

# C&P Environmental Ltd

## Giants Grave Landfill Site

## Annual Environmental Monitoring Report 2025

## Environmental Permit EPR/SP3298FT/T009

**Prepared for: Neath Port Talbot County Borough Council**

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**By: C & P Environmental Limited**

**26<sup>th</sup> March 2026**

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**CP4259-SP3298FT-2025**

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## EXECUTIVE SUMMARY

C&P Environmental Ltd has been commissioned by Neath Port Talbot County Borough Council (NPTCBC) to produce an Annual Environmental Monitoring Report for Giants Grave Landfill Site in accordance with the environmental permit EPR/SP3298FT and section 8 of the Landfill Aftercare Plan. This Annual Environmental Monitoring Report summarises the monitoring data recorded at the Giants Grave Landfill Site between 1<sup>st</sup> January and 31<sup>st</sup> December 2025.

The following key points have been observed during 2025:

### Leachate Monitoring

For leachate levels, there were several locations that recorded exceedance of the compliance limit in December: LW5, LW8, LW15, LW17b and A1305, with only LW17b recording exceedance across all months where leachate levels were recorded. However, there were some strange leachate levels recorded in LW15 (including negative levels) and so, after investigation, a new well base was determined. If this depth of LW15 was used throughout 2025 then three other months (January, February and July) also marginally exceeded the depth of 2.1m.

For leachate quality, the mean ammoniacal nitrogen concentration has shown an increasing trend from 2023 to 2025, although this is explained by the increasing proportion of samples that are taken from the A130x wells compared with the LW wells. The potassium and chloride levels were of a similar mean concentration as per 2024.

There was one breach of the compliance levels for the Discharge Flap Valve in 2025 from initial testing (copper in October), although on retesting of the same sample, the copper result was significantly lower. The mean concentration of several metals increased in the Discharge when compared with 2024 – including copper, zinc, lead and iron, although the analysis of samples collected throughout 2025 (following the retest in October) has shown that the concentrations of all the measured parameters within the effluent discharged are within the compliance limits as stated within the Discharge Consent Number BP0236201.

The calculated flow of water over the Vee Notch Weir was much lower in 2025 than 2024 and is the lowest flow recorded since 2019. Importantly, there were far fewer results that were above the tolerance of the weir measurement than recent years and so there is more confidence in the flow measurement calculation.

### Groundwater Monitoring

For groundwater quality, the main concerns arising in 2025 are the continued breaches of the trigger level for ammoniacal nitrogen in BH43B (on seven occasions) and BH45B for all occasions. A further location (BH12) also exceeded the control level on one occasion.

The most significant rising trend observed continues to be for ammoniacal nitrogen for BH43B (although a rising trend for chloride and potassium at this location has not continued throughout 2025).

In general, no significant adverse trends noted in the biannual hazardous substances monitoring nor the hazardous substances monitored on a two-yearly basis. The most significant differences were for zinc concentrations in BH12 (rising by an order of magnitude) and the occasional spike (order of magnitude increase) for iron and BOD.

### Surface Water Monitoring

Trigger and control levels for ammoniacal nitrogen are detailed in the Aftercare Plan for the surface water monitoring.

For the River Neath there was a single exceedance of the trigger level for ammoniacal nitrogen in both the upstream sample and the downstream in the same month of July. However, as these are in the same month and the upstream sample is showing a much higher concentration than downstream it suggests the contamination is arising from north of the landfill site and the landfill was not the likely cause of this elevated result.

For the canal monitoring locations there was one occasion that the upstream (July) and downstream location (December) exceeded the control level but not the trigger level. Although there may be some impact from the landfill, the impact would not likely be considered significant.

### Perimeter Gas Monitoring

There were no breaches of the action or compliance levels for methane across any of the perimeter boreholes. For carbon dioxide there was a single exceedance of the action level in BH43B (in February) with a recorded result of 12.9% against the action level of 12.8%.

Other than the boreholes BH40B, BH43B and BH45B (which were at their expected elevated levels of methane), there was no elevated presence of methane recorded.

### Surface Emissions Monitoring

For the surface emissions survey in 2025, the monitoring recorded fewer locations detecting methane above 100ppm, however, two of the three locations recorded significantly elevated emissions >1000ppm, compared to all such features <1000ppm in October 2024.

The survey found three distinct infrastructure features in 2025 recording >1000ppm methane, following no such features in either January or October 2024.

## Monitoring and Reporting Recommendations

A full description and list of recommendations is provided at the end of each section. The more significant recommendations for the different monitoring programmes are provided below.

For the 2024 annual report C & P were asked to consider whether the environmental monitoring undertaken across the site might be considered too onerous for a closed landfill site and what option might there be for reducing the monitoring whilst continuing to ensure environmental protection. This report does not repeat these recommendations as discussions on any reduction of monitoring are ongoing between NPTCBC and Natural Resources Wales.

However, the report considers whether any of the recommendations suggested would be impacted due to the monitoring data from 2025.

### Leachate

Recommendations in the 2024 monitoring data considered reductions in the frequency of leachate level monitoring along with a recalculation of compliance level for leachate in well LW17b. A permit variation and revised hydrogeological risk assessment would be required to evidence the suitability of such changes.

However, recent discussion with NRW highlighted that NPTCBC could compare the leachate levels in LW17b with those for the nearby A1301 throughout 2025. This would then provide a dataset to inform any potential changes to the leachate level limit in LW17b. However, there is no recent leachate level monitoring in A1301 and no comparison can be made. It would be recommended to start monitoring the leachate levels in A1301 (along with those wells with compliance levels) on a monthly basis to build up a dataset.

The monitoring report for the 2024 data (submitted in March 2025) also provided options for reducing some leachate quality monitoring. There are no compliance levels for leachate quality and so leachate quality monitoring is intended for characterising the leachate only. The monitoring in 2025 (including for hazardous substances) has not changed the overall pattern of the leachate quality and so would not significantly impact on recommendations provided previously.

### Groundwater

It is understood that the current monthly frequency of groundwater monitoring cannot be revised without justification through a review of the hydrogeological risk assessment (HRA). This is especially the case where there have been breaches of the trigger levels over recent years (including BH43B and BH45B in 2025 plus BH9B in 2024).

However, the monitoring in 2025 (including for hazardous substances) has not changed the overall pattern of the groundwater quality and so would not significantly impact on recommendations provided previously.

For any such changes then there would be a requirement for a review of the HRA alongside a permit variation and a review of the Landfill Aftercare Plan including any contingency actions responses to any elevated results recorded.

### **Surface water**

For this report, the main consideration for any potential for reduction is to consider whether the 2025 data raises any concerns with the recommendations provided in 2024.

A reduction in monitoring where only control levels are occasionally exceeded would likely be justified which is the case for the canal monitoring. However, the breach of trigger levels in the river monitoring would likely mean a reduction in monitoring is not an option until further justification (possibly through an amendment to the HRA) is provided.

In addition to any requirements for a permit variation, for any such changes then there would be a requirement for a review of the Landfill Aftercare Plan including any contingency actions to any elevated results recorded.

### **Perimeter Gas**

For changes to perimeter gas monitoring there would need to be further evidence of the effectiveness of the gas control system and appropriate changes to the Landfill Aftercare Plan and permit variation (for any permitted compliance levels). Alongside this, a review of carbon dioxide action levels may be required for some locations if they are currently not acting as an appropriate warning level for potential action. If any monitoring frequency was reduced, then there would need to be an ability for appropriate intensive monitoring if any action or compliance levels were exceeded.

### **Surface Emissions Monitoring**

It is recommended that an action plan is developed and implemented to undertake more frequent visual monitoring and consider whether any remediation is required for the discrete surface locations.

The visual inspections of the areas should be to determine if there are any obvious surface cracks or fissures or evidence of vegetation stress (photographical evidence should be obtained). This is especially the case for those areas recording vegetation die back and all areas recording elevated methane emissions during the 2025 surface emissions survey and any future surveys.

The surveys in recent years have been undertaken when the ground has been waterlogged. It remains a recommendation to organise a surface emissions survey earlier in 2026 (during the summer months) to ensure that the surface emissions monitoring is undertaken in a different season to the recent years.

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# 1 Introduction

C&P Environmental Ltd has been commissioned by Neath Port Talbot County Borough Council (NPTCBC) to develop an Annual Environmental Monitoring Report for Giants Grave landfill site in accordance with the requirement of the environmental permit EPR/SP3298FT and Section 8 of the Landfill Aftercare Plan.

In November 2013, NRW accepted the Closure Report (which included the Landfill Aftercare Plan) and confirmed that the site at Giants Grave is now definitively closed and is now in Aftercare. The Landfill Aftercare Plan now supersedes Section 7 of the Working Plan (the environmental monitoring requirements).

In addition, NRW issued an environmental permit (EPR/SP3298FT) in July 2015. This permit incorporates the environmental monitoring requirements.

The analysis and monitoring regime for the site was revised in June 2017 for the leachate, groundwater and surface water monitoring. In September 2020, the compliance limits for the leachate levels were revised following acceptance of the hydrogeological risk assessment and compliance limits for several groundwater parameters (chloride, arsenic, mercury and phenol) were removed.

This report refers to the environmental permit, the Landfill Aftercare Plan and the revised monitoring schedule for the monitoring requirements.

Since April 2018 the routine environmental monitoring has been undertaken by NPTCBC. The annual reporting has been undertaken by C&P Environmental since December 2012.

This Annual Environmental Monitoring Report covers the period of 1<sup>st</sup> January to 31<sup>st</sup> December 2025. This report includes the following information:

- Tabular and graphical summaries of key leachate, groundwater, surface water and perimeter gas monitoring results.
- A summary assessment of leachate, groundwater, surface water and perimeter gas monitoring results, including comparison to compliance limits where they exist and determination of any significant trends.
- Recommendations for changes and improvements to the monitoring programme going forward.
- Discussion of historical and previous monitoring data reviews to enable the site monitoring data to be put into perspective.

## 1.1 Site Location and Description

Giants Grave Landfill Site is located approximately 2.5km southwest of Neath, at NGR 733 957 (see Site Location Plan, Drawing B1404900/EP/APR2010/01). The site encompasses a total of sixty-five hectares and is bounded to the west by the River Neath, to the north by the main line railway embankment and to the east by the Neath Canal.

The Giants Grave Landfill Site was issued with a Waste Disposal Licence by Neath Borough Council on 1st April 1993, for the disposal of municipal waste to landfill. Subsequently, the Waste Disposal Licence was superseded by a Waste Management Licence (WML), Number EAWML 34060. It was considered that the in-situ permeability of the underlying ground was sufficiently low to act as a containment seal. As such, there are no records of more formal

engineered lining or containment, and the landfill is considered a ‘dilute and disperse landfill’. Giants Grave Landfill Site ceased accepting waste during July 2003 and subsequently the operational status of the landfill progressed from an operational landfill to a closed landfill. In September 2003, the site was progressively capped and restored with a landfill gas extraction system installed in April 2004.

In May 2005, a Pollution Prevention and Control Permit (HP3535PS) was issued by the Environment Agency (EA) for a new landfill sited directly adjacent to the existing closed landfill. No waste material was accepted under this permit and the permit was surrendered during 2018.

## 1.2 Site Development and Maintenance During 2025

C & P Environmental are not aware of, or been informed of, any significant site development or maintenance during 2025, although the following have been mentioned by site:

- Access Road Improvements for BH5 to Leachate Lagoon for H & S reasons. This was started end of 2024 and completed in January 2025.
- Gas Compound changes include a New Compressor (Now Main) installed (September 2025) and the flare top removed and repaired (August 2025).

## 1.3 Report Structure

The remainder of this report is structured as follows:

### **Section 2: Leachate Monitoring:**

Sets out details of the leachate monitoring infrastructure and locations; Permit requirements; compliance with the site discharge consent; and an assessment of leachate monitoring data obtained during 2025.

### **Section 3: Groundwater Monitoring:**

Sets out details of the groundwater monitoring infrastructure and locations; Permit requirements; and an assessment of groundwater monitoring data obtained during 2025.

### **Section 4: Surface Water Monitoring:**

Sets out details of the surface water monitoring infrastructure and locations; Permit requirements; and an assessment of surface water monitoring data obtained during 2025.

### **Section 5: Landfill Gas Monitoring:**

Sets out details of the perimeter gas and in-waste monitoring infrastructure and locations; Permit requirements; and an assessment of gas monitoring data obtained during 2025.

## 2 Leachate Monitoring

This section provides a summary of the leachate level and quality monitoring at Giants Grave for 2025 in addition to the water quality at the Discharge Flap Valve as required by Schedule 3, Tables 3.2 and 3.3 of the environmental permit EPR/SP3298FT and Appendix A2 of the Landfill Aftercare Plan.

### 2.1 Leachate Monitoring Locations

Leachate monitoring points are situated throughout the existing waste mass at Giants Grave Landfill Site. Compliance levels for leachate levels are now in place for six dedicated leachate wells and these are monitored monthly.

The locations of the leachate wells, Vee Notch Weir and Discharge Flap Valve monitoring points are shown on the sampling location plan in Appendix E.

### 2.2 Leachate Monitoring Requirements

Tables 2A and 2B identify the leachate wells that will be monitored, the type of monitoring and the frequency of the monitoring.

**Table 2A – Leachate Level Monitoring Schedule – 2025**

Monitoring Point	Parameter	Monitoring Frequency
6 leachate wells with compliance levels: Leachate Wells (LW): 5, 8, 15, 17b, A1302, and A1305CV	Level / Dip	Monthly
	Base Level	Monthly

Note – until June 2023 several further leachate wells were monitored for the leachate level and base level. This report concentrates on those with permit compliance levels as specified in the table.

**Table 2B – Leachate Quality Monitoring Schedule**

Monitoring Point	Parameter	Monitoring Frequency
Leachate Wells (LW): 3, 5, 8, 9, 15, 16, 17b, 18 plus A1301, A1302, A1303, A1304 and A1305CV	pH, Temperature, Electrical Conductivity, Ammoniacal Nitrogen, Chloride, Potassium	Quarterly
	Chemical Oxygen Demand, Biological Oxygen Demand, Nickel, Sulphate, Alkalinity, Total Organic Carbon, Sodium, Calcium, Magnesium, Iron, Manganese, Cadmium, Chromium, Copper, Lead, Zinc & Arsenic	Annually
	Hazardous substances	Every four years

Note - the quarterly monitoring was attempted in January, April, July and October for all wells, although LW8 and LW9 were unable to be sampled due to low leachate levels/being dry. The aftercare plan only requires annual monitoring of the wells LW16, LW18, A1301, A1302, A1303 and A1304 (October), although all but LW18 was completed quarterly in 2025. LW18 does not appear to have been monitored for the annual requirement.

The annual hazardous substances suite for leachate samples was completed in October 2025. The four yearly hazardous substances suite was completed on samples in October 2025.

Table 2C specifies the required flow monitoring at the Vee Notch Weir. This flow monitoring was previously undertaken through the recording of a single water depth at the Vee Notch Weir each month. Following discussions with NRW there was an option for using a calculated flow (on a 15-minute basis) from the automated telemetry set up at the site. Although there is some potentially unreliable flow data, this is considered to provide more reliable and relevant data overall.

**Table 2C – Leachate Flow Monitoring Schedule**

Monitoring Point	Parameter	Monitoring Frequency
Vee Notch Weir	Flow measurement	Monthly

Table 2D identifies the monitoring required at the Discharge Flap Valve and the compliance limits for each parameter.

**Table 2D – Discharge Flap Valve Leachate Level Monitoring Schedule**

Parameter	Compliance Level	Monitoring Frequency
Ammoniacal Nitrogen (mg/l)	190	Monthly
Nickel (µg/l)	90	
Copper (µg/l)	85	
Zinc (µg/l)	376	
Lead (µg/l)	40	
Chromium (µg/l)	40	
Cadmium (µg/l)	3	
Arsenic (µg/l)	130	
Iron (µg/l)	40,000	

## 2.3 Leachate Control and Trigger Levels

Control and trigger levels, along with observed trends from control and trigger charts, provide a warning to the site operator that a problem may be occurring. They can be used to spot adverse trends in the monitoring data, or changes because of natural variations in the background water quality. Control levels are intended to provide an early warning indicator for when the landfill is beginning to deviate from its design performance so that corrective or remedial measures can be implemented before a trigger level is exceeded.

For leachate levels, a trigger level of 1m above cell basal liner is stated in the environmental permit (unless otherwise agreed in writing with Natural Resources Wales). Well specific levels were developed using statistical assessment of previous data and, from these, several well leachate compliance levels were proposed to NRW in April 2019<sup>1</sup>. The wells were selected to

<sup>1</sup> Addendum to the Hydrogeological Risk Assessment Review 2016, Neath Port Talbot Waste Management Co Ltd, 30<sup>th</sup> April 2019.

provide a geographical coverage of the site and are detailed in Table 2E. Following agreement by NRW these well specific revised leachate levels were applicable from September 2020.

**Table 2E – Leachate Compliance Levels**

Monitoring Point	From September 2020 - Leachate Level Above Base (m)
LW5	1.6
LW8	1.0
LW15	2.1
LW17b	1.0
A1302	3.0
A1305CV	2.8
Any additional wells installed after April 2019	1.0

There are no control or trigger levels set for the quality of the leachate.

Compliance levels are set for several parameters at the Discharge Flap Valve as specified in Table 2D.

## 2.4 Leachate Monitoring Results and Data Assessment

### 2.4.1 Leachate Level Monitoring

Leachate level data is obtained by measuring the well base and the height of the leachate head within the well during each monitoring visit. The data is shown in depth above the well base and is not directly indicative of the overall leachate head in metres, as the actual depth to the bottom of the waste mass is unknown.

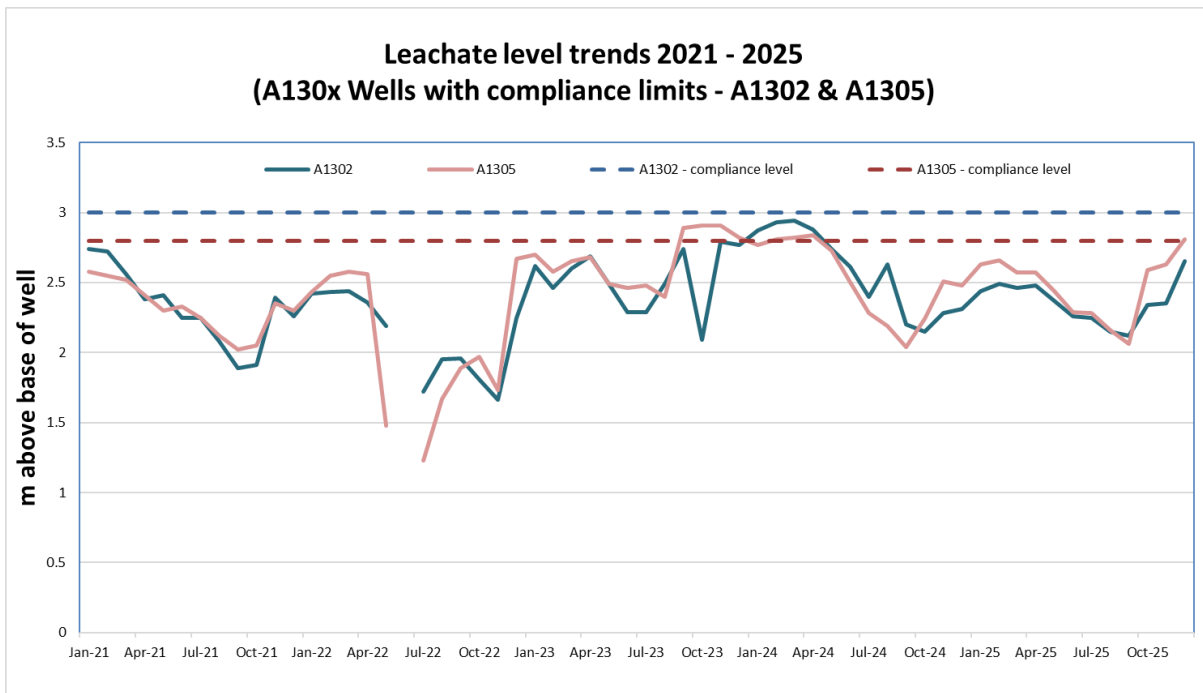
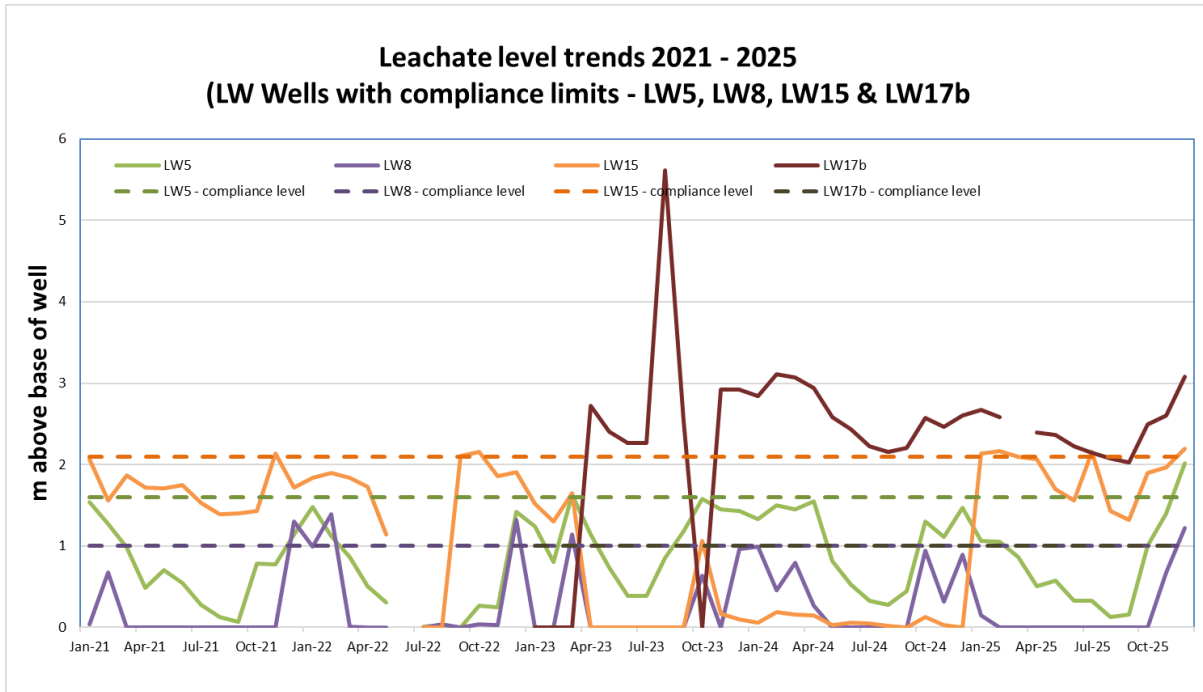
A summary table of the leachate level data obtained during 2025 for those wells with compliance levels is given in Table 2F. All leachate monitoring data is provided in Appendix A.

**Table 2F – Summary of Leachate Levels**

Monitoring Point	Minimum Leachate Level Above Base (m)	Maximum Leachate Level Above Base (m)	Comment
LW5	0.13	2.02	Leachate >1m in Jan, Feb, Nov and December. One exceedance of the compliance level of 1.6m above base in December 2025.
LW8	Dry	1.22	Either recorded as 'dry' or zero leachate depth across the months of February to October. The highest recorded depth was 1.22m in December 2025 – exceeding the compliance level of 1.0m
LW15	-0.58*	2.2	*Depth confirmed as 12.7mbTOC in Aug 2025 following investigation (changed from 10.56mbTOC which was used previously). The compliance level of 2.1m was exceeded in December 2025 (although, if the agreed depth was used throughout 2025 then January, February and July also recorded a

			leachate depth of between 2.14m and 2.17m and so marginally above the compliance level)
LW17b	dry	3.08	Apart from March 2025 when the well was dry, all other monthly readings are above the compliance level of 1.0m.
A1302	2.12	2.65	All readings >2m with the highest in December 2025. All readings below the compliance level of 3.0m.
A1305CV	2.06	2.81	All readings >2m with the highest in December 2025. The compliance level of 2.8m was marginally exceeded in December 2025.

Graphs of the leachate levels for these wells are provided below.



Direct comparison of the leachate level above the base of each well against the revised compliance levels for the relevant boreholes can be seen in Table 2G.

**Table 2G – Summary of Leachate Trigger level exceedance**

Leachate well	Leachate Levels (m above base of well)												Leachate compliance level (from September 2020 onwards)
	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	
LW5	1.06	1.05	0.86	0.51	0.58	0.33	0.33	0.13	0.16	1	1.4	2.02	1.6
LW8	0.15	0	0	0	0	0	0	0	0	0	0.67	1.22	1
LW15	2.14	2.17	0	2.07	1.7	1.56	2.16	1.43	1.32	1.9	1.97	2.2	2.1
LW17b	2.67	2.58		2.39	2.36	2.23	2.15	2.08	2.03	2.49	2.6	3.08	1
A1302	2.44	2.49	2.46	2.48	2.37	2.26	2.25	2.15	2.12	2.34	2.35	2.65	3
A1305	2.63	2.66	2.57	2.57	2.44	2.29	2.28	2.16	2.06	2.59	2.63	2.81	2.8

Empty cells signifies unable to be monitored

Some wells recorded as 'dry' on the monitoring records - these have been consider zero in the above table

LW17b recorded 'dry' in March, although this appears to be unlikely - possible issues with measuring the depth.

Red text indicates exceedance of the well specific leachate level threshold (those agreed from September 2020)

For LW15 - the actual depth of 12.7mb TOC (which was agreed from investigation from August) has been used for the previous months of 2025 for this table and the graphs

In summary:

- The exceedances of the revised compliance levels in 2025 were for the following:
  - LW17b in every month of 2025 (except for March which indicated 'dry' in the field sheet) with all levels recorded greater than 2m compared to a leachate compliance level of 1m.
  - On one occasion for each well LW5, LW8 and A1305 in December 2025
  - LW15 on one occasion (December) after the borehole depth was investigated and agreed to be 12.7m depth (from August 2025). However, if this depth is used throughout 2025 then three other months (January, February and July) also marginally exceeded the depth of 2.1m.

Following discussion with Natural Resources Wales, and as part of a response to changing of monitoring at Giants Grave, the following was stated:

*'As agreed by NRW in an email dated 22/01/2025, the operator was required to compare LW17b with A1301 throughout 2025. A full 12-month dataset should soon be available and must be used to inform any proposed amendments to compliance limits for LW17b and an HRA review.'*

However, Leachate levels in A1301 have not been measured in 2025 and so no comparison can be made.

## 2.4.2 Leachate Quality Monitoring

### a) Leachate Wells

The frequency of testing on the leachate (including samples analysed at the laboratory) is quarterly. There is on-site field monitoring for temperature, but pH and conductivity are completed in the laboratory along with the quarterly components of chloride, ammoniacal nitrogen and potassium.

#### Quarterly monitoring data

The range of data for the key contaminants from quarterly monitoring of leachate wells is summarised in Table 2H.

**Table 2H – Summary of Components from Quarterly Leachate Monitoring**

Parameter	Unit	Minimum	Maximum	Mean 2025	Mean 2024	Mean 2023
pH	-	6.8	7.7	-	-	-
Temperature	°C	14.1	28.5	19.7	-	-
Conductivity	µS	780	9500	3315	-	-
Ammoniacal Nitrogen (N)	mg/l	1.2	590	183	170	150
Chloride	mg/l	8.7	1200	265	302	205
Potassium (diss.filt)	mg/l	9.3	430	137	138	121
Number of samples (LW)				20	21	19
Number of samples (A130x)				20	19	16

Note – The calculated means were taken from the four quarterly monitoring results across the wells monitored. In 2025, in total there were 40 results for ammoniacal nitrogen, chloride and potassium across 10 separate wells.

From the quarterly leachate quality monitoring the following observations can be made:

### Ammoniacal nitrogen

- When considering all leachate samples across 2025, the mean ammoniacal nitrogen concentration has shown an increasing trend from 2023 to 2025. This is explained by the increasing proportion of samples that are taken from the A130x wells (mean of 283mg/l) compared with the LW wells (82mg/l).
- The ammoniacal nitrogen concentrations between the samples taken from individual wells was relatively consistent (within the same order of magnitude) other than for:
  - LW17b - range from 5.3mg/l to 21mg/l across the four samples taken.
  - A1303 - range from 86mg/l to 590mg/l across the four samples taken.
  - All wells were monitored on four occasions during 2025. For trends then graphs have been provided below for the data since 2023 in each well.
- The highest concentrations of ammoniacal nitrogen continue to be recorded in the A130x wells, with A1301 recording the highest mean at 475mg/l, although A1303 recording the highest concentration at 590mg/l. The mean concentrations for each well are detailed in Table 2I. Although some wells show an increase in the mean concentration of ammoniacal nitrogen, there are no significant adverse trends noted other than a gradual rising trend in LW15. Note:
  - LW3 has increased its mean by fourfold, but the 2024 data was for only 2 samples including one result <<1mg/l. The data from 2025 shows a more consistent range for ammoniacal nitrogen of between 1.2mg/l and 5.4mg/l, but this is at a low concentration compared to several other wells.
  - LW15 recorded a rising trend in ammoniacal nitrogen since the start of 2024 with the 2025 results between 140mg/l and 160mg/l following a mean across 2024 of 97mg/l.

### Other parameters

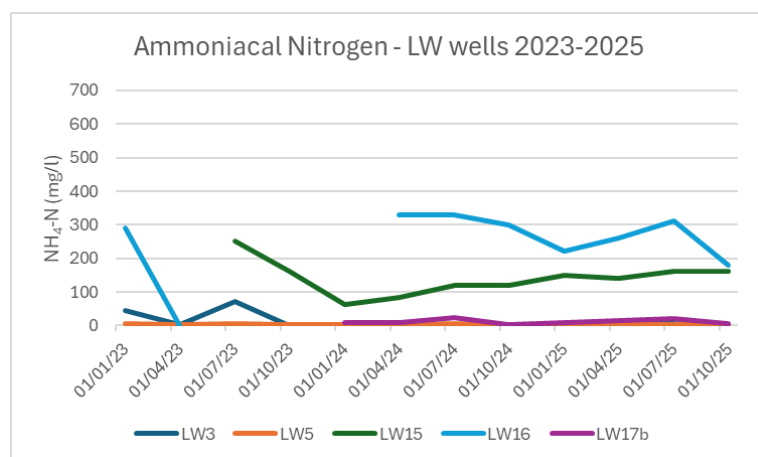
- The mean chloride and potassium concentrations from many locations in 2025 show mean concentrations at similar or slightly lower concentrations than 2024, with the main exception being LW15 that records an approximate 30% increase.

- The results across the individual wells generally recorded a range in concentrations for chloride and potassium within an order of magnitude. However, the following locations show the most variance:
  - LW17b records a range of chloride from 36mg/l to 120mg/l.
  - A1303 – potassium ranges from 53mg/l to 290mg/l and chloride ranges from 72mg/l to 700mg/l across the four samples taken
- The pH across the wells is within the range pH 6.8 to 7.7, which remains similar to recent years.

**Table 2I – Summary of Ammoniacal Nitrogen, Chloride and Potassium in Leachate**

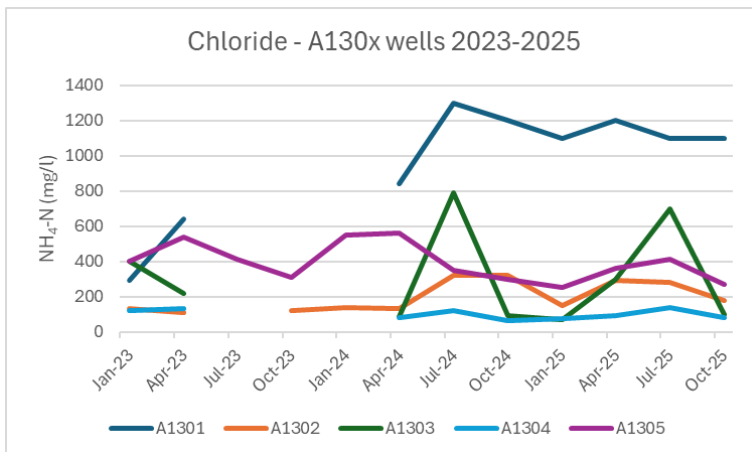
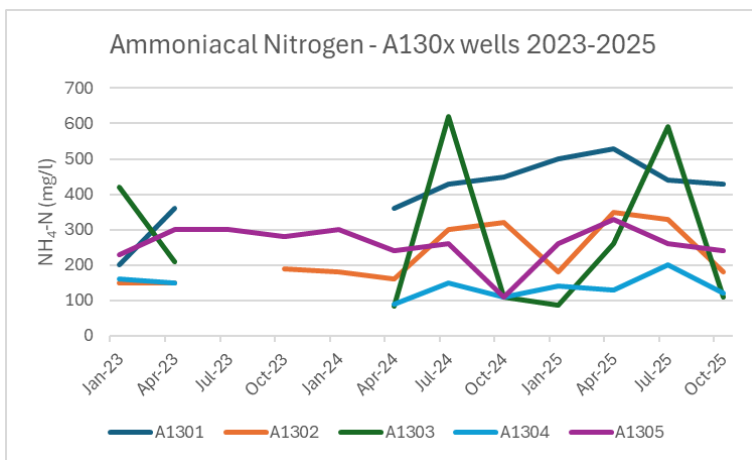
Monitoring Point	Number of Samples (for NH <sub>3</sub> -N)	Ammoniacal Nitrogen mean (mg/l)		Chloride mean (mg/l)		Potassium mean (mg/l)	
		2025	2024	2025	2024	2025	2024
LW3	4	3.1	0.7	11.7	8.1	11.1	9.3
LW5	4	2	2.7	12.3	7.7	12.1	11.5
LW8	0	dry	1	dry	23.6	dry	6.4
LW15	4	153	96.8	140	105.5	110	86.8
LW16	4	243	320	343	490	238	290
LW17b	4	12.2	10.9	78.8	120	59	66
A1301	4	475	434	1125	1136	400	382
A1302	4	260	240	225	227.5	144	140
A1303	4	262	271.7	293	321.3	139	151
A1304	4	148	116.7	97.3	88.3	75.8	75.3
A1305CV	4	273	227.5	323	440	185	197.5

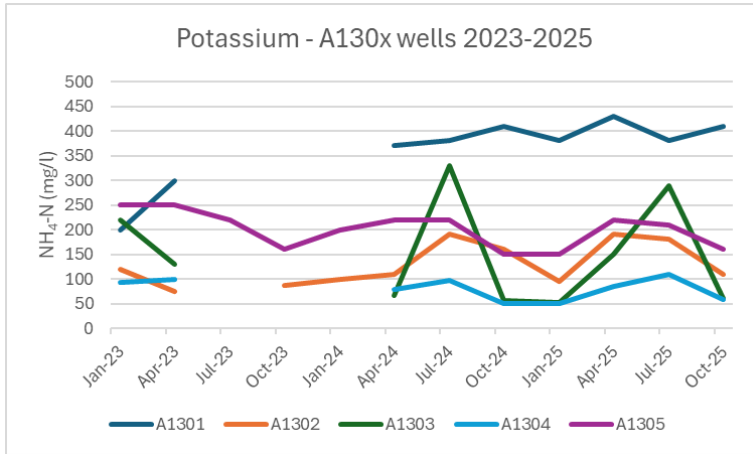
The mean ammoniacal nitrogen and chloride across the LWx wells is consistent with a leachate from an aged waste mass, although the results from the 2013 A130x installed leachate wells continue to record higher concentrations.



The following graphs have been added to show a comparison between the A130x wells and show whether there are any significant trends across the three main parameters of ammoniacal nitrogen, chloride and potassium. In general, the trend in these three parameters follows the same pattern across the five wells with:

- A1301 consistently recording the highest concentrations and A1304 consistently recording the lowest concentrations.
- A1303 records the most significant fluctuation between the concentrations measured for all parameters, with highs in July 2024 and July 2025 sampling, but all other sampling records much lower concentrations. Well A1302 also shows a fluctuating pattern similar to A1303, but not as extreme.
- Although some fluctuating results are recorded, there are no significant ongoing adverse trends noted across these wells for each parameter.





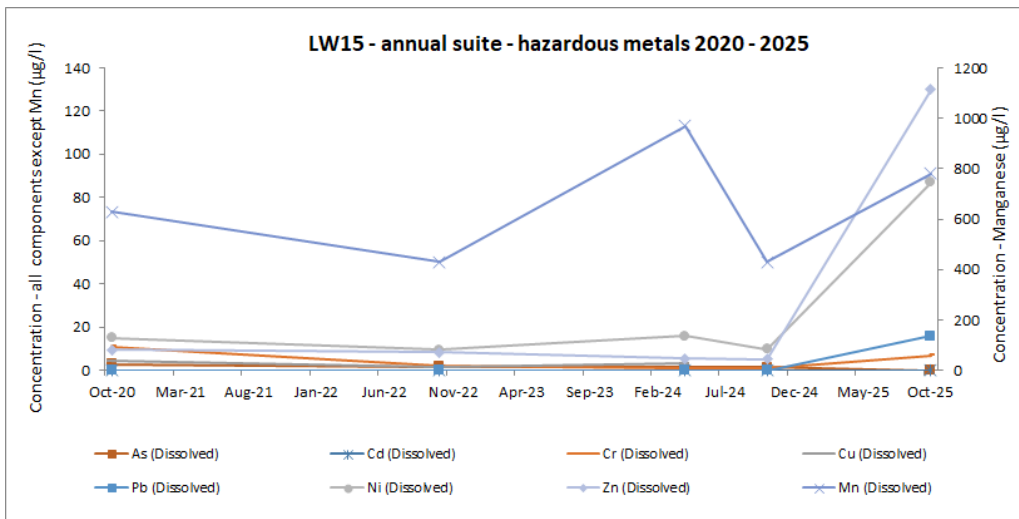
**Annual monitoring data**

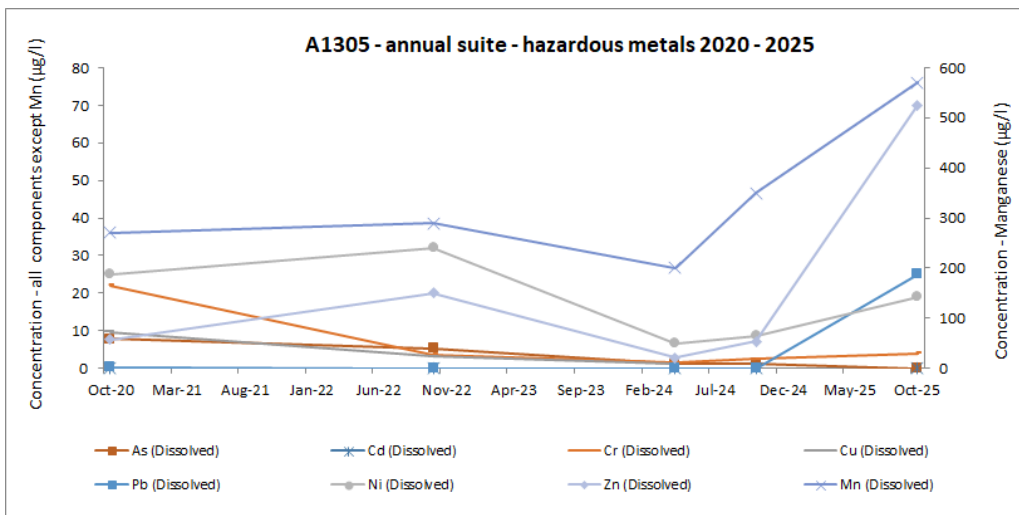
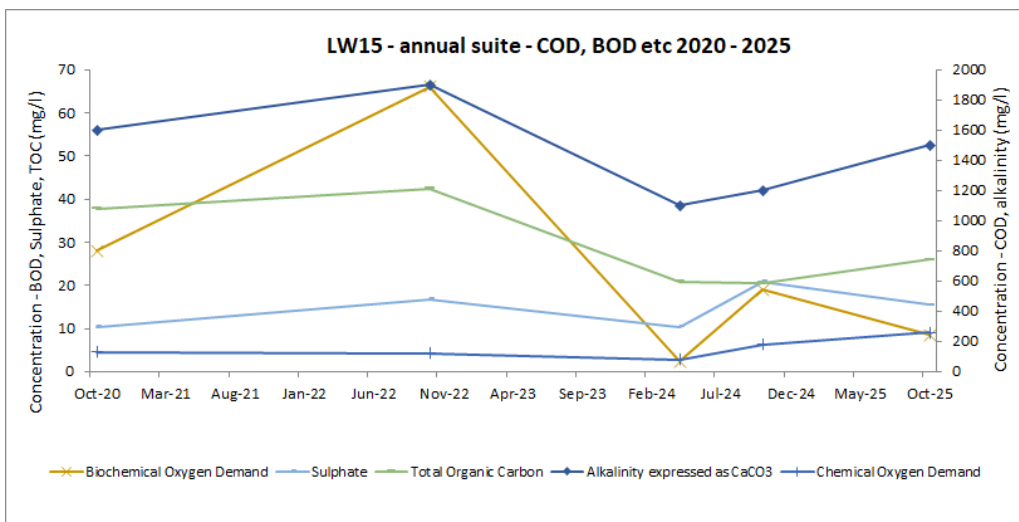
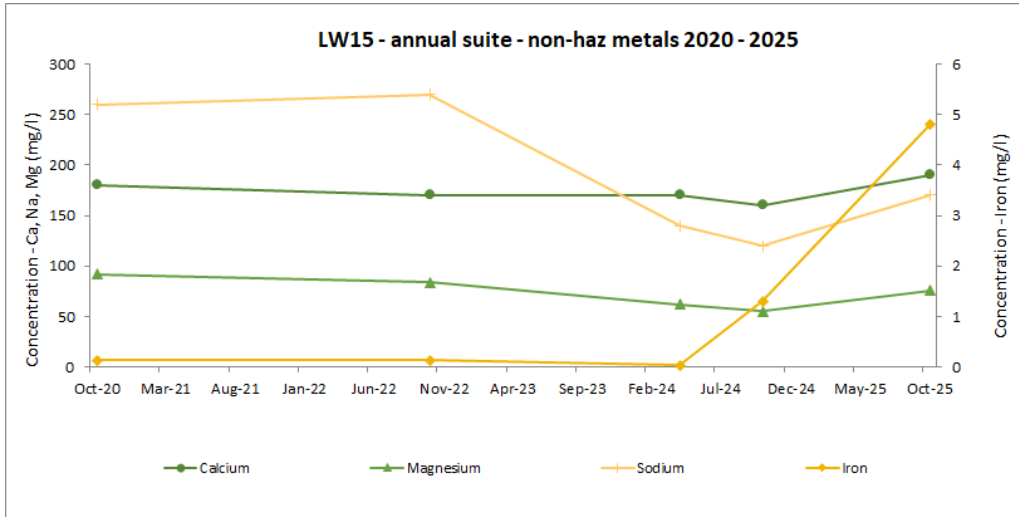
The annual hazardous substances suite was completed on a total of ten samples in October 2025, with both LW8 and LW9 being dry.

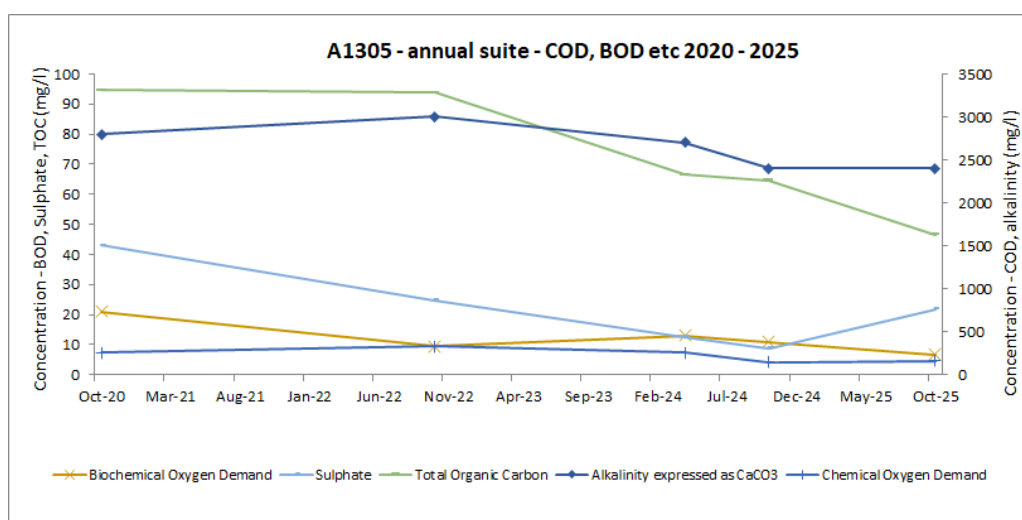
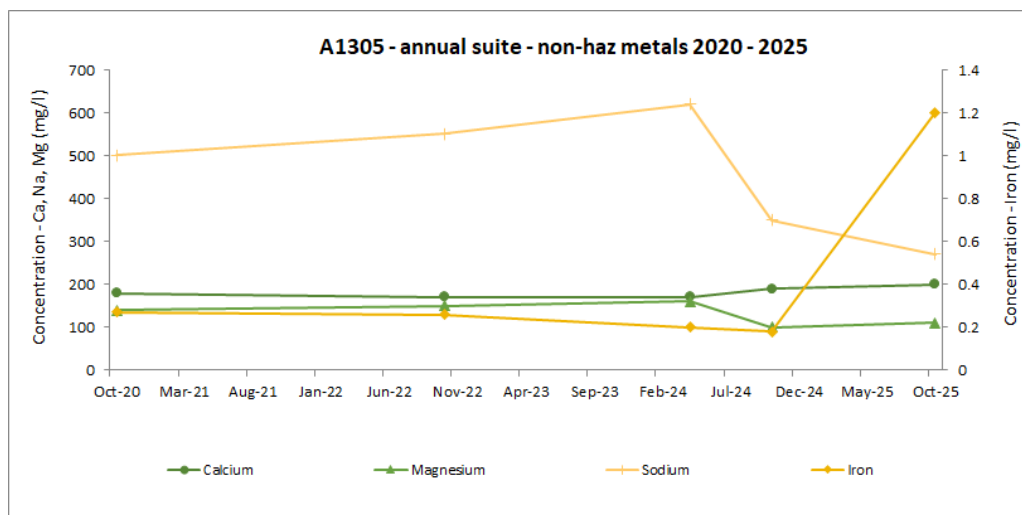
Only a select number of leachate locations have been included in each of the annual testing suite sampling in the last 6 years: LW3, LW5, LW15, A1304 and A1305.

*Note – the analysis has been conducted during the following months: October 2020, October 2022, April & October 2024 and October 2025.*

The following graphs and comments provide some information on any significant trends noticed across these wells but includes the graphs for LW15 and A1305 as examples only.







**Hazardous metals**

The highest concentration of a hazardous metal recorded is for manganese with LW3 recording fluctuating but a falling trend since 2020. The most significant rising trend for manganese is in A1305 since April 2024.

The October 2025 monitoring in A1305 recorded the well’s highest concentrations of lead, zinc and manganese. In LW15, the October 2025 monitoring recorded elevated zinc, nickel and lead compared to previous results in this well.

The hazardous metals of arsenic, cadmium and chromium do not record any significant adverse trends.

Note – the laboratory has been unable to report copper concentrations in the last two sets of annual monitoring analysis.

**Other parameters**

Many of the wells record fluctuating concentrations for the general leachate parameters such as BOD, COD etc. This is especially the case for the ‘LW’ wells, where the highest results were recorded in October 2022, low results in April 2024 and higher results again in 2025.

Although October 2025 has recorded higher concentrations for several parameters across some wells, there is no obvious ongoing adverse trend noted.

Four-yearly hazardous substances monitoring data

The four yearly hazardous substances suite was completed on samples in October 2021 and again in October 2025. The hazardous substances suite was completed on a total of 10 leachate samples from across the site: LW3, LW5, LW15, LW16, LW17b plus the five A130x wells.

From this 2025 hazardous substances suite, the following comments can be made (in comparison to the 2021 results):

**Hazardous metals/metalloids**

2025 analysis	2021 analysis for comparison
Uranium not detected but elevated minimum reporting value (MRV) of 50µg/l	Uranium detected in several samples up to 3.3µg/l
Antimony not detected in any samples (MRV of 1.8µg/l)	Antimony detected in all samples with one sample (A1301) at higher than 1.8µg/l – recorded at 4.3µg/l
For those metals detected, the highest concentrations were recorded for boron at up to 7000µg/l (mean of 1700µg/l) and then barium up to 790µg/l (mean of 394µg/l).	Boron mean of 860µg/l with highest at 2200µg/l Barium mean of 332µg/l with highest up to 650µg/l
Molybdenum detected in seven samples at up to 47µg/l with cobalt also detected in seven samples with highest at 16µg/l. The highest molybdenum detected in the LW wells, whereas the highest cobalt in the A130x wells.	Similar comments for 2021 although Mo and Co detected in all wells
Vanadium detected in two samples at up to 6.5µg/l (MRV of 1.9µg/l)	V detected in 6 of 9 samples, although only above the 2025 MRV in 3 samples (all A130x wells) – recorded up to 12µg/l
Selenium detected in one sample (A1303) at 4.2µg/l compared to a minimum reporting value of 4µg/l.	Se reported in several samples, although only 2 above 2025 MRV – highest of 9.3µg/l in A1301
Overall, the leachate from A1301 recorded the highest concentration of several of the metals except molybdenum. The minimum reporting values in 2025 were not as low as those in 2021 and so fewer positive detections in 2025.	

**Other inorganics**

2025 analysis	2021 analysis for comparison
No cyanide detected in any leachate sample	
Fluoride detected in all samples with highest in A1301 at 1300µg/l (mean of 583µg/l)	Fluoride detected in all samples with highest in A1301 at 800µg/l (mean of 424µg/l)
Nitrite detected in eight samples with highest in LW17b at 390µg/l	Nitrite detected in four samples with highest LW16 at 240µg/l
Phosphorous recorded a range between 220µg/l and 9200µg/l (mean of 2141µg/l) with orthophosphate relatively consistent across all wells (39µg/l to 64µg/l) except A1301 at 800µg/l	Phosphorous recorded a range between 260µg/l and 1700µg/l (mean of 577µg/l). Orthophosphate recorded similarly elevated concentration in A1301 of 850µg/l with several samples recording <20µg/l

**Hazardous organics**

2025 analysis	2021 analysis for comparison
No benzo(a)pyrene detected in any sample with naphthalene detected in three of the A130x samples – highest of 5.7µg/l in A1301	No benzo(a)pyrene detected. Naphthalene detected only in A1301 at 8.6µg/l
Mecoprop detected in all samples except LW3 at between 0.1µg/l to 44µg/l (A1031). The mean across the newer A130x wells is five times the mean across the LW wells	Mecoprop detected in six of nine samples at between up to 38µg/l (A1301) with the mean across the newer A130x wells significantly higher than the older LW wells
For TPH then only one trace detection of an aliphatic TPH (5µg/l in A1031 for C6-C8 fraction), whereas several samples record detection of the aromatic TPH (LW15 and all A130x wells). All LW wells at <10µg/l of aromatic TPH except LW15 at 190µg/l. The A130x wells record total aromatic TPH between 210µg/l and 490µg/l	No TPH detections in 2021 – same MRVs
Trace benzene and xylene detected in A130x wells at up to 1.7µg/l benzene (compared to minimum reporting value of 1µg/l) and 2.1µg/l of all combined m-, p- and o-xylene	No BTEX detections in 2021 – same MRVs
No phenol detected and no phenol compounds detected except 2,4-Dimethylphenol in LW16 at 0.5µg/l – all others below minimum reporting value of 0.05µg/l	Phenol detected in A1301 at 6.2µg/l but no other detections. No detections of any other phenolic compounds

Overall, the 2025 hazardous substances analysis has recorded higher concentrations of many of the hazardous organics and also the hazardous metals. The minimum reporting value for many of the metals is higher in 2025.

## b) Discharge Flap Valve

A summary of the data collected from the consented discharge quality monitoring point at the Discharge Flap Valve during 2025 is given in Table 2J. Compliance levels for leachate quality are only specified for samples taken from the consented discharge monitoring point. Further detailed data for the Discharge Flap Valve are presented within Appendix A.

**Table 2J – Summary of Leachate Quality Data from the Discharge Flap Valve**

Parameter		Compliance Level	Minimum	Maximum	2025 Mean <sup>1</sup>	2024 Mean <sup>1</sup>
Ammoniacal Nitrogen as N	mg/l	190	<0.015	2.8	0.75	4.01
Arsenic	µg/l	130	<1	13	3.55	2.85
Cadmium	µg/l	3	0	0	<0.6	0.037
Chromium	µg/l	40	<0.5	3.4	1.14	0.66
Copper	µg/l	85	<0.4	99* retest 23	31.23* 24.9	6.4
Iron	mg/l	40	0.042	2.3	0.44	0.06
Lead	µg/l	40	<1.0	5.2	1.83	0.36
Nickel	µg/l	130	1.9	7.1	4.38	3.54
Zinc	µg/l	376	<1.5	97	19.9	5.37

NOTE <sup>1</sup> – When compiling summary statistics (e.g. mean values), where a parameter has not been detected at a concentration greater than the detection limit, the detection limit has been used in the calculations.

Concentrations in red indicate a breach of the discharge consent limit.

For Cd – the 2025 results reported was <0.6 µg/l but this minimum reporting value is more than an order of magnitude higher than the typical level of 0.02 µg/l for analysis up to November 2024.

Copper breached the compliance limit of 85 µg/l during October 2025, however on a retest of the same October sample, the copper result was 23 µg/l and so below the compliance limit. The copper results both prior to and after this October result were below the compliance limit.

Other than the initial copper result in October, there were no breaches of the discharge consent for the discharge from the flap valve in 2025. This follows no breaches of the discharge consent for the discharge from the flap valve since a single breach of the copper compliance level in August 2021 at 150µg/l compared with the 85µg/l limit.

The analysis of samples collected throughout 2025 (following the retest in October) has shown that the concentrations of all the measured parameters within the effluent discharged are within the compliance limits as stated within the Discharge Consent Number BP0236201 (as reproduced in the Landfill Aftercare Plan).

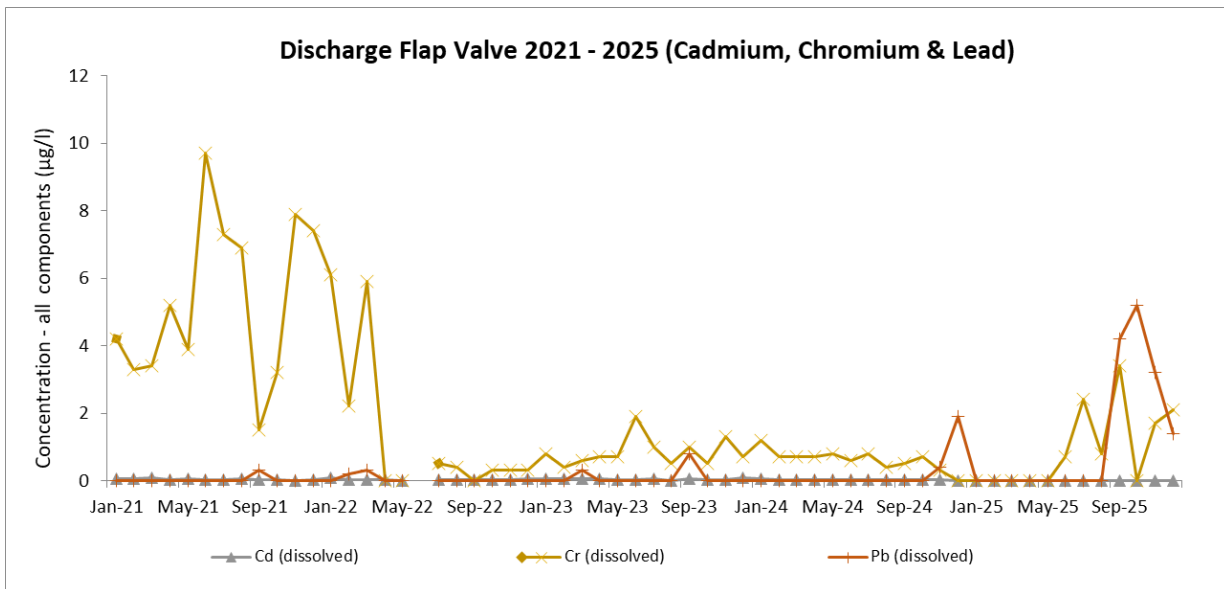
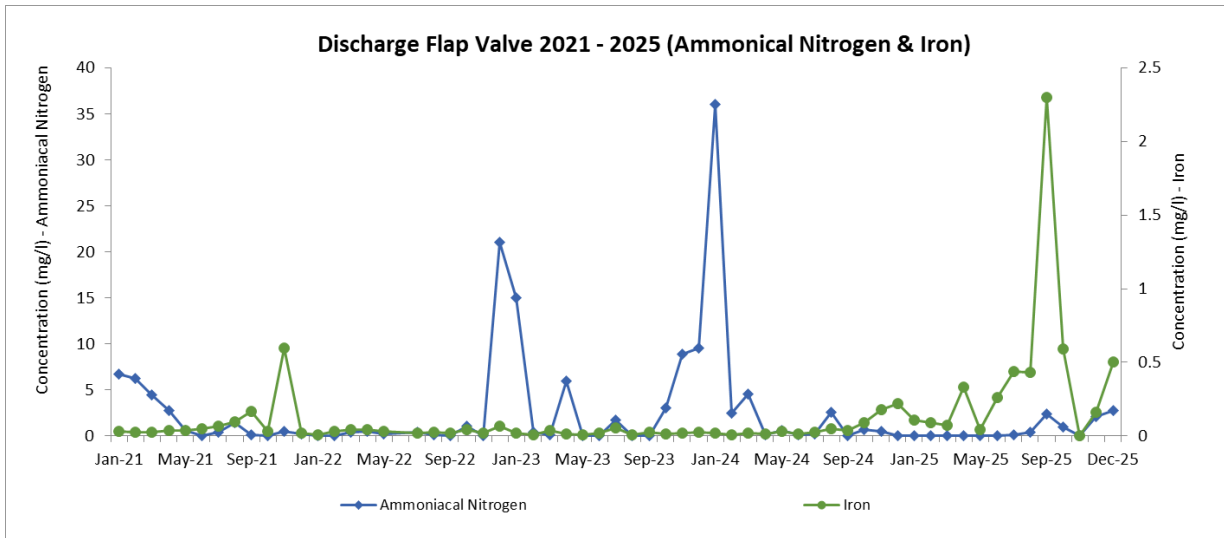
However, the mean concentration across 2025 has increased from that recorded in 2024, including:

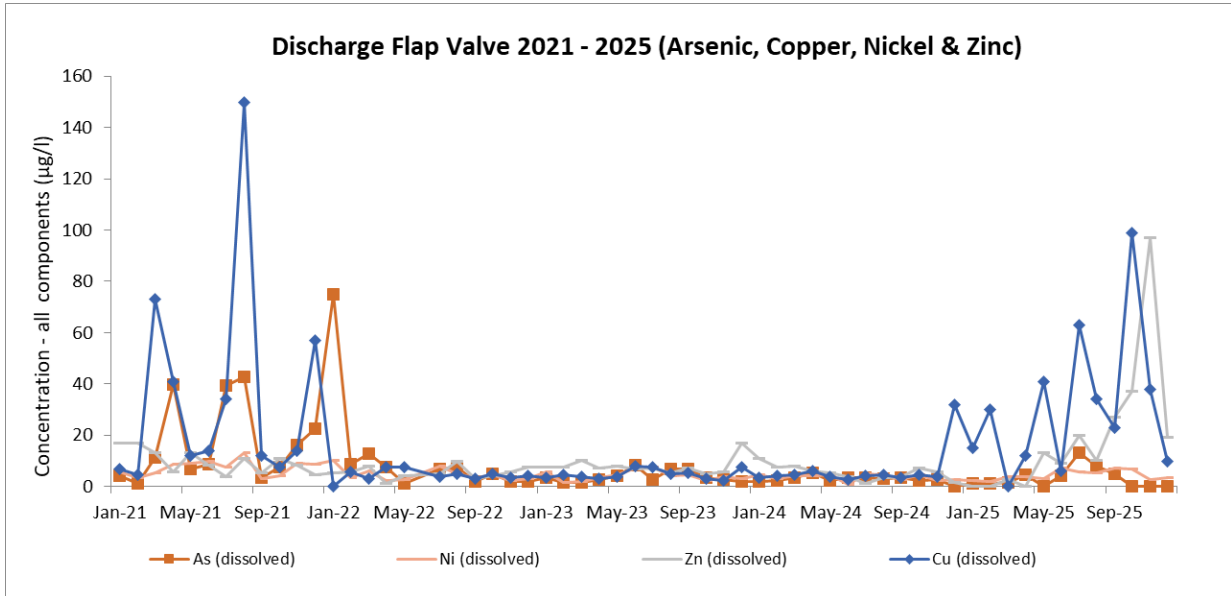
- The mean concentrations of arsenic, chromium and nickel have increased but within the same order of magnitude.

- The mean concentrations zinc, lead, copper and iron have increased by fourfold to an order of magnitude higher.
- The mean concentration of cadmium is an order of magnitude higher, but this is due to the higher minimum reporting value in 2025 of 0.06µg/l compared to 0.02µg/l for most of 2024.

The only parameter recording a lower mean concentration is ammoniacal nitrogen – which shows an order of magnitude difference, primarily due to elevated spikes as recorded in early 2024.

The graphs show that, especially for the metals of copper, zinc, lead and iron, the elevated levels recorded in 2025. The graphs below provide visual trends since January 2021.





### 2.4.3 Leachate Flow Monitoring

Leachate flow data was obtained from the Vee Notch Weir during 2025 as summarised in Table 2K. The value recorded represents a calculated flow from the continuous level monitor connected to a data logger used by NRW to provide flow data for the site.

The data provided was on a 15-minute time period for each reading and provided in m<sup>3</sup>/s. This data has been used to calculate averaged flow rate for the month (in m<sup>3</sup>/day) for comparison to the data from previous years.

NRW provide the following important details regarding the use of the data:

*The operational range of the thinplate weir located at this site is 0.0m to 0.26m stage (0.0 m<sup>3</sup>/s to 0.046 m<sup>3</sup>/s). Recorded level values outside this range will not generate reliable flows.*

*The site is also significantly influenced by water level changes resulting from tidal cycles. Data recorded at the site suggests that moderately high tidal peaks can result in a variable backwater effect through the thinplate weir. Water level data recorded during periods of tidal influence should be treated as suspect, as should the calculated flow for such periods. The variable nature of the tidal influence at this site makes it very difficult to identify precise times when tidal influence begins and ends. I would suggest the only reliable means of identifying conditions which are unaffected by the tide would be to physically observe free flow of water through the thinplate weir.*

The following table states the proportion (%) of readings in that month that are above the reliable range and the maximum flows recorded to provide an indication of the appropriateness of the data.

**Table 2K – Summary of Flow Monitoring Data (Vee Notch Weir)**

Month of Monitoring	Averaged Flow in 2025 (m <sup>3</sup> /day)	Maximum flow rate reading (m <sup>3</sup> /s)	Proportion (%) of readings greater than 0.046m <sup>3</sup> /s (or no readings)	Averaged Flow in 2024 (m <sup>3</sup> /day)	Averaged Flow in 2023 (m <sup>3</sup> /day)
Jan-25	2063	0.92	8.0	2812	3875
Feb-25	1121	0.93	2.5	6684	528
Mar-25	476	0.06	0.2	3656	3023
Apr-25	566	0.14	1.6	2912	1044
May-25	559	0.14	1.5	515	336
Jun-25	197	0.05	0.1	290	88
Jul-25*	18	0.01	0.5	202	329
Aug-25	24	0.02	0.0	486	595
Sep-25	736	0.26	2.7	1295	1162
Oct-25	974	1.54	1.3	2707	3928
Nov-25*	2570	1.17	10.8	1457	3256
Dec-25	5268	2.04	17.6	2812	3709

\*The instrumentation seemed to fail for short periods of time on both 14<sup>th</sup> July and 30<sup>th</sup> November, although this was for only a total of 68 15—minute readings. There were a significant number of readings of zero between June and September. The proportion of readings ABOVE the upper operational range of 0.046m<sup>3</sup>/s was significantly lower in 2025 than 2024.

A daily flow rate (based on the 15-minute flow measurements) during 2025 was an average 1217m<sup>3</sup>/day. This is significantly lower than the flows recorded in 2024 and 2023 and bucks the increasing trend recorded over recent years. This compares to a mean of 2032m<sup>3</sup>/day in 2024, 1838m<sup>3</sup>/day in 2023, 932m<sup>3</sup>/day in 2022, 1314 m<sup>3</sup>/day in 2021, 1429 m<sup>3</sup>/day in 2020, 953m<sup>3</sup>/day in 2019 and 1486m<sup>3</sup>/day in 2018.

However, as mentioned below Table 2K, the number of unreliable readings in 2025 is significantly lower than those recorded for 2024 and so, overall, the calculated flows are more reliable.

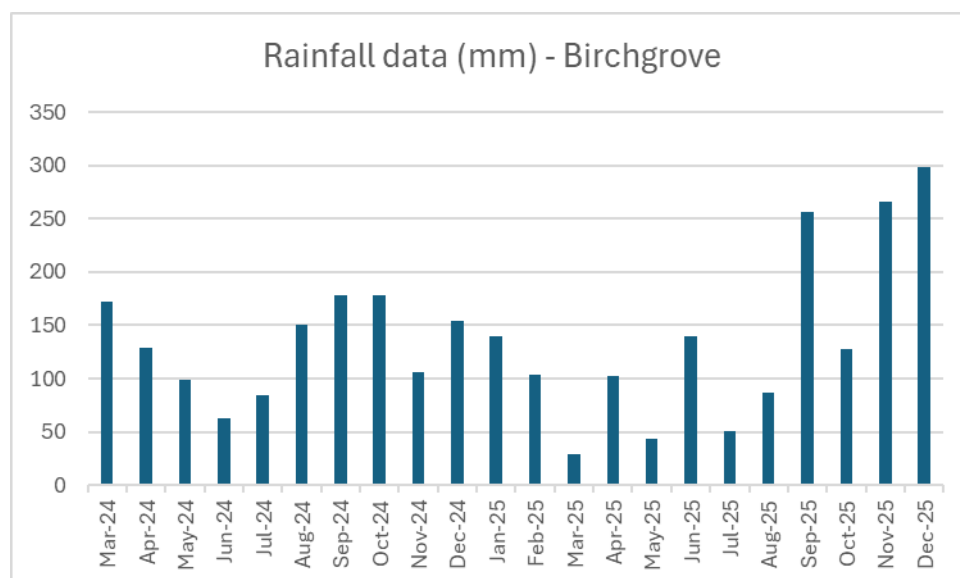
**Table 2L – Flow readings above operational range for Vee Notch Weir (%)**

Month of Monitoring	Number of readings in year	Readings above operational range	% of readings above tolerance
2025	34570	1361	3.9
2024	32836	5225	15.9
2023	34848	2782	8.0
2022	33504	1327	4.0

Based on the fewer readings recorded that were above the operational range (and the relatively short periods of time that the datalogger was not working), the data-logged measurements are still considered to be a more reliable method of recording flow across the Vee Notch Weir than the previous regime of recording a single reading each month (as was used up to 2018).

For information only, the following graph provides the rainfall measured from the Birchgrove weather station (situated approximately 4km north-west of Giants Grave). The data has been taken from the following webpage:

<https://rivers-and-seas.naturalresources.wales/Station/1111>



The graph indicates that 2025 has recorded some significantly wetter months than any from 2024 (September, November and December), but also drier months across the summer.

## 2.5 Summary and Recommendations for Leachate Monitoring Programme

The leachate samples have been taken in accordance with the requirements of the landfill aftercare plan and permit requirements with respect to the leachate level monitoring and the quarterly monitoring schedule.

For leachate levels, there were several locations that recorded exceedance of the compliance limit in December: LW5, LW8, LW15, LW17b and A1305, with only LW17b recording exceedance across all months where leachate levels were recorded. However, there were some strange leachate levels recorded in LW15 (including negative levels) and so, after investigation, a new well base was determined. If this depth of LW15 was used throughout 2025 then three other months (January, February and July) also marginally exceeded the depth of 2.1m.

For leachate quality, the mean ammoniacal nitrogen concentration has shown an increasing trend from 2023 to 2025, although this is explained by the increasing proportion of samples that are taken from the A130x wells compared with the LW wells. The potassium and chloride levels were of a similar mean concentration as per 2024. The mean ammoniacal nitrogen and chloride across the LWx wells continues to be lower than those from the 2013 installed A130x wells.

There was one breach of the compliance levels for the Discharge Flap Valve in 2025 from initial testing (copper in October), although on retesting the same sample, the copper result was significantly lower. The mean concentration of several metals increased in the Discharge when compared with 2024 – including copper, zinc, lead and iron. The analysis of samples collected throughout 2025 (following the retest in October) has shown that the concentrations of all the measured parameters within the effluent discharged are within the compliance limits as stated within the Discharge Consent Number BP0236201.

The calculated flow of water over the Vee Notch Weir was much lower in 2025 than 2024 (a mean flow of 1217m<sup>3</sup>/day compared to a mean of 2032m<sup>3</sup>/day in 2024) and is the lowest flow reading since 2019. Importantly, there were far fewer results that were above the tolerance of the weir measurement than recent years and so there is more confidence in the flow measurement calculation.

For the 2024 annual report C & P were asked to consider whether the environmental monitoring undertaken across the site might be considered too onerous for a closed landfill site and what option might there be for reducing the monitoring whilst continuing to ensure environmental protection. This report does not repeat these recommendations as discussions on any reduction of monitoring are ongoing between NPTCBC and Natural Resources Wales.

Any changes to leachate level and leachate quality monitoring will require a revised hydrogeological risk assessment (HRA) alongside permit variation and revision to the Landfill Aftercare Plan.

However, the monitoring in 2025 (including for hazardous substances) has not changed the overall pattern of the leachate quality and so would not significantly impact on recommendations provided previously.

Note – one of the potential changes in leachate level monitoring is to recalculate the leachate level in LW17b as the current permit limit of a generic 1.0m above well base was set when this well was unable to be monitored consistently or accurately. As part of this change (along with any required justification through a revision to the HRA) there is consideration about whether the well A1301 provides appropriate information about the leachate level in this area of the site. However, there is no recent leachate level monitoring in A1301 and no comparison can be made. It would be recommended to start monitoring the leachate levels in A1301 (along with those wells with compliance levels) on a monthly basis to build up information so a that comparison between LW17b and A1301 can be made.

### 3 Groundwater Monitoring

This section provides a summary of the groundwater monitoring at Giants Grave for 2025 as required by Schedule 3, Tables 3.4 and 3.5 of the environmental permit EPR/SP3298FT and Appendix A3 of the Landfill Aftercare Plan.

#### 3.1 Groundwater Monitoring Locations

Groundwater quality monitoring is undertaken from a total of eight boreholes from around the site including two from within each of the western and southern extension areas. The monitoring locations are as shown on the sampling location plan in Appendix E.

Groundwater level monitoring is also monitored from a further seven boreholes: BH3W, BH5B and BH7B (north); BH4, BH6, BH7 (west); and BH40B (east).

Groundwater quality was monitored from four boreholes to the north and east of the capped and restored area of the site. These boreholes are located as follows:

- Borehole BH9B is located on the northern boundary of the site, north of the Northern Leachate Drain; and
- Boreholes BH1B, BH45B and BH43B are situated along the eastern boundary adjacent to the canal from the north-eastern tip of the site (BH1B) proceeding southwest along the eastern boundary (BH45B and BH43B).

The monitoring from within the Western Extension Area comprises boreholes BH5 and BH8 which run along the eastern boundary of the western extension. Both boreholes are located at the bottom of the west bund of the Cut (in which the reed bed system is located).

The monitoring from within the Southern Extension Area comprises boreholes BH12 and BH15. These boreholes are located as follows:

- Borehole BH12 is located towards the middle of the Southern Extension Area; and
- Borehole BH15 is located at the bottom of the river bund on the western edge of the Southern Extension Area.

#### 3.2 Groundwater Monitoring Requirements

Tables 3A and 3B identify the groundwater wells that will be monitored, the type of monitoring and the frequency of the monitoring.

**Table 3A – Groundwater Level Monitoring Schedule (June 2017 onwards)**

Monitoring Point	Parameter	Monitoring Frequency
North: BH9B East: BH43B, BH1B, BH45B South: BH12, BH15 West: BH5, BH8 <i>Note – additional boreholes are also required to be monitored from June 2017: BH3W, BH5B and BH7B (north); BH4, BH6, BH7 (west); and BH40B (east)</i>	Water Level	Monthly

**Table 3B – Groundwater Quality Monitoring Schedule (June 2017 onwards)**

Monitoring Point	Parameter	Monitoring Frequency
North: BH9B East: BH43B, BH1B, BH45B	pH, Temperature, Electrical Conductivity, Ammoniacal Nitrogen, Chloride, Potassium	Monthly
South: BH12, BH15 West: BH5, BH8	Mercury, Chemical Oxygen Demand, Biological Oxygen Demand, Nickel, Chloride, Sulphate, Alkalinity, Total Organic Carbon, Sodium, Calcium, Magnesium, Iron, Manganese, Cadmium, Chromium, Copper, Lead, Zinc & Arsenic	6-monthly
	Hazardous substances	Every two years

The above quality monthly monitoring schedule was followed throughout 2025 (where monitoring was possible and where samples were able to be taken). Monitoring in April and October was completed for the 6-monthly monitoring. The full 2-yearly hazardous substances suite was undertaken in October.

### 3.3 Groundwater Control and Trigger Levels

Control and trigger levels, along with observed trends from control and trigger charts, provide a warning to the site operator that a problem may be occurring. They can be used to spot adverse trends in the monitoring data, or changes because of natural variations in the background water quality. Control levels are intended to provide an early warning indicator for when the landfill is beginning to deviate from its design performance so that corrective or remedial measures can be implemented before a trigger level is exceeded.

Following a revision to the hydrogeological risk assessment the compliance limits for the parameters, arsenic, mercury and phenol have been removed from the permit (from September 2020). From 2020, the only permit compliance levels are for ammoniacal nitrogen.

The current trigger and control levels for ammoniacal nitrogen date back to 2010 and so, as part of every annual review, the levels will be considered for revision to determine whether they remain fit for purpose (to provide the early warning).

**Table 3C – Groundwater Control and Trigger Levels**

Parameter	Borehole	Permit compliance (Trigger) Level	Landfill Aftercare Plan Action (Control) Level
Ammoniacal Nitrogen (mg/l)	BH1B	3.1	2
	BH5	23.3	15.5
	BH8	88.6	59.1
	BH9B	1.6	1
	BH12	2.5	1.6
	BH15	2.3	1.5
	BH43B	108.9	72.6
	BH45B	59.5	39.7

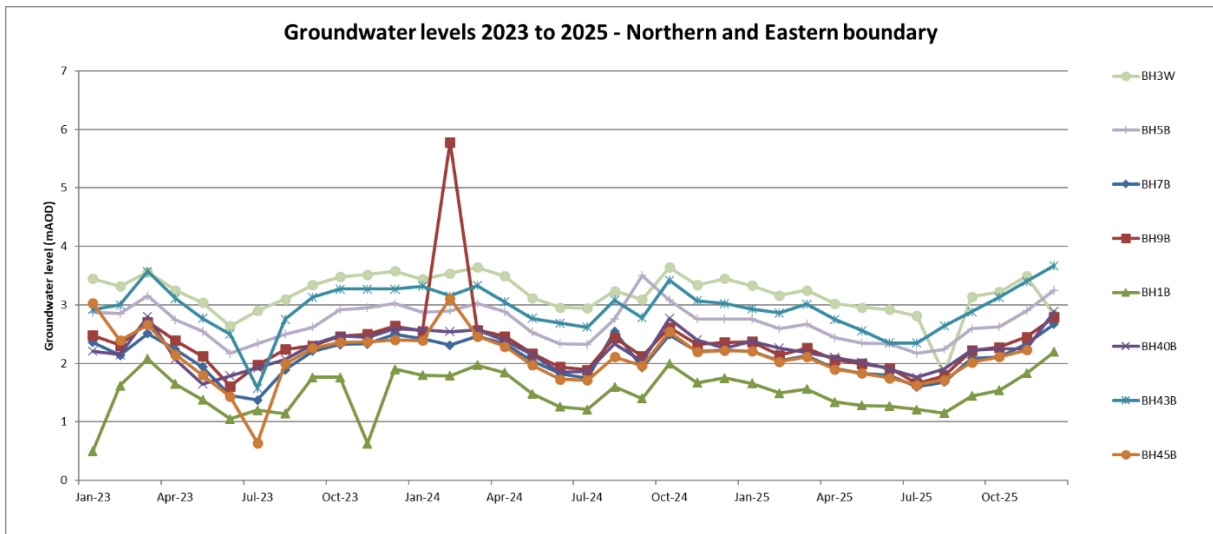
### 3.4 Groundwater Monitoring Results and Data Assessment

#### 3.4.1 Groundwater Level Monitoring

Groundwater level monitoring has been carried out monthly during 2025 in accordance with the Landfill Aftercare Plan. The data obtained during 2025 is presented in Appendix B. A summary of the groundwater levels is set out in Table 3D.

The groundwater levels across the boreholes are illustrated below (water depth above AOD).

*Note – for consistency the well depth and top of casing for 2017 have been used to calculate the levels for subsequent years including the 2025 levels. These mAOD depths have been used for many years to report the groundwater level data and were provided to C&P when compiling the first annual report in 2013. Note – the only difference is the top of well casing was for BH12 that was changed for December 2024 onwards (due to new monitoring platform).*



*Note – the February 2024 level in BH9B was suspected to be erroneous but has been retained on the graph.*

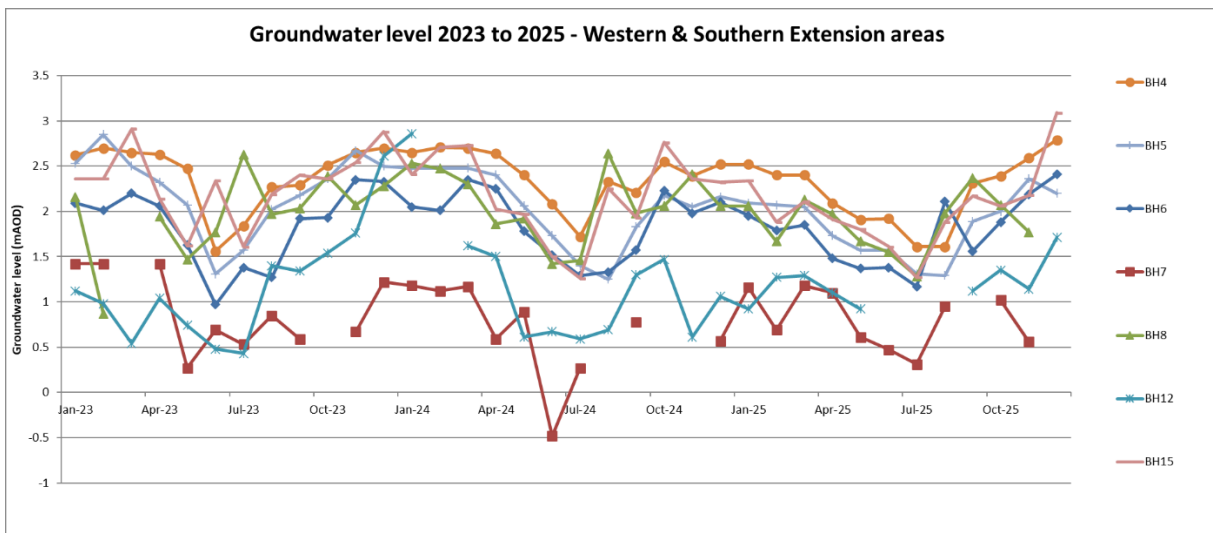


Table 3D – Summary of Groundwater Level Monitoring

Borehole	Well Base (mAOD)	Top of casing (mAOD)	Minimum Groundwater Level (mAOD)	Maximum Groundwater Level (mAOD)	Difference in groundwater levels (max-min) (m)
Northern boundary					
BH3W	-1.40	6.51	1.82	3.49	1.67
BH5B	-3.91	7.36	2.17	3.25	1.08
BH7B	-4.39	6.87	1.6	2.67	1.07
BH9B	-3.06	7.42	1.66	2.79	1.13
Eastern boundary					
BH1B	-2.76	5.76	1.15	2.2	1.05
BH40B	-0.55	6.43	1.76	2.89	1.13
BH43B	-1.56	6.59	2.35	3.67	1.32
BH45B	-3.08	6.37	1.63	2.23	0.60
Western extension					
BH4	0.31	3.32	1.61	2.79	1.18
BH5	-0.51	3.27	1.29	2.36	1.07
BH6	-0.42	3.45	1.17	2.41	1.24
BH7	-1.58	3.06	0.31	1.18	0.87
BH8	-0.82	2.47	1.28	2.37	1.09
Southern extension					
BH12	0.43	6.95	0.92	1.71	0.79
BH15	0.50	4.38	1.27	3.09	1.82

Note – all groundwater wells were monitored on every occasion in 2025 except on the following occasions when the area around the borehole was flooded: BH7 in September and December, BH8 in December and BH45B in December.

The tidal nature of the River Neath Estuary, which is close to the Site, influences the groundwater beneath the site, and as such, there is relatively low (close to zero) hydraulic gradient beneath the site. The hydrogeological risk assessments have established the direction of groundwater flow beneath Giants Grave Landfill Site indicating that there is a slight hydraulic gradient within the superficial deposits towards the western side of the landfill and the River Neath, broadly consistent with local topography.

From Table 3D and the groundwater fluctuation graphs, the following observations can be made:

- The difference between the lowest and highest groundwater levels in each well is between 0.60m and 1.82m.
  - The most significant variation between minimum and maximum groundwater levels are in BH15 (1.82m) and BH3W (1.67m).
- Other than the occasional unusual result (such as for BH3W in August and December), the groundwater along the northern and eastern boundaries follows similar patterns, with a gradually falling groundwater level to the low in August and then rising again to the highest levels in December.
- For the groundwater along the western and southern boundaries, then more fluctuation in the levels is recorded especially in BH7 and BH12 and these locations are more likely to be influenced by the tidal nature of the river. In general, the levels follow a similar pattern of a gradually falling groundwater to July and August and then a more significant rising trend to December.

### 3.4.2 Groundwater Quality Monitoring – Key Parameters

A review of the groundwater quality monitoring data has been undertaken. Table 3E provides a summary of the concentrations for ammoniacal nitrogen which has trigger levels stated within the environmental permit (Schedule 3 Table 3.5) and control levels in accordance with the Landfill Aftercare Plan as detailed in Table 3C.

For Table 3E, when compiling summary statistics (e.g. mean values), where a parameter has not been detected at concentrations greater than the detection limit, the detection limit has been used in the calculations.

**Table 3E – Groundwater Quality Indicator – Ammoniacal Nitrogen**

Parameter	Borehole	2025			2024		
		Minimum	Maximum	Mean	Minimum	Maximum	Mean
Ammoniacal Nitrogen (mg/l)	BH1B	<0.015	1.4	0.98	0.025	2.2	0.85
	BH5	<0.015	0.016	0.02	<0.015	0.057	0.02
	BH8	2.6	41	20.34	0.015	38	13.85
	BH9B	0.28	0.98	0.68	0.063	3.6	1.05
	BH12	<0.015	1.7	0.27	<0.015	1.8	0.39
	BH15	<0.015	0.42	0.06	<0.015	0.2	0.06
	BH43B	83	120	104	42	110	80.58
	BH45B	83	130	102	19	130	85.8

For ammoniacal nitrogen the maximum values in red exceed the trigger level and those in orange exceed the control level.

BH8 / BH43B / BH45B – flooded December 2025

BH12 – dry August 2025

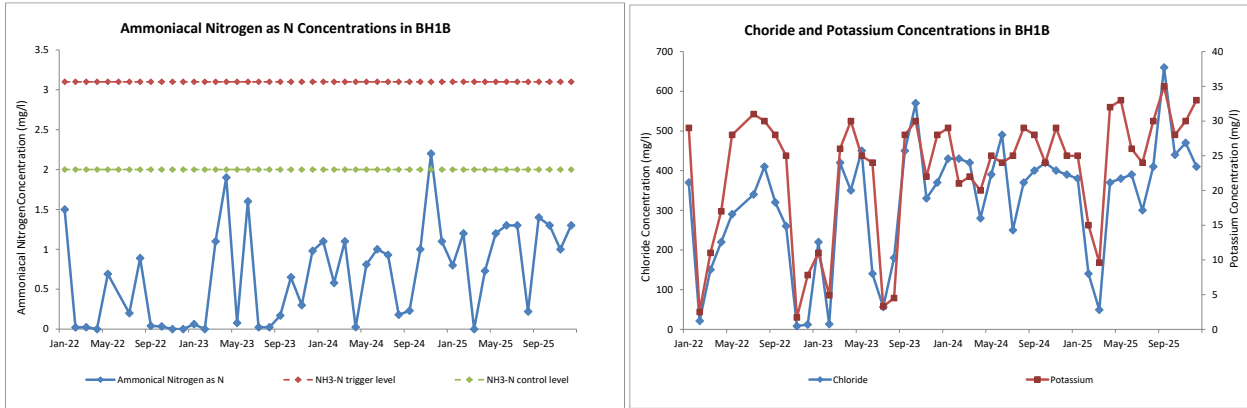
When comparing the 2025 groundwater data in Table 3E with the control and trigger levels specified in Table 3C, the following general comments can be provided:

- **Ammoniacal Nitrogen** – three of the eight boreholes exceeded either the trigger level or control level during 2025 (which compares to five of the eight boreholes in 2024, four boreholes in 2023 and three boreholes in 2022):
  - BH12 – The control level of 1.6mg/l was exceeded in July 2025 with a reading of 1.7mg/l.
  - BH45B – The trigger level of 59.5mg/l was exceeded on all eleven occasions (flooded December 2025). The concentration recorded was up to a maximum concentration of 130mg/l in April 2025.
  - BH43B – exceeded either the control or trigger level in all eleven occasions (flooded December 2025). Exceeded the trigger level of 108.9mg/l on six occasions (January, March to June and November) with the highest concentration being 120mg/l.

Note – graphical illustration of the ammoniacal nitrogen, chloride and potassium concentrations are provided for all boreholes below. Also note that there are no control or trigger levels set for the chloride or potassium concentrations in the groundwater at Giants Grave landfill.

**Borehole BH1B**

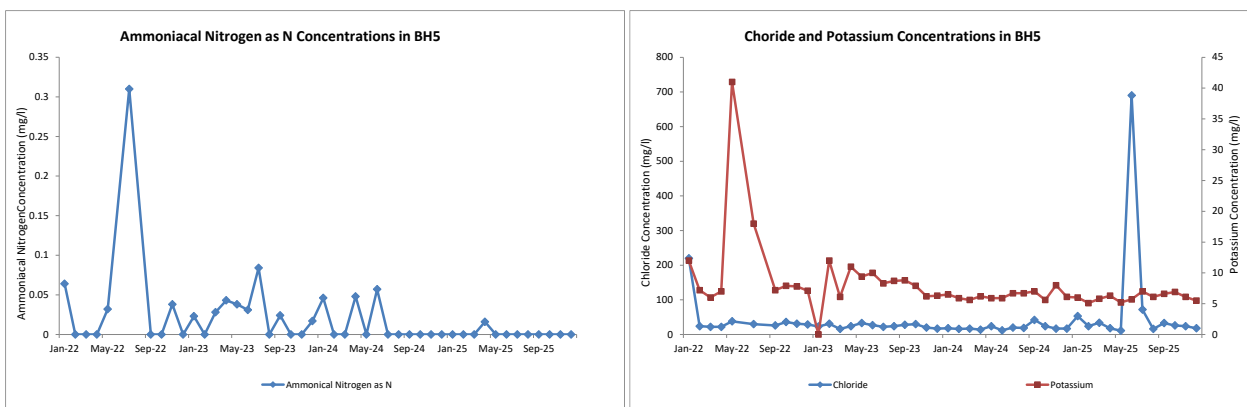
The ammoniacal nitrogen concentration continues to fluctuate but no exceedance of the control level in 2025 and so no repeat of control level exceedance in November 2024. The current ammoniacal nitrogen control and trigger levels for this location appear to remain relevant as an early warning of any adverse changes in groundwater quality.



The chloride concentrations in 2025 initially record a falling trend down to <50mg/l in March and then a subsequent rising trend up to the highest concentration recorded for several years at 660mg/l. The overall mean in concentrations for chloride is 367mg/l in 2025 compared with 389mg/l in 2024 but shows significant more fluctuation across 2025. The potassium concentrations have recorded a similar fluctuating pattern to chloride in 2025 but has a similar mean when compared with 2024.

**Borehole BH5**

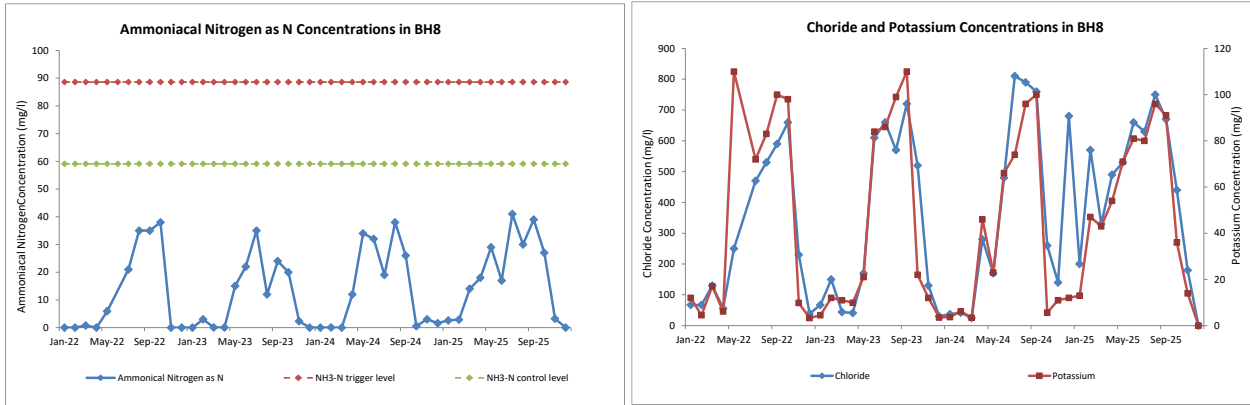
All concentrations since March 2018 have been <1mg/l with all 2025 concentrations <0.1mg/l. The control and trigger levels are not shown on the graph as they are set at concentrations of 15mg/l and 23mg/l respectively. Based on the data for the last few years, these control and trigger levels would not be considered fit for purpose as they are more than an order of magnitude above the typical concentrations recorded.



The graph illustrates that a significant spike for chloride has been recorded in June 2025 at 690mg/l compared with typical results between 20mg/l and 50mg/l, although the elevated result was not repeated for the remainder of 2025. The potassium concentrations remained consistent across 2025 and continue a similar pattern since 2023.

**Borehole BH8**

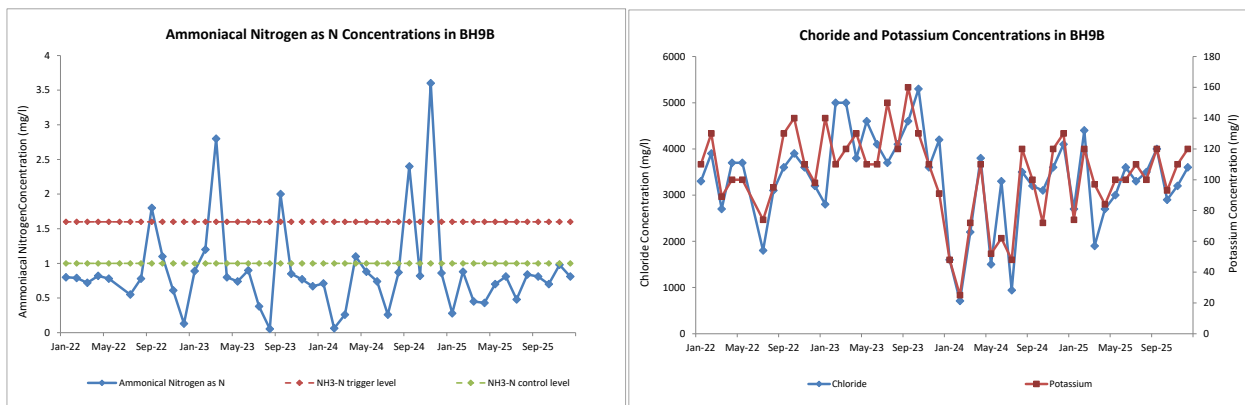
The ammoniacal nitrogen concentrations since early 2018 have remained below the control and trigger levels. The highest ammoniacal nitrogen concentrations recorded in 2025 are in the months May to November, as was the same in 2023 and 2024. This continues to suggest a seasonal pattern of higher detection in the summer to autumn months. No adverse trend noted for ammoniacal nitrogen in this groundwater.



The chloride and potassium in borehole BH8 continue to show a correlation throughout the recent years and including 2025. The highest concentrations for both potassium and chloride occur during June to September summer months with significantly lower concentration early and late in the year. Although the seasonal spikes are noted, there are no apparent adverse trends.

**Borehole BH9B**

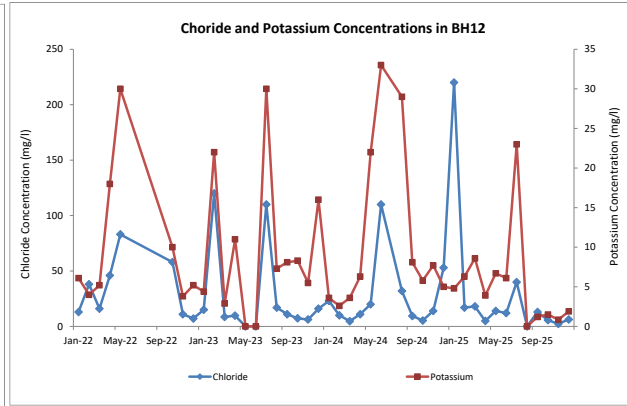
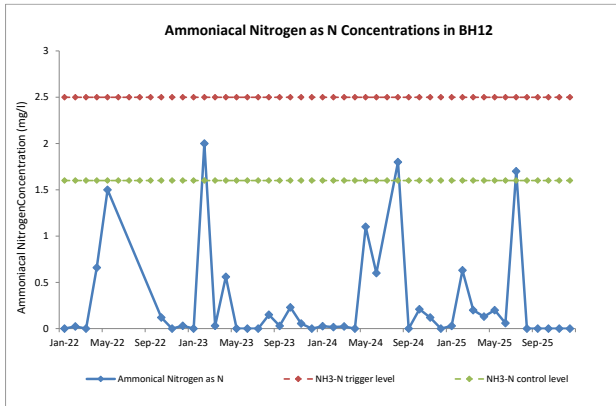
This borehole previously recorded occasional ammoniacal nitrogen results above the control and trigger levels including in September and November 2024. However, the results in 2025 have all remained below the control level of 1mg/l. The mean concentration across 2025 at 0.68mg/l is much lower than the means from recent years (including 1.05mg/l in 2024 and 1.0mg/l in 2023). Although occasional breaches of the trigger level are noted there are no ongoing adverse trends and the control level for ammoniacal nitrogen at 1.0mg/l (and higher trigger level of 1.6mg/l) would appear to be relevant.



Borehole BH9B continues to record the highest chloride concentrations of all the groundwater. The concentration of chloride and potassium correlate well across the last few years. No significant adverse trends are noted, although when considering the lowest concentrations in July 2024, there has been a general rising trend since (but well within ranges previously recorded at this location).

**Borehole BH12**

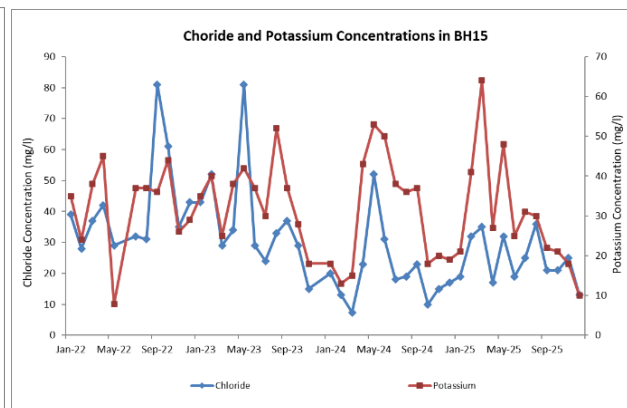
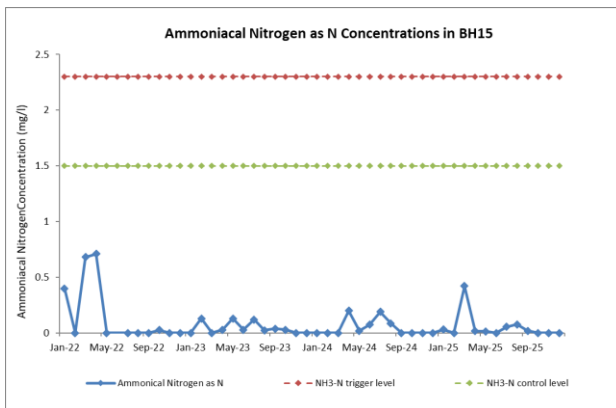
Due to insufficient groundwater being present, samples could not be obtained in August 2025. No exceedance of the trigger levels was recorded at this location in 2025, although one result at 1.7mg/l in July exceeded the 1.6mg/l control level. The groundwater continues to record fluctuating results, but the control and trigger levels remain relevant to this groundwater.



For chloride and potassium, the 2025 concentrations continue to record highly fluctuating pattern with occasional elevated spikes: chloride in January 2025 at 220mg/l (which is the highest concentration recorded in recent years) and potassium in July at 23mg/l (which continues a pattern of occasional spikes in potassium concentrations at this location).

**Borehole BH15**

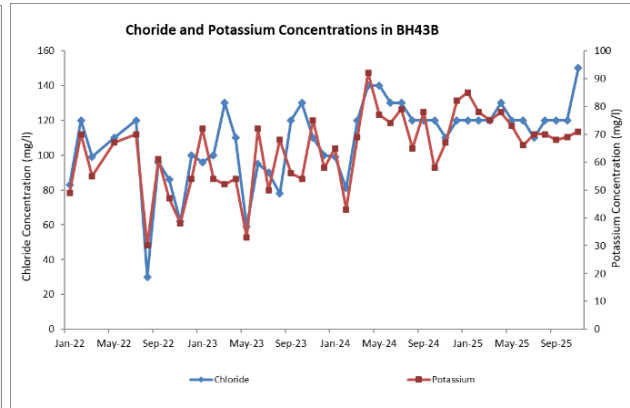
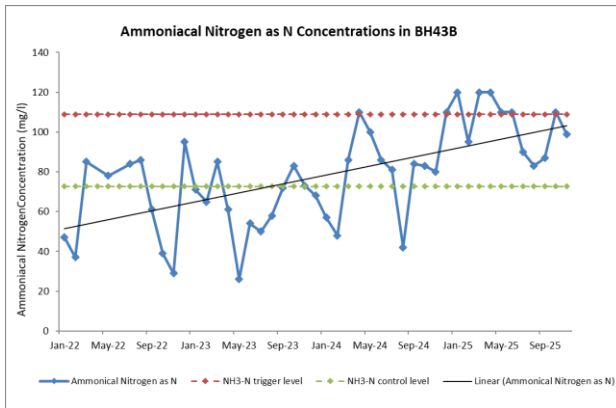
Although no longer on the graph below, an elevated spike of ammoniacal nitrogen was recorded in October 2018 at 7.6mg/l and so significantly above the trigger level. However, all subsequent readings have been well below the control level set at 1.5mg/l. The highest concentration recorded in 2025 is 0.42mg/l with several results below detection. The graph shows that the control and trigger levels are relevant to the data observed over the last few years.



Fluctuating results continue to be recorded for chloride and potassium, although no adverse trends noted. A spike in the concentration of potassium in March 2025 at 61mg/l is the highest recorded for several years.

**Borehole BH43B**

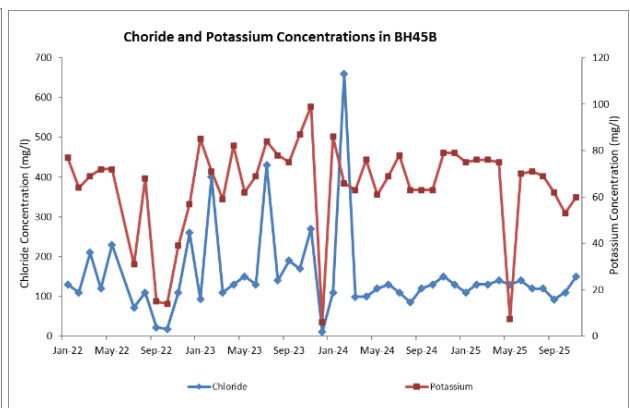
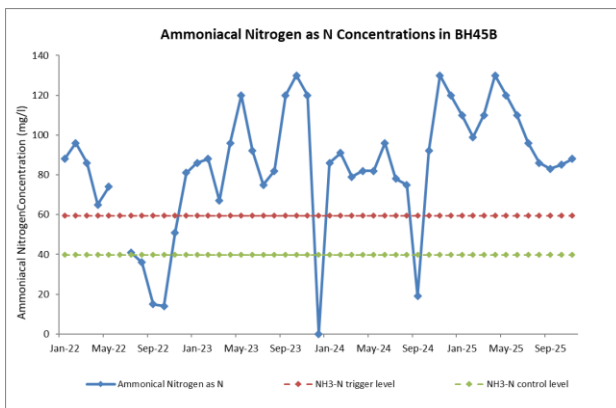
The ammoniacal nitrogen in 2025 continues a general rising trend observed since 2022 (as shown by the linear trendline on the graph) with all results in 2025 above the control level of 72.6mg/l. The results now fluctuate around the trigger level of 108.9mg/l with six of eleven results breaching this compliance level. The groundwater being sampled in this borehole has always had elevated ammoniacal nitrogen present, but the levels are now much higher. Potential investigation into the groundwater in the borehole should be considered.



Relatively consistent results for chloride and potassium in this location except a slight spike in December for chloride. The 2025 results do not continue the gradual rising trend observed over recent years for these parameters.

**Borehole BH45B**

All monitoring completed in 2025 has exceeded the trigger level of 59.5mg/l (eleven results as location flooded in December). The mean concentration in 2025 has increased to 102mg/l compared to 81mg/l in 2024. It is recognised that this location also records elevated methane and the likely presence of landfill gas as it is believed that this borehole (along with BH43B and BH40B) are buried in waste outside the landfill boundary and therefore outside the influence of the any onsite leachate and gas control infrastructure – although confirmation of this would be a recommendation.



The chloride in 2025 have recorded consistent concentrations of around 100mg/l and not repeated a spike recorded in 2024. Other than an atypical low result in May 2025, the potassium concentrations have shown a slight falling trend across 2025.

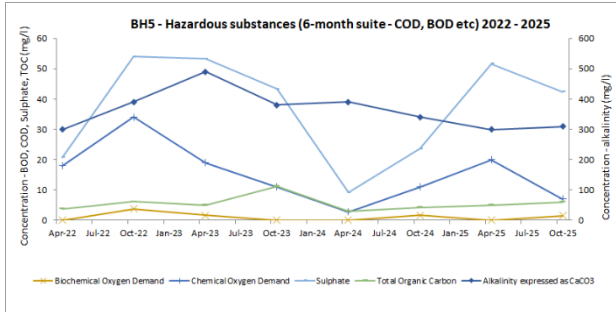
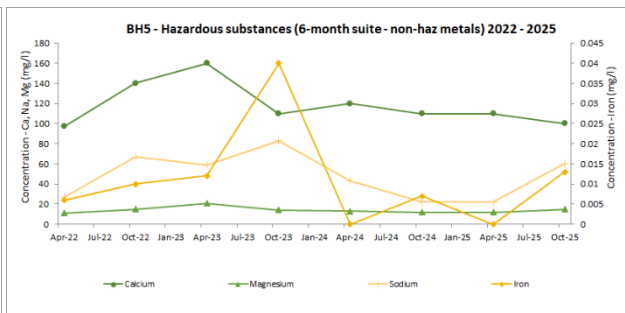
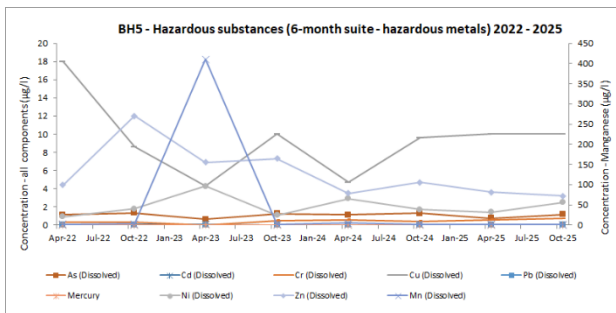
3.4.3 Groundwater Quality Monitoring – Other Parameters

a) Six-monthly

The six-monthly monitoring of groundwater for a range of metals and other parameters (such as COD, BOD etc) was undertaken in April 2025 and October 2025 for all locations. Graphical analysis is provided below for each of the boreholes and parameters tested with the most significant changes noted.

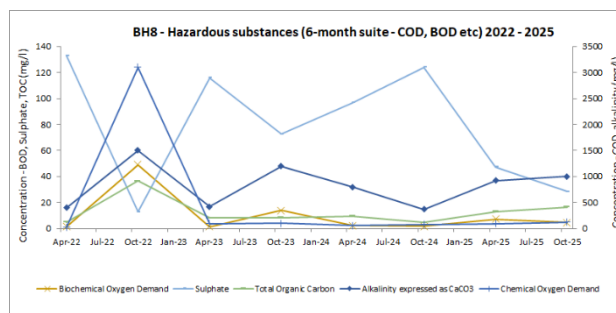
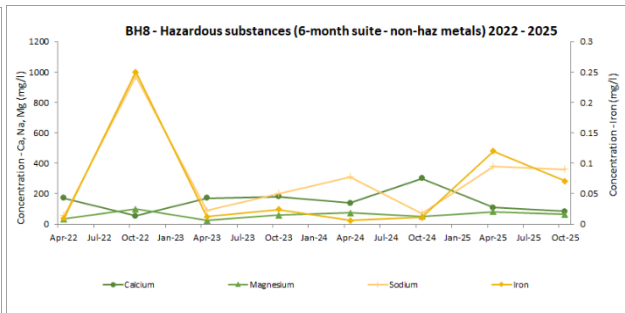
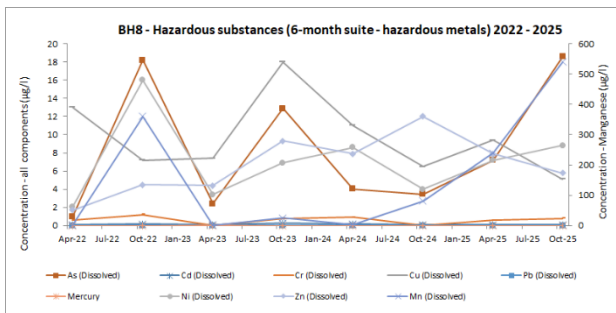
**BH5**

No order of magnitude differences observed in the hazardous substances for BH5 with relatively consistent results for the range of metals and anions across 2024 and 2025.



Of all the parameters, the most significant change is for sulphate between April 2024 and April 2025. Overall, no adverse trends noted for the six-monthly hazardous substances suite.

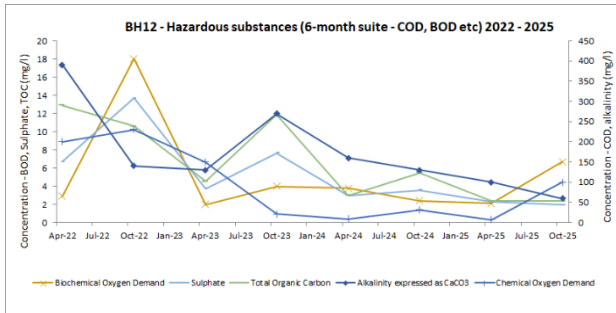
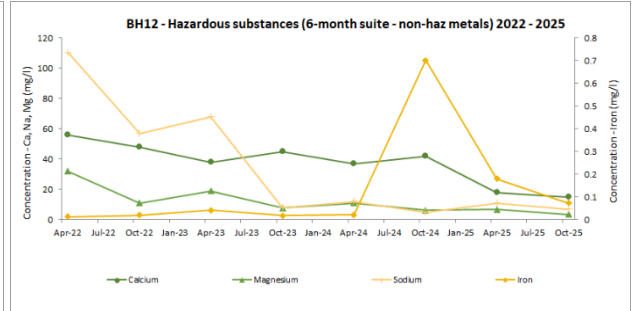
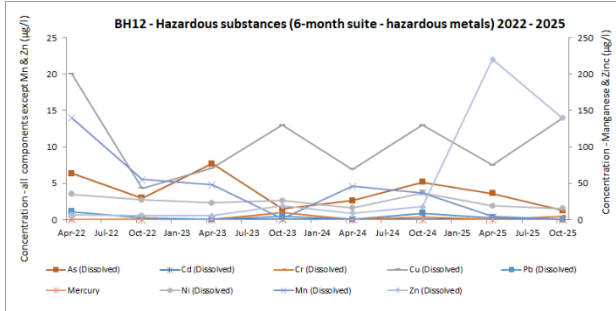
**BH8**



The most significant differences for hazardous substances suite in BH8 are the rising trend for arsenic from 2024 and a falling trend for sulphate levels since October 2024, otherwise no significant changes across 2024 into 2025.

**BH12**

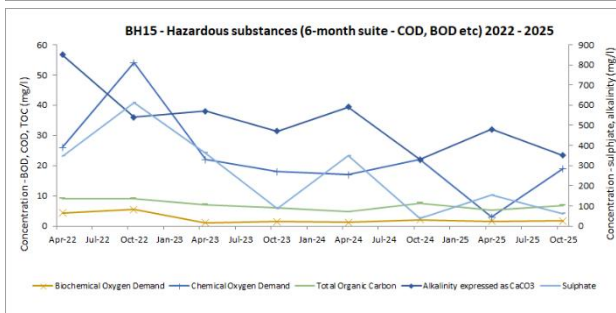
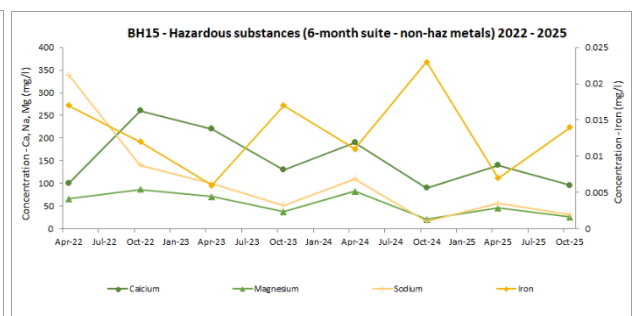
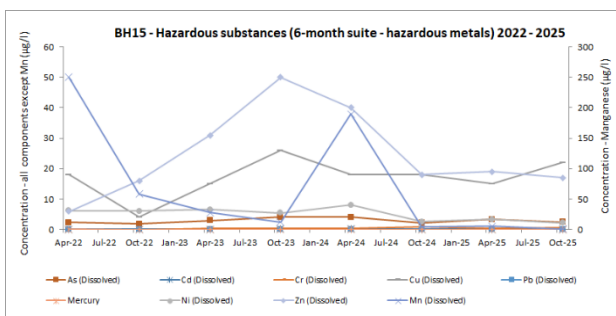
A significant increase in zinc compounds recorded in BH12 during 2025 compared to previous years. The hazardous metals graph includes zinc on the right-hand scale and recorded results an order of magnitude higher at 220µg/l and 140µg/l in 2025 compared with the highest result in 2024 of 18µg/l. All other hazardous metals do not record any significant differences in concentrations with 2024.



The spike in iron concentrations recorded in October 2024 has not been repeated with 2025 concentrations returning to levels previously recorded.

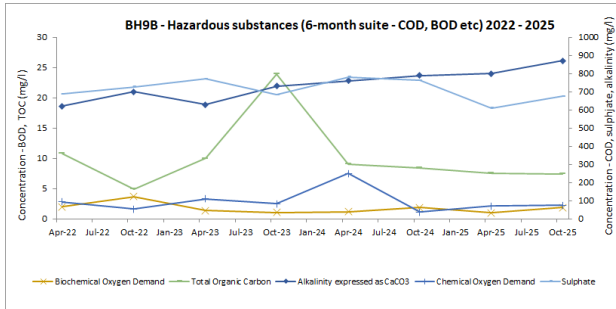
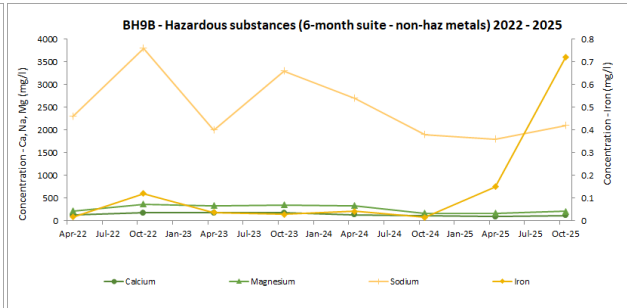
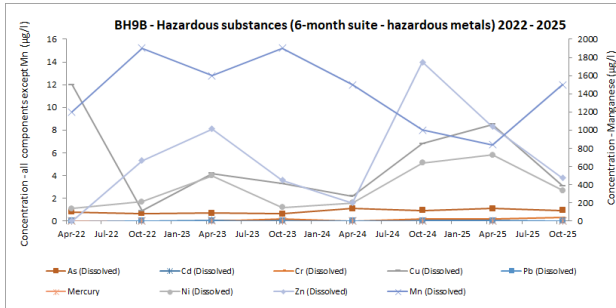
**BH15**

No order of magnitude differences observed in the hazardous substances for BH15 with relatively consistent results for the range of metals and anions across 2024 and 2025. Of all the parameters, the most significant change is the reduction in iron between October 2024 and April 2025. Overall, no adverse trends noted for the 6 monthly hazardous substances suite.



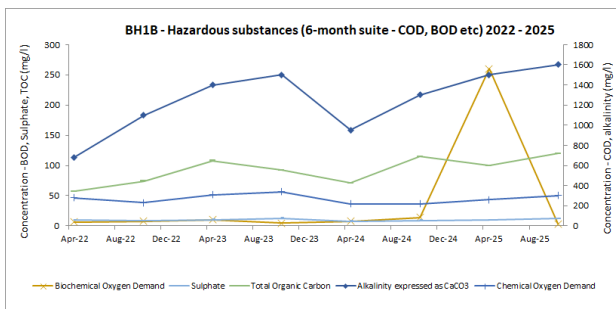
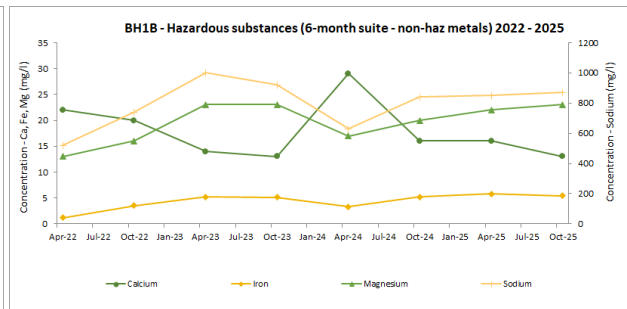
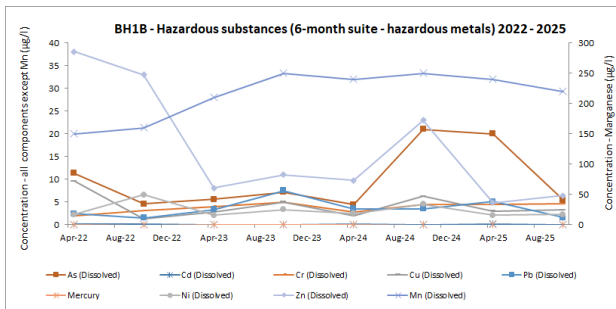
**BH9B**

Following an elevated spike in zinc in October 2024, the 2025 results have fallen to similar levels to those recorded across 2022 to 2023. The concentrations of iron record a rising trend in 2025. The alkalinity shows a gradual rising trend over recent years.



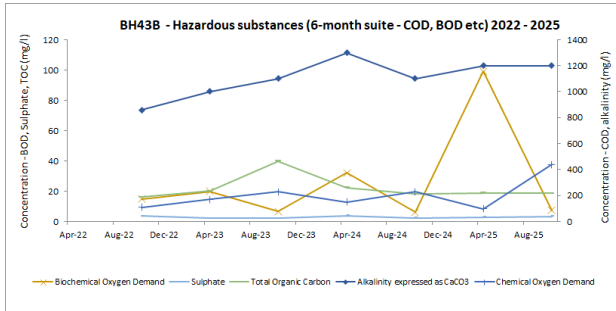
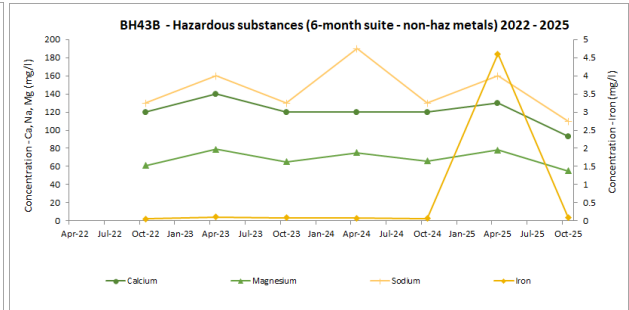
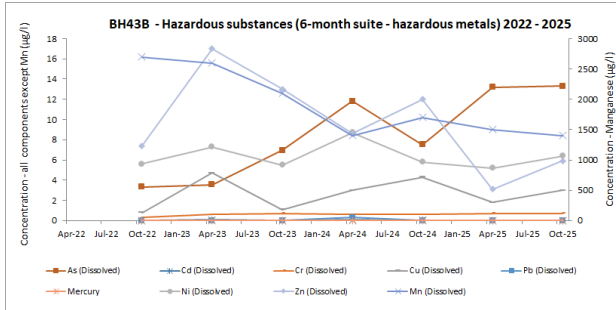
**BH1B**

Over the years zinc records a falling and then rising trend, with the 2025 results recording a falling trend to results lower than previously recorded. An elevated arsenic concentration in October 2024 was also recorded in April 2025 but lower later in 2025. The most significant change was an order of magnitude increase in BOD between October 2024 and April 2025, although this reversed in October back to low concentrations.



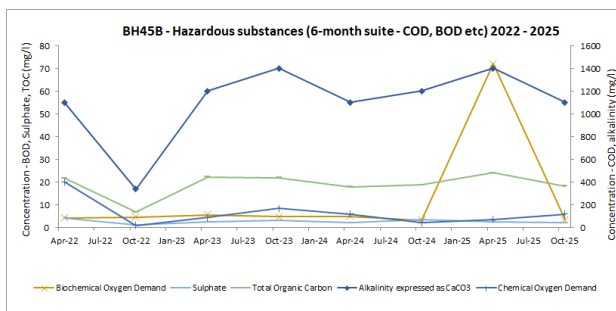
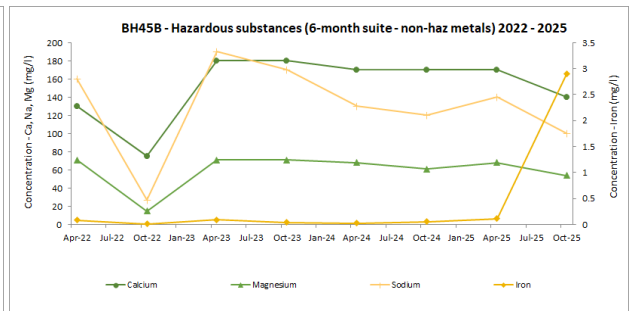
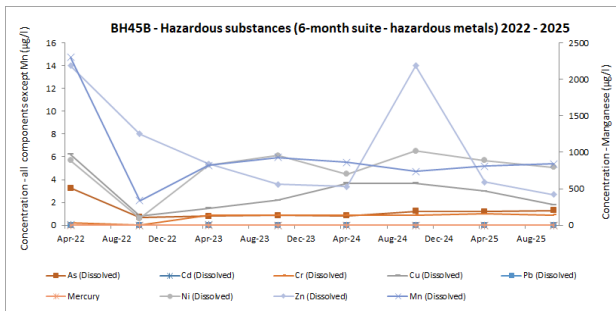
**BH43B**

There is a general rising trend in arsenic concentrations over recent years. The most significant changes was an order of magnitude increase in both BOD and iron between October 2024 and April 2025, although this reversed in October back to low concentrations.



**BH45B**

Since 2022 zinc concentrations have recorded a falling trend except a spike in October 2024, although the 2025 concentrations continue the falling trend previously observed. The most significant changes were an order of magnitude increase in BOD between October 2024 and April 2025, although this reversed in October back to low concentrations and also a spike in iron in October 2024.



**b) 2 yearly monitoring**

The 2-yearly monitoring for other hazardous substances was undertaken in October 2025 for all eight groundwater boreholes.

From this 2025 hazardous substances suite then the following comments can be made (in comparison to the 2023 results):

**Hazardous metals/metalloids**

2025 analysis	2023 analysis for comparison
Uranium detected in groundwater from boreholes BH5, BH8 and BH15 at similar levels to the 2023 analysis (which also recorded detection in the same boreholes)	
Antimony detected in two groundwater locations at up to 0.7µg/l	Antimony detected in five locations at up to 1.1µg/l
For those metals detected then the highest concentrations were recorded for boron at up to 1900µg/l (BH1B) with overall mean of 822µg/l and then barium up to 260µg/l (BH45B) with mean of 52µg/l.	Boron mean of 775µg/l with highest at 1900µg/l (BH1B) Barium mean of 72µg/l with highest up to 320µg/l (BH45B)
Cobalt detected in five samples with highest at 3.7µg/l in BH8 and then BH43B and BH45B.	Cobalt detected in the same five samples with highest at 3.1µg/l in BH43B.
Vanadium and molybdenum detected in all groundwater samples at up to 12µg/l and 2.3µg/l respectively. No significant differences between the 2025 and 2023 results.	Both metals recorded in all samples at up to 13µg/l V and 2.2µg/l Mo
Selenium detected in five groundwater samples at up to 2.6µg/l.	Se reported order of magnitude difference between the lowest results (<0.6µg/l) up to 29µg/l in BH9B
Overall, the groundwaters do not record any significant increases between the 2023 results and those from October 2025 for the hazardous metals.	

**Other inorganics**

2025 analysis	2023 analysis for comparison
No cyanide detected in any groundwater sample	
Fluoride detected in all samples with highest in BH1B at 2300µg/l (mean of 790µg/l)	Fluoride detected in all samples with highest in BH1B at 1800µg/l (mean of 655µg/l)
Nitrite detected in four samples with highest in BH8 at 200µg/l with all but BH9B recording lower concentrations than 2023	Nitrite detected in five samples with highest BH8 at 860µg/l

2025 analysis	2023 analysis for comparison
Phosphorous recorded an order of magnitude difference between samples with a range between 39µg/l and 5900µg/l (mean of 1435µg/l) with orthophosphate also recording a significant range between 53µg/l and 5600µg/l (mean of 808µg/l). The highest concentrations recorded in BH1B.	Phosphorous recorded an order of magnitude difference between samples with a range between 31µg/l and 500µg/l (mean of 1540µg/l) with orthophosphate also recording a significant range between <20µg/l and 5100µg/l (mean of 688µg/l). The highest concentrations recorded in BH1B.
Overall, the groundwaters do not record any significant increases between the 2023 results and those from October 2025 for the other inorganics analysed.	

### Hazardous organics

2025 analysis	2023 analysis for comparison
No benzo(a)pyrene or naphthalene detected in any groundwater sample across either 2023 or 2025.	
Mecoprop detected in three locations (BH8, BH43B and BH45B) at up to 1.5µg/l.	Mecoprop detected in three locations (BH8, BH43B and BH45B) at up to 1.4µg/l.
Most groundwaters did not record any detection of TPHs other than: <ul style="list-style-type: none"> <li>BH12 – aliphatic TPHs at 170µg/l recorded (C12 and above)</li> <li>BH45B – aromatic TPHs at 100µg/l recorded (C10 and above)</li> </ul>	No TPH detections in 2023
No BTEX detected in either 2023 or 2025 – the 2025 results include improved minimum reporting values.	
No phenol or phenol compounds detected in either 2023 or 2025.	

Overall, the 2025 hazardous substances analysis has not recorded any results that are significantly different from those recorded in 2023.

### 3.5 Summary and Recommendations for the Groundwater Monitoring Programme

For groundwater quality, the main concerns arising in 2025 are the continued breaches of the trigger level for ammoniacal nitrogen BH43B (on seven occasions) and BH45B at all occasions.

A further location (BH12) also exceeded the control level on one occasion.

The most significant rising trend observed continues to be for ammoniacal nitrogen for BH43B (although a rising trend in chloride and potassium for this location did not continue throughout 2025).

In general, no significant adverse trends noted in the biannual hazardous substances monitoring nor the hazardous substances monitored on a two-yearly basis. The most significant differences were for zinc concentrations in BH12 (rising by an order of magnitude) and the occasional spike (order of magnitude increase) for iron and BOD.

For the 2024 annual report C & P were asked to consider whether the environmental monitoring undertaken across the site might be considered too onerous for a closed landfill site and what option might there be for reducing the monitoring whilst continuing to ensure environmental protection. This report does not repeat these recommendations as discussions on any reduction of monitoring are ongoing between NPTCBC and Natural Resources Wales.

It is understood that the current monthly frequency of groundwater monitoring cannot be revised without justification through a review of the hydrogeological risk assessment (HRA). This is especially the case where there have been breaches of the trigger levels over recent years (including BH43B and BH45B in 2025 plus BH9B in 2024).

However, the monitoring in 2025 (including for hazardous substances) has not changed the overall pattern of the groundwater quality and so would not significantly impact on recommendations provided previously.

For any such changes then there would be a requirement for a review of the HRA alongside a permit variation and a review of the Landfill Aftercare Plan including any contingency action to any elevated results recorded.

## 4 Surface Water Monitoring

This section provides a summary of the surface water monitoring at Giants Grave for 2025 in accordance with Schedule 3, Table 3.9 of the environmental permit EPR/SP3298FT and Appendix A4 of the Landfill Aftercare Plan.

A new monitoring regime was agreed with NRW from June 2017 onwards. For surface water monitoring the only change was to remove the requirement to analyse for chloride and to remove the visual inspection for any evidence of contamination.

Within the Addendum to the HRA<sup>2</sup> (approved by NRW and ratified by the NPTWM Board during 2020), the following is stated:

“Once the proposal to revise compliance limits, as set out in this Addendum, have been determined by NRW, NPTWM will submit a revision to the Aftercare Plan in respect of control and trigger levels for surface water:

- To remove Chloride limits from River North and River South (in accordance with Section 8.2 of HRA2016); and
- To revise Ammoniacal Nitrogen limits at River North and River South (in accordance with the 2018 Annual Report).”

Although the changes to chloride were implemented from June 2017, the changes to compliance limits for ammoniacal nitrogen have not been implemented and are awaiting a revision to the Landfill Aftercare Plan.

### 4.1 Surface Water Monitoring Locations

Surface water monitoring is undertaken at four monitoring locations near the site:

- The Neath Canal forms the eastern boundary of Giants Grave Landfill Site. The Canal has only minimal flow from north to south. The monitoring points, Canal North and Canal South, are located on the Canal, adjacent to the Northern and Southern extents of the site respectively.
- The River Neath forms the southwestern boundary to the western extension and forms part of the western boundary to the southern extension. The river flows from north to south and is considered tidal at this point. Monitoring points – River North and River South - are located on the River Neath, adjacent to the Northern and Southern extents of the site respectively.

The locations of the surface water monitoring points are shown on the sampling location plan in Appendix E.

### 4.2 Surface Water Monitoring Requirements

Table 4A summarises the surface water monitoring requirements of the environmental permit and Landfill Aftercare Plan.

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<sup>2</sup> Giants Grave Landfill Site (in Aftercare) - EPR/SP3298FT - Addendum to the Hydrogeological Risk Assessment Review 2016 (NPTWM, April 2016)

**Table 4A – Surface Water Monitoring Schedule**

Monitoring Point	Parameter	Monitoring Frequency
Canal North; Canal South; River North; River South  NB River North and River South sampled at high tide to help minimise the safety risk to monitoring personnel at these locations	pH, Temperature, Electrical Conductivity, Ammoniacal Nitrogen, Suspended Solids, Chemical Oxygen Demand, Biological Oxygen Demand, Dissolved Oxygen, Nickel, Nitrate, Phenol	Monthly

### 4.3 Surface Water Control and Trigger Levels

Control and trigger levels, along with observed trends from control and trigger charts, provide a warning to the site operator that a problem may be occurring. They can be used to spot adverse trends in the monitoring data, or changes because of natural variations in the background water quality. Control levels are intended to provide an early warning indicator for when the landfill is beginning to deviate from its design performance so that corrective or remedial measures can be implemented before a trigger level is exceeded.

Surface water control and trigger charts for the key parameter of ammoniacal nitrogen have been prepared for the surface water monitoring locations specified in Table 4B. These limits are not stated in the environmental permit but were set within the Landfill Aftercare Plan. This annual environmental report reviews and recommends whether these control and trigger levels are relevant.

**Table 4B – Surface Water Control and Trigger Levels**

Parameter	Surface Water Monitoring Location	2010 Trigger Level	2010 Control Level
Ammoniacal Nitrogen (mg/l)	Canal North	1.0	0.7
	Canal South	0.5	0.3
	River North	0.4	0.3
	River South	0.5	0.3

## 4.4 Surface Water Monitoring Results and Data Assessment

### 4.4.1 Surface Water Quality Monitoring

Table 4C provides a summary of the key surface water indicator parameters analysed monthly.

**Table 4C – Surface Water Quality Indicator Parameters**

Parameter	Monitoring Location	Minimum	Maximum	Mean	Comments
Parameters with Control and Trigger Levels					
Ammoniacal Nitrogen (mg/l)	Canal North	<0.015	<b>0.95</b>	0.113	One exceedance of control level (July)
	Canal South	0.022	<b>0.44</b>	0.2	One exceedance of control level (Dec)
	River North	<0.015	<b>13</b>	1.2	One exceedance of trigger level (July) all other results <0.03mg/l
	River South	<0.015	<b>1.5</b>	0.15	One exceedance of trigger level (July) all other results <0.1mg/l

Parameter	Monitoring Location	Minimum	Maximum	Mean	Comments
Nickel (µg/l)	Canal North	1.4	3.4	2.2	All samples recorded positive detections and relatively consistent when considering the range and the means
	Canal South	1.5	4.1	2.3	
	River North	<0.5	4.2	2.0	All samples recorded positive detections. More variable than canal results with the range but similar mean concentrations overall
	River South	<0.5	7.9	2.1	
Chemical Oxygen Demand (mg/l)	Canal North	<2	25	8.6	The range indicates an order of magnitude difference between the lowest and highest concentrations, with the mean concentrations being similar
	Canal South	<2	22	9.7	
	River North	5.5	1300	684.5	The range indicates two order of magnitude differences between the lowest and highest concentrations, although the mean concentrations are not too dissimilar. Monthly results can be variable upstream and downstream
	River South	8.6	1500	771.2	
Biological Oxygen Demand (mg/l)	Canal North	<1	3.4	1.8	The ranges and mean concentrations are not too dissimilar between the upstream and downstream samples. The monthly results are relatively similar, although tend to be slightly higher downstream for the Canal samples.
	Canal South	1.2	4.4	2.4	
	River North	<1	6.7	2.2	
	River South	1	5	2.1	
Phenol (mg/l)	Canal North	<0.0005	<0.0005	-	No Phenol detected during 2025
	Canal South	<0.0005	<0.0005	-	
	River North	<0.0005	<0.0005	-	
	River South	<0.0005	<0.0005	-	

Parameter	Monitoring Location	Minimum	Maximum	Mean	Comments
Nitrate as N (mg/l)	Canal North	<0.01	0.54	0.2	Generally similar readings N & S across most months. The ranges and means similar.
	Canal South	<0.01	0.65	0.2	
	River North	0.02	0.58	0.2	Similar readings N & S except Jun (N much higher than S) and September (where S much higher than N)
	River South	0.01	2.24	0.4	
Total Suspended Solids (mg/l)	Canal North	<2	13	5.5	Generally similar readings N & S across most months. The ranges and means similar.
	Canal South	<2	16	5.0	
	River North	9	160	58.3	The readings upstream and downstream show a difference on monthly readings but overall, a similar range and mean concentrations for 2025
	River South	9.7	180	73.1	

General Note – (Unless otherwise stated in the table above) when compiling summary statistics (e.g. mean values), where a parameter has not been detected at concentrations greater than the detection limit, the detection limit has been used in the calculations.

River North – no access during December 2025

### a) Canal North and Canal South

Surface water monitoring data was collected from Canal North and Canal South monthly throughout 2025. Table 4D summarises the ammoniacal nitrogen concentration range in 2025 and compares with those observed during 2023 and 2024.

During 2025 there were two exceedances of control levels but no exceedance of compliance/trigger levels:

- **Canal North - Ammoniacal nitrogen:** The control level was exceeded in July at 0.95mg/l (compared with control level of 0.7mg/l)
- **Canal South - Ammoniacal nitrogen:** The control level was exceeded in December at 0.44mg/l (compared with control level of 0.3mg/l).

The trends for ammoniacal nitrogen compared to the control and trigger levels for Canal North and Canal South can be observed graphically below.

**Table 4D – Summary of Canal North and Canal South Monitoring Data**

Monitoring Point	Ammoniacal Nitrogen Ranges (mg/l)		
	2023	2024	2025
Canal North	0.035 – 3.5	<0.015 – 0.2	<0.015 – 0.95
Canal South	0.1 – 0.85	0.016 – 0.43	0.022 – 0.44

From the information in Tables 4C and 4D, and a review of the 2025 data in Appendix C the following observations can be made for the Canal monitoring locations:

- For many of the parameters measured, the maximum and mean concentrations for both Canal North (upstream) and Canal South (downstream) are similar and there is no

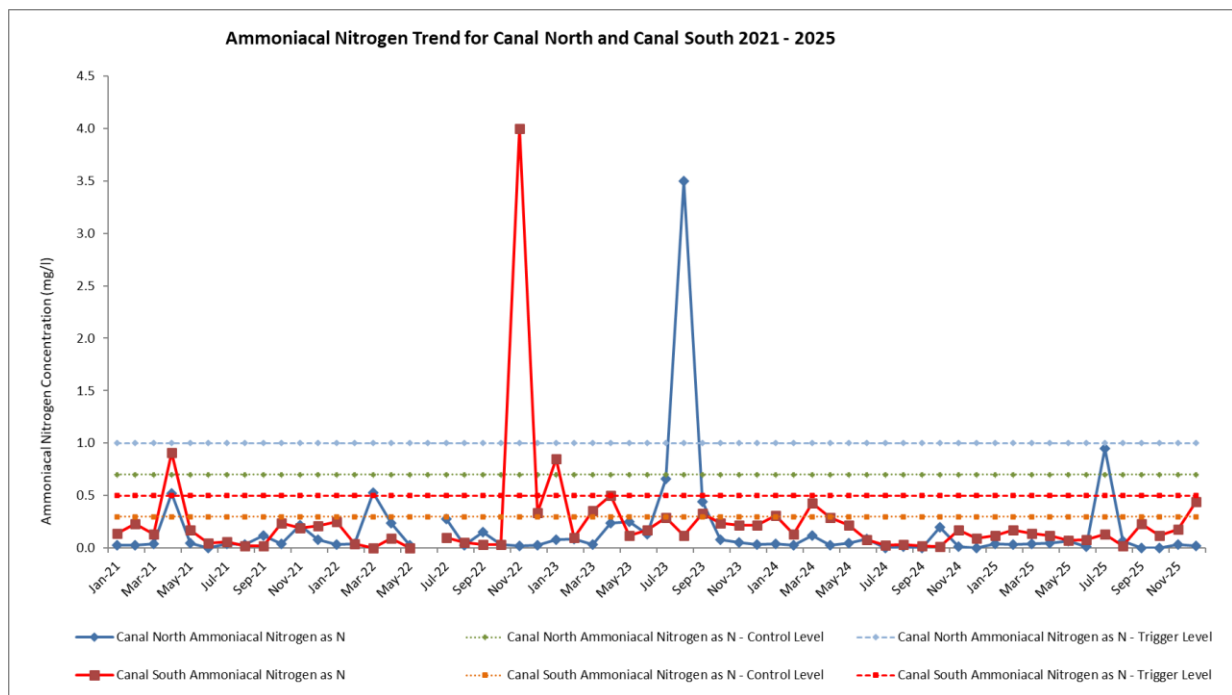
obvious impact on water quality between the upstream and downstream locations. This is applicable to the parameters of nickel, COD, phenol, nitrate and suspended solids.

- For these parameters, there are no order of magnitude differences between the north and south monitoring locations monthly. These parameters are not considered further in this report.
- For BOD, nine of the twelve months record slightly higher results downstream compared to upstream with the most significant difference being in September where upstream is at 1.6mg/l compared to downstream at 4.1mg/l, whereas for COD the monthly pattern is more mixed.
- In 2025 the ammoniacal nitrogen concentrations tend to show slightly higher concentrations in the downstream monitoring location – other than in July where the highest result is recorded upstream. This is further described below.

Ammoniacal nitrogen

Graphical analysis for the ammoniacal nitrogen concentrations in the upstream and downstream samples is provided below. The upstream and downstream results were within 0.2mg/l on most occasions in 2025 except in the following months:

- July - in which the Canal North location recorded the locations highest concentration of 0.95mg/l compared with 0.13mg/l in Canal South. The Canal North concentration exceeded the control level for this location but remained below the trigger level.
- In December where the upstream result was 0.023mg/l compared to 0.44mg/l in the downstream monitoring locations. This is an order of magnitude difference, and the December result exceeded the control level at the downstream location.



For understanding the potential environmental impact of the site then the most important results are where the downstream monitoring location records a much higher result than the upstream monitoring location, such as in December, as this may indicate an impact from the landfill. However, the trigger level for the downstream south monitoring location (0.5mg/l) was not exceeded during 2025 or 2024 having previously been exceeded once during each of the four

years between 2020 and 2023. Although there may be some impact from the landfill, the impact would not likely be considered significant.

## b) River North and River South

Surface water monitoring data was collected from River North and River South monthly throughout 2025 (no access River North in December). The River North and River South monitoring points are subject to both tidal influence (saltwater) and the flow of the river (freshwater). Both are sampled at high tide to minimise the safety risks posed to monitoring personnel – with both samples being taken within approximately 15mins of each other in the same tidal cycle. The samples tend to be taken from the downstream sampling point prior to the upstream, although there is no specific rule for this order.

During 2025 there was one exceedance of the trigger levels in both River North and River South during July 2025. There were no other elevated results recorded in 2025. The specific breaches were:

- **River North - Ammoniacal nitrogen:** The compliance/trigger level was exceeded in July at 13mg/l (compared with trigger level of 0.4mg/l).
- **River South - Ammoniacal nitrogen:** The compliance/trigger level was exceeded in July at 1.5mg/l (compared with control level of 0.5mg/l).

Table 4E summarises the ammoniacal nitrogen concentration range in 2025 and compares with those observed during 2023 and 2024. The trend for ammoniacal nitrogen compared to the control and trigger levels for River North and River South can be observed graphically below.

**Table 4E – Summary of River North and River South Monitoring Data**

Monitoring Point	Ammoniacal Nitrogen Ranges (mg/l)			
	2023	2024	2025 (with July elevated results)	2025 (without July elevated results)
River North	0.035 – 0.53	<0.015 – 0.082	<0.015 - 13	<0.015 – 0.029
River South	<0.015 – 0.38	<0.015 – 0.4	<0.015 – 1.5	<0.015 – 0.098

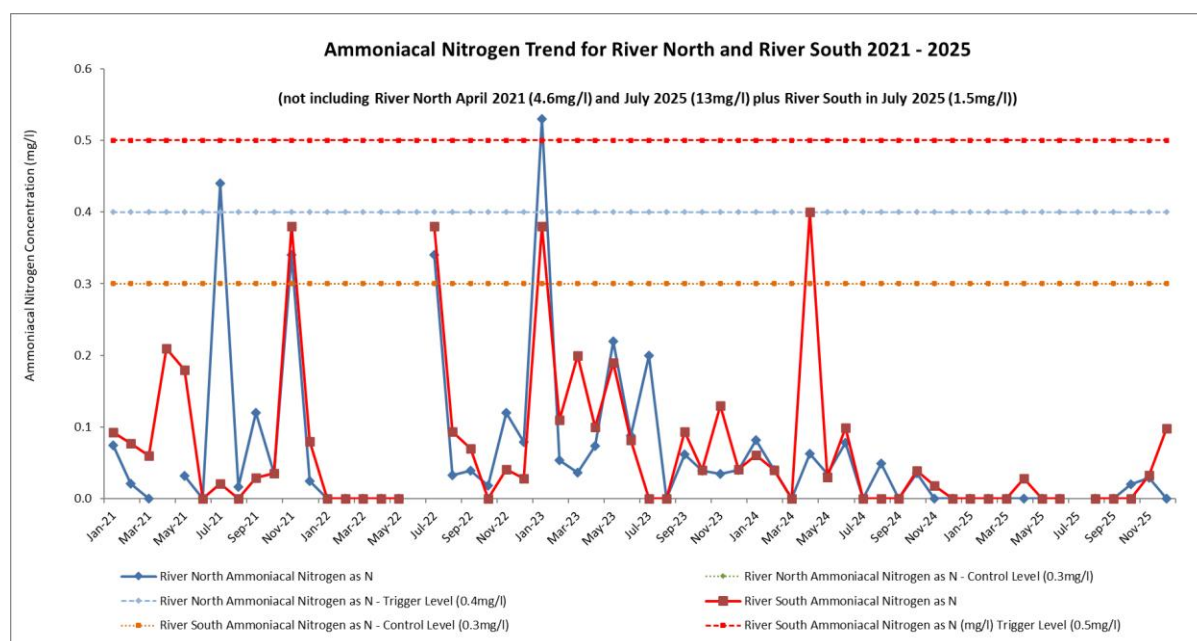
### Ammoniacal nitrogen

The ammoniacal nitrogen concentrations in the upstream and downstream samples were within 0.1mg/l on all occasions in 2025 except for the elevated concentrations recorded both upstream and downstream. For seven of the months the ammoniacal nitrogen in both locations was below the minimum reporting value of 0.015mg/l. In all but July, the results were less than 0.1mg/l.

Table 4E shows that, other than for the July elevated result, the minimum, maximum and range of ammoniacal nitrogen results in River South is lower than in 2024 and 2023. Other than for the July result the River North ammoniacal nitrogen levels are lower than those recorded in 2024 and 2023.

The one concern in 2025 is the significantly elevated ammoniacal nitrogen concentrations in July at 13mg/l in River North and 1.5mg/l in River South, that both exceed their relevant compliance level. However, as these are in the same month and the upstream sample is showing a much higher concentration than downstream it suggests the contamination is arising from north of the landfill site and the landfill was not the likely cause this elevated result.

The graph below has not included the significantly elevated July 2025 results (and also a previously elevated River North result in April 2021) as it does not allow the trends and comparison between the upstream and downstream locations to be observed.



As can be seen from the graph the ammoniacal nitrogen concentrations at River North and River South correlate reasonably well during 2025. The downstream samples are occasionally higher than upstream but, for 2025, are all within 0.1mg/l except for the elevated results in both locations in July.

Recommendations in the 2024 annual report for potential to reduce the frequency of monitoring for the River location was based on there not being breaches of the trigger levels for these surface water locations in recent years. Due to the exceedence of trigger levels then further discussion will be required as to whether reduced frequency is applicable – although there is some mitigation that the elevated ammoniacal nitrogen in July appears to arise from upstream of the landfill site.

### Other parameters

For the other parameters (except for phenol where there were no detections recorded), the following provides a summary of any monitoring where there was a significant difference between the upstream and downstream locations in 2025:

- The suspended solids recorded variable levels between upstream and downstream with no consistency as to which recorded higher concentrations. The most significant difference occurred in January where upstream recorded 26mg/l and downstream 160mg/l, The highest result of 180mg/l in December is much lower than the high of

1100mg/l in 2024. There is no obvious impact from the landfill for suspended solids in the river surface water.

- Nitrate recorded similar concentrations upstream and downstream other than for September where the downstream result was an order of magnitude higher. Although there are a range of sources for nitrate in surface water, the slightly elevated result recorded in the downstream sample in September may be due to oxidised ammoniacal nitrogen in the leachate being discharged through the reed bed treatment system.
- For nickel, the upstream sample typically recorded slightly higher results than downstream. However, the most significant difference was recorded in June with the upstream at 1.4µg/l compared with downstream at 7.9µg/l.
- For BOD, there is a variability between the upstream and downstream samples with respect to which records higher concentrations, although all comparative monthly results are within 2mg/l.
- The most significant differences in concentrations upstream to downstream are seen for COD. The results are all within an order of magnitude except the following:
  - June: upstream 120mg/l and downstream 970mg/l
  - October: upstream 9.1mg/l and downstream 770mg/l
  - There are many sources that would impact on COD results but the difference between upstream and downstream means that the treated landfill leachate discharge through the reed beds cannot be discounted as an impact.

#### 4.5 Summary and Recommendations for Surface Water Monitoring

Trigger and control levels for ammoniacal nitrogen are detailed in the Aftercare Plan for the surface water monitoring and based on the 2025 data, the control and trigger levels for the River and Canal monitoring locations remain relevant.

For the River Neath there was a single exceedance of the trigger level for ammoniacal nitrogen in both the upstream sample and the downstream in the same month of July. However, as these are in the same month and the upstream sample is showing a much higher concentration than downstream it suggests the contamination is arising from north of the landfill site and the landfill was not the likely cause this elevated result.

For the canal monitoring locations there was one occasion that the upstream (July) and downstream location (December) exceeded the control level but not the trigger level. Although there may be some impact from the landfill, the impact would not likely be considered significant.

For the 2024 annual report C & P were asked to consider whether the environmental monitoring undertaken across the site might be considered too onerous for a closed landfill site and what option might there be for reducing the monitoring whilst continuing to ensure environmental protection. This report does not repeat these recommendations as discussions on any reduction of monitoring are ongoing between NPTCBC and Natural Resources Wales.

For this report, the main consideration for any potential for reduction is to consider whether the 2025 data raises any concerns with the recommendations provided in 2024.

A reduction in monitoring where only control levels are occasionally exceeded would likely be justified which is the case for the canal monitoring. However, the breach of trigger levels in the

river monitoring would likely mean a reduction in monitoring is not an option until further justification (possibly through an amendment to the HRA) is provided.

In addition to any requirements for a permit variation, for any such changes then there would be a requirement for a review of the Landfill Aftercare Plan including any contingency actions responses to any elevated results recorded.

## 5 Landfill Gas Monitoring

This section provides a summary of the perimeter gas monitoring at Giants Grave for 2025 as required by the environmental permit EPR/SP3298FT and Appendix A1 of the Landfill Aftercare Plan.

### 5.1 Landfill Gas Monitoring Locations

#### 5.1.1 Perimeter Gas Monitoring Locations

Perimeter gas monitoring is undertaken from a total of 16 boreholes around the landfill site. The locations of these perimeter gas monitoring points are shown on the sampling location plan in Appendix E.

Perimeter gas is monitored from eleven boreholes to the north and east of the capped and restored area of the site. These boreholes are located as follows:

- Boreholes BH9B, BH7B, BH5B and BH3W are located on the northern boundary of the site in a clockwise direction from the northern tip of the site proceeding southeast along the northern boundary; and
- Boreholes BH1B, BH49W, BH47W, BH45B, BH43B and BH40B are located along the eastern boundary adjacent to the canal in a clockwise direction from the north-eastern tip of the site proceeding southwest along the eastern boundary.
- Borehole BH55B is located to the east of the site on the opposite side of the Neath Canal on latitude just north of BH45B.

The monitoring from along the western edge of the site comprises boreholes BH4, BH5 and BH8. These boreholes are located along the eastern boundary of the Western Extension Area (towards the bottom of the west bund of the Cut).

The monitoring from within the Southern Extension Area comprises boreholes BH12 and BH15. These boreholes are located as follows:

- Borehole BH12 is located towards the middle of the Southern Extension Area; and
- Borehole BH15 is located at the bottom of the river bund on the western edge of the extension area.

#### 5.1.2 In-Waste Landfill Gas Monitoring Locations

It is understood that the in-waste landfill gas monitoring is conducted at the monitoring point locations Manifolds A to D, although this information has not been received or reviewed by C&P Environmental Ltd.

Annual report requirements for the landfill gas elements of the permit are provided in Appendix F.

## 5.2 Landfill Gas Monitoring Requirements

### 5.2.1 Perimeter Gas Monitoring Requirements

Table 5A summarises the perimeter gas monitoring requirements of the environmental permit EPR/SP3298FT and Landfill Aftercare Plan.

**Table 5A – Perimeter Landfill Gas Monitoring Schedule**

Monitoring Point	Parameter	Monitoring Frequency
North: BH3W, BH9B, BH5B, BH7B East: BH1B, BH40B, BH43B, BH45B, BH47W, BH49W, BH55B South: BH12, BH15 West: BH4, BH5, BH8	Oxygen, Temperature, Atmospheric Pressure, Differential Pressure, Carbon Monoxide, Meteorological Conditions	Monthly
	Methane	Monthly
	Carbon Dioxide	Monthly

*All locations were able to be monitored during 2025 other than BH8 and BH45B in December due to flooding in the area.*

### 5.2.2 In-Waste Landfill Gas Monitoring Requirements

Tables 5B summarises the in-waste gas monitoring undertaken on a monthly schedule at Giants Grave landfill site (Schedule 3, Table 3.8 of the environmental permit). As no data is provided by the monitoring contractor for the in-waste landfill gas wells then it cannot be confirmed that the monitoring regime was complied with. Annual report requirements for the landfill gas elements of the permit are provided in Appendix F.

**Table 5B – In-Waste Landfill Gas Monitoring Schedule**

Monitoring Point	Parameter	Monitoring Frequency
All gas collection wells and any other (in-waste) gas monitoring points	Methane, Carbon Dioxide, Oxygen, Balance gas, Atmospheric Pressure, Differential Pressure, Carbon Monoxide, Meteorological Conditions	Monthly
	Hydrogen sulphide	Six-monthly

## 5.3 Perimeter Gas Control and Trigger Levels

The control and trigger levels for perimeter landfill gas monitoring for 2025 are presented as a single action level for carbon dioxide and an action and compliance level for methane. No methane action or compliance levels are currently applicable for unstable data – including for boreholes BH3W, BH40B, BH43B and BH45B. The environmental permit EPR/SP3298FT does not state any limits for carbon dioxide. The compliance limits are detailed in Schedule 3, Table 3.6 of the environmental permit. These levels are presented in Table 5C below.

**Table 5C – Perimeter Gas Emission Action and Compliance Levels**

Borehole	Data Stability	CO <sub>2</sub> Action %	CH <sub>4</sub> Action %	CH <sub>4</sub> Compliance %
<b>Northern boundary</b>				
BH3W	Unstable	8.4	n/a	n/a
BH5B	Stable	1.4	0.9	1.4
BH7B	Stable	1.1	0.7	1.2
BH9B	Stable	1.2	0.7	1.2
<b>Western boundary (Western Extension)</b>				
BH4	Stable	2.0	0.7	1.2
BH5	Stable	3.5	0.7	1.2
BH8	Stable	1.6	0.7	1.2
<b>Southern boundary (Southern Extension)</b>				
BH12	Stable	1.9	0.7	1.2
BH15	Stable	3.1	0.7	1.2
<b>Eastern boundary</b>				
BH1B	Stable	2.7	3.6 <sup>1</sup>	4.1 <sup>1</sup>
BH40B	Unstable	4.7	n/a	n/a
BH43B	Unstable	12.8	n/a	n/a
BH45B	Unstable	13.9	n/a	n/a
BH47W	Stable	4.5	2.5	3.0
BH49W	Stable	4.8	0.9	1.4
BH55B	Stable	7.9	0.9	1.4

Note 1 – for BH1B the 2017 annual report recalculated the CH<sub>4</sub> action and compliance levels which indicated that the concentrations of 1.3% and 1.8% respectively were more relevant. However, the permit remains at 4.1% as a compliance level for CH<sub>4</sub>. The review of this gas quality below considers the permitted compliance level.

There are no control and trigger levels for in-waste landfill gas monitoring, although the gas extraction system is subject to management and control systems as detailed by the Landfill Gas Management Plan.

## 5.4 Landfill Gas Monitoring Results and Data Assessment

### 5.4.1 Perimeter Landfill Gas Monitoring

A summary of the perimeter gas monitoring data obtained during 2025 is presented in Table 5D with the full results provided in Appendix D.

**Table 5D – Summary of Perimeter Gas Monitoring**

Borehole	Methane (%v/v)				Carbon Dioxide (%v/v)		
	Mean	Maximum	Action level breach	Compliance limit breach	Mean	Maximum	Action level breach
<b>Northern Boundary</b>							
BH3W <sup>1</sup>	<	0	-	-	2.0	3.2	-
BH5B	<	0	-	-	0.2	0.3	-
BH7B	<	0	-	-	0.5	0.8	-
BH9B	<	0	-	-	0.2	0.4	-

Western Boundary (Western Extension)							
BH4	<	0	-	-	0.7	1.8	-
BH5	<	0.1	-	-	1.6	3.3	-
BH8	<	0.1	-	-	0.5	1.3	-
Southern Boundary (Southern Extension)							
BH12	0.1	0.2	-	-	0.4	0.7	-
BH15	<	0.1	-	-	1.2	2.2	-
Eastern Boundary							
BH1B	0.1	0.1	-	-	1.3	2.6	-
BH40B	50.2	83.3	n/a	n/a	2.6	4.7	-
BH43B	71.7	92.1	n/a	n/a	10.1	12.9	Feb
BH45B	23.2	44.8	n/a	n/a	6.3	10.4	-
BH47W	<	0	-	-	0.5	1.6	-
BH49W	<	0	-	-	0.4	0.8	-
BH55B	0.1	0.1	-	-	4.5	6.9	-

General note – The mean concentrations for methane and carbon dioxide have been rounded to one decimal place. '<' means a mean concentration of <0.1%.

BH8 and BH45B flooded December 2025.

*NOTE 1* There is no permit compliance limit set for borehole BH3W as the gas data for this location has been unstable in the past. A compliance limit of 1.6% was calculated following the 2017 annual report review and this level was not exceeded during 2025. For carbon dioxide, the action level for BH3W was recalculated to be 3.1% (from 8.4%). This proposed revised action level has not been implemented into the Landfill Aftercare Plan and so the current action level of 8.4% has been used.

#### Permit compliance limit breaches - methane

There were no compliance level breaches during 2025. Previously there was a single compliance breach during 2023 (BH8 September 2023). There were no permit compliance limit breaches for methane during 2020 to 2022.

#### Action level exceedances - methane

There were no action level exceedances for methane during 2025, as was the case for 2020 to 2024 (other than the compliance level breach in BH8 in September 2023).

#### Action level exceedances – carbon dioxide

The action level for carbon dioxide was exceeded on one occasion in the boreholes around the perimeter of the site:

Northern Boundary - no exceedance of the carbon dioxide action levels

Western extension - no exceedance of the carbon dioxide action levels

Southern extension – no exceedance of the carbon dioxide action levels

Eastern boundary – the carbon dioxide action level of 12.8% was marginally exceeded in borehole BH43B in February (12.9%) but returned to below 12.8% in subsequent months.

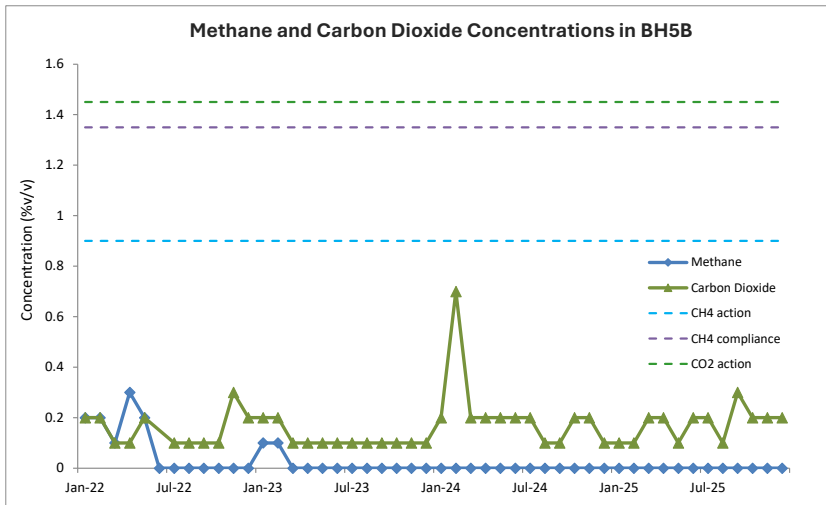
a) Northern boundary boreholes

A review of the gas conditions in the northern boundary boreholes is provided below, although none of the locations recorded any exceedances of a permitted action or compliance level for methane.

Unless noted the carbon monoxide concentrations were at or below 1ppm throughout 2025.

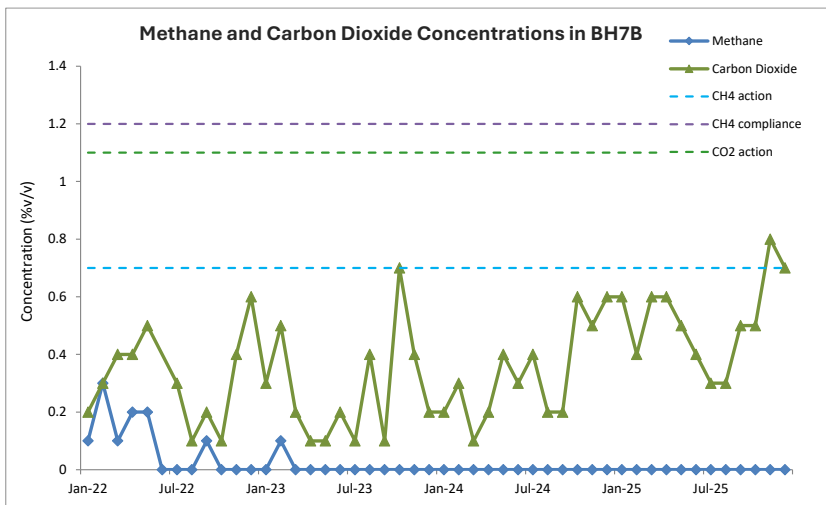
**Borehole BH5B**

BH5B has not recorded any elevated carbon dioxide or methane in 2025 – and there has been no repeat of the elevated carbon dioxide spikes in January 2019 (21.1%) and June 2021 (3.1%). There was no methane detected during 2025, and all carbon dioxide was at or below 0.3%. No adverse trends in gas conditions noted at this location.

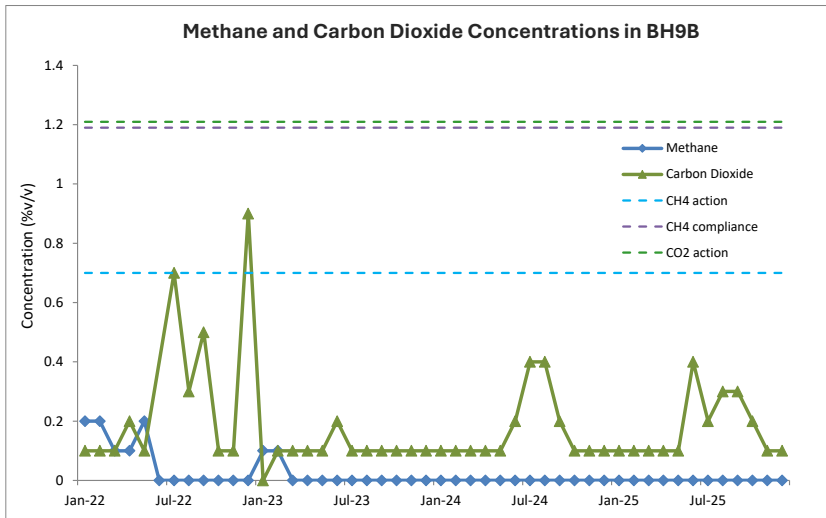


**Borehole BH7B**

Methane was not recorded in BH7B during 2025. The carbon dioxide continues to show some fluctuation and a possibly slight rising trend across 2024 through to end 2025, although all carbon dioxide results are at or below 0.8% in recent years.

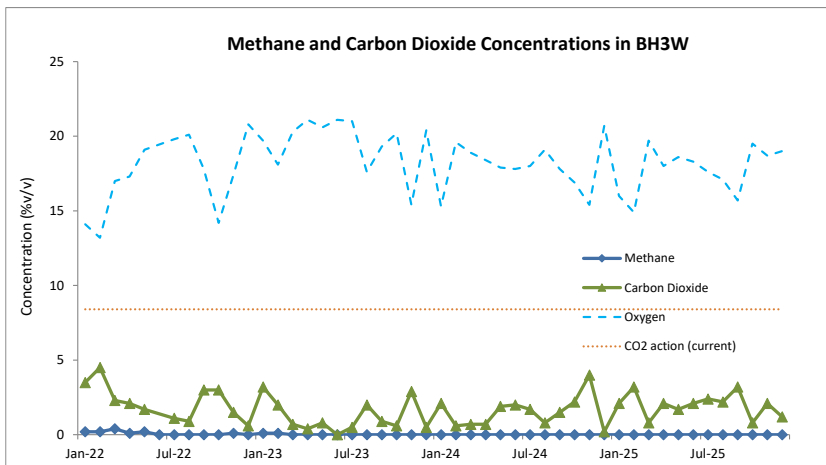


Borehole BH9B



BH9B has recorded no methane detection during 2025, and no elevated methane since 0.8% in August 2019. The carbon dioxide results remain low when compared with the action level of 1.2% with the highest being 0.4%.

Borehole BH3W



BH3W has recorded no methane detection during 2025, and no elevated methane since 2020. The carbon dioxide results remain below the Landfill Aftercare Plan action level of 8.4% (highest of 3.2%).

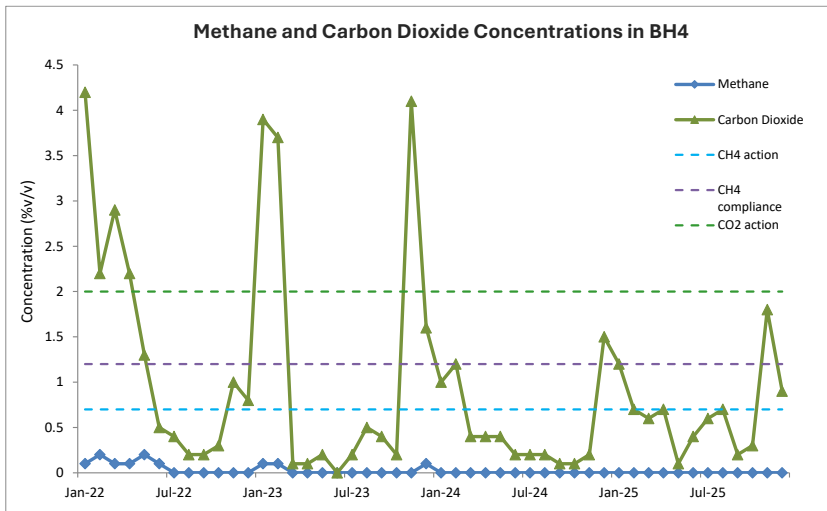
Note for BH3W – the 2017 proposed compliance level for methane (1.6%) and action level for carbon dioxide (3.1%) have not been included on the graph. The carbon dioxide marginally exceeded the 2017 proposed action level on two occasions (February and September), although this action level has never been implemented. Any future changes to the Landfill Aftercare Plan should consider implementing new calculated action and compliance levels.

**b) Western boundary boreholes**

A review of the gas conditions in the western boundary boreholes is provided below. BH8 recorded elevated carbon dioxide in February that exceeded the action level.

Unless noted the carbon monoxide concentrations were at or below 1ppm throughout 2025.

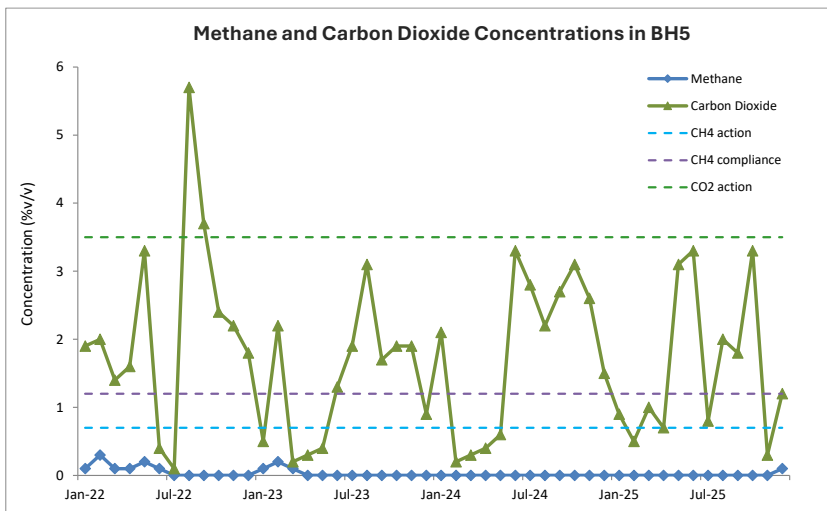
**Borehole BH4**



No methane recorded in BH4 in 2025. Carbon dioxide has stayed below the action level of 2.0% throughout 2024, with the highest reading of 1.8% in November. The elevated carbon dioxide continues to show a seasonal pattern of higher concentrations during the winter months.

No adverse trends noted in the gas conditions at this location.

**Borehole BH5**

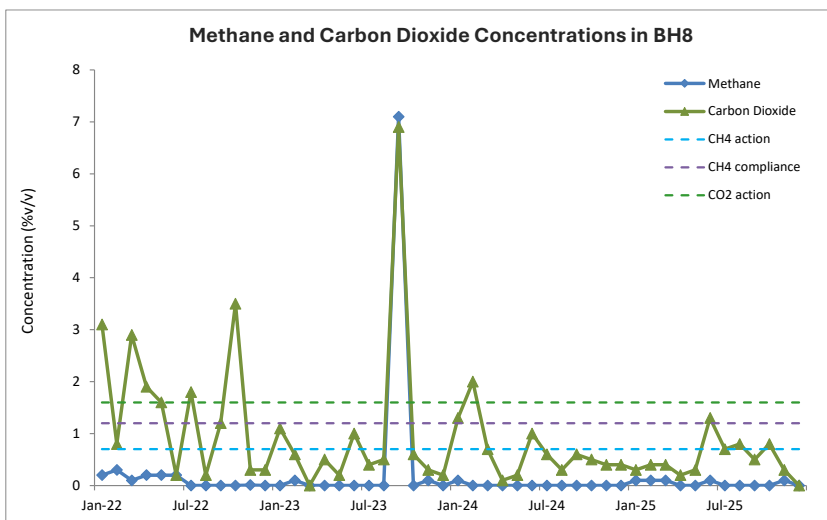


No methane detected at >0.1% during 2025.

Carbon dioxide continues to fluctuate although all below the action level of 3.5%

No adverse trends noted in the gas conditions at this location.

**Borehole BH8**



No methane detected at >0.1% during 2025 and no repeat of spike in Sep 2023.

No exceedance of the carbon dioxide action level of 1.6%, with the highest reading at 1.4%.

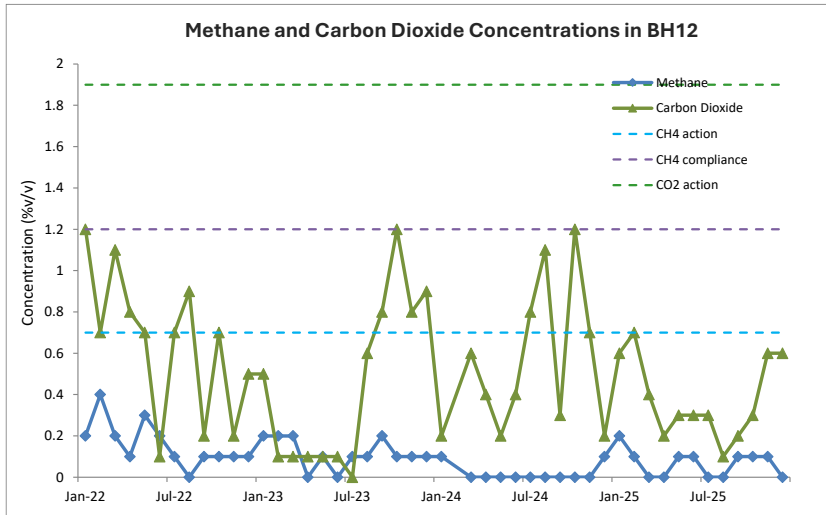
No adverse trends noted in the gas conditions at this location in 2025.

**c) Southern boundary boreholes**

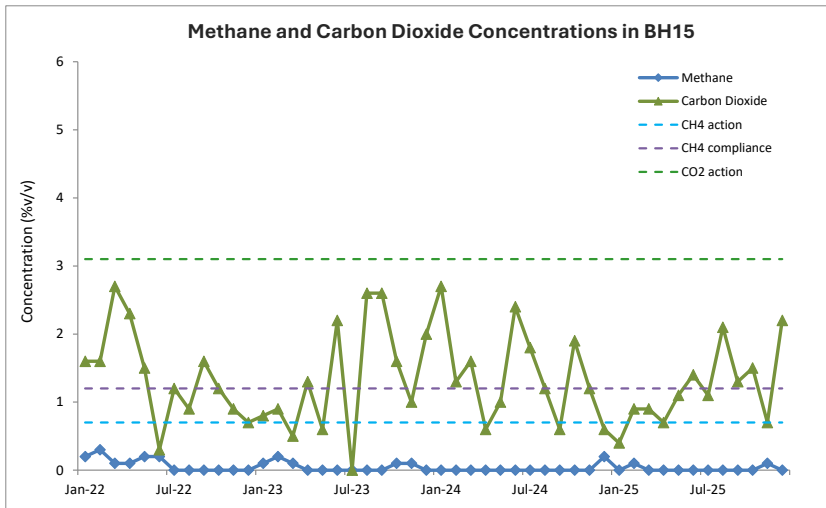
A review of the gas conditions in the southern boundary boreholes is provided below, although none of the locations recorded any exceedances of a permitted action or compliance level for methane. All carbon monoxide concentrations were below 1ppm throughout 2025.

**Borehole BH12**

The highest detection of methane during 2025 was 0.2%. The carbon dioxide concentrations continue to fluctuate although no results approach the action level of 1.9%. No adverse trends in gas conditions noted at this location.



**Borehole BH15**



No methane detected at >0.1% during 2025.

No exceedance of the carbon dioxide action level of 3.1%, with the highest reading at 2.2%.

No adverse trends noted in the gas conditions at this location.

**d) Eastern boundary boreholes**

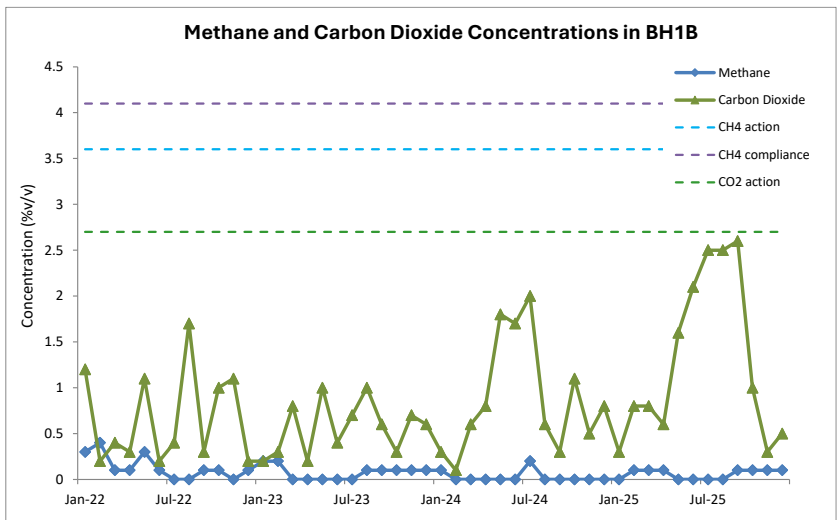
A review of the gas conditions in the eastern boundary boreholes is provided below, although none of the locations recorded any exceedances of a permitted action or compliance level for methane. The action levels for carbon dioxide were also not exceeded during 2025.

The locations BH40B and BH43B recorded some detection of carbon monoxide as described below, although the remaining locations were all at or below 2ppm throughout 2025.

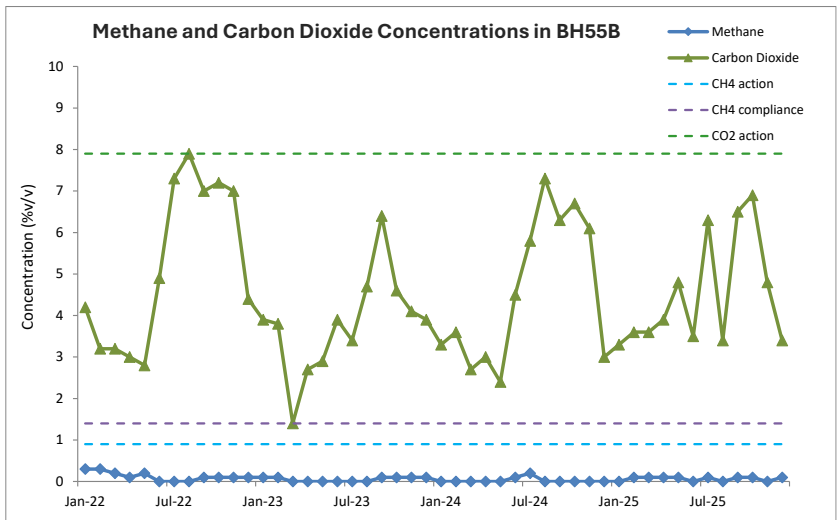
**Boreholes BH1B and BH55B**

No methane detected at >0.1% during 2025 in either BH1B or BH55B. The carbon dioxide concentrations approach the action level of 2.7% in BH1B but do not exceed, although are the highest concentrations recorded for several years.

For BH55 the carbon dioxide records fluctuating results but all below the action level of 7.9%.



Note: for BH1B, the 2017 annual report recalculated the action and compliance levels for methane: action level of 1.3% and compliance level of 1.8% (compared to those previous calculated at 3.6% and 4.1% respectively). The methane remained below these respective levels, and it continues to be recommended that the recalculated levels would be more appropriate for ongoing monitoring for this location and should be added into the next review of the Landfill Aftercare Plan.



Boreholes BH40B, BH43B and BH45B

Elevated concentrations of methane have consistently been observed in these boreholes, and this is in line with historic data. A risk assessment (last completed in 2013) indicated the elevated concentrations did not pose a risk to human health. It is believed that the landfill gas measured in these wells is from waste buried beneath the surface outside the landfill boundary and therefore outside the influence of the on-site gas control infrastructure. Due to the elevated methane and unstable gas conditions, no action levels or compliance limits for methane have been set on these wells.

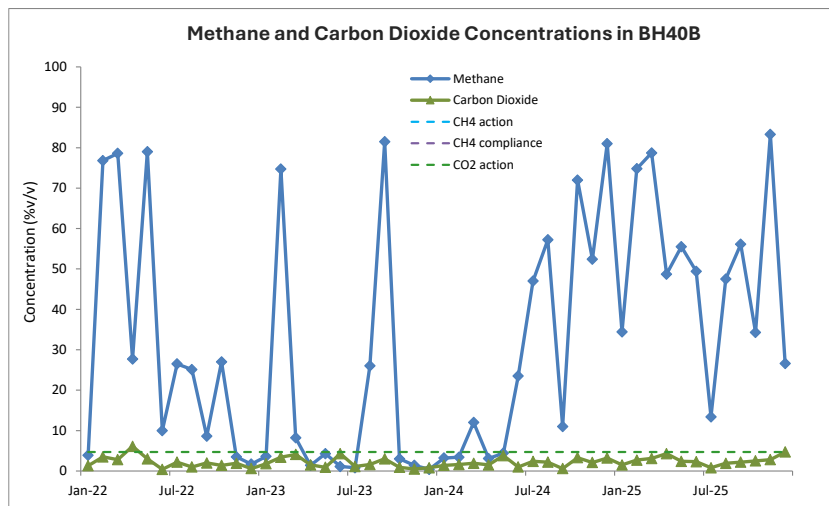
Each of these boreholes records relatively consistent and low carbon dioxide concentrations and (when elevated methane detected) a depleted oxygen gas regime. The elevated methane but lower carbon dioxide would suggest there is some carbon dioxide removal mechanism within the sub-surface.

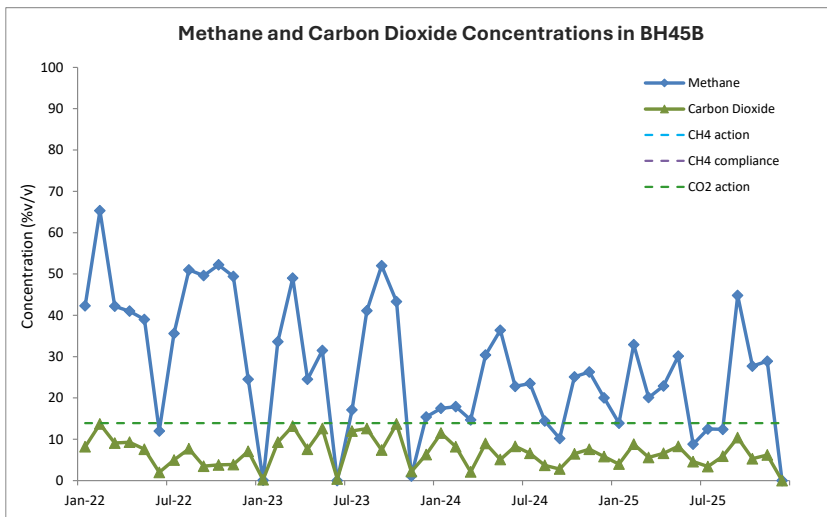
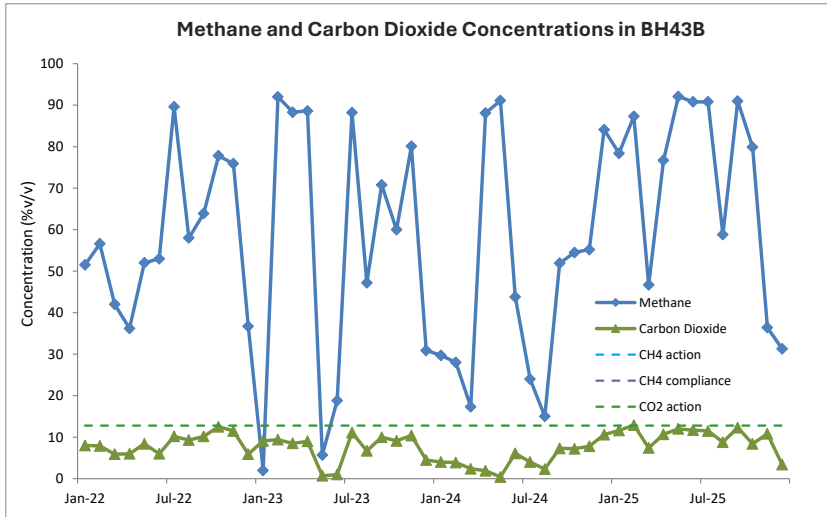
Although no compliance or actions levels are set for methane, the boreholes have carbon dioxide action levels due to the relatively consistent carbon dioxide data. For 2025 there was one exceedance of the carbon dioxide action level in BH43B at 12.9% (compared to the action level of 12.8%). The carbon dioxide concentrations in BH43B returned to below 12.8% in subsequent months.

Carbon monoxide was recorded at 32ppm in BH43B in August with further detected carbon monoxide at 8ppm in September, otherwise readings of zero carbon monoxide recorded.

Carbon monoxide was also detected in BH40B at up to 9ppm in September 2025 with positive detections in three other months. These are below the summer 2024 detections up to 35ppm.

Ongoing detection of carbon monoxide especially at concentrations approaching 100ppm or higher would be a concern and a potential indicator of a landfill fire - although there is no strong indication in 2025 based on the monitoring.

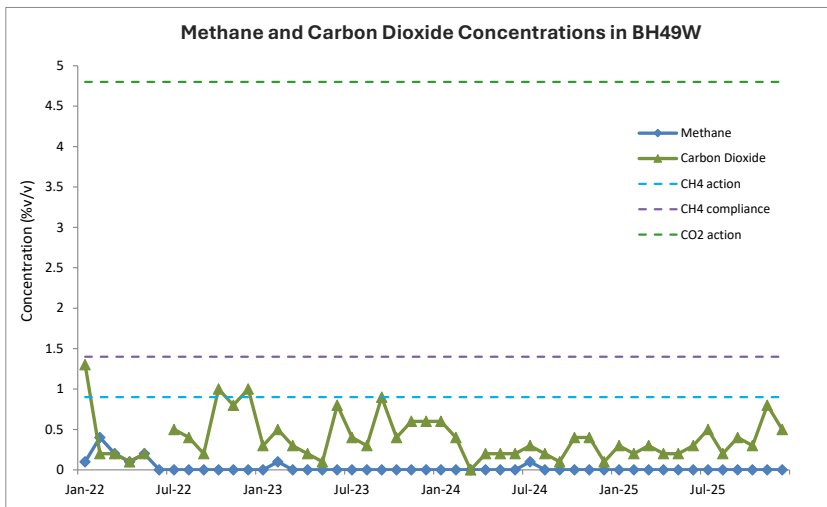
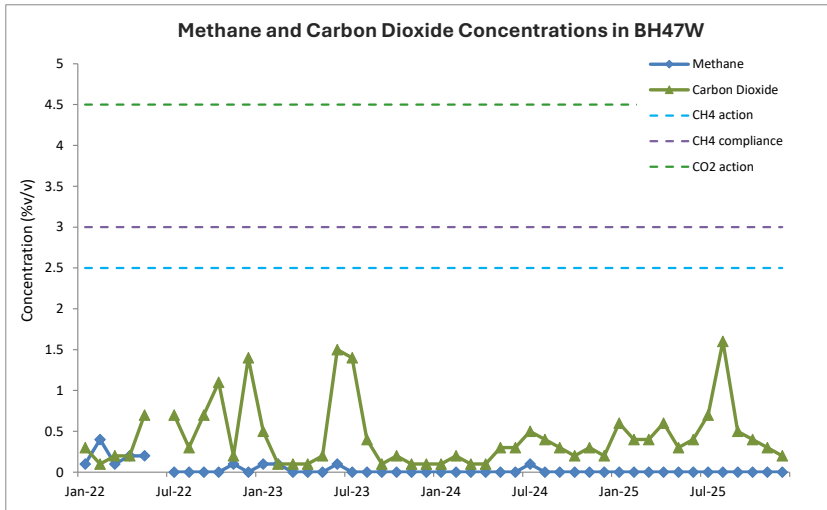




Boreholes BH47W and BH49W

No methane detected in either of these two boreholes during 2025.

A slight spike in carbon dioxide concentrations in BH47W at 1.6% (August) compared to 2024, although similar to those recorded in 2022 and 2023. The carbon dioxide continues to be well below the action level of 4.5% at this location. For BH49W the carbon dioxide concentrations are all below 1% compared to the action level of 4.8%. No adverse trend in carbon dioxide is observed based on the 2025 data for either location.



### 5.4.2 In-Waste Landfill Gas Monitoring

Any data collected from the in-waste landfill gas wells during 2025 has not been provided for compilation of this annual report. Therefore, this report does not include any review of the in-waste gas data.

Appendix F includes the data collected on the following:

1. Annual Performance Report
2. Weekly, Monthly and Six-Monthly Monitoring Data
3. Annual Emissions Testing
4. Annual Trace Gas Analysis
5. Quarterly Engine Emissions
6. C&P - Surface Emissions Survey (results described in section 5.4.3)

### 5.4.3 Surface Emissions Monitoring

In accordance with the requirements in Table 3.7 of the permit and agreement with NRW, the annual surface emissions monitoring was undertaken on 27<sup>th</sup>, 28<sup>th</sup> and 29<sup>th</sup> October 2025. This was in the form of a surface emissions survey undertaken by Enitial.

Enitial stated the following within the desk study element of planning the survey:

*‘The areas that would be subject to Surface Emissions Monitoring included the entire landfill site and were identified during previous surveys undertaken by Enitial. The survey plan was produced detailing the proposed survey areas with a survey route based on survey transects spaced at 10m intervals as detailed in the Enitial Emissions Mapping Surveys on Landfill Sites Method Statement 2025. In addition, all infrastructure as identified from the information provided by C&P and during the previous surveys was also included on the survey plan.’*

A Tunable Diode Laser (TDL) Laser Methane Detector instrument was used to undertake the survey which detects methane from 0ppm to 100% with a resolution of 1ppm. A Mobile Data Collector utilising a sub-meter GNSS receiver was connected to the TDL providing continuous GPS and time stamped data logging.

The survey was undertaken as per the predetermined survey plan. During the survey, the surface was scanned at a distance not exceeding 5cm above the surface whilst a steady walking pace was maintained. In the event of excessive vegetation and / or other obstruction preventing surface scanning at <5cm, the TDL probe was held as close to the surface as possible. It is to be noted that some locations of the survey were inaccessible due to areas of dense vegetation, particularly on the southern and western slopes. Enitial also noted that some of the areas accessed during the 2024 survey were no longer accessible due to the increased growth of vegetation in the previous 12 months.

Landfill gas and leachate extraction / monitoring infrastructure was included in the survey. In surveying such features, all potential emission points of the feature were monitored. The data logging parameter was set to reflect if the surface or an infrastructure location was being surveyed to allow this data to be filtered out and assessed separately at the reporting stage.

The full report is provided in Appendix F.

Weather conditions encountered were sunny on morning of 27<sup>th</sup> moving to medium-level cloud for the 27<sup>th</sup> afternoon and all day 28<sup>th</sup>. The 29<sup>th</sup> recorded light rain and low-level cloud. The ground conditions across all days were recorded as waterlogged.

Similar wind speeds were measured across the first two days, with the highest being 7.8mph on the afternoon of the 28<sup>th</sup>. Lighter wind speed recorded on the 29<sup>th</sup> of up to 1.2mph.

#### Landfill surface emissions survey results

A total of 27,138 methane concentration readings were recorded during the survey of the landfill surface of which 99.8% were <100ppm and within the assessment criteria of:

- Through capped surfaces: 100ppm Methane
- Through point source features: 1,000ppm Methane

Table 3.3 of the report summarises the 3 discrete locations where concentrations were recorded  $\geq$ 100ppm. This table is provided on page 8 of the report and reproduced below.

*Table 3.3 Surface locations above Assessment Criteria*

Data Ref	Reference	Easting	Northing	Peak Concentration (ppm)	Comment
440	Surface1	273149	195452	117	Edge of track
534	Surface2	273189	195452	1,647	Edge of track
19619	Surface3	273432	195638	1,995	Isolated area of surface

To contextualise these surface emissions, a comparison to the monitoring in recent years and October 2025 can be made:

- In October 2025: 3 readings across the surface that were >100ppm of methane with the highest reading of 1995ppm.
- In October 2024: 7 readings across the surface that were >100ppm of methane with the highest reading of 704ppm.
- In January 2024: 5 readings across the surface that were >100ppm of methane with the highest reading of 3072ppm (with a second reading at 2341ppm).
- In January 2023: 11 readings across the surface that were >100ppm of methane with the highest reading of 4196ppm (plus 4 further readings between 1000ppm and 1500ppm)

The comparison between the methane contour plots shows that the higher readings from October 2025 were in both new and some similar locations to some of those in October 2024:

- Surface locations 1 and 2 are along the pathway to the south of the site (southern flank) and corresponds to a location in October 2024 recording elevated levels.
- Surface 3 location is a new location not recorded in October 2024 (although in a similar vicinity to 2024 Surface 6 location) and is to the north west of Manifold B. This location is to the north of an area of dense vegetation detailed on the contour plan.
- The other locations recording high levels in October 2024 were either not an issue in 2025 or were not able to be reached due to dense vegetation:

- Three of the higher readings in 2024 (Surface 3, 4 & 5) were along the southwestern slope. No such elevated readings in 2025, although some areas have dense vegetation.
- A location east of LW4 in the north of the site (Surface 7) was not recorded as elevated in 2025.
- The 2024 Surface 2 location along the southern boundary did not record such elevated levels in 2025.

Although the October 2025 monitoring recorded fewer locations detecting methane above 100ppm, two of the three locations recorded significantly elevated emissions >1000ppm, compared to all such features <1000ppm in October 2024.

Photographs of the areas where the elevated surface readings were taken are provided in the Enitial report<sup>3</sup>, with some provided below for information.



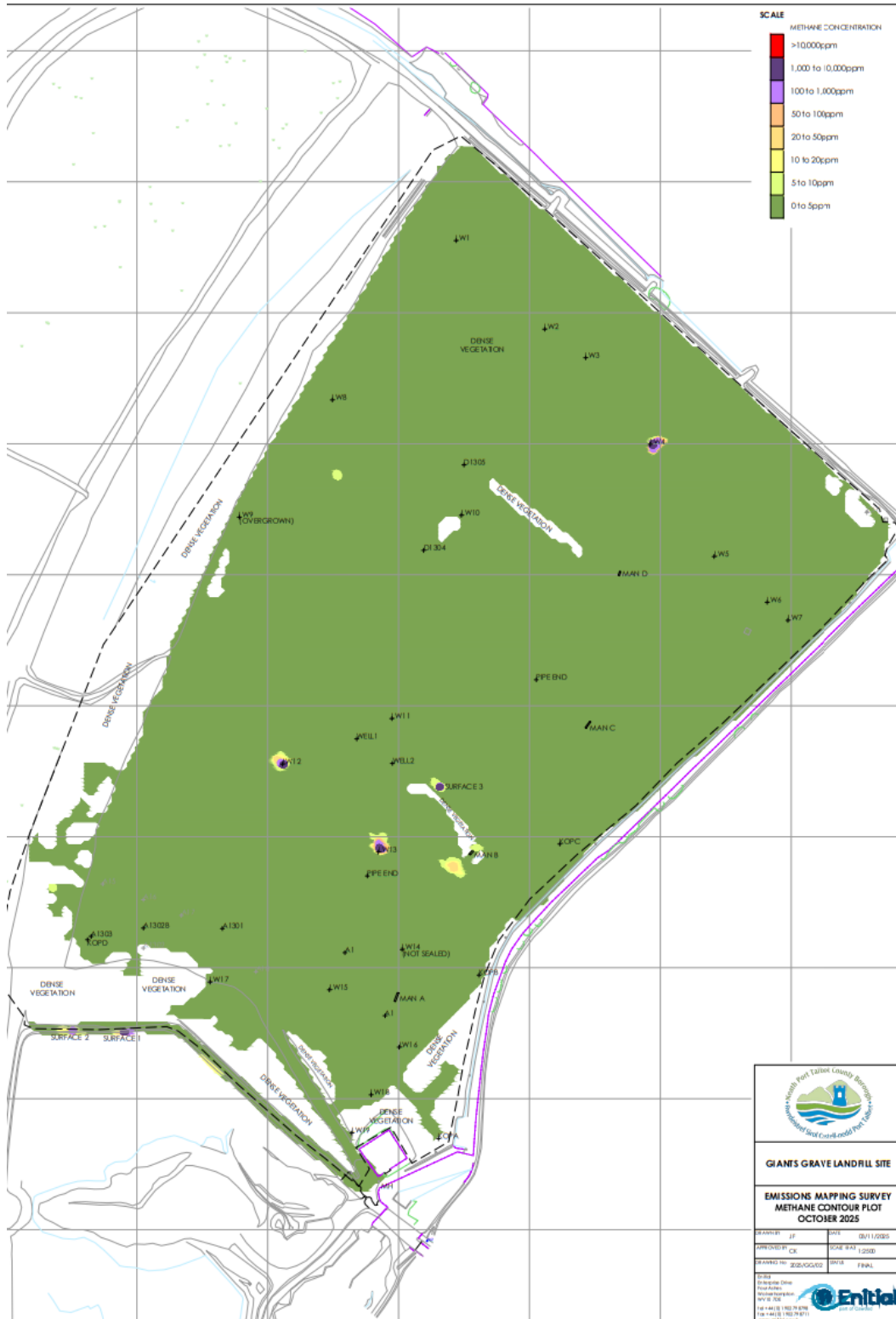
Surface 3 – isolated area of surface (NW of Manifold B) does not specifically indicate a discrete feature, although some browning (dieback) of the vegetation might be suggested.

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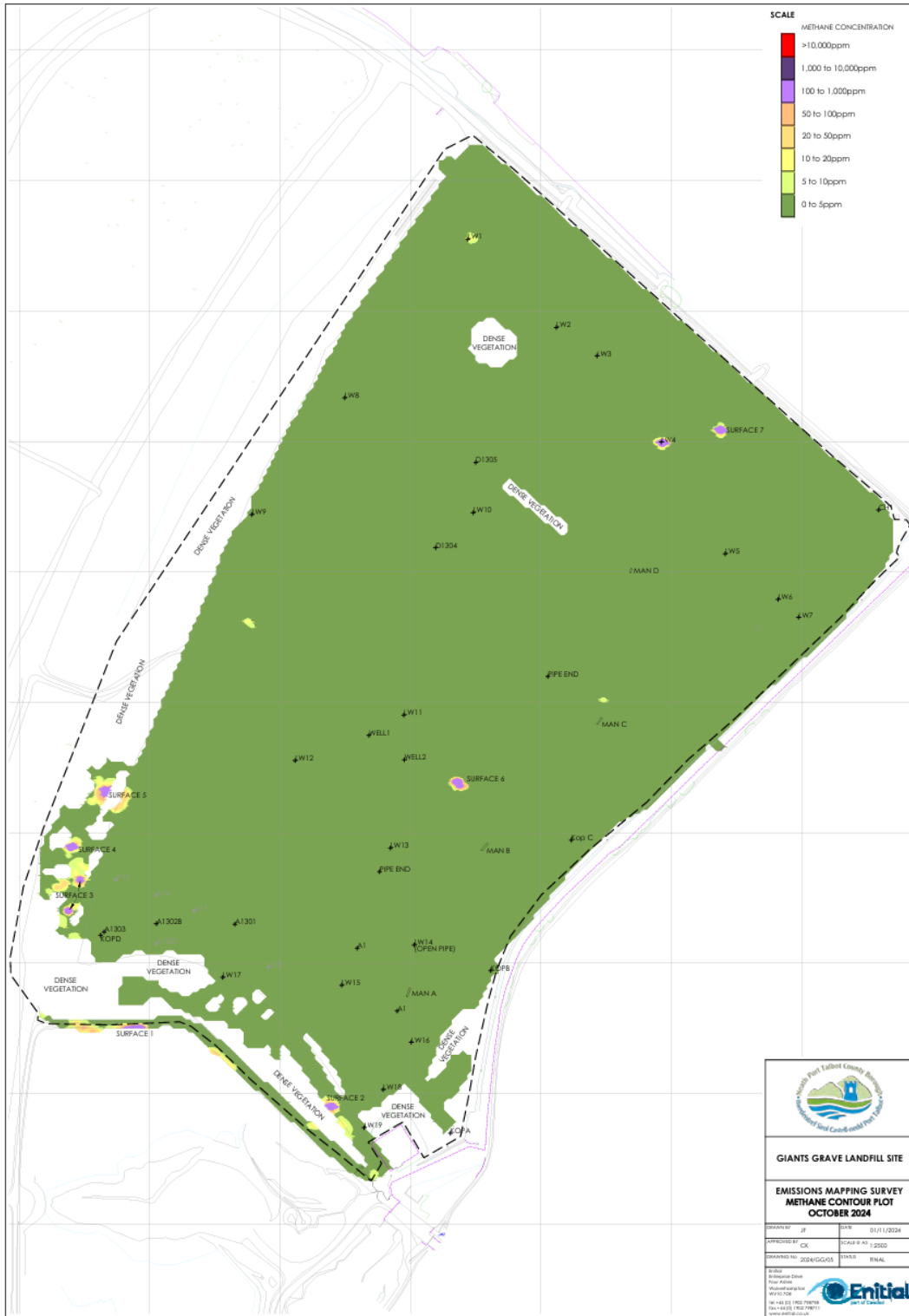
<sup>3</sup> Surface Emissions Monitoring Report Giants Grave Landfill Site, Enitial, October 2024

The methane contour plots from October 2025 and October 2024 of the site are provided below for reference.

October 2025



October 2024



The LFTGN07 guidance states that if a walkover survey demonstrates the cap is not consistent and there are discrete features emitting substantial amounts of landfill gas, remedial action is required as soon as practically possible. Large surface fissures in landfill capping do not comply with current best practice for site restoration. Irrespective of the gas concentration close to these features, it should be assumed some remedial action will be necessary.

Therefore, it is recommended that an action plan is considered and implemented to more frequently monitor (visually) and consider whether any remediation is required. The visual inspections of the areas should be to determine if there are any obvious surface cracks or fissures or evidence of vegetation stress (photographical evidence should be obtained). This is especially the case for those areas recording vegetation die back, such as central location (Surface 3) but should be considered for all areas recording higher methane emissions in the October 2025 survey.

*Note – the aftercare plan for the site does not specifically consider actions for discrete surface emissions features and should be updated to reflect appropriate actions.*

Over recent years the surface emissions have typically been carried out during the late autumn and winter months (October / January). In 2025 the surface was waterlogged. Therefore, it remains a recommendation to organise a surface emissions during the summer to ensure that the surface emissions monitoring is undertaken in a different season to the recent years.

Overall, the average surface emissions from across the site are not elevated, but there are several discrete features of elevated methane emissions through the cap.

#### Infrastructure surface emissions survey results

A total of 39 infrastructure locations were monitored during this survey. Table 3.4 (of the surface emissions report) summarises the three discrete locations where concentrations were recorded  $\geq 1,000$ ppm. This compares to no discrete features recorded in 2024 (either October or January).

*Table 3.4 Infrastructure locations above Assessment Criteria*

<b>Data Ref</b>	<b>Reference</b>	<b>Easting</b>	<b>Northing</b>	<b>Peak Concentration (ppm)</b>	<b>Comment</b>
14404	LW4	273593	195900	2,756	Surface around well inside chamber
25843	LW13	273386	195590	3,558	Mounded area around base of well
27449	LW12	273313	195655	1,874	Top plate / gasket, damaged Tefen valve

These discrete features will have required maintenance as soon as the information was available. The report, along with a summary of these infrastructure features were provided after the survey was completed in October 2025.

Photographs of the areas the elevated surface readings were taken are provided in the Enitial report<sup>4</sup>, with these also provided below for information.

<sup>4</sup> Surface Emissions Monitoring Report Giants Grave Landfill Site, Enitial, October 2024



LW4 – surface around well inside chamber



LW13 – mounded area around base of well



LW12 – top plate / gasket, damaged Tefen valve

## 5.5 Summary and Recommendations for the Perimeter Gas and Surface Emissions Monitoring Programme

There were no breaches of the action or compliance levels for methane across any of the perimeter boreholes. For carbon dioxide there was a single exceedance of the action level in BH43B (in February) with a recorded result of 12.9% against the action level of 12.8%.

Other than the boreholes BH40B, BH43B and BH45B (which were at their expected elevated levels of methane), there was no elevated presence of methane recorded.

For the 2024 annual report C & P were asked to consider whether the environmental monitoring undertaken across the site might be considered too onerous for a closed landfill site and what option might there be for reducing the monitoring whilst continuing to ensure environmental protection. This report does not repeat these recommendations as discussions on any reduction of monitoring are ongoing between NPTCBC and Natural Resources Wales. However, the 2025 perimeter gas monitoring does not suggest any adverse trends or changes that would significantly impact on recommendations previously mentioned.

For changes to perimeter gas monitoring there would need to be further evidence of the effectiveness of the gas control system and appropriate changes to the Landfill Aftercare Plan and permit variation (for any permitted compliance levels). Alongside this, a review of carbon dioxide action levels may be required for some locations if they are currently not acting as an appropriate warning level for potential action. If any monitoring frequency was reduced, then there would need to be an ability for appropriate intensive monitoring if any action or compliance levels were exceeded.

For the surface emissions survey in 2025, the monitoring recorded fewer locations detecting methane above 100ppm, however, two of the three locations recorded significantly elevated emissions >1000ppm, compared to all such features <1000ppm in October 2024. There should be the development of an action plan to put into place following the annual surface emissions (or when any evidence of elevated emissions is observed from site walk overs).

The survey found three distinct infrastructure features in 2025 recording >1000ppm methane, following no such features in either January or October 2024.

## Appendices

<b>Appendix A</b>	<b>Leachate Monitoring Data</b>
<b>Appendix B</b>	<b>Groundwater Monitoring Data</b>
<b>Appendix C</b>	<b>Surface Water Monitoring Data</b>
<b>Appendix D</b>	<b>Perimeter Gas Monitoring Data</b>
<b>Appendix E</b>	<b>Borehole location plan</b>
<b>Appendix F</b>	<b>Landfill Gas</b>

## Appendix A - Leachate Monitoring Data

## A1 - Leachate Level and Quarterly Monitoring Data

Monitoring location	Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Dissolved oxygen	Chloride	Ammoniacal nitrogen	Potassium	
	mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l	mg/l	
LW3	Jan-25		7.64		6.8	16.2	840	6	10	1.2	9.3
	Feb-25										
	Mar-25										
	Apr-25		7.64		6.8	17.3	1000	2.9	12	4.1	12
	May-25										
	Jun-25										
	Jul-25		7.64		6.9	15.9	940	41	8.7	5.4	11
	Aug-25										
	Sep-25										
	Oct-25		7.64		6.8	19.1	860	1.7	16	1.5	12
	Nov-25										
	Dec-25										
LW5	Jan-25	5.99	7.05	1.06	6.9	14.1	800	8.5	11	1.5	9.5
	Feb-25	6	7.05	1.05							
	Mar-25	6.19	7.05	0.86							
	Apr-25	6.54	7.05	0.51	6.8	15.1	840	2.9	11	1.5	12
	May-25	6.47	7.05	0.58							
	Jun-25	6.72	7.05	0.33							
	Jul-25	6.72	7.05	0.33	7.1	19.7	930	3.9	12	2.8	16
	Aug-25	6.92	7.05	0.13							
	Sep-25	6.89	7.05	0.16							
	Oct-25	6.05	7.05	1	6.8	16.6	780	3.7	15	2	11
	Nov-25	5.65	7.05	1.4							
	Dec-25	5.03	7.05	2.02							
LW8	Jan-25	5.79	5.94	0.15	dry - no leachate to sample						
	Feb-25	dry	5.94	dry							
	Mar-25	dry	5.94	dry							
	Apr-25	dry	5.94	dry	dry - no leachate to sample						
	May-25	dry	5.94	dry							
	Jun-25	Dry	5.94	dry							
	Jul-25	dry	5.94	dry	dry - no leachate to sample						
	Aug-25	dry	5.94	dry							
	Sep-25	dry	5.94	dry							
	Oct-25	dry	5.94	dry	dry - no leachate to sample						
	Nov-25	5.27	5.94	0.67							
	Dec-25	4.72	5.94	1.22							
LW9	Jan-25		7.05		dry - no leachate to sample						
	Feb-25										
	Mar-25										
	Apr-25		7.05		dry - no leachate to sample						
	May-25										
	Jun-25										
	Jul-25		7.05		dry - no leachate to sample						
	Aug-25										
	Sep-25										
	Oct-25		7.05		dry - no leachate to sample						
	Nov-25										
	Dec-25										
LW15	Jan-25	10.56	10.56	0	7.1	17.8	2500	7.8	140	150	91
	Feb-25	10.53	10.56	0.03							
	Mar-25	10.6	10.56	0							
	Apr-25	10.63	10.56	-0.07	7	19.8	2300	3.9	130	140	120
	May-25	11	10.56	-0.44							
	Jun-25	11.14	10.56	-0.58							
	Jul-25	10.54	10.56	0.02	7.4	22.8	2900	8	150	160	130
	Aug-25	11.27	12.7	1.43							
	Sep-25	11.38	12.7	1.32							
	Oct-25	10.8	12.7	1.9	7.1	19.7	2700	3.1	140	160	100
	Nov-25	10.73	12.7	1.97							
	Dec-25	10.5	12.7	2.2							

Note – the LW15 leachate level results above are those based on the leachate well base depth as understood at the time of monitoring. The LW15 results below are based on the leachate well base depth following the investigation and confirmation in August 2025 (and calculated the leachate levels for the previous monitoring in 2025)

Monitoring location	Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Dissolved oxygen	Chloride	Ammoniacal nitrogen	Potassium	
	mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l	mg/l	
LW15	Jan-25	10.56	12.7	2.14	7.1	17.8	2500	7.8	140	150	91
	Feb-25	10.53	12.7	2.17							
	Mar-25	10.6	12.7	2.1							
	Apr-25	10.63	12.7	2.07	7	19.8	2300	3.9	130	140	120
	May-25	11	12.7	1.7							
	Jun-25	11.14	12.7	1.56							
	Jul-25	10.54	12.7	2.16	7.4	22.8	2900	8	150	160	130
	Aug-25	11.27	12.7	1.43							
	Sep-25	11.38	12.7	1.32							
	Oct-25	10.8	12.7	1.9	7.1	19.7	2700	3.1	140	160	100
	Nov-25	10.73	12.7	1.97							
Dec-25	10.5	12.7	2.2								
LW16	Jan-25		9.06		7.2	14.9	4600	4.5	340	220	230
	Feb-25										
	Mar-25										
	Apr-25		9.06		7.3	16.9	4300	<1.0	380	260	260
	May-25										
	Jun-25										
	Jul-25		9.06		7.7	21.9	4700	1.9	370	310	260
	Aug-25										
	Sep-25										
	Oct-25		9.06		7.2	17.2	3700	<1	280	180	200
	Nov-25										
Dec-25											
LW17b	Jan-25	11.89	14.56	2.67	7.3	24.3	1400	<1.0	36	7.6	43
	Feb-25	11.98	14.56	2.58							
	Mar-25	dry	14.56	dry							
	Apr-25	12.17	14.56	2.39	7.4	25.9	1800	7.9	120	15	77
	May-25	12.2	14.56	2.36							
	Jun-25	12.33	14.56	2.23							
	Jul-25	12.41	14.56	2.15	7.6	28	2000	<1.0	120	21	76
	Aug-25	12.48	14.56	2.08							
	Sep-25	12.53	14.56	2.03							
	Oct-25	12.07	14.56	2.49	7.3	25.2	1100	7.5	39	5.3	40
	Nov-25	11.96	14.56	2.6							
Dec-25	11.48	14.56	3.08								
A1301	Jan-25		19.69		7.7	22.5	8200	8.4	1100	500	380
	Feb-25										
	Mar-25										
	Apr-25		19.69		7.6	25.3	7700	7.9	1200	530	430
	May-25										
	Jun-25										
	Jul-25		19.69		7.7	28.5	8400	4.6	1100	440	380
	Aug-25										
	Sep-25										
	Oct-25		19.69		7.5	24.9	9500	4.6	1100	430	410
	Nov-25										
Dec-25											
A1302	Jan-25	15.65	18.09	2.44	7.5	19.1	3000	9.3	150	180	96
	Feb-25	15.6	18.09	2.49							
	Mar-25	15.63	18.09	2.46							
	Apr-25	15.61	18.09	2.48	7.3	23.2	4500	3.9	290	350	190
	May-25	15.72	18.09	2.37							
	Jun-25	15.83	18.09	2.26							
	Jul-25	15.84	18.09	2.25	7.5	25.5	4800	<1.0	280	330	180
	Aug-25	15.94	18.09	2.15							
	Sep-25	15.97	18.09	2.12							
	Oct-25	15.75	18.09	2.34	7.2	23.6	3500	2.2	180	180	110
	Nov-25	15.74	18.09	2.35							
Dec-25	15.44	18.09	2.65								

Monitoring location		Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Dissolved oxygen	Chloride	Ammoniacal nitrogen	Potassium
		mbTOC	mbTOC								
A1303	Jan-25		11.13		6.9	16.8	1800	7.6	72	86	53
	Feb-25										
	Mar-25										
	Apr-25		11.13		7.1	17.6	3800	4.5	300	260	150
	May-25										
	Jun-25										
	Jul-25		11.13		7.6	20.6	7700	6.1	700	590	290
	Aug-25										
	Sep-25										
	Oct-25		11.13		7	18.5	2100	4.1	100	110	61
	Nov-25										
	Dec-25										
A1304	Jan-25		14		7	15.8	1900	7.9	74	140	50
	Feb-25										
	Mar-25										
	Apr-25		14		6.9	16.1	2200	6.1	94	130	85
	May-25										
	Jun-25										
	Jul-25		14		7.3	18	2900	1.9	140	200	110
	Aug-25										
	Sep-25										
	Oct-25		14		6.9	16.1	2000	2.4	81	120	58
	Nov-25										
	Dec-25										
A1305CV	Jan-25	10.55	13.18	2.63	7.2	16.3	3500	6.5	250	260	150
	Feb-25	10.52	13.18	2.66							
	Mar-25	10.61	13.18	2.57							
	Apr-25	10.61	13.18	2.57	7.1	16.9	4600	5.6	360	330	220
	May-25	10.74	13.18	2.44							
	Jun-25	10.89	13.18	2.29							
	Jul-25	10.9	13.18	2.28	7.5	18.1	5100	3.2	410	260	210
	Aug-25	11.02	13.18	2.16							
	Sep-25	11.12	13.18	2.06							
	Oct-25	10.59	13.18	2.59	7.1	16.2	4400	2.9	270	240	160
	Nov-25	10.55	13.18	2.63							
	Dec-25	10.37	13.18	2.81							

Black shading is for data not required to be monitored. Grey boxes are for data not required for that month. Blank spaces indicate monitoring not undertaken

## Leachate Levels (m above base of well) in 2024

Leachate well	Leachate Levels (m above base of well)												Leachate compliance level (from September 2020 onwards)
	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	
LW5	1.06	1.05	0.86	0.51	0.58	0.33	0.33	0.13	0.16	1	1.4	2.02	1.6
LW8	0.15	0	0	0	0	0	0	0	0	0	0.67	1.22	1
LW15	2.14	2.17	2.1	2.07	1.7	1.56	2.16	1.43	1.32	1.9	1.97	2.2	2.1
LW17b	2.67	2.58		2.39	2.36	2.23	2.15	2.08	2.03	2.49	2.6	3.08	1
A1302	2.44	2.49	2.46	2.48	2.37	2.26	2.25	2.15	2.12	2.34	2.35	2.65	3
A1305	2.63	2.66	2.57	2.57	2.44	2.29	2.28	2.16	2.06	2.59	2.63	2.81	2.8

## A2 – Leachate Quality Monitoring – Annual Data

Determinand	Units	Monitoring location											
		LW3	LW5	LW8	LW9	LW15	LW16	LW17b	A1301	A1302	A1303	A1304	A1305CV
Alkalinity expressed as CaCO <sub>3</sub>	mg/l	530	530	Leachate well dry	Leachate well dry	1500	2100	690	3900	2000	1200	1100	2400
As (Dissolved)	µg/l	1.5	<1.0			<1.0	4.8	4	3	<1.0	<1.0	<1.0	<1.0
Biochemical Oxygen Demand	mg/l	45	5.2			8.5	87	3.4	22	9.8	5.7	8.3	6.7
Cd (Dissolved)	µg/l	<0.6	<0.6			<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Calcium	mg/l	180	140			190	140	190	130	200	200	160	200
Chemical Oxygen Demand	mg/l	460	20			260	1200	83	700	380	170	120	160
Cr (Dissolved)	µg/l	1.8	<0.5			7	2.2	1.4	12	3.6	3.7	0.7	3.9
Cu (Dissolved)	µg/l												
Iron	mg/l	1.1	1.1			4.8	3.4	0.52	1.4	0.45	1.1	0.4	1.2
Pb (Dissolved)	µg/l	11	9			16	18	5.8	310	6	2.8	3.6	25
Magnesium	mg/l	35	27			76	71	52	150	68	51	41	110
Mn (Dissolved)	µg/l	130	160			780	410	110	260	800	940	720	570
Ni (Dissolved)	µg/l	68	20			87	81	7.9	39	38	14	5.1	19
Sodium	mg/l	18	15			170	300	54	990	210	100	80	270
Sulphate	mg/l	88.4	23.8			15.5	83.5	87.8	29.1	20.3	12.7	3.3	21.8
Total Organic Carbon	mg/l	7.78	7.17			25.9	40.7	8.75	234	47.5	31.6	20.7	46.6
Zn (Dissolved)	µg/l	42	130	130	280	79	68	29	23	29	70		

## A3 – Leachate Quality Monitoring – Discharge Flap Valve

Parameter	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Oct-25 (retest of sample)	Nov-25	Dec-25
Ammoniacal Nitrogen	<0.015	<0.015	<0.015	0.079	0.081	<0.015	0.13	0.39	2.4	0.94	-	2.1	2.8
As (dissolved)	1.3	1.1	1.7	4.5	<1.0	4.3	13	7.8	4.9	<1	-	<1	<1
Cd (dissolved)	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	-	<0.6	<0.6
Cr (dissolved)	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	2.4	0.8	3.4	<0.5	-	1.7	2.1
Cu (dissolved)	15	30	<4.0	12	41	5.9	63	34	23	99	23	38	9.8
Iron	0.11	0.093	0.076	0.33	0.042	0.26	0.44	0.43	2.3	0.59	-	0.16	0.5
Pb (dissolved)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.2	5.2	-	3.2	1.4
Ni (dissolved)	2.3	1.9	3.6	3.7	3.2	7.1	5.6	5.4	7	6.6	-	2.8	3.4
Zn (dissolved)	<1.5	<1.5	2.6	<1.5	13	9.2	20	10	27	37	-	97	19

## A4 – Leachate Quality Monitoring – Four-Yearly Data

Determinand	Units	Monitoring location									
		LW 3	LW 5	LW 15	LW 16	LW 17b	A1301	A1302	A1303	A1304	A1305 CV
Sb (Dissolved)	ug/l	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Ba (Dissolved)	ug/l	160	140	790	290	180	790	490	290	180	630
Boron	ug/l	310	260	1300	1700	930	7000	2300	610	510	2100
Co (Dissolved)	ug/l	< 1.1	< 1.1	2.2	3	< 1.1	16	8.5	1.6	1.6	4.5
Mo (Dissolved)	ug/l	27	3.3	4.4	47	6.1	< 1.8	5.2	2	< 1.8	< 1.8
Se (Dissolved)	ug/l	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	4.2	< 4.0	< 4.0
Uranium	ug/l	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
V (Dissolved)	ug/l	< 1.9	< 1.9	1.9	< 1.9	< 1.9	6.5	< 1.9	< 1.9	< 1.9	2.4
Cyanide(Total)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Fluoride	ug/l	570	530	660	490	590	1300	410	180	240	860
Nitrite as NO <sub>2</sub>	ug/l	9.4	6.6	18	31	390	10	< 5.0	< 5.0	5.5	26
Orthophosphate as P	ug/l	39	46	46	52	54	800	64	64	44	61
Phosphorus (Total)	ug/l	9200	220	740	2800	540	1800	3200	700	1400	810
Benzo(a)Pyrene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	5.7	1.9	1.5	1.3	< 0.01
Mecoprop	ug/l	< 0.02	0.16	6.2	6.3	0.1	44	13	4	5.1	11
TPH (C5-C6 aliphatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6-C8 aliphatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8-C10 aliphatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH DW(C10-C12 aliphatic)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH DW(C12-C16 aliphatic)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH DW(C16-C21 aliphatic)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH DW(C21-C35 aliphatic)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH (Aliphatic) total	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH (C6-C7 aromatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8	1.7	< 1.0	2.3	1.7
TPH (C7-C8 aromatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8-C10 aromatic)	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.1	4.7	2.8	< 1.0	2.8
TPH DW(C10-C12 aromatic)	ug/l	< 10	< 10	40	< 10	< 10	130	70	86	60	50
TPH DW(C12-C16 aromatic)	ug/l	< 10	< 10	75	< 10	< 10	160	90	190	120	82
TPH DW(C16-C21 aromatic)	ug/l	< 10	< 10	70	< 10	< 10	50	60	220	130	70
TPH DW(C21-C35 aromatic)	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH (Aromatic) total	ug/l	< 10	< 10	190	< 10	< 10	350	230	490	320	210
MTBE (Methyl Tertiary Butyl Ether)	ug/l	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.5	1.4	< 1.0	1.7	1.3
Toluene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8	2.1	1.1	< 1.0	1.5
o-xylene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1	1	< 1.0	< 1.0	< 1.0
Phenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	ug/l	< 0.05	< 0.05	< 0.05	0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

## Appendix B - Groundwater Monitoring Data

## B1 - Groundwater Level Monitoring Data

Groundwater levels (mAOD)													
Borehole	Well Base (mAOD)	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25
<b>Northern Boundary</b>													
BH3W	-1.4	3.33	3.16	3.25	3.02	2.96	2.92	2.81	1.82	3.14	3.22	3.49	2.83
BH5B	-3.91	2.76	2.59	2.67	2.44	2.35	2.34	2.17	2.24	2.59	2.63	2.9	3.25
BH7B	-4.39	2.21	2.04	2.13	1.91	1.83	1.8	1.6	1.68	2.09	2.11	2.34	2.67
BH9B	-3.06	2.37	2.14	2.26	2.06	1.99	1.92	1.66	1.79	2.22	2.28	2.45	2.79
<b>Eastern Boundary</b>													
BH1B	-2.76	1.66	1.49	1.56	1.34	1.28	1.27	1.21	1.15	1.44	1.54	1.83	2.2
BH40B	-0.55	2.38	2.26	2.18	2.1	2.02	1.9	1.76	1.9	2.23	2.25	2.25	2.89
BH43B	-1.56	2.93	2.86	3.01	2.75	2.56	2.35	2.35	2.64	2.88	3.13	3.4	3.67
BH45B	-3.08	2.21	2.03	2.11	1.9	1.83	1.75	1.63	1.72	2.02	2.11	2.23	Flooded
<b>Western Extension</b>													
BH4	0.31	2.52	2.4	2.4	2.09	1.91	1.92	1.61	1.61	2.31	2.39	2.59	2.79
BH5	-0.51	2.09	2.07	2.05	1.73	1.57	1.57	1.31	1.29	1.89	2	2.36	2.2
BH6	-0.42	1.95	1.79	1.85	1.48	1.37	1.38	1.17	2.11	1.56	1.88	2.19	2.41
BH7	-1.58	1.16	0.69	1.18	1.1	0.61	0.47	0.31	0.95	Flooded	1.02	0.56	Flooded
BH8	-0.82	2.06	1.67	2.13	1.97	1.67	1.55	1.28	1.98	2.37	2.07	1.77	Flooded
<b>Southern Extension</b>													
BH12	0.43	0.92	1.27	1.29	1.1	0.92	Dry	Dry	Dry	1.12	1.35	1.14	1.71
BH15	0.5	2.34	1.88	2.11	1.91	1.8	1.61	1.27	1.88	2.17	2.06	2.18	3.09

## B2 - Groundwater Quality Monitoring – Monthly Data

Monitoring location	Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Chloride	Ammoniacal nitrogen	Potassium	
	mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l	
BH4	Jan-25	0.59	2.8	2.21						
	Feb-25	0.71	2.8	2.09						
	Mar-25	0.71	2.8	2.09						
	Apr-25	1.02	2.8	1.78						
	May-25	1.2	2.8	1.6						
	Jun-25	1.19	2.8	1.61						
	Jul-25	1.5	2.8	1.3						
	Aug-25	1.5	2.8	1.3						
	Sep-25	0.8	2.8	2						
	Oct-25	0.72	2.8	2.08						
	Nov-25	0.52	2.8	2.28						
	Dec-25	0.32	2.8	2.48						
BH5	Jan-25	0.76	3.36	2.6	7.4	10.1	600	53	<0.015	6
	Feb-25	0.78	3.36	2.58	7.1	10.2	2000	24	<0.015	5.1
	Mar-25	0.8	3.36	2.56	7.4	11.6	600	34	<0.015	5.8
	Apr-25	1.12	3.36	2.24	7.4	13.1	580	18	0.016	6.3
	May-25	1.28	3.36	2.08	7.3	13.2	480	11	<0.015	5.2
	Jun-25	1.28	3.36	2.08	7.1	14.8	600	690	<0.015	5.7
	Jul-25	1.54	3.36	1.82	7.1	15.8	780	72	<0.015	7
	Aug-25	1.56	3.36	1.8	7.3	16.5	580	16	<0.015	6.1
	Sep-25	0.96	3.36	2.4	7.5	16.3	650	33	<0.015	6.6
	Oct-25	0.85	3.36	2.51	7.3	14.2	620	26	<0.015	6.9
	Nov-25	0.49	3.36	2.87	7.4	11.5	650	24	<0.015	6.1
	Dec-25	0.65	3.36	2.71	8	12.2	590	18	<0.015	5.5

Monitoring location	Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Chloride	Ammoniacal nitrogen	Potassium	
	mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l	
BH6	Jan-25	0.68	3.05	2.37						
	Feb-25	0.84	3.05	2.21						
	Mar-25	0.78	3.05	2.27						
	Apr-25	1.15	3.05	1.9						
	May-25	1.26	3.05	1.79						
	Jun-25	1.25	3.05	1.8						
	Jul-25	1.46	3.05	1.59						
	Aug-25	0.52	3.05	2.53						
	Sep-25	1.07	3.05	1.98						
	Oct-25	0.75	3.05	2.3						
	Nov-25	0.44	3.05	2.61						
	Dec-25	0.22	3.05	2.83						
BH7	Jan-25	0.26	3	2.74						
	Feb-25	0.73	3	2.27						
	Mar-25	0.24	3	2.76						
	Apr-25	0.32	3	2.68						
	May-25	0.81	3	2.19						
	Jun-25	0.95	3	2.05						
	Jul-25	1.11	3	1.89						
	Aug-25	0.47	3	2.53						
	Sep-25	flooded	3	flooded						
	Oct-25	0.4	3	2.6						
	Nov-25	0.86	3	2.14						
	Dec-25	flooded								
BH8	Jan-25	0.81	3.69	2.88	7.6	12.1	1100	200	2.6	13
	Feb-25	1.2	3.69	2.49	7.6	11.2	2600	570	2.9	47
	Mar-25	0.74	3.69	2.95	7.7	13.9	2100	330	14	43
	Apr-25	0.9	3.69	2.79	7.6	13.2	2600	490	18	54
	May-25	1.2	3.69	2.49	7.6	14.4	3000	530	29	71
	Jun-25	1.32	3.69	2.37	7.5	17.5	3300	660	17	81
	Jul-25	1.59	3.69	2.1	7.6	17.3	3500	630	41	80
	Aug-25	0.89	3.69	2.8	7.9	16.6	3900	750	30	96
	Sep-25	0.5	3.69	3.19	7.6	15.9	3800	670	39	91
	Oct-25	0.8	3.69	2.89	7.4	14.6	2400	440	27	36
	Nov-25	1.1	3.69	2.59	7.3	12.4	1200	180	3.2	14
	Dec-25	flooded								
BH12	Jan-25	4.93	5	0.07	7.5	12.9	230	220	0.03	4.8
	Feb-25	4.58	5	0.42	7.4	12.3	290	17	0.63	6.3
	Mar-25	4.56	5	0.44	7.5	13.9	390	18	0.2	8.6
	Apr-25	4.75	5	0.25	7.5	13.9	180	4.9	0.13	3.9
	May-25	4.93	5	0.07	8	17.4	310	14	0.2	6.7
	Jun-25	dry	5	dry	7.2	15.4	310	12	0.059	6.1
	Jul-25	Dry	5	Dry	7.4	18	980	40	1.7	23
	Aug-25	dry	5	Dry	dry					
	Sep-25	4.73	5	0.27	6.9	15.1	130	13	<0.015	1.2
	Oct-25	4.5	5	0.5	7.3	14.8	130	5.6	<0.015	1.5
	Nov-25	4.71	5	0.29	7	13.1	82	2.3	<0.015	0.85
	Dec-25	4.14	5	0.86	7.7	13.9	130	6.3	<0.015	1.9
BH15	Jan-25	2.02	3.86	1.84	7.1	11.6	670	19	0.032	21
	Feb-25	2.48	3.86	1.38	7.5	10.9	1500	32	<0.015	41
	Mar-25	2.25	3.86	1.61	7.1	12.5	2100	35	0.42	64
	Apr-25	2.45	3.86	1.41	7	12.2	990	17	0.016	27
	May-25	2.56	3.86	1.3	6.9	12.3	2000	32	0.015	48
	Jun-25	2.75	3.86	1.11	6.9	13.2	940	19	<0.015	25
	Jul-25	3.09	3.86	0.77	7.1	13.6	1300	25	0.055	31
	Aug-25	2.48	3.86	1.38	7.3	13.5	1200	36	0.078	30
	Sep-25	2.19	3.86	1.67	7.1	15.9	680	21	0.019	22
	Oct-25	2.3	3.86	1.56	7	14.3	690	21	<0.015	21
	Nov-25	2.18	3.86	1.68	7	12.2	790	25	<0.015	18
	Dec-25	1.27	3.86	2.59	7.7	12.3	570	13	<0.015	10

Monitoring location	Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Chloride	Ammoniacal nitrogen	Potassium	
	mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l	
BH9B	Jan-25	4.87	10.3	5.43	7.4	13.1	6500	2700	0.28	74
	Feb-25	5.1	10.3	5.2	7.2	12.3	8100	4400	0.88	120
	Mar-25	4.98	10.3	5.32	7.3	14	8600	1900	0.45	97
	Apr-25	5.18	10.3	5.12	7.4	15.1	9200	2700	0.43	84
	May-25	5.25	10.3	5.05	7.2	16.6	10000	3000	0.7	100
	Jun-25	5.32	10.3	4.98	7	14.5	11000	3600	0.81	100
	Jul-25	5.58	10.3	4.72	7.2	17.5	11000	3300	0.48	110
	Aug-25	5.45	10.3	4.85	7.4	17.9	12000	3500	0.84	100
	Sep-25	5.02	10.3	5.28	6.7	14.8	13000	4000	0.81	120
	Oct-25	4.96	10.3	5.34	7.1	14.3	10000	2900	0.7	93
Nov-25	4.79	10.3	5.51	7.1	12	12000	3200	0.98	110	
Dec-25	4.45	10.3	5.85	7.7	13.4	11000	3600	0.81	120	
BH7B	Jan-25	4.68	11.28	6.6						
	Feb-25	4.85	11.28	6.43						
	Mar-25	4.76	11.28	6.52						
	Apr-25	4.98	11.28	6.3						
	May-25	5.06	11.28	6.22						
	Jun-25	5.09	11.28	6.19						
	Jul-25	5.29	11.28	5.99						
	Aug-25	5.21	11.28	6.07						
	Sep-25	4.8	11.28	6.48						
	Oct-25	4.78	11.28	6.5						
Nov-25	4.55	11.28	6.73							
Dec-25	4.22	11.28	7.06							
BH5B	Jan-25	4.56	11.23	6.67						
	Feb-25	4.73	11.23	6.5						
	Mar-25	4.65	11.23	6.58						
	Apr-25	4.88	11.23	6.35						
	May-25	4.97	11.23	6.26						
	Jun-25	4.98	11.23	6.25						
	Jul-25	5.15	11.23	6.08						
	Aug-25	5.08	11.23	6.15						
	Sep-25	4.73	11.23	6.5						
	Oct-25	4.69	11.23	6.54						
Nov-25	4.42	11.23	6.81							
Dec-25	4.07	11.23	7.16							
BH3W	Jan-25	3.11	7.84	4.73						
	Feb-25	3.28	7.84	4.56						
	Mar-25	3.19	7.84	4.65						
	Apr-25	3.42	7.84	4.42						
	May-25	3.48	7.84	4.36						
	Jun-25	3.52	7.84	4.32						
	Jul-25	3.63	7.84	4.21						
	Aug-25	4.62	7.84	3.22						
	Sep-25	3.3	7.84	4.54						
	Oct-25	3.22	7.84	4.62						
Nov-25	2.95	7.84	4.89							
Dec-25	3.61	7.84	4.23							
BH1B	Jan-25	3.48	7.9	4.42	7.8	13.2	2900	380	0.8	25
	Feb-25	3.65	7.9	4.25	7.9	12.4	1100	140	1.2	15
	Mar-25	3.58	7.9	4.32	7.7	15.2	720	49	<0.015	9.6
	Apr-25	3.8	7.9	4.1	7.8	16.5	2900	370	0.73	32
	May-25	3.86	7.9	4.04	7.8	16	3200	380	1.2	33
	Jun-25	3.87	7.9	4.03	7.8	16.8	2900	390	1.3	26
	Jul-25	3.93	7.9	3.97	7.8	18.9	2600	300	1.3	24
	Aug-25	3.99	7.9	3.91	8.1	16.4	3200	410	0.22	30
	Sep-25	3.7	7.9	4.2	8	14.9	3600	660	1.4	35
	Oct-25	3.6	7.9	4.3	7.8	15.3	3100	440	1.3	28
Nov-25	3.31	7.9	4.59	7.9	12.9	3200	470	1	30	
Dec-25	2.94	7.9	4.96	8.4	13.7	3200	410	1.3	33	

Monitoring location		Borehole Levels	Borehole Depth	Difference	pH	Temperature	Conductivity	Chloride	Ammoniacal nitrogen	Potassium
		mbTOC	mbTOC	m	-	°C	µS	mg/l	mg/l	mg/l
BH45B	Jan-25	4.12	9.41	5.29	7	13.2	2200	110	110	75
	Feb-25	4.3	9.41	5.11	7	12.9	1800	130	99	76
	Mar-25	4.22	9.41	5.19	7	14.9	2200	130	110	76
	Apr-25	4.43	9.41	4.98	7	15.1	2300	140	130	75
	May-25	4.5	9.41	4.91	7	16.6	2200	130	120	7.5
	Jun-25	4.58	9.41	4.83	7	15.9	2300	140	110	70
	Jul-25	4.7	9.41	4.71	7.1	17.8	2300	120	96	71
	Aug-25	4.61	9.41	4.8	7.2	16.8	2200	120	86	69
	Sep-25	4.31	9.41	5.1	7.1	15	1900	92	83	62
	Oct-25	4.22	9.41	5.19	6.9	14.5	1800	110	85	53
	Nov-25	4.1	9.41	5.31	7	12.8	2000	150	88	60
Dec-25	flooded									
BH43B	Jan-25	4.44	8.93	4.49	7.1	13.3	2200	120	120	85
	Feb-25	4.51	8.93	4.42	7.2	13.1	1700	120	95	78
	Mar-25	4.36	8.93	4.57	7.1	14.8	2100	120	120	75
	Apr-25	4.62	8.93	4.31	7.2	14.4	2100	130	120	78
	May-25	4.81	8.93	4.12	7	17.1	2100	120	110	73
	Jun-25	5.02	8.93	3.91	7.2	16.4	2000	120	110	66
	Jul-25	5.02	8.93	3.91	7.1	17.7	2100	110	90	70
	Aug-25	4.73	8.93	4.2	7.3	16.5	2100	120	83	70
	Sep-25	4.49	8.93	4.44	7	15.2	2100	120	87	68
	Oct-25	4.24	8.93	4.69	7	14.9	2000	120	110	69
	Nov-25	3.97	8.93	4.96	7.1	12.8	2200	150	99	71
Dec-25	3.7	8.93	5.23	flooded						
BH40B	Jan-25	3.97	6.9	2.93	7.7		1700	160	13	47
	Feb-25	4.09	6.9	2.81						
	Mar-25	4.17	6.9	2.73						
	Apr-25	4.25	6.9	2.65	7.6	15.8	1600	150	10	42
	May-25	4.33	6.9	2.57						
	Jun-25	4.45	6.9	2.45						
	Jul-25	4.59	6.9	2.31						
	Aug-25	4.45	6.9	2.45						
	Sep-25	4.12	6.9	2.78						
	Oct-25	4.1	6.9	2.8						
	Nov-25	4.1	6.9	2.8						
Dec-25	3.46	6.9	3.44							

Number in orange font indicate exceedance of a Control level  
 Number in red font indicate exceedance of a Trigger level

Black shading is for data not required to be monitored. Grey boxes are for data not required for that month. Blank spaces indicate monitoring not undertaken.

'U/S' means unsuitable sample for the analysis requested. 'I/S' means insufficient sample.

**B3 - Groundwater Quality Monitoring – Six-Monthly Data****April 2025**

Determinand	Units	Monitoring location								
		BH5	BH8	BH12	BH15	BH9B	BH1B	BH43B	BH45B	BH40B
Alkalinity expressed as CaCO <sub>3</sub>	mg/l	300	920	100	480	800	1500	1200	1400	880
As (Dissolved)	µg/l	0.75	7.2	3.59	3.31	1.11	20	13.2	1.2	47.2
Biochemical Oxygen Demand	mg/l	<1.0	7.2	2.1	1.6	1	260	99	72	130
Cd (Dissolved)	µg/l	<0.02	0.1	0.03	0.11	0.04	0.13	<0.02	<0.02	<0.02
Calcium	mg/l	110	110	18	140	94	16	130	170	33
Chemical Oxygen Demand	mg/l	20	94	7.6	2.9	72	260	99	72	130
Cr (Dissolved)	µg/l	0.6	0.6	<0.2	0.5	0.2	4.4	0.7	1	0.5
Cu (Dissolved)	µg/l	10	9.4	7.5	15	8.5	3	1.8	3	2
Iron	mg/l	<0.004	0.12	0.18	0.007	0.15	5.8	4.6	0.11	0.23
Pb (Dissolved)	µg/l	<0.2	<0.2	0.3	<0.2	<0.2	5.1	<0.2	<0.2	0.9
Magnesium	mg/l	12	82	6.8	46	170	22	78	68	47
Mn (Dissolved)	µg/l	1.5	240	4.5	5.6	840	240	1500	810	300
Mercury	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	u/s	<0.005	<0.005	<0.005
Ni (Dissolved)	µg/l	1.4	7.2	1.9	3.3	5.8	2.1	5.2	5.7	3.3
Sodium	mg/l	22	380	11	56	1800	850	160	140	290
Sulphate	mg/l	51.6	47.3	2.27	153	610	9.48	2.92	2.54	2
Total Organic Carbon	mg/l	5.02	12.9	2.38	5.21	7.56	100	19	24	21.5
Zn (Dissolved)	µg/l	3.6	7.9	220	19	8.3	4.8	3.1	3.8	6.2

**October 2025**

Determinand	Units	Monitoring location								
		BH5	BH8	BH12	BH15	BH9B	BH1B	BH43B	BH45B	
Alkalinity expressed as CaCO <sub>3</sub>	mg/l	310	1000	60	350	870	1600	1200	1100	
As (Dissolved)	µg/l	1.16	18.6	1.28	2.4	0.94	5.4	13.3	1.31	
Biochemical Oxygen Demand	mg/l	1.5	4.7	6.7	1.7	1.9	3.2	7.3	3.4	
Cd (Dissolved)	µg/l	<0.02	0.09	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	
Calcium	mg/l	100	85	15	96	120	13	93	140	
Chemical Oxygen Demand	mg/l	7	120	100	19	76	300	440	120	
Cr (Dissolved)	µg/l	0.7	0.8	0.5	0.7	0.3	4.6	0.7	0.9	
Cu (Dissolved)	µg/l	10	5.1	14	22	3.1	3.2	3	1.8	
Iron	mg/l	0.013	0.071	0.073	0.014	0.72	5.4	0.095	2.9	
Pb (Dissolved)	µg/l	<0.2	<0.2	<0.2	<0.2	<0.2	1.6	<0.2	<0.2	
Magnesium	mg/l	15	64	3.4	26	210	23	55	54	
Mn (Dissolved)	µg/l	1.2	540	0.9	1.2	1500	220	1400	840	
Mercury	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	
Ni (Dissolved)	µg/l	2.5	8.8	1.5	2.2	2.7	2.2	6.4	5.1	
Sodium	mg/l	60	360	7	31	2100	870	110	100	
Sulphate	mg/l	42.4	28.5	1.95	60.7	674	12.1	3.39	2.08	
Total Organic Carbon	mg/l	6.04	16.4	2.37	6.87	7.46	120	18.7	18.2	
Zn (Dissolved)	µg/l	3.2	5.8	140	17	3.8	6.4	5.9	2.7	

**B4 - Groundwater Quality Monitoring – Two Yearly Data****October 2025**

Determinand	Units	Monitoring location							
		BH5	BH8	BH12	BH15	BH9B	BH1B	BH43B	BH45B
2-methylphenol	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methylphenol	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenol	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sb (Dissolved)	ug/l	<0.4	<0.4	<0.4	0.7	<0.4	0.4	<0.4	<0.4
Ba (Dissolved)	ug/l	25	22	37	17	24	17	14	260
Benzo(a)Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Boron	ug/l	120	1100	26	270	1300	1900	990	870
Co (Dissolved)	ug/l	<0.2	3.7	<0.2	<0.2	0.3	1.2	2.7	2.1
Cyanide(Total)	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
Fluoride	ug/l	420	1000	70	770	730	2300	620	410
Mo (Dissolved)	ug/l	1.8	0.62	0.32	1.8	2.3	0.77	0.82	0.21
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as N	ug/l	<5.0	200	30	18	150	<5.0	<5.0	<5.0
Mecoprop	ug/l	<0.02	0.93	<0.02	<0.02	<0.02	<0.02	0.83	1.4
Phosphate as P	ug/l	53	470	72	95	55	5600	56	61
Phosphorus (Total)	ug/l	39	2500	250	130	1200	5900	830	630
Se (Dissolved)	ug/l	<0.6	0.7	<0.6	1.1	0.7	2.6	2.3	2.1
Uranium	ug/l	2.3	2.6	<1.0	3.7	<1.0	<1.0	<1.0	<1.0
V (Dissolved)	ug/l	0.4	11	0.3	1	1	11	12	0.3
TPH (C5-C6 aliphatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH (C6-C8 aliphatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH (C8-C10 aliphatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH DW(C10-C12 aliphatic)	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH DW(C12-C16 aliphatic)	ug/l	<10	<10	25	<10	<10	<10	<10	<10
TPH DW(C16-C21 aliphatic)	ug/l	<10	<10	41	<10	<10	<10	<10	<10
TPH DW(C21-C35 aliphatic)	ug/l	<10	<10	100	<10	<10	<10	<10	<10
TPH (Aliphatic) total	ug/l	<10	<10	170	<10	<10	<10	<10	<10
TPH (C6-C7 aromatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH (C7-C8 aromatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH (C8-C10 aromatic)	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TPH DW(C10-C12 aromatic)	ug/l	<10	<10	<10	<10	<10	<10	<10	22
TPH DW(C12-C16 aromatic)	ug/l	<10	<10	<10	<10	<10	<10	<10	52
TPH DW(C16-C21 aromatic)	ug/l	<10	<10	<10	<10	<10	<10	<10	30
TPH DW(C21-C35 aromatic)	ug/l	<10	<10	<10	<10	<10	<10	<10	<10
TPH (Aromatic) total	ug/l	<10	<10	<10	<10	<10	<10	<10	100
Benzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EthylBenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
M/P Xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-Butyl Ether	ug/l	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
O Xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

## Appendix C - Surface Water Monitoring Data

Monitoring location		pH	Temperature	Conductivity	Dissolved oxygen	Ammoniacal Nitrogen as N	BOD	COD	Ni (Dissolved)	Nitrate as N	Phenol	Suspended Solids (total)
		-	°C	µS	mg/l	mg/l	mg/l	mg/l	µg/l	mg/l	µg/l	mg/l
River north	Jan-25	7.9	9.6	48000	11	<0.015	2.8	850	2.9	0.58	<0.5	26
	Feb-25	7.9	8.9	34000	11	<0.015	6.7	1100	1.1	0.47	<0.5	57
	Mar-25	8	14.1	35000	10	<0.015	1.2	700	1.4	0.26	<0.5	160
	Apr-25	7.9		26000	9.6	<0.015	<1	1100	1.4	0.36	<0.5	80
	May-25	8.2	19.1	48000	9.9	<0.015	2.2	1100	2.4	0.1	<0.5	59
	Jun-25	8	18.3	10000	9.2	<0.015	<1	120	1.4	0.27	<0.5	18
	Jul-25	8	21	52000	9	13	2.1	1300	<0.5	0.02	<0.5	9
	Aug-25	8.1	21.6	44000	9.5	<0.015	1.9	1200	4.2	0.02	<0.5	59
	Sep-25	7.8	15.4	170	9.9	<0.015	1.5	5.5	2.6	0.16	<0.5	42
	Oct-25	8	13.2	3600	10	0.02	2.4	9.1	2	0.21	<0.5	56
	Nov-25	7.9	8.5	5400	11	0.029	1.9	45	1.7	0.18	<0.5	75
Dec-25	No results - no access											
River south	Jan-25	7.9	10.1	47000	11	<0.015	2	1200	1.8	0.44	<0.5	160
	Feb-25	7.9	8.3	35000	11	<0.015	5	1100	0.9	0.49	<0.5	110
	Mar-25	8	14	36000	11	<0.015	1.2	940	1.4	0.3	<0.5	86
	Apr-25	8		29000	9.8	0.028	1.6	500	1.9	0.29	<0.5	63
	May-25	8.2	18.3	47000	10	<0.015	2	1100	2	0.11	<0.5	42
	Jun-25	8	18.9	46000	9.2	<0.015	1	970	7.9	0.04	<0.5	66
	Jul-25	8.1	20.9	52000	9.7	1.5	2	1100	<0.5	0.01	<0.5	9.7
	Aug-25	8.1	21.9	50000	9.5	<0.015	2.3	1500	1.6	0.02	<0.5	22
	Sep-25	7.8	15.3	240	9.7	<0.015	2	8.6	2.3	2.24	<0.5	38
	Oct-25	8	13.6	21000	10	<0.015	1.7	770	1.5	0.15	<0.5	34
	Nov-25	7.9	8.5	14000	11	0.033	2.5	25	1.6	0.16	<0.5	67
Dec-25	7.9	12.3	590	9.4	0.098	1.7	41	1.5	0.68	<0.5	180	

Monitoring location		pH	Temperature	Conductivity	Dissolved oxygen	Ammoniacal Nitrogen as N	BOD	COD	Ni (Dissolved)	Nitrate as N	Phenol	Suspended Solids (total)
		-	°C	µS	mg/l	mg/l	mg/l	mg/l	µg/l	mg/l	µg/l	mg/l
Canal north	Jan-25	7.5	7.2	190	7.2	0.042	<1.0	5	2.4	0.54	<0.5	5
	Feb-25	7.4	7.4	210	9.2	0.034	2	4.8	2.3	0.42	<0.5	2.2
	Mar-25	7.3	12.9	230	6	0.039	1.9	3.3	2.5	0.08	<0.5	5
	Apr-25	7.2		190	7.3	0.048	1.6	14	3.4	0.26	<0.5	<2
	May-25	7.1	16.1	190	5.9	0.07	2.3	11	2.1	0.07	<0.5	7
	Jun-25	7	19.1	150	6.5	0.016	1.7	11	2.1	0.05	<0.5	<2
	Jul-25	7.1	17.8	230	2.6	0.95	3.4	5.3	1.7	<0.01	<0.5	2.6
	Aug-25	7.3	18.9	240	6.1	0.068	2	25	1.4	0.02	<0.5	12
	Sep-25	6.9	15.5	140	7.4	<0.015	1.6	7.7	3.1	0.09	<0.5	<2
	Oct-25	7	12.9	180	8.5	<0.015	1.7	<2	1.7	0.05	<0.5	<2
	Nov-25	7.2	6.9	180	7	0.032	1.8	6.6	1.5	0.32	<0.5	11
	Dec-25	7.4	11.3	160	8.3	0.023	<1	6.9	2.2	0.17	<0.5	13
Canal south	Jan-25	7.3	7.2	200	8.2	0.12	1.2	7.3	2.4	0.65	<0.5	3
	Feb-25	7.3	7.3	210	7.2	0.17	2.9	3.7	2.1	0.59	<0.5	<2
	Mar-25	7.2	12.6	240	5.8	0.14	2.2	3.1	2.2	0.22	<0.5	8
	Apr-25	7.2		200	6.2	0.12	1.9	16	2.4	0.26	<0.5	<2
	May-25	7	15.5	200	7.7	0.073	3.4	8	2	0.1	<0.5	<2
	Jun-25	6.8	18.5	160	6.5	0.081	1.5	13	3	<0.01	<0.5	3
	Jul-25	6.9	17.8	210	6.2	0.13	4.1	14	2.5	<0.01	<0.5	6.2
	Aug-25	7.1	18.2	240	2.6	0.022	2.9	22	1.5	0.02	<0.5	12
	Sep-25	6.9	15.4	170	6.3	0.23	4.4	6.3	4.1	0.07	<0.5	<2
	Oct-25	7.1	12.5	190	5.2	0.12	1.3	<2	2	0.01	<0.5	<2
	Nov-25	7.2	7.1	190	5.6	0.18	1.7	11	1.7	0.39	<0.5	<2
	Dec-25	7.5	11.3	160	6.9	0.44	1.4	10	1.8	0.3	<0.5	16

Number in orange font indicate exceedance of a Control level  
 Number in red font indicate exceedance of a Trigger / Compliance level

## Appendix D - Perimeter Gas Monitoring Data

Monitoring location	Month	Methane	Carbon dioxide	Oxygen	Carbon monoxide	Atmospheric pressure	Differential pressure
		%	%	%	ppm	mbar	mbar
BH4	Jan-25	0	1.2	19	0	1032	-0.02
	Feb-25	0	0.7	20	0	1019	0
	Mar-25	0	0.6	20.3	0	1026	-0.03
	Apr-25	0	0.7	20.2	0	1000	-0.02
	May-25	0	0.1	20.1	0	1009	0.02
	Jun-25	0	0.4	20.1	0	1015	0
	Jul-25	0	0.6	19.9	0	1000	-0.02
	Aug-25	0	0.7	20.1	0	1006	-0.02
	Sep-25	0	0.2	20.6	0	1010	-0.02
	Oct-25	0	0.3	20.3	0	981	0
	Nov-25	0	1.8	19.4	0	1023	0.03
Dec-25	0	0.9	19.9	0	1004	0	
BH5	Jan-25	0	0.9	18.2	0	1034	0
	Feb-25	0	0.5	20.1	0	1019	0
	Mar-25	0	1	18.4	0	1026	-0.03
	Apr-25	0	0.7	19.1	0	1000	-0.03
	May-25	0	3.1	15.7	0	1009	0.02
	Jun-25	0	3.3	15	0	1015	-0.04
	Jul-25	0	0.8	19.6	0	1000	0.02
	Aug-25	0	2	19.7	0	1006	0
	Sep-25	0	1.8	19.2	0	1010	0.02
	Oct-25	0	3.3	15.7	0	981	-0.03
	Nov-25	0	0.3	20.6	0	1023	0
Dec-25	0.1	1.2	19	0	1004	-0.02	
BH8	Jan-25	0.1	0.3	20.3	0	1034	0
	Feb-25	0.1	0.4	20.6	0	1018	0
	Mar-25	0.1	0.4	20.2	0	1026	-0.03
	Apr-25	0	0.2	20.2	0	1000	0
	May-25	0	0.3	20.1	0	1009	0.04
	Jun-25	0.1	1.3	19.1	0	1015	-0.04
	Jul-25	0	0.7	19.7	0	1000	0.02
	Aug-25	0	0.8	20.1	0	1006	0
	Sep-25	0	0.5	20.1	0	1010	0.03
	Oct-25	0	0.8	19.5	0	981	-0.02
	Nov-25	0.1	0.3	20.4	0	1023	-0.03
Dec-25	flooded						
BH12	Jan-25	0.2	0.6	19.8	0	1034	0.03
	Feb-25	0.1	0.7	19.7	0	1018	-0.02
	Mar-25	0	0.4	19.9	0	1026	-0.02
	Apr-25	0	0.2	19.5	0	1000	0.02
	May-25	0.1	0.3	19.4	0	1008	0.04
	Jun-25	0.1	0.3	18.5	0	1015	-0.03
	Jul-25	0	0.3	20.1	0	1000	0
	Aug-25	0	0.1	19.9	0	1005	-0.05
	Sep-25	0.1	0.2	18.5	0	1010	0.02
	Oct-25	0.1	0.3	20.8	0	980	0.03
	Nov-25	0.1	0.6	15.3	0	1023	-0.03
Dec-25	0	0.6	19.4	0	1004	-0.02	
BH15	Jan-25	0	0.4	20	0	1034	0.02
	Feb-25	0.1	0.9	19.8	0	1018	0
	Mar-25	0	0.9	19.2	0	1026	0
	Apr-25	0	0.7	19.6	0	1000	0
	May-25	0	1.1	18.8	0	1008	-0.03
	Jun-25	0	1.4	17.3	0	1015	-0.02
	Jul-25	0	1.1	18.9	0	1000	-0.03
	Aug-25	0	2.1	17.1	0	1005	0
	Sep-25	0	1.3	19.5	0	1010	0.02
	Oct-25	0	1.5	19.7	0	989	0
	Nov-25	0.1	0.7	19.9	0	1023	-0.02
Dec-25	0	2.2	19.5	0	1004	0	

Monitoring location	Month	Methane	Carbon dioxide	Oxygen	Carbon monoxide	Atmospheric pressure	Differential pressure
		%	%	%	ppm	mbar	mbar
BH9B	Jan-25	0	0.1	20.1	0	1034	0
	Feb-25	0	0.1	20.7	0	1019	0.03
	Mar-25	0	0.1	20.7	0	1026	-0.04
	Apr-25	0	0.1	20.4	0	1000	0.3
	May-25	0	0.1	20.1	0	1009	0.03
	Jun-25	0	0.4	20	0	1015	-0.02
	Jul-25	0	0.2	20.4	0	1000	0.02
	Aug-25	0	0.3	20.5	0	1006	-0.02
	Sep-25	0	0.3	20.5	0	1010	-0.03
	Oct-25	0	0.2	20.3	0	981	-0.02
	Nov-25	0	0.1	20.2	0	1023	0
	Dec-25	0	0.1	20.2	0	1004	0.02
BH7B	Jan-25	0	0.6	19.5	0	1034	0.03
	Feb-25	0	0.4	20.4	0	1019	0
	Mar-25	0	0.6	19.9	0	1026	-0.03
	Apr-25	0	0.6	19.5	0	1000	0.02
	May-25	0	0.5	19.4	0	1009	0
	Jun-25	0	0.4	19.8	0	1015	0.02
	Jul-25	0	0.3	20.2	0	1000	0.02
	Aug-25	0	0.3	20.4	0	1006	-0.05
	Sep-25	0	0.5	19.9	0	1010	-0.03
	Oct-25	0	0.5	19.9	0	981	-0.02
	Nov-25	0	0.8	19.5	0	1023	-0.03
	Dec-25	0	0.7	19.3	0	1004	0.02
BH5B	Jan-25	0	0.1	20.4	0	1034	0
	Feb-25	0	0.1	21	0	1019	0.02
	Mar-25	0	0.2	20.5	0	1026	-0.03
	Apr-25	0	0.2	20.5	0	1000	0.02
	May-25	0	0.1	20.3	0	1009	0
	Jun-25	0	0.2	20.4	0	1015	0
	Jul-25	0	0.2	20.4	0	1000	0.03
	Aug-25	0	0.1	20.6	0	1006	-0.02
	Sep-25	0	0.3	20.6	0	1010	-0.03
	Oct-25	0	0.2	20.5	0	981	-0.02
	Nov-25	0	0.2	20.4	0	1023	0
	Dec-25	0	0.2	20.4	0	1004	0.02
BH3W	Jan-25	0	2.1	16	0	1034	0
	Feb-25	0	3.2	14.9	0	1019	0.02
	Mar-25	0	0.8	19.7	0	1026	-0.02
	Apr-25	0	2.1	18	0	1000	0
	May-25	0	1.7	18.6	0	1009	-0.03
	Jun-25	0	2.1	18.3	0	1015	0
	Jul-25	0	2.4	17.6	0	1000	0.03
	Aug-25	0	2.2	17.1	0	1006	-0.02
	Sep-25	0	3.2	15.7	0	1010	0
	Oct-25	0	0.8	19.5	0	981	-0.03
	Nov-25	0	2.1	18.7	0	1023	0.03
	Dec-25	0	1.2	19	0	1004	0
BH1B	Jan-25	0	0.3	20.3	0	1033	0.02
	Feb-25	0.1	0.8	20.4	0	1018	0.02
	Mar-25	0.1	0.8	20	0	1026	0
	Apr-25	0.1	0.6	19.3	0	1000	0.03
	May-25	0	1.6	17.9	0	1008	0.02
	Jun-25	0	2.1	17	0	1015	0.04
	Jul-25	0	2.5	17.3	0	1000	0.05
	Aug-25	0	2.5	16.4	0	1004	-0.03
	Sep-25	0.1	2.6	17.1	0	1010	-0.03
	Oct-25	0.1	1	19.2	0	980	-0.04
	Nov-25	0.1	0.3	20.7	0	1023	0.02
	Dec-25	0.1	0.5	20.3	0	1003	-0.02

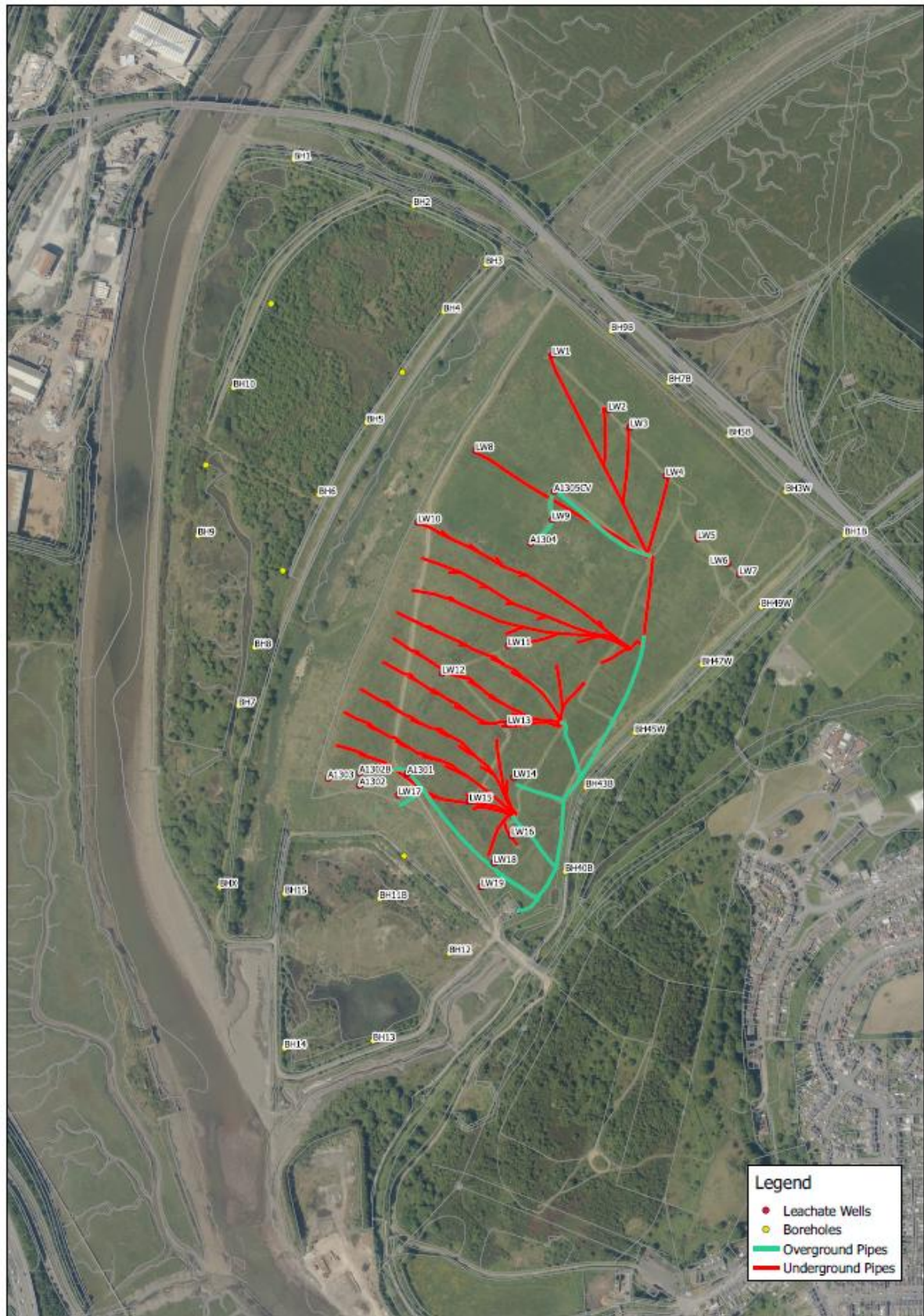
Monitoring location	Month	Methane	Carbon dioxide	Oxygen	Carbon monoxide	Atmospheric pressure	Differential pressure
		%	%	%	ppm	mbar	mbar
BH49W	Jan-25	0	0.3	20.3	0	1034	0.03
	Feb-25	0	0.2	21.2	0	1018	0
	Mar-25	0	0.3	20.8	0	1026	0
	Apr-25	0	0.2	20.6	0	1000	0
	May-25	0	0.2	20.3	0	1009	-0.02
	Jun-25	0	0.3	20.3	0	1015	0
	Jul-25	0	0.5	20.2	0	1000	0.05
	Aug-25	0	0.2	20.7	0	1006	-0.03
	Sep-25	0	0.4	20.5	0	1010	0
	Oct-25	0	0.3	20.6	0	981	0
	Nov-25	0	0.8	19.8	0	1023	0.02
	Dec-25	0	0.5	20.2	0	1004	0
BH47W	Jan-25	0	0.6	20.2	0	1034	-0.02
	Feb-25	0	0.4	21.1	0	1018	0.02
	Mar-25	0	0.4	20.5	0	1026	0
	Apr-25	0	0.6	20.3	0	1000	0
	May-25	0	0.3	20.3	0	1009	-0.04
	Jun-25	0	0.4	20.2	0	1015	0
	Jul-25	0	0.7	19.9	0	1000	-0.04
	Aug-25	0	1.6	19.7	0	1006	0.03
	Sep-25	0	0.5	20.3	0	1010	0.02
	Oct-25	0	0.4	20.5	0	981	0.02
	Nov-25	0	0.3	20.9	0	1023	-0.02
	Dec-25	0	0.2	20.8	0	1004	-0.02
BH55B	Jan-25	0	3.3	17.5	0	1032	0
	Feb-25	0.1	3.6	17.4	0	1017	0.02
	Mar-25	0.1	3.6	17.9	0	1025	0
	Apr-25	0.1	3.9	16	0	999	-0.02
	May-25	0.1	4.8	15.3	0	1009	0.03
	Jun-25	0	3.5	17.2	0	1015	0.01
	Jul-25	0.1	6.3	13.1	0	1001	0.02
	Aug-25	0	3.4	15.4	0	1006	-0.02
	Sep-25	0.1	6.5	10.9	0	1010	0.05
	Oct-25	0.1	6.9	14.6	0	981	0.04
	Nov-25	0	4.8	16.9	0	1023	0
	Dec-25	0.1	3.4	16.8	0	1004	0.03
BH45B	Jan-25	13.9	4	16.6	0	1033	-0.02
	Feb-25	32.9	8.8	12.3	0	1018	-0.02
	Mar-25	20.1	5.6	15.7	0	1026	0
	Apr-25	22.9	6.6	13.2	0	1000	0.02
	May-25	30.1	8.3	9.5	0	1008	0
	Jun-25	8.8	4.6	13.9	0	1015	-0.02
	Jul-25	12.5	3.4	16.4	0	1000	0
	Aug-25	12.4	5.9	12	0	1005	-0.05
	Sep-25	44.8	10.4	4.3	0	1010	0
	Oct-25	27.7	5.3	11.6	0	980	0.02
	Nov-25	28.9	6.2	12	0	1023	0.02
	Dec-25	flooded					
BH43B	Jan-25	78.4	11.6	3	0	1033	-0.02
	Feb-25	87.3	12.9	1.9	0	1018	0
	Mar-25	46.7	7.4	8.8	0	1026	0.02
	Apr-25	76.7	10.7	3.4	0	1000	-0.03
	May-25	92.1	12	1.4	0	1008	-0.02
	Jun-25	90.8	11.7	1.7	0	1015	-0.02
	Jul-25	90.8	11.5	1.8	0	1000	-0.03
	Aug-25	58.8	8.8	6.6	32	1005	-0.05
	Sep-25	91	12.3	0.5	8	1010	-0.03
	Oct-25	79.9	8.4	6.8	0	980	0
	Nov-25	36.4	10.8	4.4	0	1010	0
	Dec-25	31.3	3.4	14.7	0	1003	0.02

Monitoring location	Month	Methane	Carbon dioxide	Oxygen	Carbon monoxide	Atmospheric pressure	Differential pressure
		%	%	%	ppm	mbar	mbar
BH40B	Jan-25	34.4	1.5	10.5	0	1033	-0.02
	Feb-25	74.8	2.7	2	0	1018	-0.02
	Mar-25	78.7	3.1	7	0	1026	0.03
	Apr-25	48.7	4.3	1.1	0	1000	0
	May-25	55.5	2.4	4.3	4	1008	0.02
	Jun-25	49.4	2.3	5.7	3	1015	0
	Jul-25	13.4	0.8	15.7	0	1000	-0.04
	Aug-25	47.5	1.9	7.7	0	1005	0.02
	Sep-25	56.1	2.2	5.5	9	1010	0.03
	Oct-25	34.3	2.5	1.5	2	980	-0.02
	Nov-25	83.3	2.8	3.3	0	1023	0
	Dec-25	26.6	4.7	6.1	0	1003	0.03

Number in orange font indicate exceedance of an Action level

Number in red font indicate exceedance of a Compliance level

Appendix E – Sampling point location plan



## Appendix F – Landfill Gas

**The following appendix is available as a separate document to this annual report.**

**This separate document has the following contents:**

1. Annual Performance Report
2. Weekly, Monthly and Six-Monthly Monitoring Data
3. Annual Emissions Testing
4. Annual Trace Gas Analysis
5. Quarterly Engine Emissions
6. C&P - Surface Emissions Survey

File name:

'Giants Grave SEM - Report October 2025 v2'

Report title

Surface Emissions Monitoring Report  
Giants Grave Landfill Site, Britton Ferry, Neath Port Talbot, SA11 2LN  
Neath Port Talbot County Borough Council  
October 2025