pump fault at IPS2 during bypass meant the average flow to secondary treatment was lower than 9m³/s during the event.

Influent chemistry monitoring



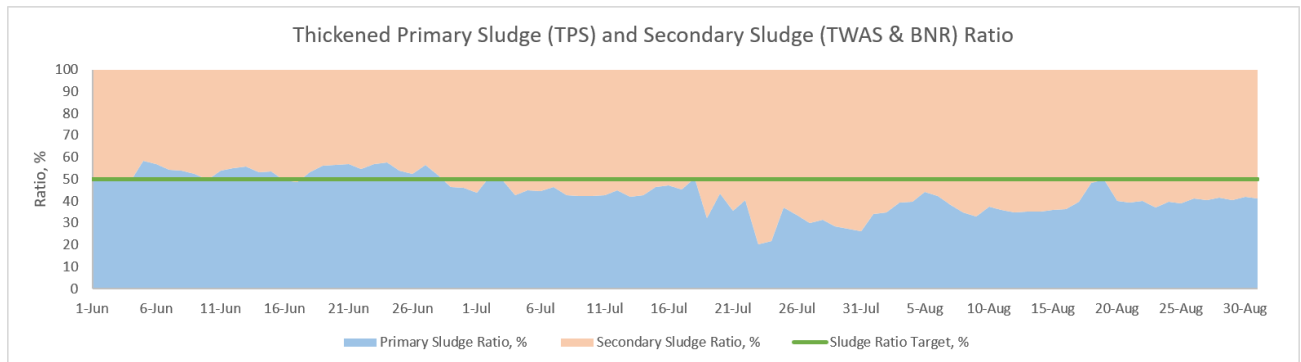
Note: Lower TKN results correspond with wet weather events.





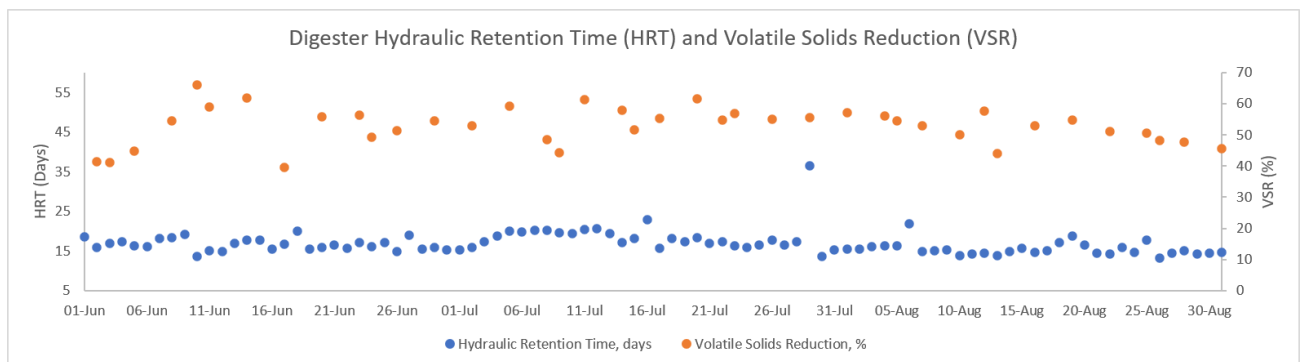
Solids Process

Primary and Secondary sludge ratio



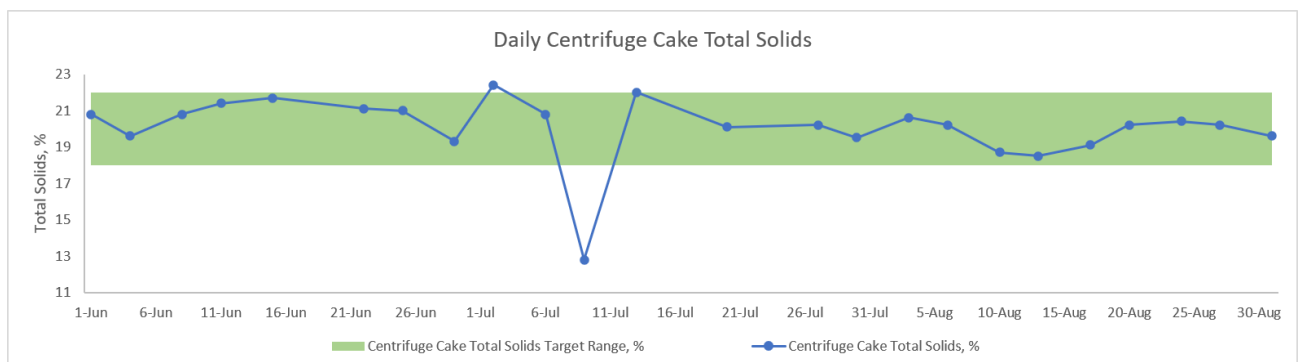
Primary sludge ratio from mid-late July through August was below the target. This is most likely due to the Thickened Primary Sludge (TPS) flow meter measuring range being lower than the actual flow rate; meaning TPS was pumped out at a higher flow rate, resulting in lower TPS total solids % and low calculated primary ratio. The TPS flow meter measuring range has been adjusted recently, which will give more accurate flow rate reading and improve TPS concentration.

Digester performance



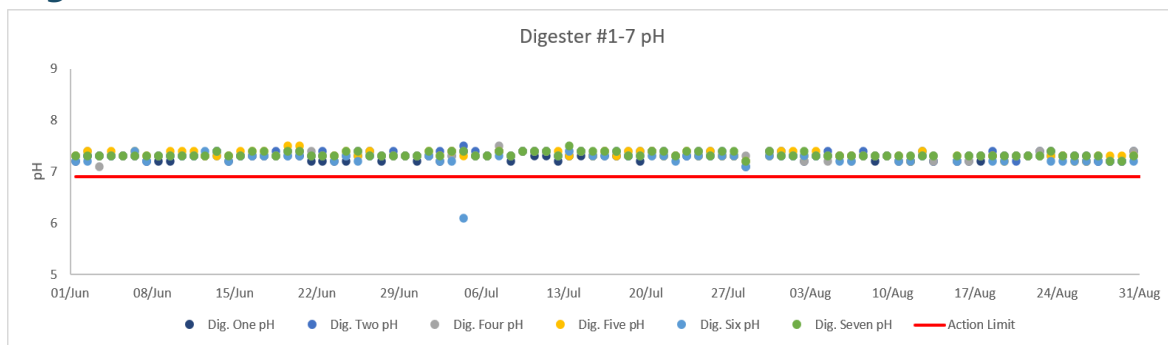
Secondary axis added for VSR % in this quarter's graphing. The average HRT this quarter is 17 days. The high HRT on 29 July was due to digester spill line cleaning work which required the feed to digesters to be stopped for approximately 12 hours.

Dewatering performance

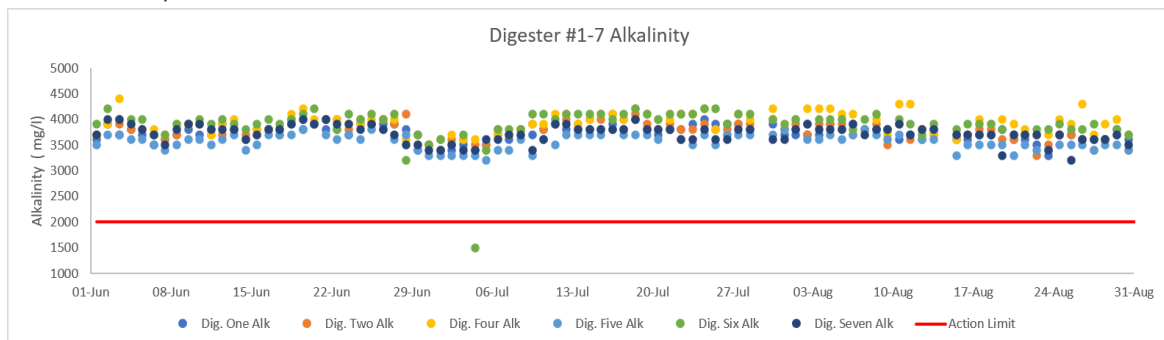


The low centrifuge cake total solids percentage on 9 July was likely caused by a polymer make up issue on poly train #2 which occurred during the night shift.

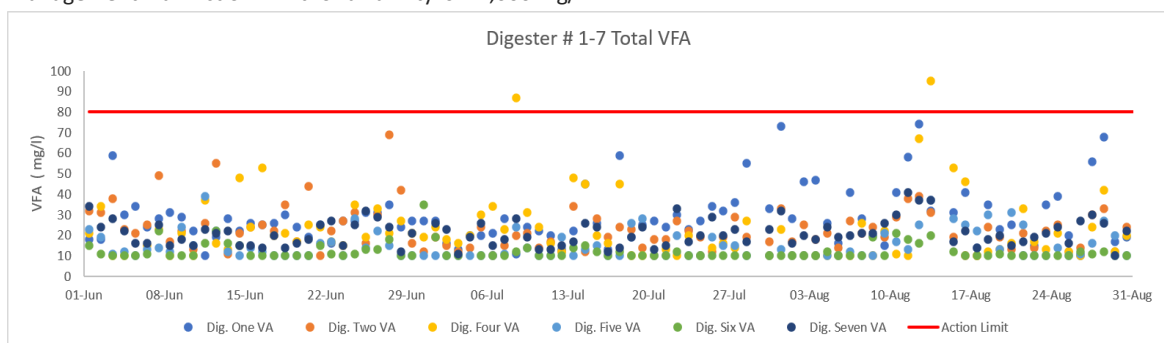
Digester Health Indicators



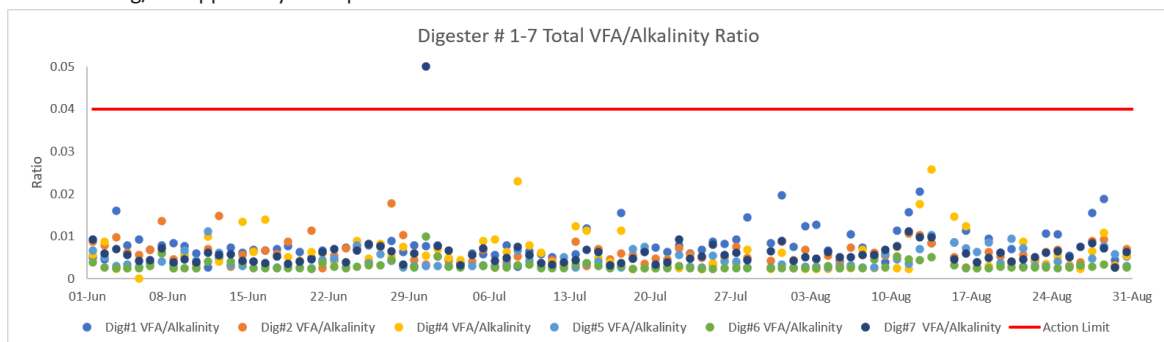
Normal operating range for digester pH is 6.9 - 7.4. The Mangere Digester Monitoring and Adjustment Management Plan Action Limit for pH is < 6.9.



Normal operating range for digester alkalinity is 3,000 - 4,200 mg/L. The Mangere Digester Monitoring and Adjustment Management Plan Action Limit for alkalinity is < 2,000 mg/L.



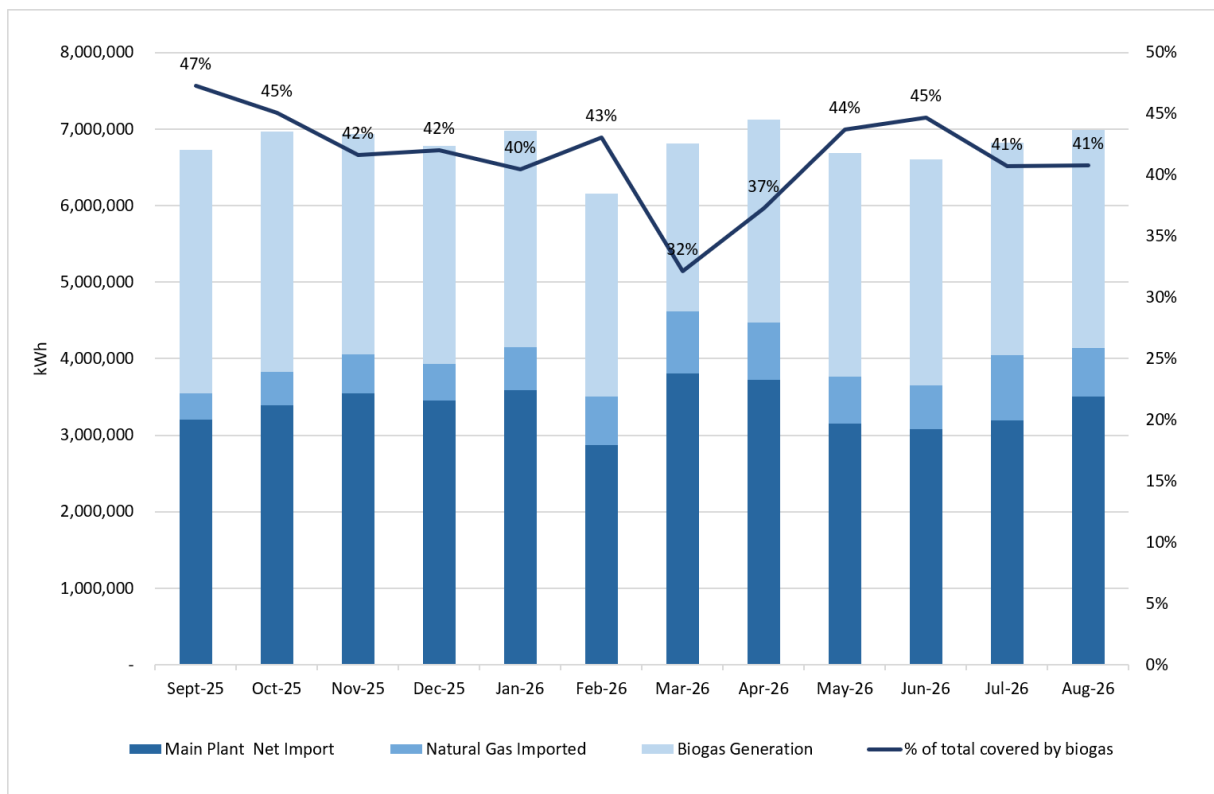
A disruption to heat supply caused by only having two engines available between 15 – 17 August reduced temperatures across all digesters, impacting VFA over this period. Normal operating range for digester VFA is 10 - 60 mg/L. The Mangere Digester Monitoring and Adjustment Management Plan Action Limit for VFA is > 100 mg/L; however, a more conservative limit of 80 mg/L is applied by site operations.



A VFA/Alkalinity ratio of 0.04 is applied by site operations as requiring further investigation/action.

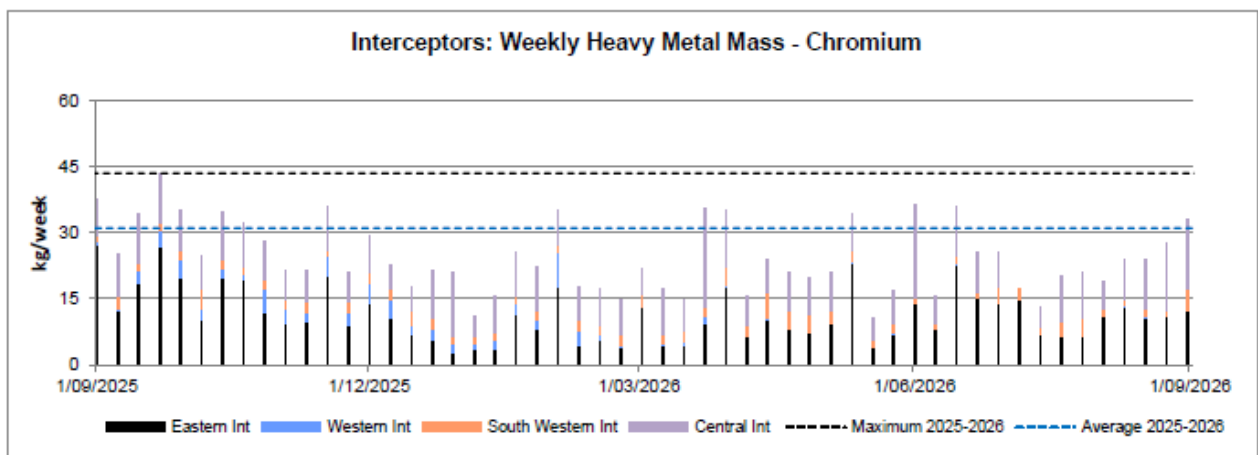
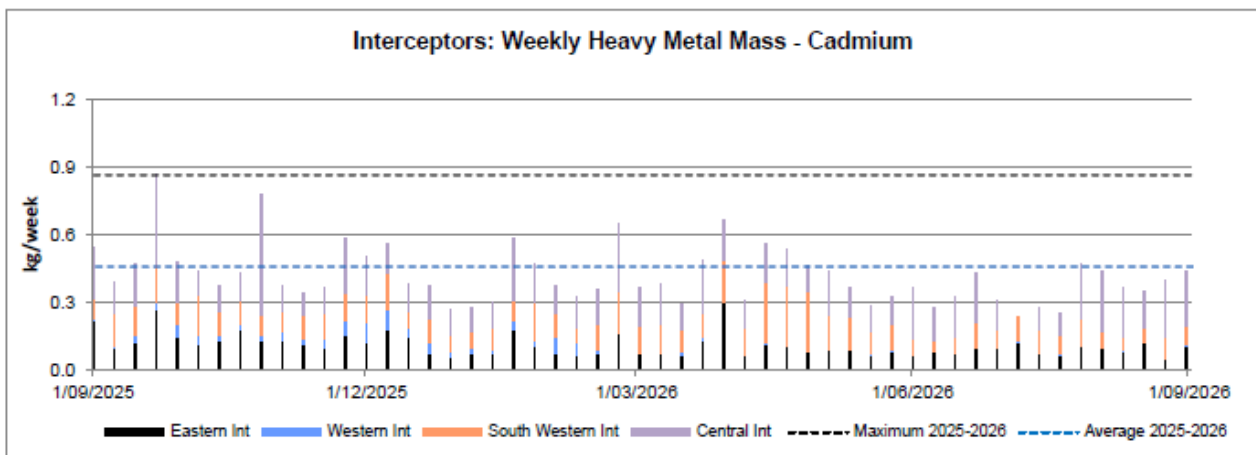
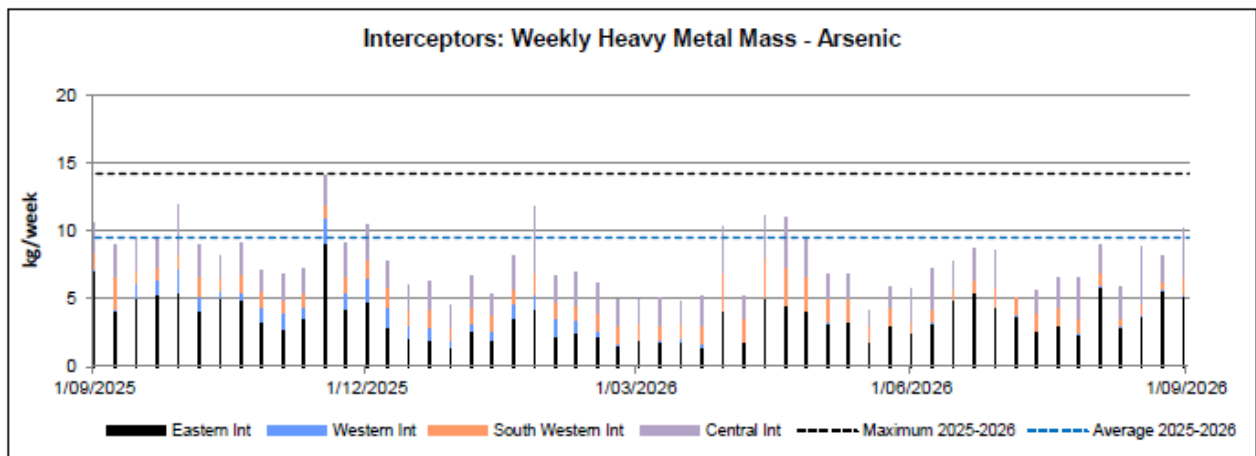
One-off exceedances of action limits for parameters were back within normal operating range following retesting.

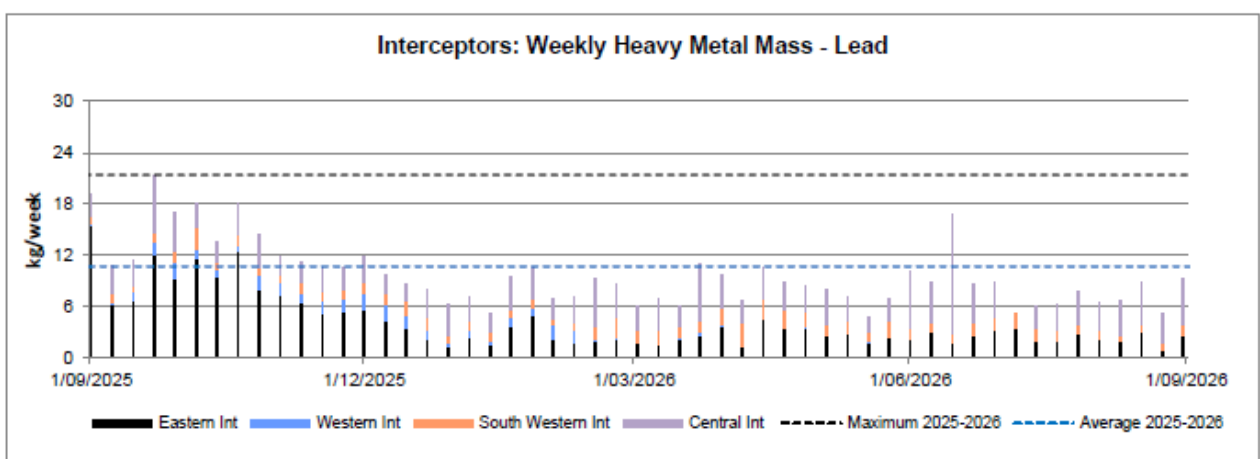
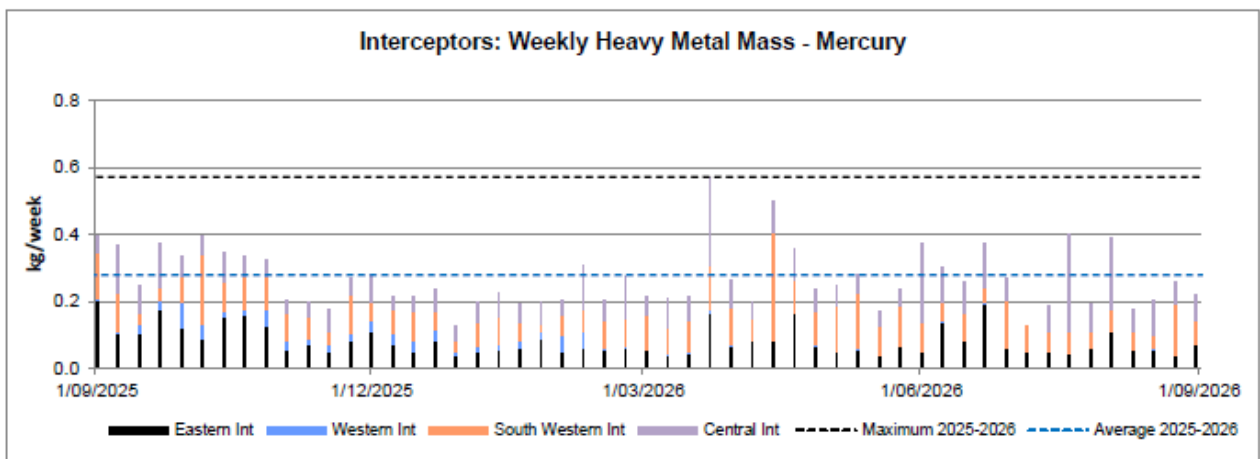
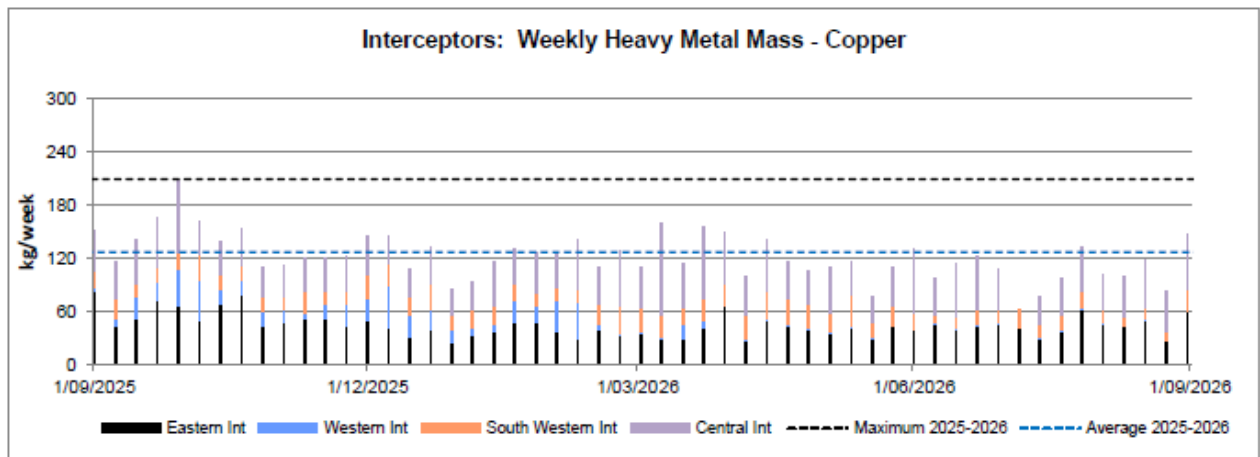
Imported Energy vs Biogas Generated Energy

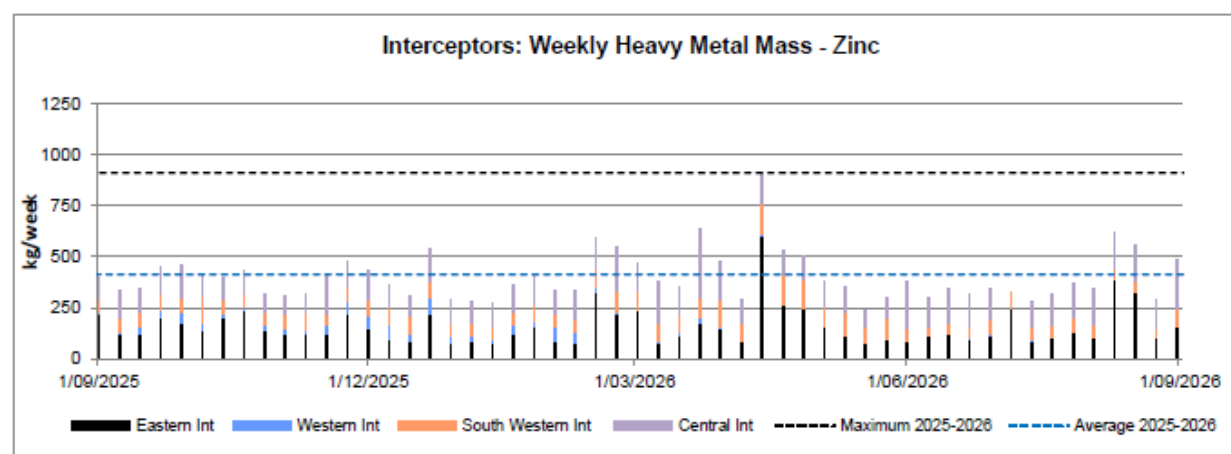
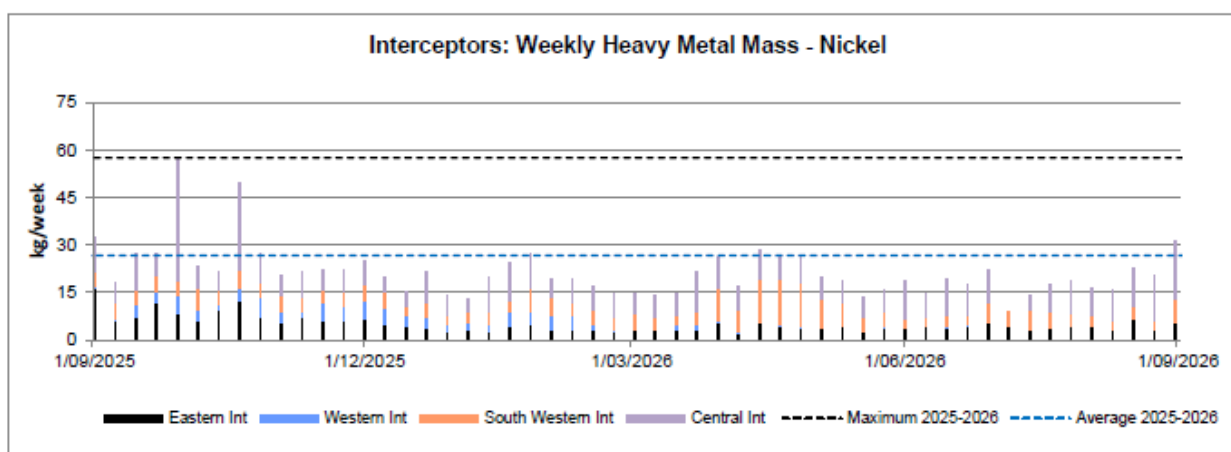


3 INFLUENT & BIOSOLIDS MONITORING

Heavy Metals – Interceptors





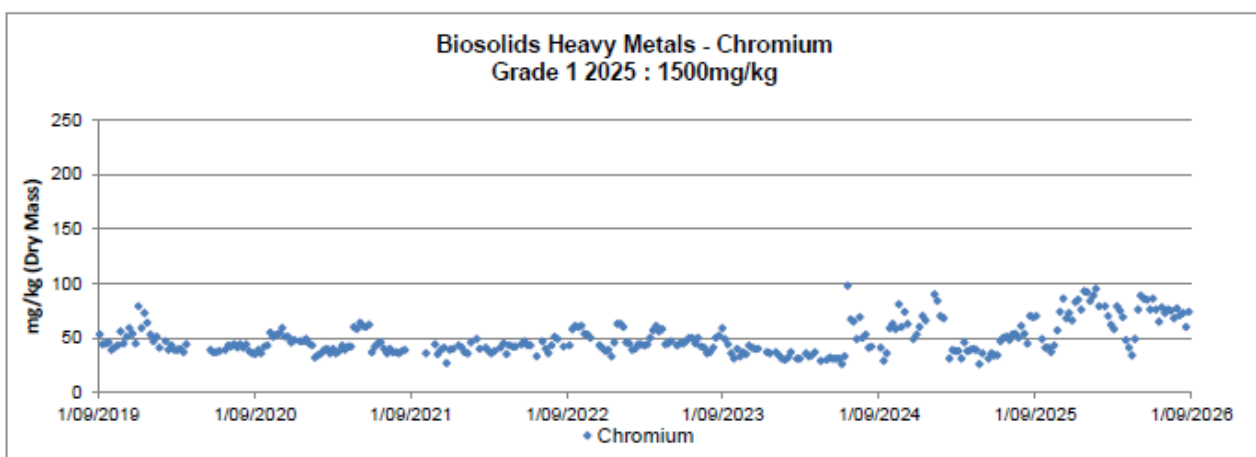
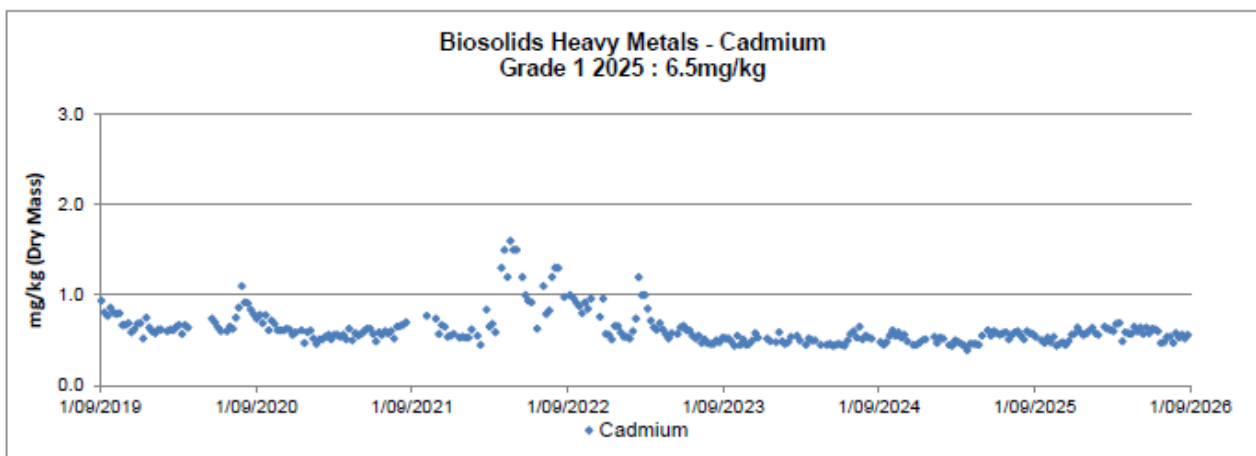
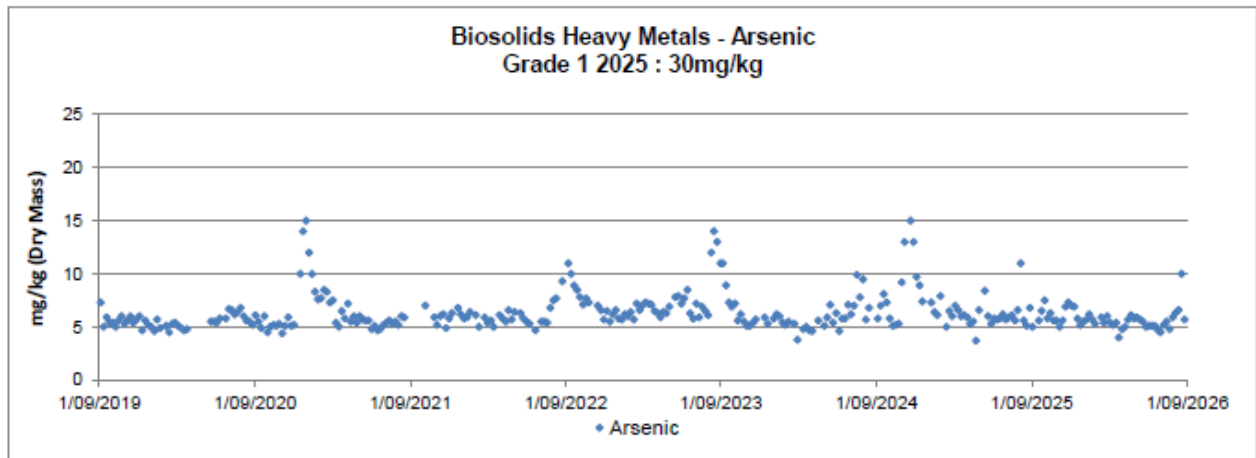


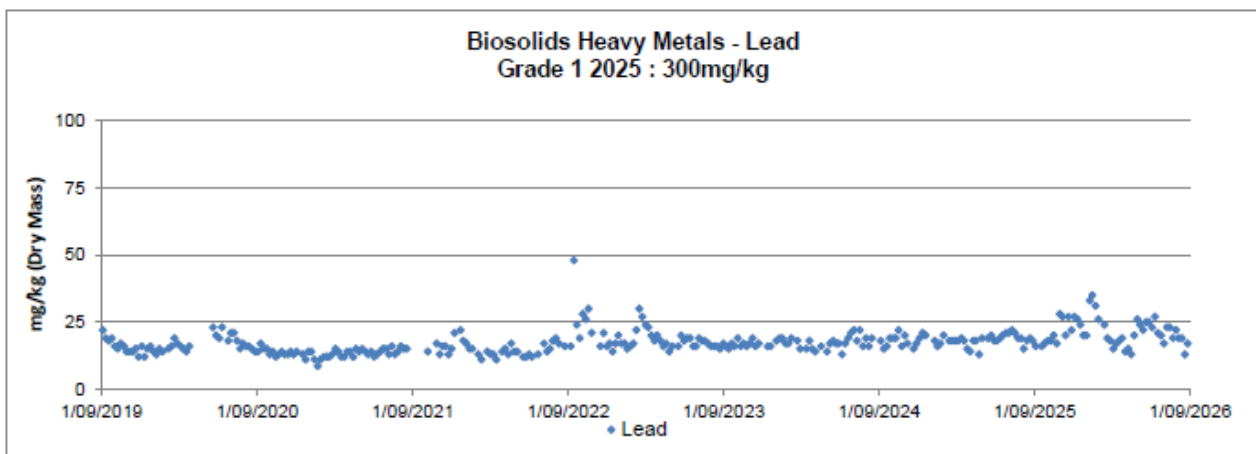
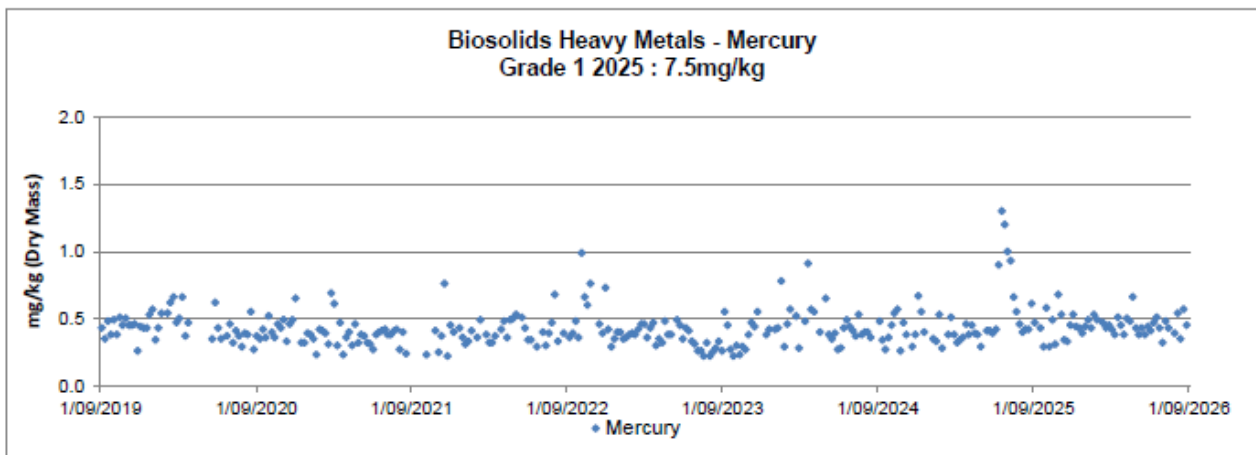
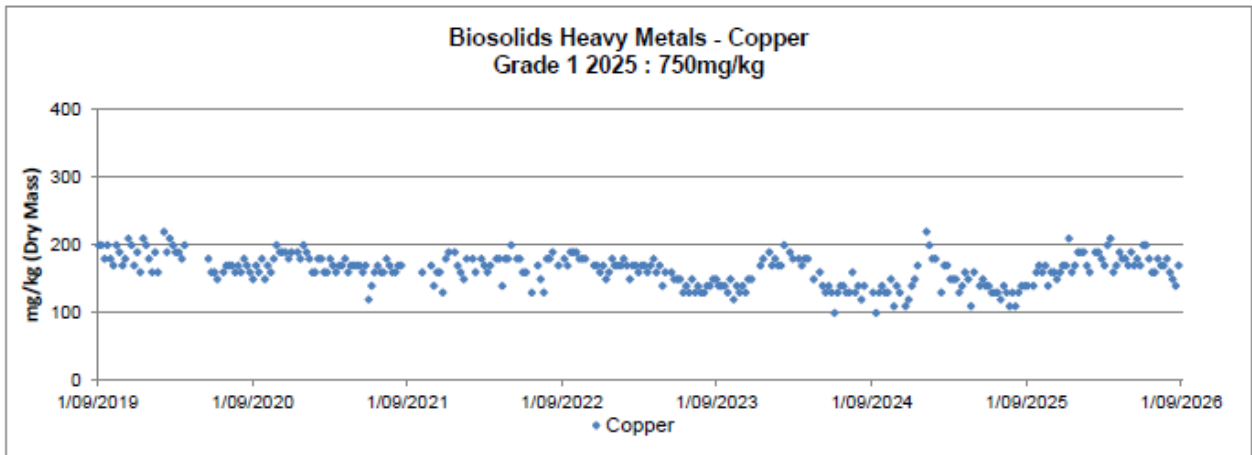
Some results showed higher-than-average concentrations, with results generally within the range of variability observed historically. No causative factors were identified, including for the elevated lead result recorded in the Central Interceptor on 15 June, and there were no noticeable changes in biosolids characteristics or other observed impacts at the WWTP.

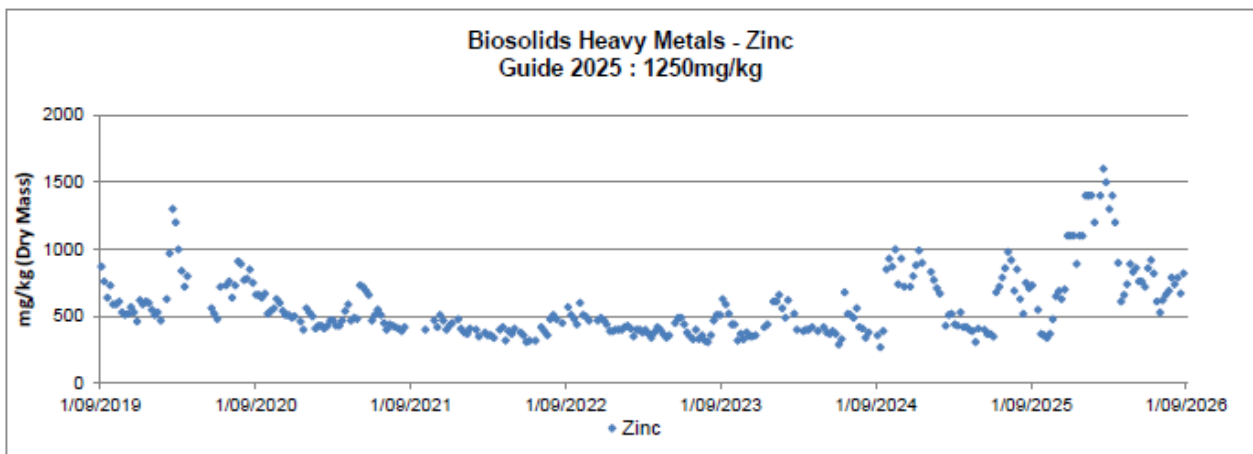
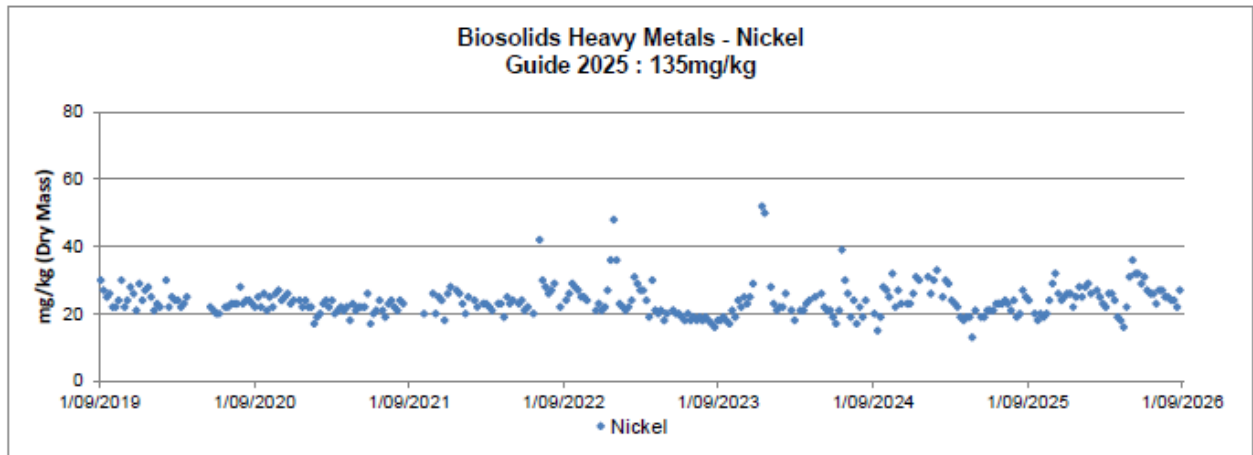
Note: No results were available from the Central Interceptor on the 6th July due to the autosampler being inoperational.

The top five Trade Waste non-compliances recorded during the quarter were related to exceedances of oil and grease (O&G), total petroleum hydrocarbons (TPH), and pH associated with food manufacturing and various cleaning facilities. While these non-compliances had the potential to affect the local wastewater network and upstream infrastructure, they did not result in any identified adverse impacts on the WWTP. All non-compliances were investigated in accordance with Trade Waste procedures, with appropriate corrective actions implemented by the respective customers to address the causes of the exceedances and prevent recurrence.

Heavy Metals – Long-term trend in Biosolids







There was one elevated arsenic result on 19 August. There was no corresponding evidence of noticeably elevated arsenic concentrations in the influent and results have since returned to the usual trend.

As noted last quarter, zinc concentrations in the biosolids increased unexpectedly between December 2025 and March 2026, with results exceeding 1000mg/kg. However, results over the last six months have been consistently below 1000mg/kg. Zinc concentrations in the influent pre-dating and during December 2025 and March 2026 were not noticeably elevated and were relatively consistent with those observed over the most recent six months. No causative factor for the earlier increase has yet been identified.

4 MIDGE CONTROL REPORT

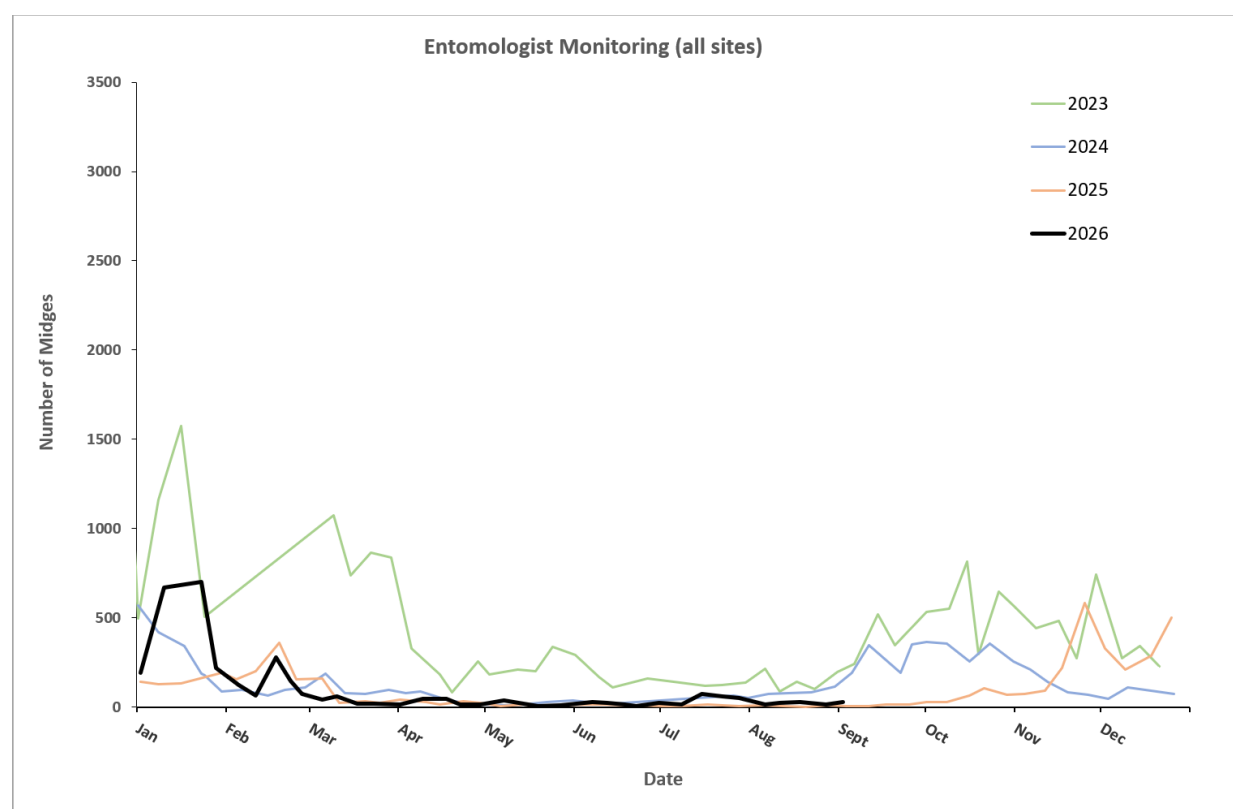
Situation

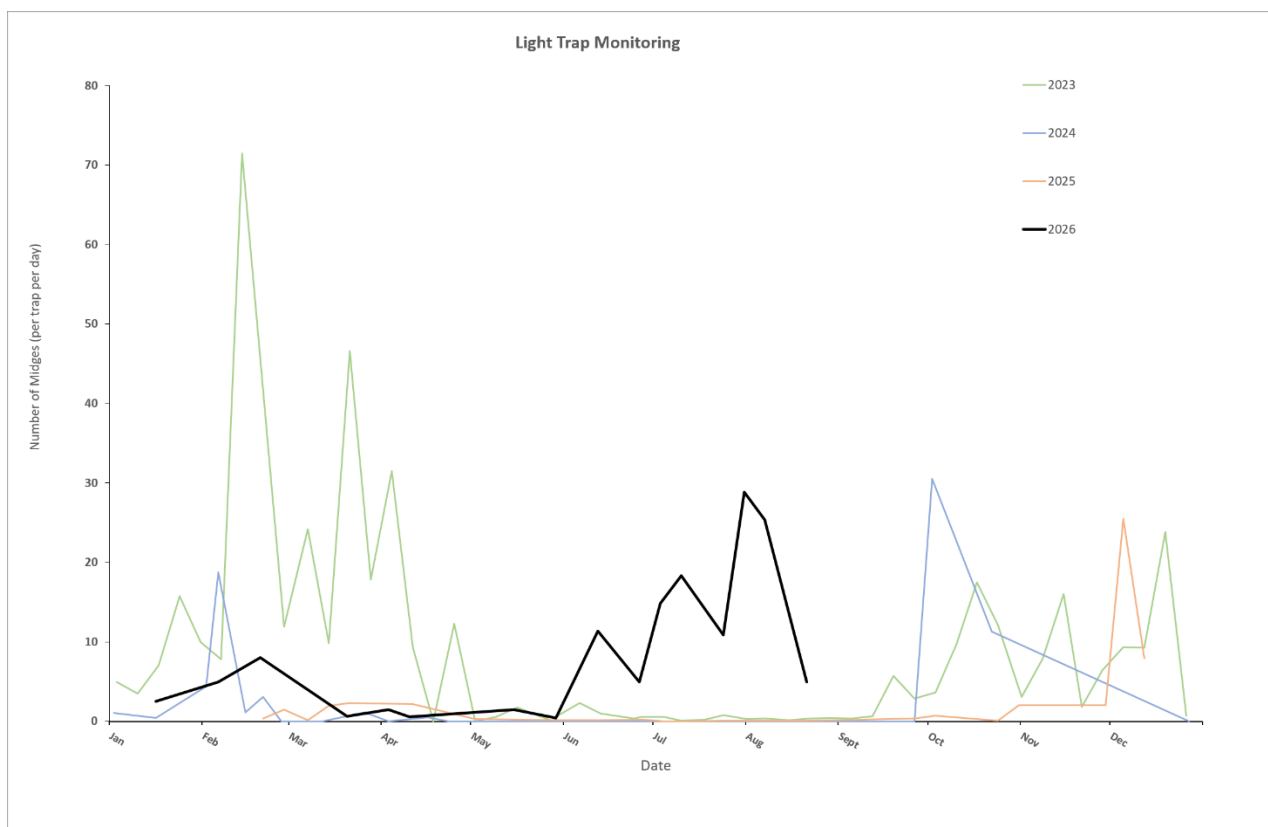
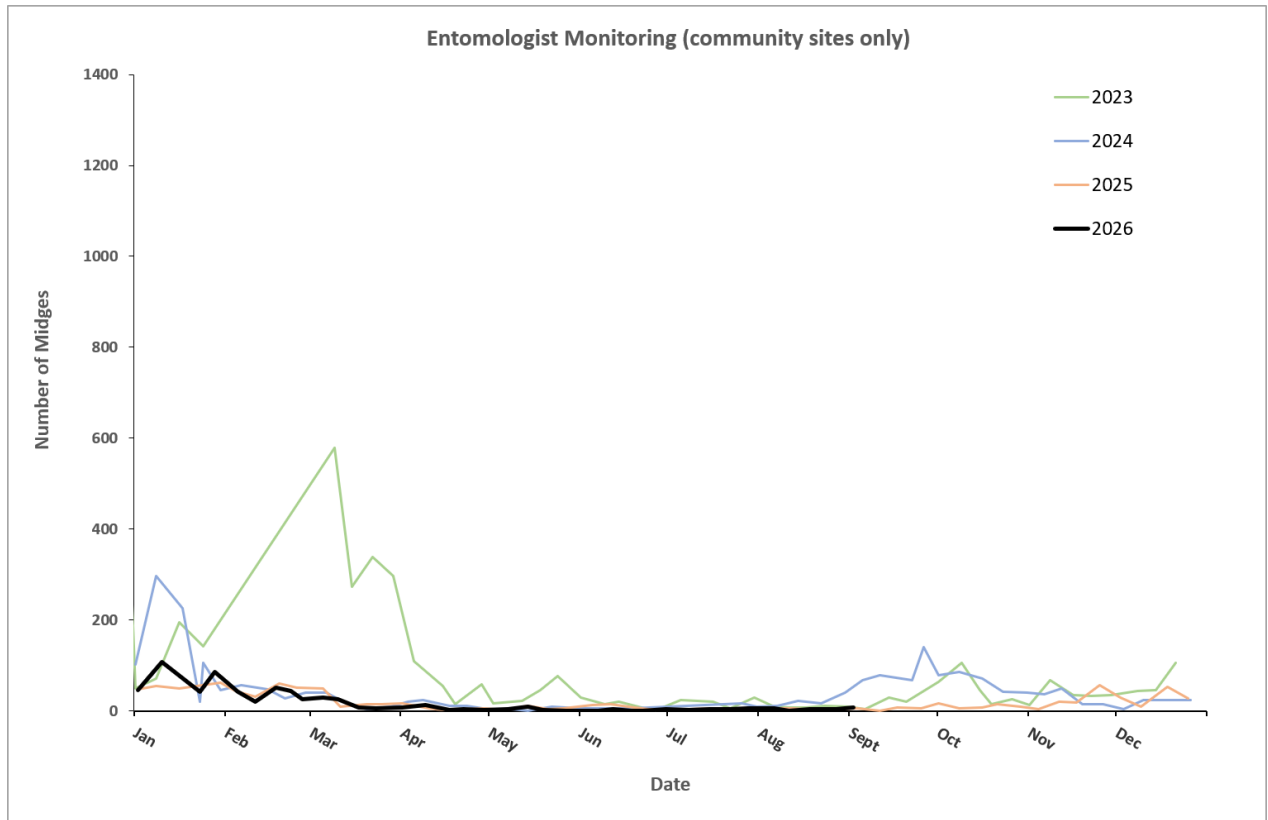
- Midge numbers have remained low throughout the quarter.
- The net monitoring done by an entomologist has been the most reliable source for accurate midge counts over the past few years. The current regimen of midge control appears to be working well.
- The Audit Group has approved for monitoring via 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





5 ODOUR REPORT

Weekly walkover odour offensiveness scores (inside Māngere WWTP)

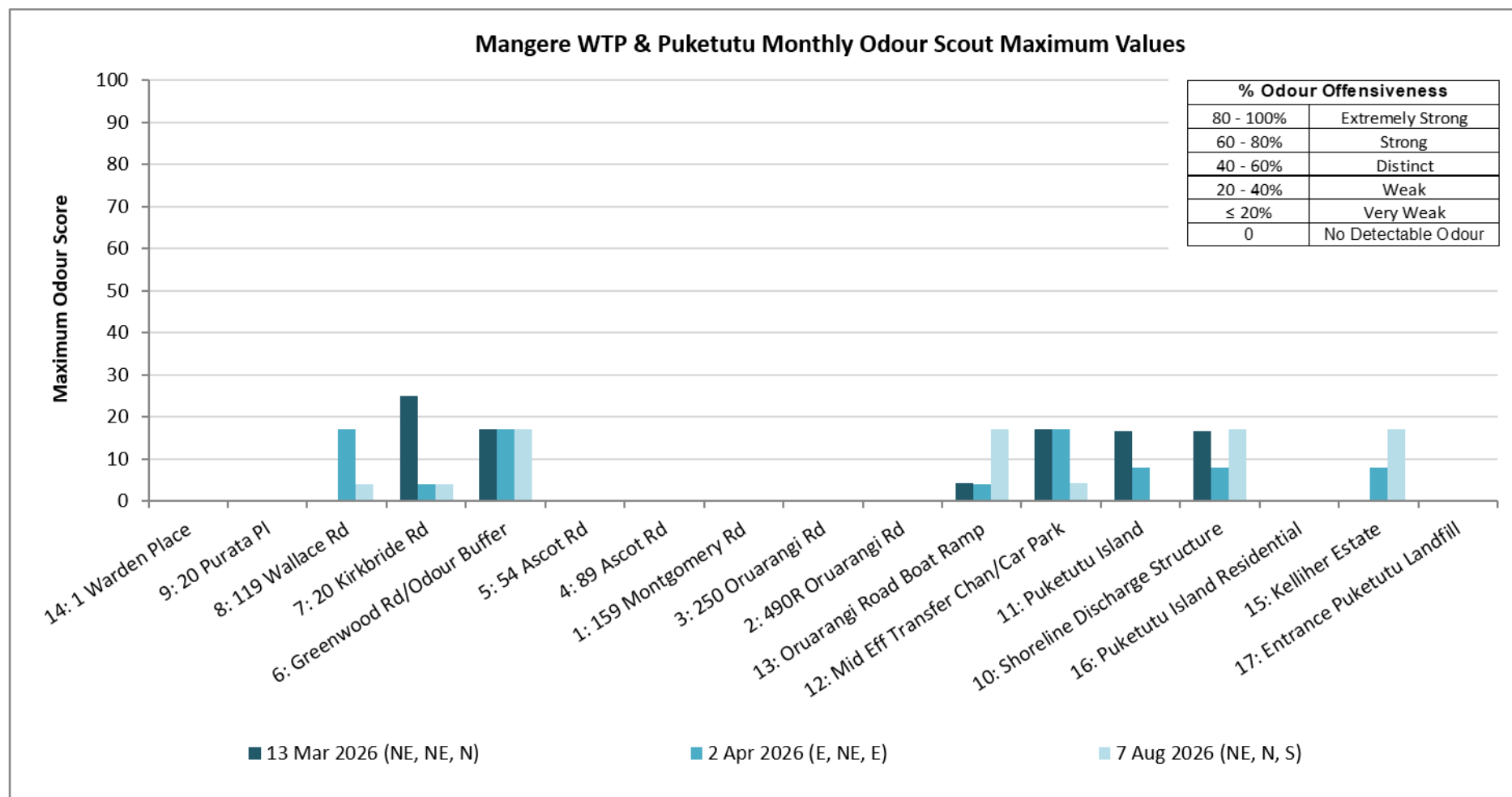
Location	11 Jun 26	17 Jun 26	25 Jun 26	2 Jul 26	6 Jul 26	17 Jul 26	24 Jul 26	28 Jul 26	6 Aug 26	10 Aug 26	17 Aug 26	26 Aug 26	Avg. quarter
Digester Area	17	17	17	17	4	4	25	17	17	25	25	17	13
DAF's/DSFT	0	0	4	8	4	17	17	17	8	4	17	4	13
GTB Biofilter	0	17	17	8	4	4	4	17	17	17	17	17	10
GBT Biofilter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6
CPB Biofilters	25	25	25	25	17	8	0	17	0	17	17	17	18
ASU Biofilters	4	25	8	8	4	17	25	17	17	17	0	17	17
BST Biofilters	8	17	17	0	4	4	0	17	8	8	4	4	13
GT/GBT Building (old)	8	4	4	0	4	8	0	8	4	0	17	0	4
GT/GBT Building (new)	17	17	67	38	0	38	17	25	17	25	25	0	11
Centrif. ASU/Biosol. Bldg.	17	8	38	25	38	0	38	8	0	0	38	17	11
Blended Sludge Tank	8	0	17	17	17	0	17	17	8	0	8	17	6
EF3	38	38	8	25	17	25	8	25	17	17	25	0	7
EF4	8	4	8	4	4	4	17	17	17	0	17	0	13
EF5	0	8	0	4	4	0	0	0	0	0	0	0	15
Splitter Box Biofilter 1	N/A	N/A	N/A	N/A	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25
Splitter Box Biofilter 2	17	25	17	25	17	8	38	25	25	25	17	17	22
Splitter Box Biofilter 3	17	25	17	17	17	25	25	38	25	25	38	25	4
Splitter Box Biofilter 4	8	0	4	0	0	0	17	8	17	0	0	4	8
IPS2	0	17	0	0	0	4	0	0	17	0	4	4	9
Primary (PSTs)	17	17	17	8	17	17	17	17	25	17	17	17	16
Screens Building	17	17	17	17	17	17	17	8	25	17	17	25	27
Tertiary (Filter & UV Plant)	17	17	8	17	4	4	4	4	8	N/A	17	N/A	8
RC1, RC2, RC4	N/A	17	17	17	17	N/A	17	4	N/A	17	17	N/A	10
RC3, RC5, RC6	17	N/A	17	17	17	4	17	N/A	17	17	N/A	17	14
RC7, RC8, RC9	N/A	17	17	N/A	17	4	17	8	17	17	17	17	10

Notes: No particular reason could be determined for the high odour score on 25 June. Odour character described as 'sewage/sulphurous'. Normal plant operations were observed over this time with no shutdowns or maintenance of nearby infrastructure.

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)

**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.
- 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

30,412 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 2,550,000 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 64% of capacity.

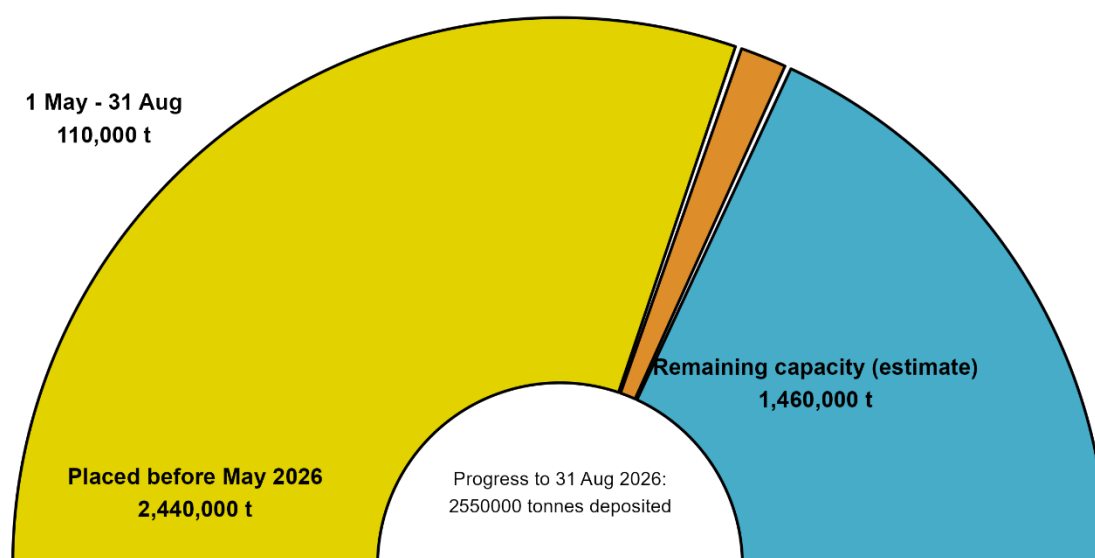


Figure 7-1: Material placement (biosolids and cover/construction) at Puketutu Biosolids Facility to date.

Biosolids truck movements were consistent with the previous quarter, whilst there has been an increase in construction materials deliveries. Currently, biosolids are deposited within phases 4 and 5, which requires the construction of multiple smaller cells in certain areas due to cell alignment. The smaller cells result in an increase in the number of cell walls, and subsequently, more construction materials required to be brought to the island compared to earlier phases.

Other matters

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

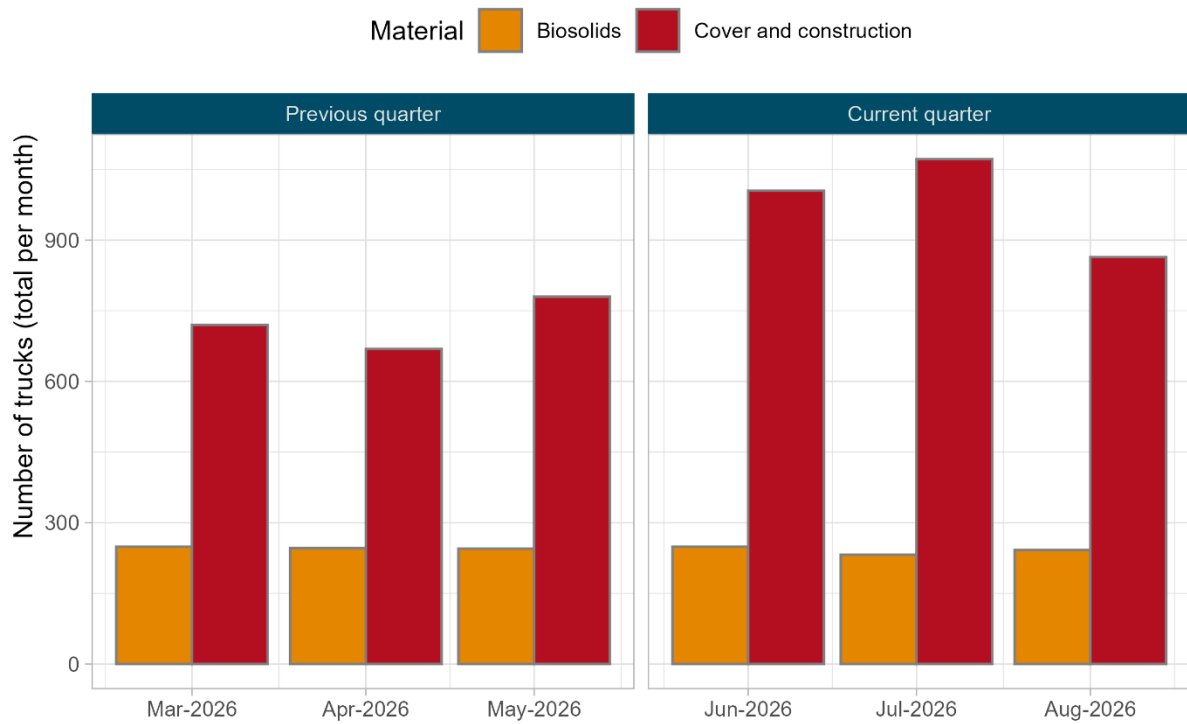


Figure 7-2: Monthly truck deliveries to Puketutu Biosolids Facility

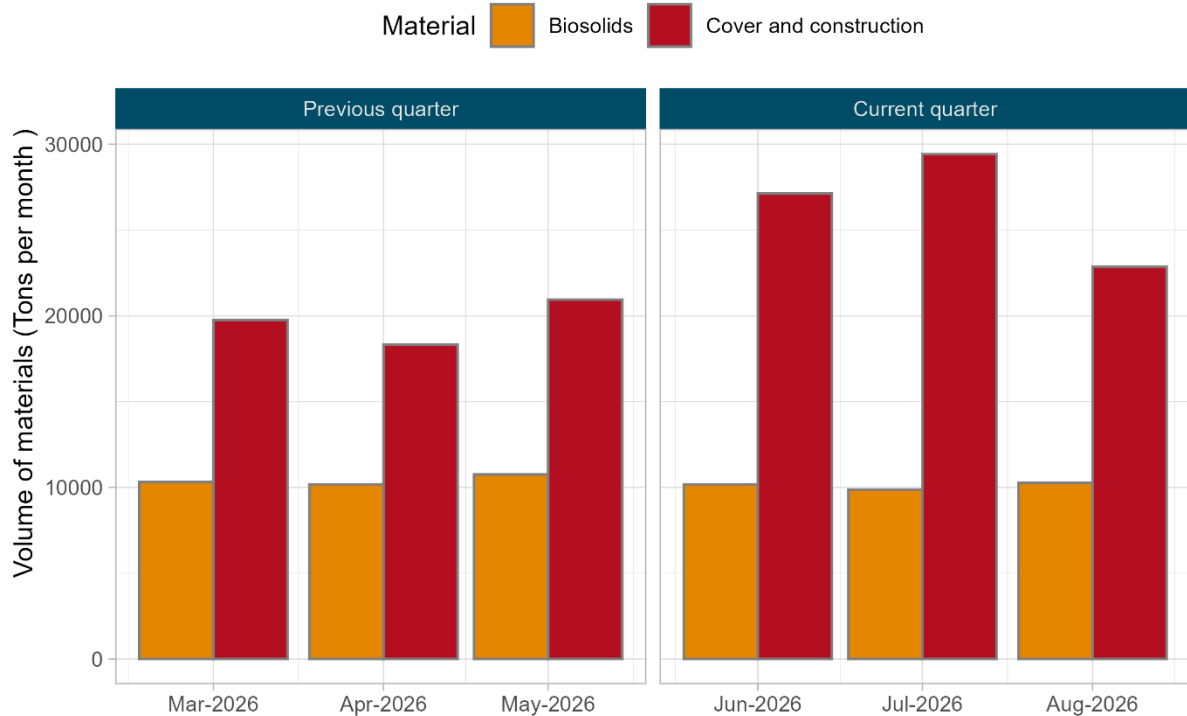


Figure 7-3: Monthly tonnages received at Puketutu Biosolids Facility