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Risk Screening and Technical Assessment

Landfill Area

Benduff Landfill

Rosscarbery

County Cork



Presented To: -
Cork County Council
Hume House,
Wolfe Tone Street
Clonakilty
Co. Cork

February 2024

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1. INTRODUCTION

Benduff Landfill was operated by Cork County Council and accepted municipal non-hazardous waste. It is estimated that there is approximately 347,600 tonnes of waste deposited on the site.

1.1 Background

The site is regulated by Waste Licence No. W-0070-01 granted by the Environmental Protection Agency (EPA). On 15th January 2013, the EPA technically amended the licence to insert the following condition;

6.15.1 Within eighteen months of the date of grant of this licence, the licensee shall carry out a risk screening and where necessary a technical assessment in accordance with the Guidance on the Authorisation of Discharges to Groundwater, published by the Environmental Protection Agency. A report on the outcome of the screening and, where relevant, the recommendations of the technical assessment in relation to the setting of groundwater compliance points and concentrations shall be included in the next AER. Any actions required to demonstrate compliance with the European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended, shall be agreed by the Agency and implemented before 22 December 2015.

O’Callaghan Moran & Associates (OCM) was appointed to undertake the assessment in accordance with Guidance on the Authorisation of Discharges to Groundwater referenced in Condition 6.15.1.

The Guidance applies to all activities that are potential sources of emissions to groundwater (e.g. percolation areas from wastewater treatment sites, animal slurry storage tanks, quarries and landfills etc.). For all sites an initial risk screening is required to determine the Source-Pathway-Receptor linkages (S-P-R) and identify if a further Technical Assessment (Tier 1, 2 or 3) is required. In the case of landfills, the Guidance recommends that a Tier 3 Technical Assessment be carried out regardless of the findings of the screening stage.

A Tier 3 Assessment describes the landfill design and construction, including remedial measures, the type and age of the waste, the geological and hydrogeological conditions (soils and subsoil classification, aquifer status, yield, groundwater flow rates, recharge rates and groundwater quality) and sensitive receptors (water supply wells, designated sites e.g. groundwater dependent ecosystems). It assesses the risks presented by the landfill and where relevant makes recommendations in relation to the establishment of groundwater compliance points and values.

1.2 Methodology

The background information sources included:

- A site history based on information provided by Cork County Council and obtained from a review of Agency files;
- Geology and Hydrogeology maps prepared by the Geological Survey of Ireland (GSI) and Teagasc;
- The Southwestern River Basin District (SWRBD) Management Plan;
- Databases on designated sites prepared by the National Parks and Wildlife Service (NPWS);
- The Annual Environmental Reports (AER) prepared by the Council which includes reviews of the surface, groundwater, landfill gas and leachate monitoring programmes.

The report was updated in 2024 to include the following:

- Updated trend analysis for all parameters from 2008 to date for all wells are included in Section 5;
- Separate trend analysis for MW1, MW2 and MW7 for the COPC's listed in section 7.3 (Compliance Monitoring) are included in Section 7;

1.3 Limitations

The purpose of the Agency's Guidance is to provide a practical framework for preparing and reviewing applications for authorisation to discharge to groundwater. This means that the scope of the different Tiers referenced in the document is based on proposed rather than existing developments.

In the case of a Tier 3 Assessment, the Guidance states that groundwater pumping tests are the preferred and accepted means of estimating the hydraulic properties of the aquifer underlying a site. There is a significant amount of information on the aquifer characteristics derived from well installation and the monitoring of water quality and levels undertaken as part of the current assessment. There is also information on the aquifer characteristics for the bedrock beneath the site. Therefore pumping tests were not undertaken as part of this assessment.

2. SITE HISTORY

Benduff Landfill opened in 1978. It is an unlined Non-Hazardous Waste Landfill operated by Cork Council located ca. 2.5km northeast of Rosscarbery. The landfill area is located in the eastern portion of a former slate quarry. The landfill stopped accepting waste at the facility in April 2004 and since that time restoration and aftercare works have been ongoing at the site. These works are summarised below.

The Landfill Cap was constructed in 2004. This incorporated an initial temporary cap followed by regrading and the placement of the following layer:

- Terram 1B1 geocomposite gas collection layer over the re-profiled landfill
- Bentomat Cap-75 barrier/protection layer over the gas collection layer
- Terram 1B1 geocomposite surface water drainage layer over the barrier layer
- 850mm deep layer of imported subsoil over the drainage layer
- 150mm deep layer of topsoil over the subsoil, subsequently grass seeded

In addition an eco-web honey comb geogrid was installed on the steep western side slope to assist in establishing vegetation growth in that area.

A surface water swale was constructed around the perimeter of the landfill which terminated at a low point along the south eastern boundary from where a 450mm stormwater pipe was laid to an existing stream, approximately 400m east of the site. The capping detail is shown on Drawing 2002-004-07-09 in Appendix 1 and was prepared by Fehily Timoney and Company who also supervised the capping works.

Two leachate collection wells were installed in the waste in 2004 during the capping works programme. The wells are located in the northeast and southwest portions of the landfill. Leachate is pumped to the leachate storage tank with a capacity of 192m³ located in the southern side of the landfill near the site entrance.

A 250m³ capacity landfill gas flare was installed adjacent to the leachate tank in 2004. In January 2012 the 250m³ enclosed flare was removed and replaced with an elevated ground flare.

These works were carried out following the approval of the Agency.

3. ENVIRONMENTAL SETTING

3.1 Site Location and layout

The existing facility is located on a side road approximately 300m north of the main Rosscarbery-Skibbereen road (N71) approximately 2.5km to the northeast of Rosscarbery (Figure 3.1).

The site covers an area of approximately 3 ha. The landfill is located in a west to east trending valley at the foot of Benduff Mountain. The ground also rises to the south of the landfill toward Barley Hill. Based on the difference in level between the quarry flow to the west of the landfill and the top of the landfill in the northwest corner of the site it is estimated that the maximum thickness of waste at the site is approximately 14m.

The site layout is shown on Photo 3.1. The site entrance is along the southern boundary of the landfill. There is a 2m high palisade and wire fence around the landfill. There is a leachate collection tank (192m³ capacity) located to the west of the site entrance (Photo 3.1) which is currently empty. Leachate is collected in two leachate wells one located in the northeast section of the landfill and one in the southwest section of the landfill. The leachate pumping is float activated. Two tankers of leachate were removed in 2023 to the Councils wastewater treatment plant in Bandon. The volumes of leachate being generated at the site have been decreasing overtime. This indicates that the capping system which has been in place since 2004 has been effective at minimising leachate generation as a result of rainfall. Landfill gas is extracted and flared off at the elevated gas flare installed in 2012 (Photo 3.1). Flaring is automated and fires when there is sufficient gas to burn. The period of gas flaring has been declining due to reduce gas concentrations in the waste mass. The landfill is capped and vegetated. The western and eastern side slopes are steep. In 2007 the Agency requested a slope stability assessment of these portions of the landfill. The assessment was undertaken by FTC who concluded that there was no slope stability risk.

Rainfall on the cap is collected in the surface water collection swale which runs around the northern eastern and southern section of the landfill and is piped to stormwater sewer located in the northeast corner of the landfill (Photo 3.3). Surface water run-off from the high ground to the north of the landfill is also collected and piped to this sewer at the northeast corner of the landfill. The surface water is piped to an outfall point at a stream located approximately 500m east of the site.

3.2 Surrounding Land Use

The site and surrounding area are shown on Photo 3.1. The facility is located in part of a former slate quarry. The remaining quarry area is located immediately to the west of the landfill area. The landfill is bounded to the northwest by forestry, to the northeast by heathland along Benduff Mountain. There is a piggery located immediately to the east of the site. The remaining lands to the south are agricultural grassland. There are approximately 17 residences within 500m of the site most of which are farm dwellings. The licensed area encompasses c.3ha and the thickness of waste is estimated to be 14m.



Photo 3.1 Site Layout and Surrounding Landuse



Photo 3.2 Leachate Collection Tank and Landfill Gas Flare



Photo 3.3 Surface water swale and discharge pipe manhole, northeast corner of landfill

3.3 Subsoil

Figure 3.2, which is derived from the Teagasc Maps, shows the subsoil distribution across the site and beneath the landfill area. Soils are thin or absent immediately to the north of the site. Based on observations of the quarry area immediately to the west there may be some soils or residual overburden and rejected quarry materials beneath the landfill area (Photo 3.4).



Photo 3.4 Floor of Quarry immediately west of landfill

The soils to the south comprises glacial tills derived from slate and sandstone and are generally no more than 2-3m thick.

3.4 Bedrock

Figure 3.3, which is derived from the GSI Bedrock Map, shows the bedrock geology. The site is located in Devonian sandstone and mudstone from the Old Head Formation. Based on the use of the site historically as a quarry it is likely that the bedrock comprises slate and siltstone.

3.5 Hydrology

The site straddles two hydrologic catchments with flow from the western section of the site toward a stream which flows west the Roury River approximately 1km to the southwest of the site. In the eastern portion of the site surface water runoff is toward a Tinneel Stream located 500m to the east of the site which flows south and discharges into the sea at Rosscarbery (Figure 3.1).

The surface water from small streams emanating from the high ground immediately north of the landfill is collected in a surface water drain and piped to a stormwater manhole located at the northeast site boundary. This water combines with surface water run-off collected from the swale around the landfill and is piped 500m to the east to the stream which discharges at Rosscarbery.

3.6 Hydrogeology

Figure 3.4, which is derived from the GSI Aquifer Map shows the aquifer characteristics. The landfill is underlain by the Old Head Formation which is classified as a Locally Important aquifer that is Productive in Local Areas (**LI**).

The aquifer is part of the Skibbereen-Clonakilty Groundwater Body. The condition of a groundwater Water Body is defined by its chemical and quantitative status, whichever is worse, and groundwater quality is ranked in one of two status classes: Good or Poor. The Skibbereen-Clonakilty Groundwater Body is categorised as being of ‘Good’ status and is ‘Not At Risk’ of failing to achieve its objective of protecting the existing status.

3.6.1 Neighbouring Wells

There are two private wells that are monitored as part of the landfill groundwater monitoring programme (Figure 3.5). Monitoring well SPJ-1 is located at a farm dwelling c.290m to the south while SPM-2 is located at a farm dwelling c.270m to the southeast. SPJ-1 is used to supply potable water and water for use on the farm. SPM-2 is used intermittently to augment the potable supply at this dwelling. These are the closest private wells to the facility. Based on the GSI database there are no other wells within 5km of the site.

3.6.2 Groundwater Flow Direction

The calculation of groundwater flow direction is based the water levels recorded on site on the 14th April 2014 and observations of the site topography during the OCM site inspection in March 2014. The groundwater flow direction is illustrated on Figure 3.5.

Based on the topographic gradient groundwater flow is from the high ground at Benduff south to the landfill. Because the landfill straddles two surface water catchments groundwater is also expected to flow to the west beneath the western portion of the site and to the east beneath the eastern portion of the site. There is also some local groundwater flow from Barley Hill in the south to the north into the valley at the foot of Benduff. This is based on the difference in groundwater level between SPJ-1 and SPM-2 to the south of the landfill fill, MW-4 and MW-6 along the southern boundary of the landfill and MW-5 and MW-3 to the northeast and east of the landfill respectively

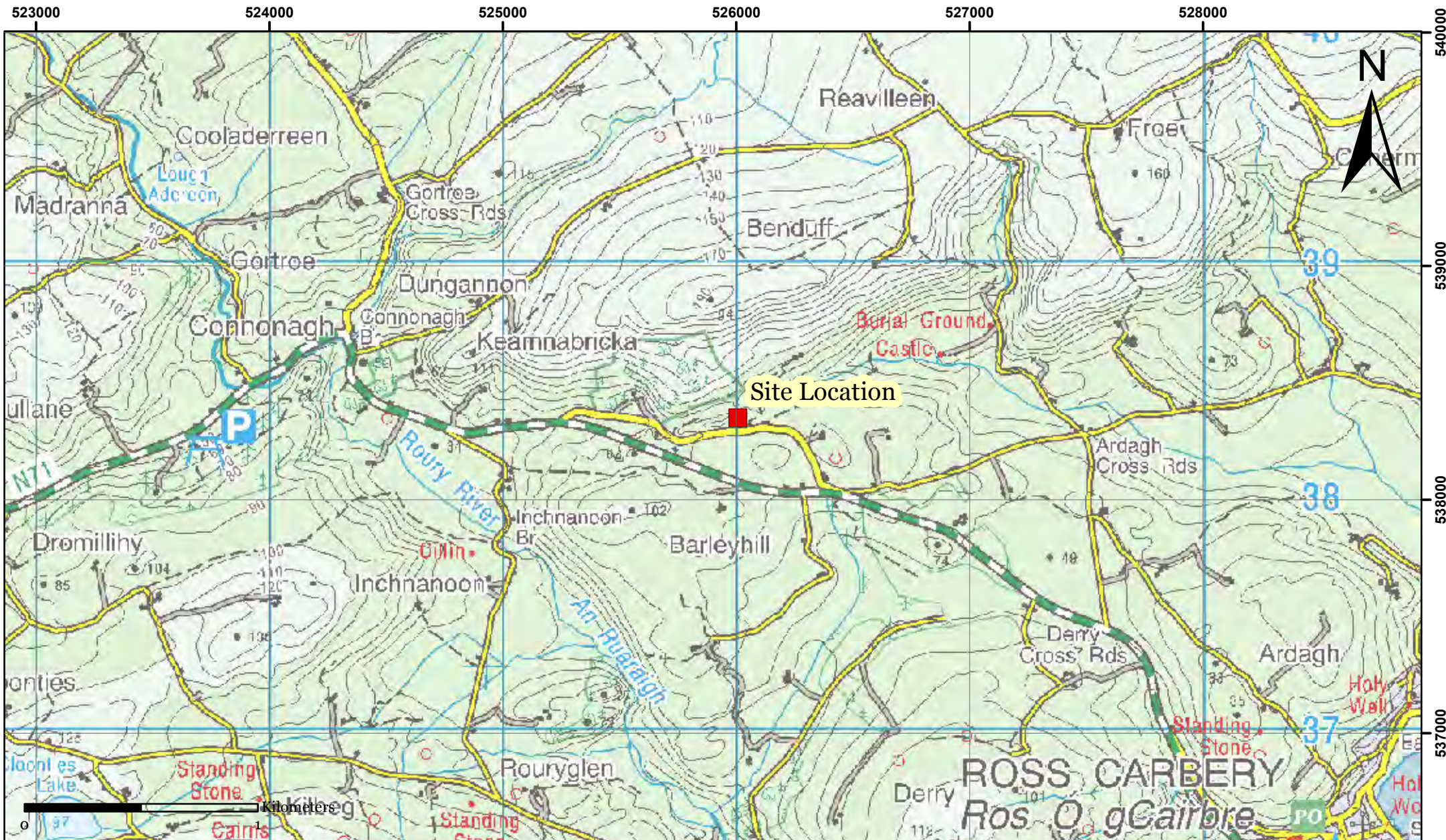
3.6.3 Aquifer Vulnerability

The GSI defines vulnerability as the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI uses four groundwater vulnerability categories - Extreme, High, Moderate and Low based on the permeability and thickness of the subsoils overlying the aquifer.

The GSI groundwater vulnerability map indicates the aquifer vulnerability of the site is generally Extreme with rock close to the surface (Figure 3.6). Based on borehole logs for the groundwater monitoring wells installed around the site subsoil thickness ranges from 1-3m which is consistent with the GSI designation.

3.7 Ecologically Sensitive Areas

The closest ecologically sensitive area is the Rosscarbery Estuary National Heritage Area which is located approximately 3km to the southeast of the site.



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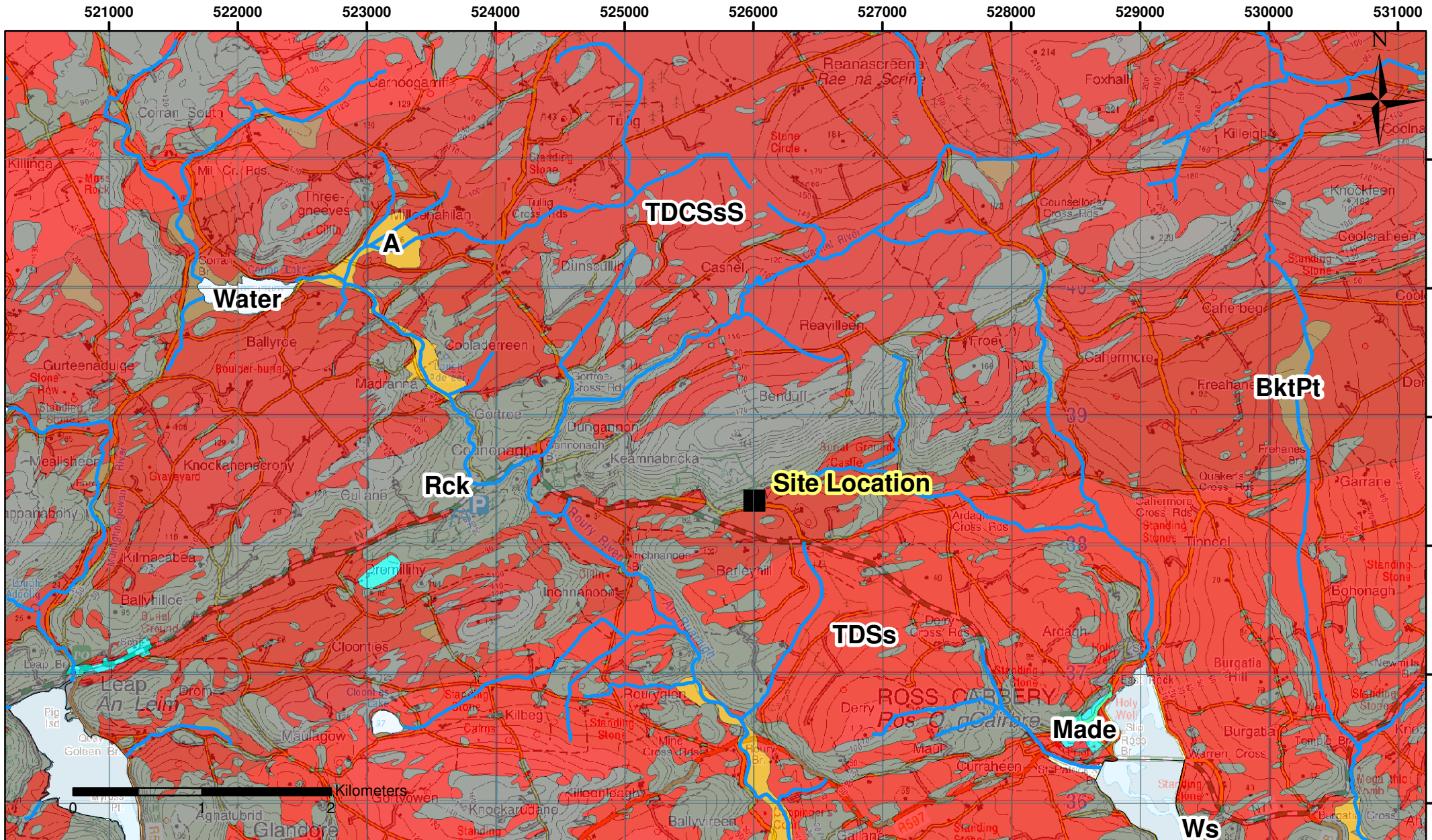
Details:

■ Site Location

TITLE
Site Location

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Figure 3.1



O'Callaghan Moran & Associates

environmental management for business

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TITLE

Subsoils

Details

■ Site_Location

— Rivers

— Alluvium

— Blanket peat

— Bedrock outcrop or subcrop

■ Windblown sands

■ Made ground

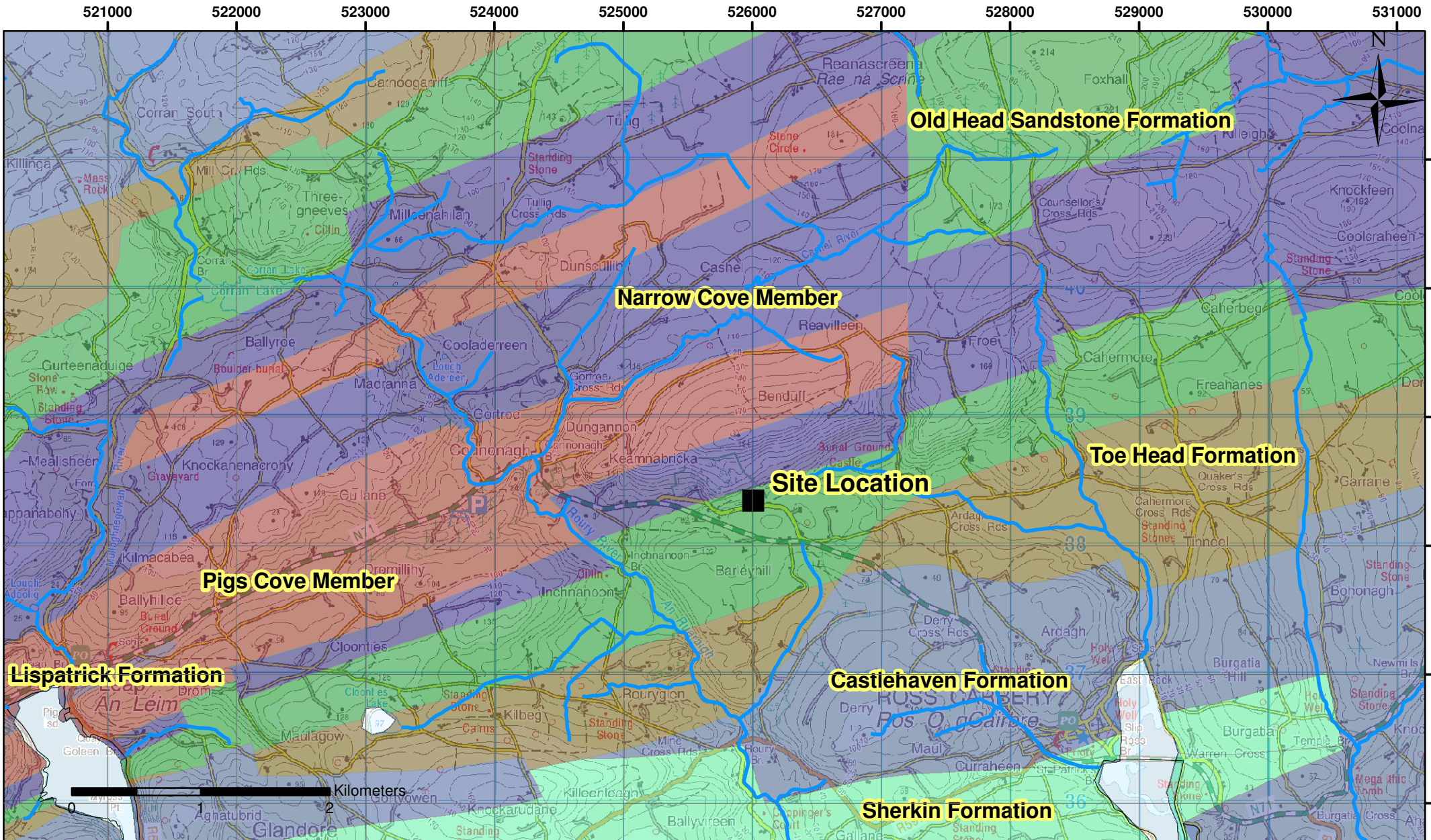
■ Till derived from Devonian and Carboniferous sandstones and shales

■ Till derived from Devonian sandstones

■ Water

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Figure 3.2





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TITLE
 Bedrock Geology

Details


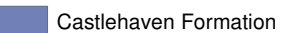



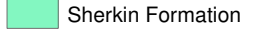
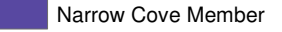
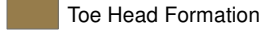
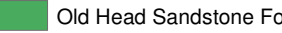
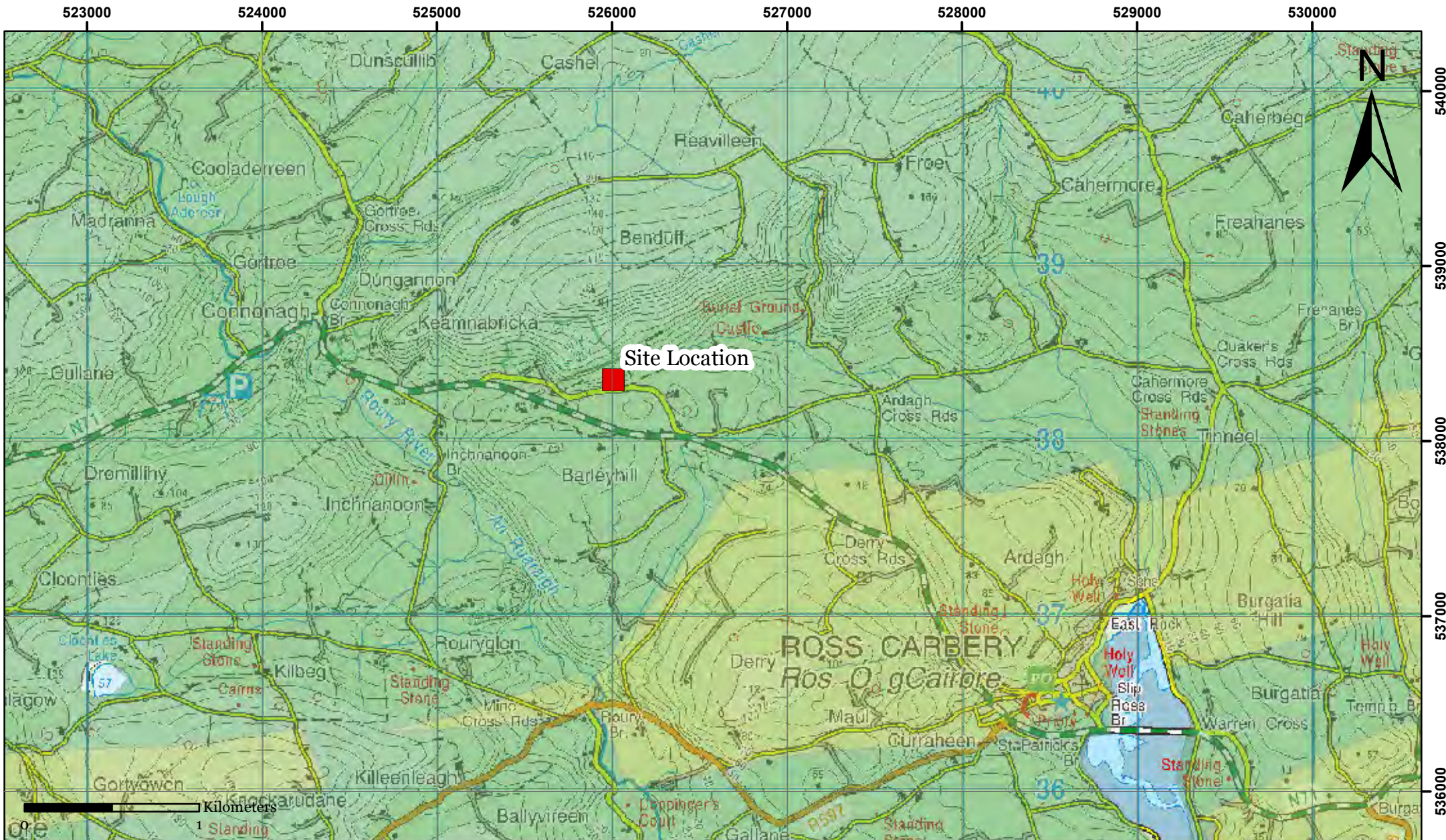
 Site_Location	 Castlehaven Formation	 Pigs Cove Member
 Rivers	 Lispatrick Formation	 Sherkin Formation
	 Narrow Cove Member	 Toe Head Formation
	 Old Head Sandstone Formation	

Figure 3.3



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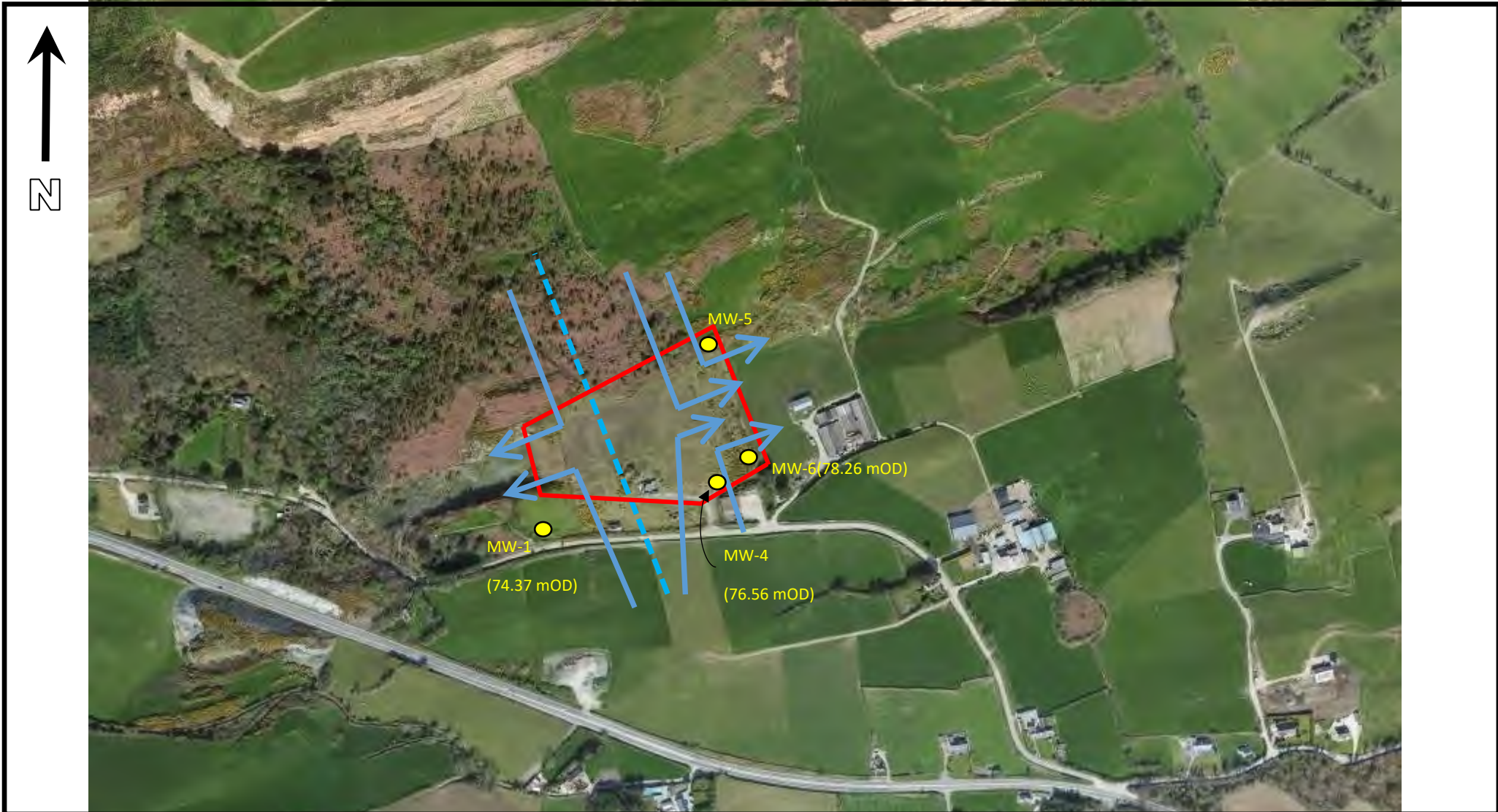
TITLE
 Aquifer Classification

Details:

- Site Location
- LI - Locally Important Aquifer. Mod. Productive only in Local Zones
- P1 - Poor Aquifer. Unproductive except for Local Zones

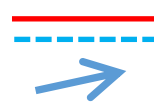
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Figure 3.4



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Legend:



Site Boundary
 Groundwater Divide
 Groundwater Flow

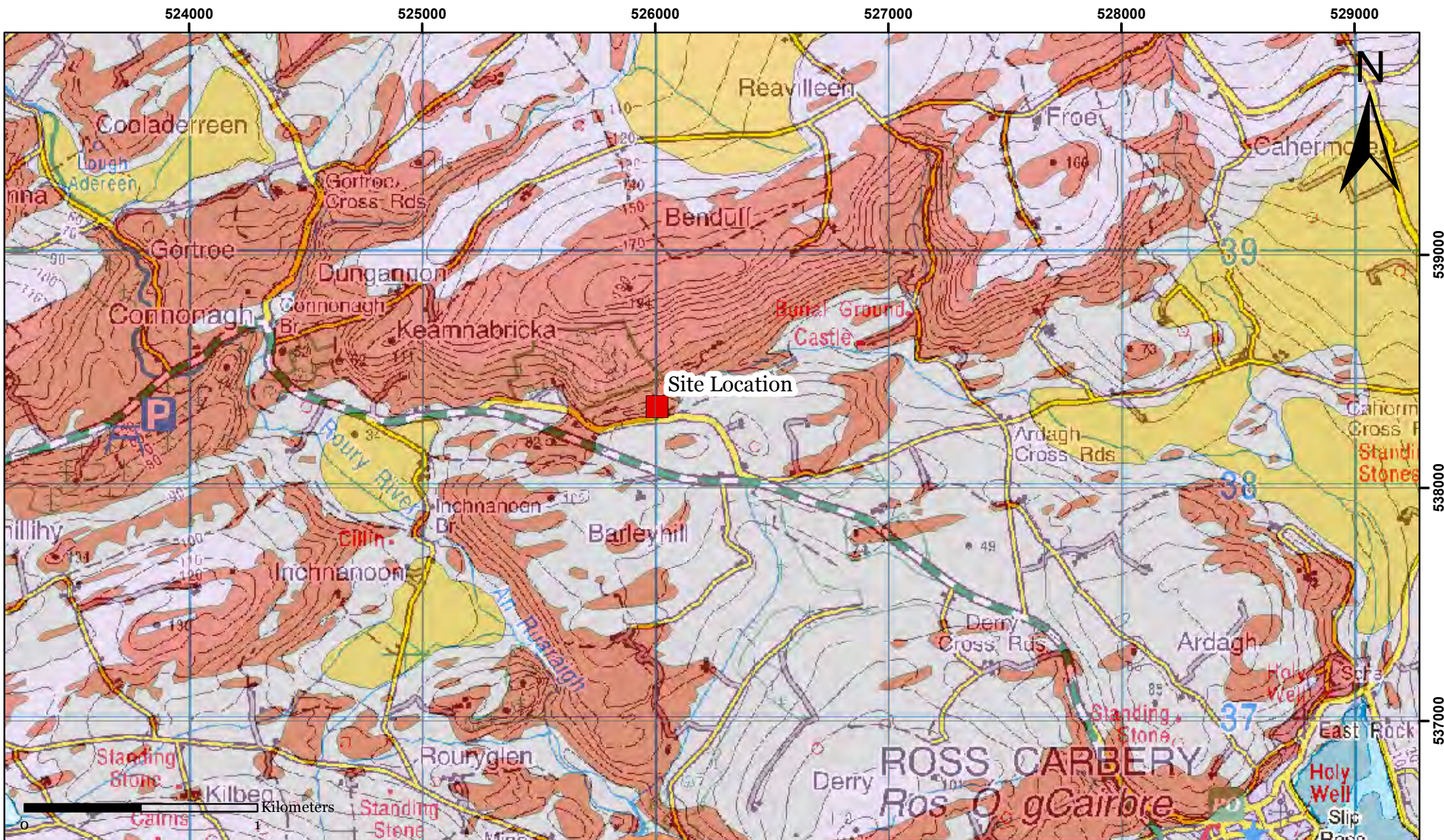


Figure 3.5

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Title:
 Groundwater Flow



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TITLE

Groundwater Vulnerability

Details:

- Site Location
- Bedrock near Surface
- Extreme
- High
- Moderate

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Figure 3.6

4. CONCEPTUAL SITE MODEL

The conceptual Site Model is illustrated on Figure 4.1. The model is based on a review of the topographic site survey combined with ordnance survey GSI mapping and site and local area reconnaissance. The line of section used to construct the CSM are shown on Figure 4.2.

The landfill is located in the eastern section of a former slate quarry in an east to west trending valley at the foot of Benduff Mountain. The lands rise steeply to the north toward Benduff and also rise gently to the south toward higher ground at Barley Hill immediately to the south of the site. The landfill straddles two surface water catchments with flow towards the Roury River to the west and an unnamed stream to the east.

The landfill occupies ca. 3 ha. The landfill does not have a basal liner or side walls though based on observations of the base of quarry to the west it may be lined with overburden and rejected quarry fill and observations of the quarry walls to the east the north and south of the landfill is likely to be contained by sub vertical slate bedrock. It is likely that these provide a barrier to groundwater and/or leachate flow to the north or south.

During operation waste in the western and eastern sides of the landfill were covered progressively with subsoils and as part of the final capping the engineered cap extends on the western and eastern sides to original ground level in these areas essentially providing side wall containment.

There is no evidence of leachate leakage between the floor of the quarry to the west and the landfill cap indicating that the cap has been effective. While the side slopes to the east and west are relatively steep a slope stability analysis undertaken by FTC in 2007 concluded that the slopes are stable. During OCMs site inspection in 2014 there was no evidence of either leachate or slope instability to the west or east of the landfill.

Rainfall run-off on the high ground at Benduff immediately north of the landfill is collected in a surface water drain and diverted to a stormwater pipeline that runs from the northeast corner of the landfill 500m east to an unnamed stream. This stream flows southeast into the sea at Rosscarbery approximately 3.5km to the southeast of the landfill.

Rainfall on the landfill cap is diverted via a surface water drainage layer to a surface water swale/drain which runs around the northern, eastern and southern section of the landfill. The high point on the cap is in the northwest corner so surface water drains by gravity away from this area to the south east and south. A small portion of the rainfall run-off is not collected as the surface water drainage system for the cap does not extend around the western side of the landfill. Here surface water runs off to the west into the old quarry.

Leachate in the landfill is collected in two leachate collection wells. Leachate Well LW-1 is located in the northeast portion of the landfill and L2 is located in the southwest portion of the landfill. Leachate levels have been gradually declining since the cap was installed. The onsite leachate holding tank which has a 192m³ capacity is currently empty.

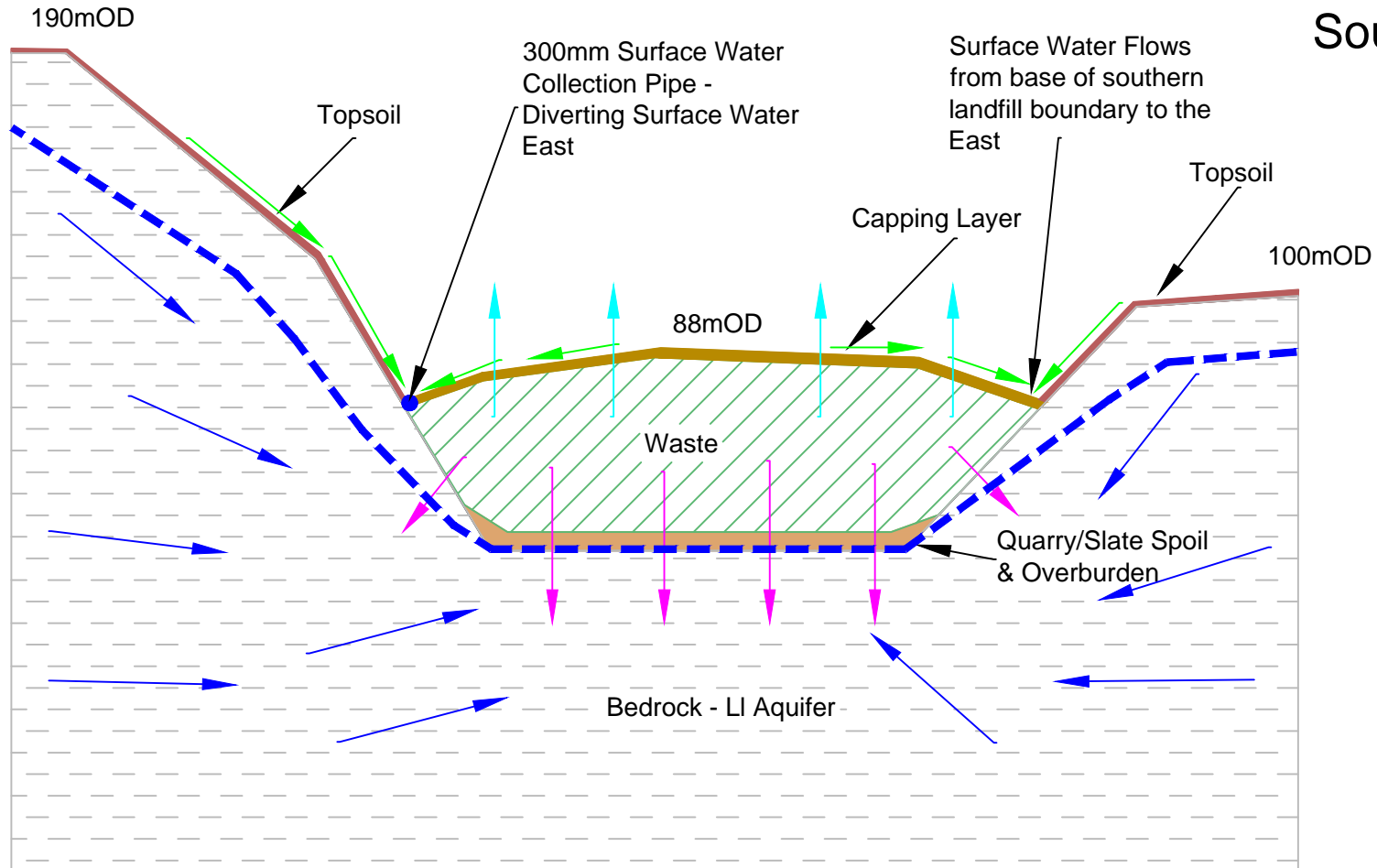
Given that the landfill does not have an engineered basal liner it is likely that some leachate can potentially migrate through the base of the landfill into the bedrock aquifer. The bedrock aquifer is poorly productive (LW-1) and it is likely that groundwater flow paths are shallow with recharge occurring to the streams to the east and west of the landfill.

Based on the topographic gradient groundwater flow is from the high ground at Benduff south to the landfill. Because the landfill straddles two surface water catchments groundwater is also expected to flow to the west beneath the western portion of the site and to the east beneath the eastern portion of the site. Based on the available groundwater flow data there is also some local groundwater flow from Barley Hill located south of the landfill to the north into the valley at the foot of Benduff. This is based on the difference in groundwater level between private wells SPJ-1 and SPM-2 south of the landfill, MW-4 and MW-6 along the southeast corner of the landfill site and MW-5 in the northeast corner of the landfill near the valley floor at the foot of Benduff.

The quarry floor immediately to the west of the landfill is dry and indicates that the water table is likely to be below the base of the waste underneath the landfill site. Given the depth of waste present at the site ca. 14 m it is likely that the basal layers of the waste are heavily compacted and most likely would minimise groundwater inflow to the landfill through the base.

North

South



- Surface Water Flow
- Leachate
- Approximate Water Table
- Groundwater Water Flow
- Landfill Gas



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details

FIGURE No.
4.1

TITLE
Conceptual Site Model

SCALE

REV.

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Legend:

- Site Boundary
- Line of Section CSM

200m

Figure:

Figure 4.2

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Title:

Line of Section Conceptual Site Model

5. ASSESSMENT OF SURFACE AND GROUNDWATER IMPACTS

Surface water, groundwater and leachate monitoring is undertaken at the landfill in accordance with the monitoring schedule in the waste licence. The monitoring points are illustrated on Figure 5.1. The 2023 sampling programme was undertaken by IAS Laboratories on behalf of the Council.

5.1 Surface Water Quality

Surface water quality samples are collected from SW-1 up stream of the landfill and from SW-4 downstream of the landfill to the west and SW-5 downstream of the landfill to the east.

The stream flowing to the west discharges to the Roury River approximately 1km to the southwest of the site. During the 2018 Water Framework Directive Surface Water quality status assessment the Roury River (IE_SW_20R021000) was classified as of Good Status and Not at Risk. The stream to the east of the landfill discharges into the sea at Rosscarbery approximately 3.5km to the southeast of the site. The Tinneel Stream status (IE_SW_20T020050) according to latest WFD Assessment 2016-2021 is Moderate and At Risk.

Water samples are collected in laboratory prepared bottles and stored in coolers prior to shipping to IAS laboratory to maintain sample temperature at approximately 4°C. The methodologies are all ISO/CEN approved. The range of analysis and sampling frequency is summarised on Table 4.1 and includes Bi-Annual and Annual parameter suites.

For the purposes of this report OCM has compiled summary tables of the surface water monitoring results for the annual suite of monitoring undertaken between March 2020 and December 2023 (Tables 5.2 – 5.4). The tables include for comparative purposes the limits set out in the Surface Water Environmental Objectives (Surface Water) Regulations 2009 (SI 272 of 2009). The Laboratory Analysis Reports for 2023 are included in Appendix 2.

Trend Graphs for Ammonia, Chloride, Electrical Conductivity and BOD for the period 2008 - 2023 are presented on Figures 5.2 – 5.5.

The content of ammonia downstream in SW-5, after a significant decrease in 2020, remains at a similar level in 2023, fluctuates around the EQS level, with a slight increase in the summer period. In SW-1 and SW-4, similarly to previous monitoring rounds, the monitoring results indicate that the landfill is not impacting significantly on surface water quality downstream of the landfill at SW-4. Chloride concentrations are similar to those in previous monitoring rounds and EC and pH levels show no significant changes.

Figure 5.1 BENDUFF LANDFILL - LOCATION OF ENVIRONMENTAL MONITORING POINTS

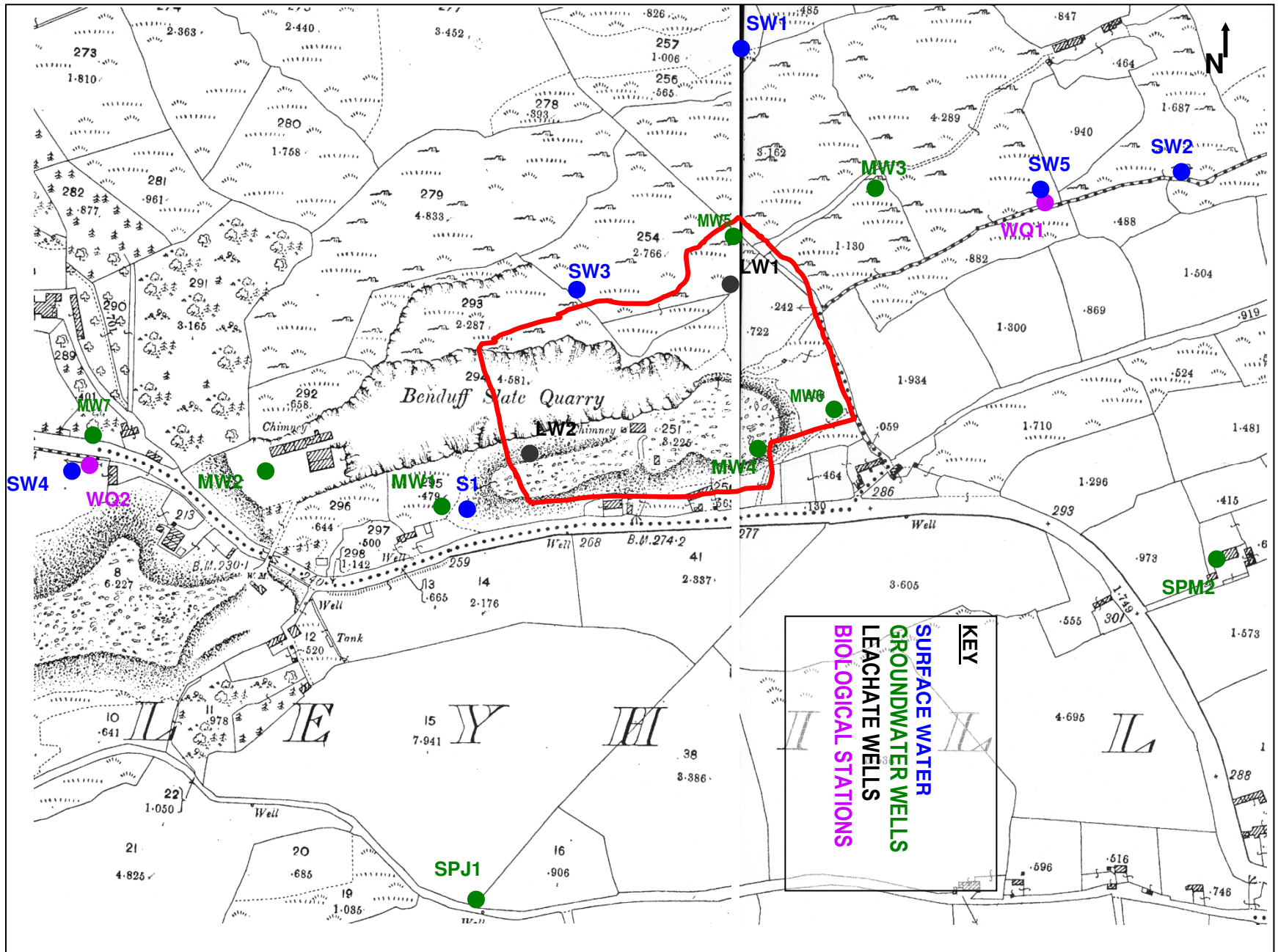


Table 5.1 Surface Water Sampling Parameters and Frequency

PARAMETER	UNIT	SW1	SW4	SW5	Frequency
Ammoniacal nitrogen	mg/l	X	X	X	Bi-Annual
BOD	mg/l	X	X	X	Bi-Annual
COD	mg/l	X	X	X	Bi-Annual
Chloride	mg/l	X	X	X	Bi-Annual
DO	mg/l	X	X	X	Bi-Annual
Conductivity	µS/cm	X	X	X	Bi-Annual
pH	pH Units	X	X	X	Bi-Annual
TSS	mg/l	X	X	X	Bi-Annual
Temperature	°C	X	X	X	Bi-Annual
Sulphates	mg/l	X	X	X	Annual
Total Alkalinity	mg/l	X	X	X	Annual
Total Phosphorous	mg/l	X	X	X	Annual
Phosphate	mg/l	X	X	X	Annual
TON	mg/l	X	X	X	Annual
Cd	mg/l	X	X	X	Annual
Ca	mg/l	X	X	X	Annual
Cr	mg/l	X	X	X	Annual
Cu	mg/l	X	X	X	Annual
Fe	mg/l	X	X	X	Annual
Pb	mg/l	X	X	X	Annual
Mg	mg/l	X	X	X	Annual
Mn	mg/l	X	X	X	Annual
Hg	mg/l	X	X	X	Annual
K	mg/l	X	X	X	Annual
Na	mg/l	X	X	X	Annual
Zn	mg/l	X	X	X	Annual

Table 5.2 Surface Water Quality Monitoring SW-1 2020 – 2023

PARAMETER	UNITS	SW-1				SW-1					SW-1				SW-1				AA-EQS	MAC-EQS
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	0.02	0.13	0.02	0.04	0.05	<0.02	0.07	0.02	0.06	0.12	0.05	DRY	0.07	<0.01	<0.05	DRY	<0.05	0.065	-
BOD	mg/l	<1.0	2.0	<1.0	1.0	1.0	<1.0	1.0	<1.0	<1.0	1.0	1.0	-	1.0	<1.0	-	-	<1.0	1.5	-
COD	mg/l	3.0	8.0	<1.0	6.0	2.0	<20.0	9.0	<1.0	8.0	9.0	10.0	-	<5.0	5.0	<8.0	-	11.0	-	-
Chloride	mg/l	20.83	24.96	22.04	19.41	18.57	20.90	20.47	20.32	18.95	24.07	27.78	-	29.39	20.70	23.60	-	19.40	250	-
DO	mg/l	9.85	8.52	9.44	8.51	10.13	99% Sat	6.92	7.13	10.09	9.85	4.32	-	10.16	9.33	-	-	19.40	-	-
Conductivity	µS/cm	108	128	122	283	120	133	107	146	135	134	201	-	140	104	130	-	100	1000	-
pH	pH	6.70	7.40	7.10	6.50	8.00	7.00	7.00	7.50	7.30	7.50	7.50	-	7.20	7.60	7.60	-	5.00	4.5-9.0	4.5-9.0
TSS	mg/l	6	24	5	3	<1	<4	20	6	<1	8	5	-	2	7	<5	-	<5	-	-
Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	8.8	-	-	-	11.6	-	-
Sulphates	mg/l	-	-	6.55	-	-	4.70	-	-	6.44	-	-	-	5.98	-	-	-	7.02	200	-
Total Alkalinity	mg/l	-	-	6.03	-	-	-	-	-	6.30	-	-	-	12.88	-	-	-	<30.0	-	-
Total Phosphorous	mg/l	-	-	0.10	-	-	-	-	-	0.02	-	-	-	0.03	-	-	-	<0.020	0.035	-
Phosphate	mg/l	-	-	0.10	-	-	-	-	-	0.01	-	-	-	0.01	-	-	-	<0.05	-	-
TON	mg/l	-	-	1.30	-	-	-	-	-	2.58	-	-	-	1.66	-	-	-	1.42	-	-
Cadmium	mg/l	-	-	<0.0006	-	-	-	-	-	<0.0006	-	-	-	0.00	-	-	-	<0.0001	0.0002	0.0006
Calcium	mg/l	-	-	44.90	-	-	-	-	-	8.62	-	-	-	8.74	-	-	-	5.07	-	-
Chromium	mg/l	-	-	<0.002	-	-	-	-	-	<0.002	-	-	-	<0.002	-	-	-	<0.001	0.0006	0.032
Copper	mg/l	-	-	<0.009	-	-	-	-	-	<0.009	-	-	-	<0.009	-	-	-	<0.003	0.005	-
Iron	mg/l	-	-	<0.230	-	-	-	-	-	<0.230	-	-	-	0.03	-	-	-	0.01	1	-
Lead	mg/l	-	-	<0.006	-	-	-	-	-	<0.006	-	-	-	<0.003	-	-	-	<0.0005	0.0072	-
Magnesium	mg/l	-	-	10.80	-	-	-	-	-	2.52	-	-	-	2.77	-	-	-	2.20	-	-
Manganese	mg/l	-	-	0.65	-	-	-	-	-	0.03	-	-	-	0.03	-	-	-	0.01	0.3	-
Mercury	mg/l	-	-	0.00	-	-	-	-	-	<0.000010	-	-	-	<0.000010	-	-	-	<0.00003	0.00005	0.00007
Potassium	mg/l	-	-	0.60	-	-	-	-	-	1.28	-	-	-	1.33	-	-	-	1.14	-	-
Sodium	mg/l	-	-	14.60	-	-	-	-	-	9.87	-	-	-	12.90	-	-	-	12.83	-	-
Zinc	mg/l	-	-	0.02	-	-	-	-	-	<0.018	-	-	-	0.01	-	-	-	0.00	0.04	-
Visual	-	-	-	-	-	-	-	-	-	-	None	None	-	None	None	None	-	None	-	-

Table 5.3 Surface Water Quality Monitoring SW-4 2020 – 2023

PARAMETER	UNITS	SW-4				SW-4					SW-4				SW-4				AA-EQS	MAC-EQS
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	0.04	DRY	DRY	DRY	0.05	<0.02	0.09	0.12	0.02	0.04	DRY	DRY	0.05	<0.01	DRY	DRY	<0.05	0.065	-
BOD	mg/l	<1.0	-	-	-	1.0	<1.0	2.0	1.0	1.0	1.0	-	-	1.0	1.0	-	-	<1.0	1.5	-
COD	mg/l	4.0	-	-	-	4.0	<20.0	15.0	19.0	6.0	11.0	-	-	5.0	6.0	-	-	11.0	-	-
Chloride	mg/l	25.83	-	-	-	18.22	20.80	24.29	25.78	24.08	29.23	-	-	31.91	30.70	-	-	24.40	250	-
DO	mg/l	8.61	-	-	-	7.71	99% Sat	7.69	1.62	10.08	8.03	-	-	9.46	9.86	-	-	20.60	-	-
Conductivity	µS/cm	330	-	-	-	309	129	372	388	364	358	-	-	363	272	-	-	330	1000	-
pH	pH	8.20	-	-	-	8.20	7.00	8.20	7.10	8.20	8.30	-	-	8.10	8.10	-	-	6.70	4.5-9.0	4.5-9.0
TSS	mg/l	3	-	-	-	3	<4	2	6	3	16	-	-	9	<5	-	-	22	-	-
Temperature	°C	-	-	-	-	-	9.9	-	-	-	-	-	-	8.8	-	-	-	11.4	-	-
Sulphates	mg/l	-	-	-	-	-	4.70	-	-	31.79	-	-	-	25.56	-	-	-	22.40	200	-
Total Alkalinity	mg/l	-	-	-	-	-	-	-	-	133.77	-	-	-	110.72	-	-	-	110.00	-	-
Total Phosphorous	mg/l	-	-	-	-	-	-	-	-	0.05	-	-	-	0.06	-	-	-	0.02	0.035	-
Phosphate	mg/l	-	-	-	-	-	0.01	-	-	0.03	-	-	-	0.03	-	-	-	<0.05	-	-
TON	mg/l	-	-	-	-	-	1.00	-	-	4.26	-	-	-	5.71	-	-	-	4.99	-	-
Cadmium	mg/l	-	-	-	-	-	-	-	-	<0.0006	-	-	-	<0.00002	-	-	-	<0.0001	0.0002	0.0006
Calcium	mg/l	-	-	-	-	-	-	-	-	53.90	-	-	-	56.40	-	-	-	28.18	-	-
Chromium	mg/l	-	-	-	-	-	-	-	-	<0.002	-	-	-	<0.002	-	-	-	0.001	0.0006	0.032
Copper	mg/l	-	-	-	-	-	-	-	-	<0.009	-	-	-	<0.009	-	-	-	<0.003	0.005	-
Iron	mg/l	-	-	-	-	-	-	-	-	<0.230	-	-	-	<0.020	-	-	-	0.02	1	-
Lead	mg/l	-	-	-	-	-	-	-	-	<0.006	-	-	-	<0.0003	-	-	-	<0.0005	0.0072	-
Magnesium	mg/l	-	-	-	-	-	-	-	-	6.60	-	-	-	6.97	-	-	-	6.32	-	-
Manganese	mg/l	-	-	-	-	-	-	-	-	<0.007	-	-	-	<0.007	-	-	-	0.00	0.3	-
Mercury	mg/l	-	-	-	-	-	-	-	-	<0.000010	-	-	-	0.00	-	-	-	<0.00003	0.00005	0.00007
Potassium	mg/l	-	-	-	-	-	-	-	-	5.04	-	-	-	5.79	-	-	-	5.60	-	-
Sodium	mg/l	-	-	-	-	-	-	-	-	13.10	-	-	-	17.40	-	-	-	25.82	-	-
Zinc	mg/l	-	-	-	-	-	-	-	-	<0.018	-	-	-	0.01	-	-	-	<0.001	0.04	-
Visual	-	-	-	-	-	-	-	-	-	-	-	-	-	None	None	-	-	None	-	-

Table 5.4 Surface Water Quality Monitoring SW-5 2020 – 2023

PARAMETER	UNITS	SW-5				SW-5				SW-5				SW-5				AA-EQS	MAC-EQS
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	0.05	DRY	0.01	0.06	0.07	0.06	0.12	0.05	0.04	0.09	DRY	0.07	0.01	0.06	DRY	<0.05	0.065	-
BOD	mg/l	<1.0	-	<1.0	1.0	1.0	1.0	1.0	1.0	<1	1.0	-	1.0	1.0	1.2	-	<1.0	1.5	-
COD	mg/l	7.0	-	<1.0	3.0	2.0	13.0	7.0	9.0	<1	15.0	-	7.0	<5.0	<8.0	-	15.0	-	-
Chloride	mg/l	21.73	-	21.52	20.00	19.32	18.53	23.63	18.97	24.68	29.22	-	28.30	18.40	24.90	-	18.90	250	-
DO	mg/l	9.05	-	9.40	8.14	10.24	7.32	7.10	10.00	9.91	9.19	-	10.20	9.13	-	-	19.40	-	-
Conductivity	µS/cm	154	-	163	556	138	146	187	176	170	202	-	141	99	145	-	110	1000	-
pH	pH	7.40	-	7.50	7.30	8.00	7.20	7.10	7.30	7.50	7.50	-	7.30	7.60	7.60	-	5.80	4.5-9.0	4.5-9.0
TSS	mg/l	10	-	10	11	50	21	9	6	6	5	-	1	10	<5	-	<5	-	-
Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	9.0	-	-	-	12.3	-	-
Sulphates	mg/l	-	-	7.53	-	-	-	-	8.48	-	-	-	5.93	-	-	-	6.87	200	-
Total Alkalinity	mg/l	-	-	39.51	-	-	-	-	37.39	-	-	-	13.31	-	-	-	<30.0	-	-
Total Phosphorous	mg/l	-	-	0.03	-	-	-	-	0.02	-	-	-	0.03	-	-	-	<0.02	0.035	-
Phosphate	mg/l	-	-	0.03	-	-	-	-	0.02	-	-	-	0.01	-	-	-	<0.05	-	-
TON	mg/l	-	-	0.99	-	-	-	-	2.87	-	-	-	1.66	-	-	-	1.21	-	-
Cadmium	mg/l	-	-	<0.0006	-	-	-	-	<0.0006	-	-	-	0.0003	-	-	-	<0.0001	0.0002	0.0006
Calcium	mg/l	-	-	14.10	-	-	-	-	18.60	-	-	-	8.68	-	-	-	6.70	-	-
Chromium	mg/l	-	-	<0.002	-	-	-	-	<0.002	-	-	-	<0.002	-	-	-	<0.001	0.0006	0.032
Copper	mg/l	-	-	<0.009	-	-	-	-	<0.009	-	-	-	<0.009	-	-	-	<0.003	0.005	-
Iron	mg/l	-	-	<0.230	-	-	-	-	<0.230	-	-	-	0.023	-	-	-	0.005	1	-
Lead	mg/l	-	-	<0.006	-	-	-	-	<0.006	-	-	-	<0.0003	-	-	-	<0.0005	0.0072	-
Magnesium	mg/l	-	-	3.09	-	-	-	-	3.22	-	-	-	2.70	-	-	-	2.44	-	-
Manganese	mg/l	-	-	<0.007	-	-	-	-	0.01	-	-	-	0.01	-	-	-	0.04	0.3	-
Mercury	mg/l	-	-	0.00	-	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-	<0.00003	0.00005	0.00007
Potassium	mg/l	-	-	2.33	-	-	-	-	2.20	-	-	-	1.26	-	-	-	1.61	-	-
Sodium	mg/l	-	-	10.60	-	-	-	-	11.10	-	-	-	12.80	-	-	-	18.31	-	-
Zinc	mg/l	-	-	<0.018	-	-	-	-	<0.018	-	-	-	0.02	-	-	-	0.00	0.04	-
Visual	-	-	-	-	-	-	-	-	-	-	-	-	-	None	None	-	None	-	-

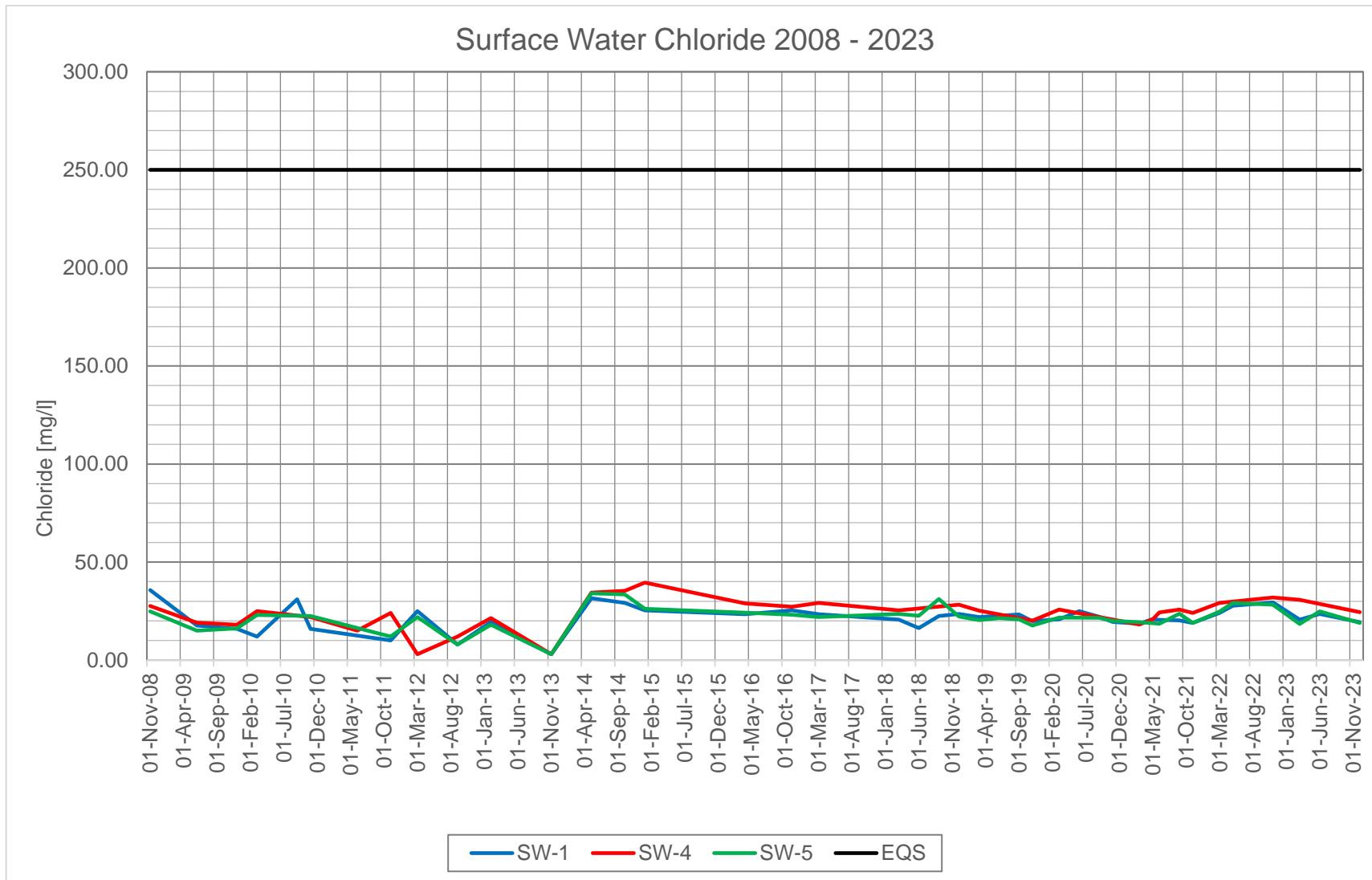


Figure 5.3 Chloride concentration trends in SW-1, SW-4 and SW-5 (2008- 2023)

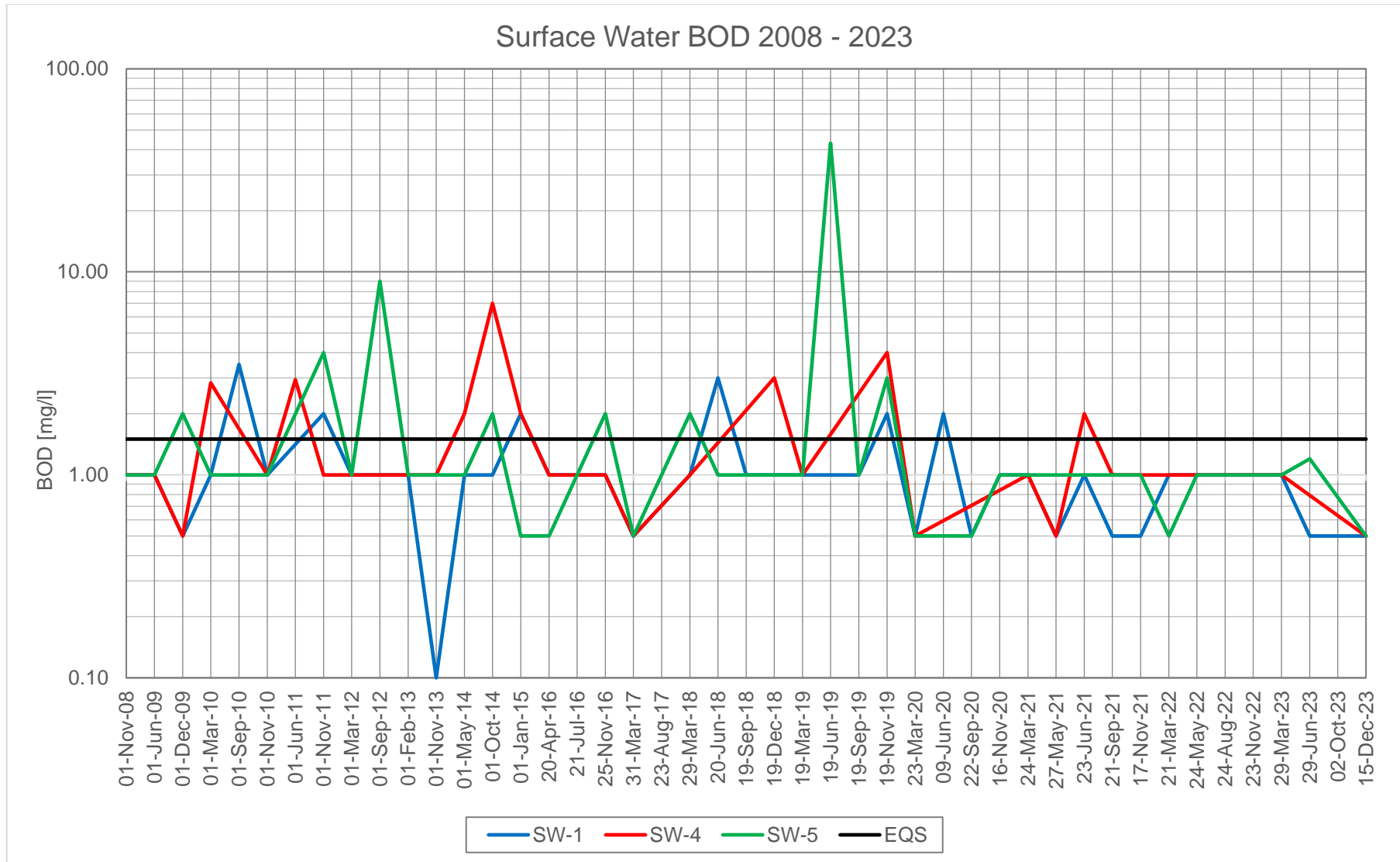


Figure 5.4 BOD trends in SW-1, SW-4 and SW-5 (2008- 2023)

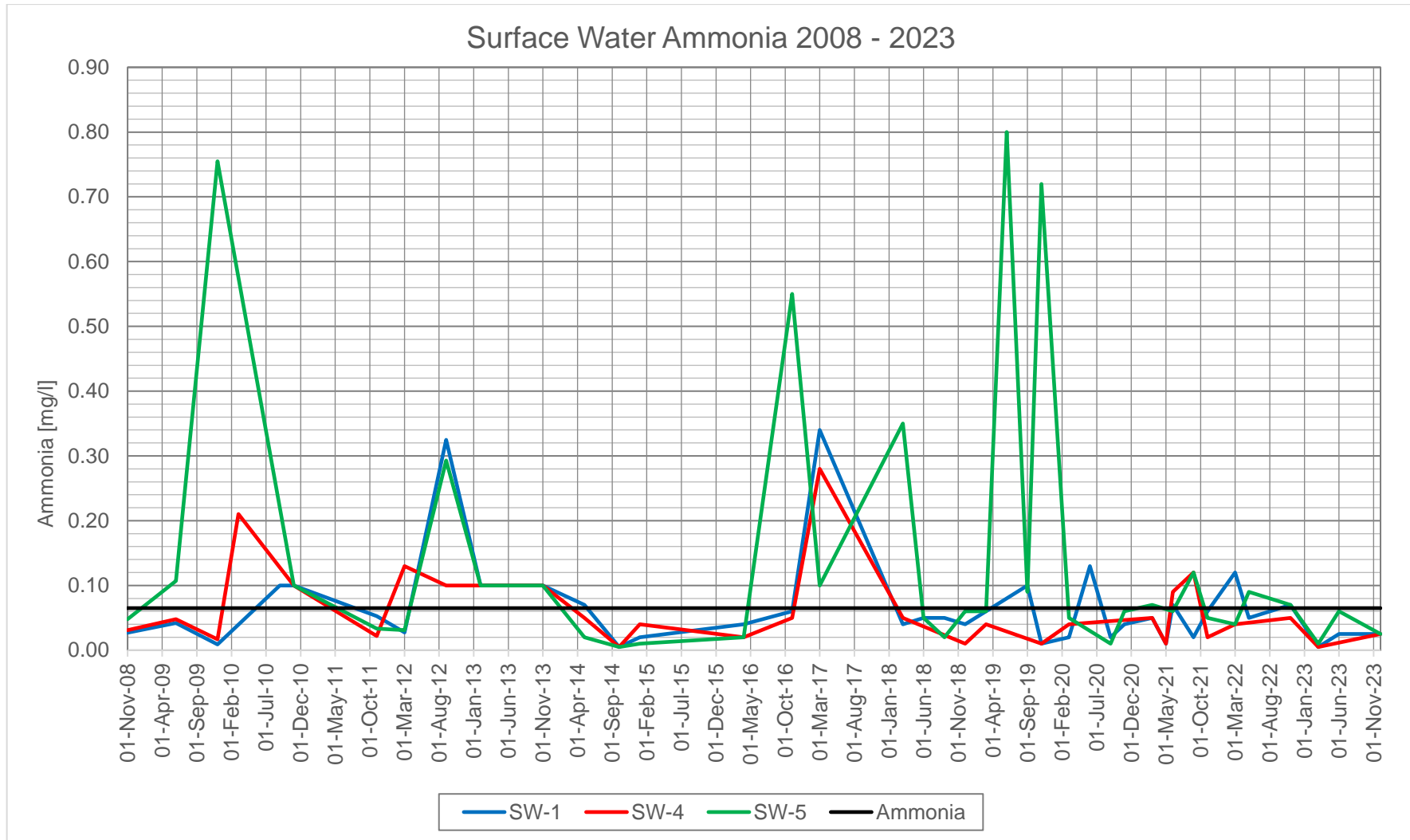


Figure 5.5 Ammonia concentration trends in SW-1, SW-4 and SW-5 (2008- 2023)

5.2 Groundwater Water Quality

Groundwater samples were collected from MW-1, 2, 3, 4, 5, 6, 7, and SPJ1 and SPM2. The locations are shown in the previous Section on Figure 5.1. Monitoring well MW-3 is located up-gradient of the landfill site, while MW-1, MW-2 and MW-7 are down hydraulic gradient of the landfill to the west and MW-4, 5 and 6 are down hydraulic gradient of the landfill to the east. SPJ1 and SPM2 are private wells sampled at taps located 300m south and 250m southeast of the site respectively.

Water samples are collected in laboratory prepared bottles and stored in coolers prior to shipping to the laboratory (IAS) to maintain sample temperature at approximately 4°C. The methodologies are all ISO/CEN approved or equivalent. The required analytical parameters and frequencies are summarised in Table 5.5. The Laboratory Analysis Reports are included in Appendix 2.

OCM has compiled summary tables of the groundwater monitoring results for the annual suite of monitoring undertaken between November 2008 and November 2023 (Tables 5.6 – 5.15).

Trend Graphs for Ammonia, Chloride, Electrical Conductivity and Manganese for the period 2008 -2023 are presented on Figures 5.6 – 5.9.

The table includes Interim Guideline Values (IGV) published by the EPA. The IGVs are not statutory, but were developed to assist in the assessment of impacts on groundwater quality in the context of the implementation of the EU Water Framework Directive. The guidelines are based on, but are more conservative than the Drinking Water quality standards. The results are also compared to the Groundwater Regulations Threshold Value (GTV) which were introduced in 2016 (S.I. 366 of 2016) on foot of requirements from the Water Framework Directive and have evolved from the IGVs.

Table 5.5 Groundwater Analytical Parameters and Frequencies

PARAMETER	UNITS	MW1	MW2	MW3	MW4	MW5	MW6	MW7	SPJ1	SPM2	Frequency
Level											Quarterly
Ammoniacal nitrogen	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
Conductivity	µS/cm	X	X	X	X	X	X	X	X	X	Quarterly
pH	pH Units	X	X	X	X	X	X	X	X	X	Quarterly
Temperature	°C	X	X	X	X	X	X	X	X	X	Quarterly
Visual/odour	-	X	X	X	X	X	X	X	X	X	Quarterly
Chloride	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
DO	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
Potassium	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
Sodium	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
TON	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
TOC	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
Phenols	mg/l	X	X	X	X	X	X	X	X	X	Quarterly
Boron	mg/l	X	X	X	X	X	X	X	X	X	Annual
Cadmium	mg/l	X	X	X	X	X	X	X	X	X	Annual
Calcium	mg/l	X	X	X	X	X	X	X	X	X	Annual
Chromium – Tot	mg/l	X	X	X	X	X	X	X	X	X	Annual
Copper	mg/l	X	X	X	X	X	X	X	X	X	Annual
Iron	mg/l	X	X	X	X	X	X	X	X	X	Annual
Lead	mg/l	X	X	X	X	X	X	X	X	X	Annual
Magnesium	mg/l	X	X	X	X	X	X	X	X	X	Annual
Zinc	mg/l	X	X	X	X	X	X	X	X	X	Annual
Mercury	mg/l	X	X	X	X	X	X	X	X	X	Annual
Manganese	mg/l	X	X	X	X	X	X	X	X	X	Annual
Phosphate	mg/l	X	X	X	X	X	X	X	X	X	Annual
Cyanide – Tot	mg/l	X	X	X	X	X	X	X	X	X	Annual
Fluoride	mg/l	X	X	X	X	X	X	X	X	X	Annual
Sulphate	mg/l	X	X	X	X	X	X	X	X	X	Annual
Total Alkalinity	mg/l	X	X	X	X	X	X	X	X	X	Annual
Total Phosphorous	mg/l	X	X	X	X	X	X	X	X	X	Annual
Residue on evaporation	mg/l	X	X	X	X	X	X	X	X	X	Annual
Faecal coliform	100/l	X	X	X	X	X	X	X	X	X	Annual
Total coliform	100/l	X	X	X	X	X	X	X	X	X	Annual

Table 5.6 Groundwater Monitoring Results MW-1 (2020-2023)

PARAMETER	UNITS	MW-1				MW-1					MW-1				MW-1				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.15	0.54	0.62	0.50		0.16	0.20	0.44	0.35	0.38	0.09	0.43	0.02	0.21	0.27	0.45	0.15	0.065-0.175
Conductivity	µS/cm	435	457	506	398	444	562	468	579	566	498	618	570	596	489	515	490	450	1000	800-1875
pH	pH Units	6.90	6.90	6.80	6.80	6.50	6.60	6.70	6.70	6.70	6.70	6.80	6.80	6.70	6.60	6.80	6.30	6.10	6.5-9.5	-
Temperature	°C	12.2	12.4	14.1	11.1	10.9		12.5	12.0	12.0	10.8	12.1	12.2	10.0	11.8	13.1	14.1	10.2	25	-
Visual/odour	-					None		None	None	None					None	None	None	None	-	-
Chloride	mg/l	22.79	25.53	28.04	26.39	20.27		26.10	25.46	27.17	25.36	29.84	30.08	35.00	33.20	28.40	26.70	26.70	30	24-187.5
DO	mg/l	5.53	4.30	6.52	3.19	2.64	28% Sat	3.45	2.08	2.39	2.71	3.91	5.38	4.36	2.47	-	4.90	20.50	NAC	-
Potassium	mg/l	5.61	5.88	5.69	6.03	5.12		4.93	6.25	5.72	6.24	6.71	5.99	6.40	5.38	6.17	5.56	5.34	5	-
Sodium	mg/l	18.50	19.20	19.40	20.20	19.60		18.10	18.70	19.30	19.20	18.90	18.20	21.00	18.80	18.64	19.24	19.93	150	150
Total oxidised nitrogen	mg/l	2.87	1.65	0.97	0.78	<0.50		1.22	1.92	0.55	<0.5	2.35	2.91	<0.5	<1.0	1.34	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	9.20	1.80	4.20	2.40	4.20		1.60	4.30	2.80	3.90	2.40	2.70	2.20	0.90	3.70	1.84	1.53	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	0.01		<0.05	<0.05	<0.05			<0.001	<0.01	<0.01	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.23						<0.23				<0.23				<0.21	1	0.75
Cadmium	mg/l			<0.0006						<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			41.10						87.70				90.10				57.99	200	-
Chromium – Tot	mg/l			<0.002						<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002						<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.230						<0.230				<0.230				<0.005	0.2	-
Lead	mg/l			<0.006						<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			9.74						18.40				18.20				14.66	50	-
Zinc	mg/l			<0.018						<0.018				<0.018				0.0018	0.1	-
Mercury	mg/l			0.00						<0.00001				<0.00001				<0.00003	0.001	0.00075
Manganese	mg/l			0.05						0.98				0.78				1.05	0.05	-
Phosphate	mg/l			0.02						0.01				0.01				<0.05	0.03	0.035
Cyanide – Tot	mg/l			<0.009						<0.009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.09						<0.08				<0.08				<0.2	1	-
Sulphate	mg/l			80.51			84.00			102.52				8.22				95.70	200	187.5
Total Alkalinity	mg/l			123.54						218.74				199.87				120.00	NAC	-
Total Phosphorous	mg/l			0.07						0.04				<0.120				0.02	0.03	0.035
Residue on evaporation	mg/l			0.01						0.02								510.32	-	-
Faecal coliform	100/l			436						7				0				-	0	-
Total coliform	100/l			>2420						>2420				4				-	0	-

Table 5.7 Groundwater Monitoring Results MW-2 (2020-2023)

PARAMETER	UNITS	MW-2				MW-2				MW-2				MW-2				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.01	0.04	0.05	0.04	0.02	0.02	0.04	0.11	0.07	0.13	0.01	0.09	0.05	<0.05	0.15	0.065-0.175
Conductivity	µS/cm	371	579	591	188	470	617	617	476	631	688	641	400	401	548	550	520	1000	800-1875
pH	pH Units	7.80	7.50	7.70	7.70	7.50	7.50	7.50	7.60	7.60	7.60	7.50	7.60	7.70	7.80	7.00	6.80	6.5-9.5	-
Temperature	°C	11.70	12.40	14.40	11.29	10.30	11.30	11.90	11.00	10.30	11.80	10.80	10.10	11.20	12.70	11.50	12.40	25	-
Visual/odour	-					None	None	None	None	None	None	None	None	None	None	None	None	-	-
Chloride	mg/l	53.08	48.83	43.82	36.60	37.74	49.97	45.36	38.06	45.06	50.67	47.56	45.89	40.00	47.10	46.70	45.70	30	24-187.5
DO	mg/l	4.51	1.93	4.05	3.11	2.41	5.77	1.30	5.79	2.13	3.16	3.16	4.03	5.24	-	4.50	20.60	-	-
Potassium	mg/l	0.92	1.21	1.54	4.72	2.04	1.72	1.56	1.38	3.18	2.09	2.10	1.40	1.45	1.41	1.65	1.65	5	-
Sodium	mg/l	24.90	29.00	27.20	24.40	26.40	24.70	29.20	22.80	27.10	25.40	25.00	25.00	23.76	28.01	28.85	28.00	150	150
Total oxidised nitrogen	mg/l	0.66	<0.5	<0.5	0.63	<0.5	0.59	<0.5	0.63	<0.5	<0.5	1.48	0.65	<1.0	<1.0	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	14.10	0.60	1.50	1.20	2.80	1.40	2.70	1.10	3.80	1.10	2.60	<0.700	3.20	<1.0	1.31	4.70	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	0.02	<0.05	<0.05			<0.001	<0.01	<0.01	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.230					<0.230				<0.230				<0.210	1	0.75
Cadmium	mg/l			<0.0006					<0.0006				<0.0006				<0.001	0.005	0.00375
Calcium	mg/l			90.90					77.80				56.40				80.96	200	
Chromium – Tot	mg/l			<0.002					<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002					<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.230					<0.230				<0.230				<0.005	0.2	-
Lead	mg/l			<0.006					<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			10.90					8.87				6.33				10.95	50	-
Zinc	mg/l			<0.018					<0.018				<0.018				0.003	0.1	-
Mercury	mg/l			0.000					<0.000010				0.000033				<0.00003	0.001	0.00075
Manganese	mg/l			<0.007					0.007				<0.007				0.001	0.05	-
Phosphate	mg/l			0.010					<0.010				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<0.0009					<0.000009				<0.000009				<0.001	0.01	0.0375
Fluoride	mg/l			0.090					<0.080				0.08				<0.200	1	-
Sulphate	mg/l			91.13					71.91				35.96				41.60	200	-
Total Alkalinity	mg/l			183.37					172.54				124.73				130.00	NAC	-
Total Phosphorous	mg/l			0.53					0.04				<0.120				0.11	0.03	0.035
Residue on evaporation	mg/l			0.19					0.02				-				825.00	-	-
Faecal coliform	100/l			<10					15				1				-	0	-
Total coliform	100/l			1658					88				11				-	0	-

Table 5.8 Groundwater Monitoring Results MW-3 (2020-2023)

PARAMETER	UNITS	MW3				MW3					MW3				MW3				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	-	0.04	0.10	0.10	0.05	0.02	0.05	0.07	0.09	0.05	0.07	0.12	0.16	<0.01	<0.05	<0.05	<0.05	0.15	0.065-0.175
Conductivity	µS/cm	202	189	207	104	203	228	167	190	206	210	218	204	222	154	149	160	160	1000	800-1875
pH	pH Units	6.50	6.10	6.20	6.20	6.70	6.10	6.00	6.20	6.10	6.10	6.10	6.20	6.20	6.20	6.40	5.60	5.60	6.5-9.5	-
Temperature	°C	11.70	11.60	15.20	10.90	11.70	10.50	12.70	12.10	11.80	10.90	12.00	12.50	9.90	11.10	10.90	14.30	8.50	25	-
Visual/odour	-										None	None	None	None	None	None	None	None	-	-
Chloride	mg/l	30.49	29.25	30.73	22.41	18.22	24.10	25.76	24.56	26.93	35.55	35.54	35.10	40.84	23.20	23.30	22.90	22.00	30	24-187.5
DO	mg/l	2.30	2.69	8.30	2.42	2.82	29% Sat	2.51	1.98	1.79	2.60	2.71	2.95	3.68	2.09	-	3.20	20.30	-	-
Potassium	mg/l	1.70	1.64	1.76	1.71	<1.000		1.46	1.65	1.66	2.20	1.57	1.65	2.00	1.35	1.49	1.58	1.62	5	-
Sodium	mg/l	16.50	17.60	18.60	17.10	16.90		15.30	16.80	17.50	19.40	18.00	17.70	20.00	16.18	15.90	16.53	17.70	150	150
Total oxidised nitrogen	mg/l	0.56	<0.5	<0.5	<0.5	<0.5	<0.20	<0.5	<0.5	<0.5	1.80	0.68	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	8.10	1.00	2.20	2.70	4.50		1.40	4.30	2.30	3.40	2.30	2.00	1.60	2.00	1.71	1.66	1.92	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	0.16		0.00	<0.050	<0.050			<0.001	<0.010	<0.010	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.230						<0.230				<0.230				<0.210	1	0.75
Cadmium	mg/l			<0.600						<0.0007				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			14.50						16.30				16.80				13.34	200	
Chromium – Tot	mg/l			<0.002						<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002						<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.3						0.67				0.38				0.21	0.2	-
Lead	mg/l			<0.006						<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			3.70						4.06				4.65				4.14	50	-
Zinc	mg/l			<0.018						0.02				0.02				0.02	0.1	-
Mercury	mg/l			0.00						0.00				0.00				<0.00003	0.001	0.00075
Manganese	mg/l			1.83						1.91				2.47				1.61	0.05	-
Phosphate	mg/l			0.01			<0.010			<0.010				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<9.000						<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.09						<0.080				<0.080				<0.200	1	-
Sulphate	mg/l			10.23			7.10			8.75				10.80				9.03	200	-
Total Alkalinity	mg/l			47.25						51.14				47.63				49.00	NAC	-
Total Phosphorous	mg/l			0.03						0.02				<0.12				<0.02	0.03	0.035
Residue on evaporation	mg/l			0.01						0.04				-				270.00	-	-
Faecal coliform	100/l			0						1				0				-	0	-
Total coliform	100/l			1						11				0				-	0	-

Table 5.9 Groundwater Monitoring Results MW-4 (2020-2023)

PARAMETER	UNITS	MW4				MW4					MW4				MW4				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	-	0.01	0.01	0.04	0.06	<0.02	0.04	0.02	0.05	0.05	0.07	0.43	0.06	<0.01	<0.05	<0.05	<0.05	0.15	0.065-0.175
Conductivity	µS/cm	203	132	107	104	168	90	88	55	94	167	118	81	129	74	<100.000	41	45	1000	800-1875
pH	pH Units	5.90	6.10	6.10	5.80	6.30	6.10	5.70	5.90	5.90	5.90	6.10	6.00	5.90	6.20	6.30	5.20	5.70	6.5-9.5	-
Temperature	°C	10.6	11.8	13.0	11.2	11.1	10.1	12.0	12.0	11.4	10.9	12.0	12.1	9.8	11.1	15.1	14.2	11.6	25	-
Visual/odour	-					None		None	None	None	None	None	None	None	None	None	None	Earthy	-	-
Chloride	mg/l	25.15	19.11	12.73	18.62	27.90	16.90	14.27	6.58	17.64	31.74	19.86	12.05	28.23	8.20	11.30	5.22	6.87	30	24-187.5
DO	mg/l	2.08	5.64	6.38	5.56	3.53	94% Sat	5.49	6.32	6.24	3.45	7.36	5.28	4.31	9.89	-	4.60	21.90	-	-
Potassium	mg/l	0.76	0.87	0.83	0.84	<1.0		<1.000	<1.000	<1.000	1.19	<1.000	<1.000	0.64	0.51	0.46	0.35	0.66	5	-
Sodium	mg/l	15.20	12.80	9.61	11.10	18.30		8.46	5.06	10.70	18.90	10.10	7.15	15.00	8.47	7.38	4.87	5.41	150	150
Total oxidised nitrogen	mg/l	1.50	1.76	1.46	0.92	1.52	0.95	1.34	1.13	1.19	1.07	2.13	1.76	1.04	<1.0	1.03	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	7.40	<0.3	1.10	1.40	6.80		0.60	3.10	1.30	4.60	1.80	1.10	1.30	1.00	<1.0	<1.0	1.18	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002		0.01	<0.050	<0.05			<0.001	<0.010	<0.010	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.230						<0.230				<0.230				<0.210	1	0.75
Cadmium	mg/l			<0.0006						<0.0006				<0.0006				0.00	0.005	0.00375
Calcium	mg/l			6.81						7.15				7.76				5.62	200	
Chromium – Tot	mg/l			<0.002						<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002						<0.009				<0.009				0.003	0.03	1.5
Iron	mg/l			<0.300						<0.230				<0.230				0.01	0.2	-
Lead	mg/l			<0.006						<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			1.76						1.77				2.10				1.45	50	-
Zinc	mg/l			0.03						0.05				0.05				0.10	0.1	-
Mercury	mg/l			0.00						<0.00001				<0.00001				<0.00003	0.001	0.00075
Manganese	mg/l			0.01						<0.007				0.01				0.01	0.05	-
Phosphate	mg/l			<0.010			<0.010			0.02				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<9.000						<0.000009				0.01				<0.001	0.01	0.0375
Fluoride	mg/l			0.06						<0.080				<0.080				<0.200	1	-
Sulphate	mg/l			12.66			3.70			13.93				10.40				9.57	200	-
Total Alkalinity	mg/l			8.53						258.71				3.13				<30	NAC	-
Total Phosphorous	mg/l			0.04						0.02				<0.120				0.02	0.03	0.035
Residue on evaporation	mg/l			0.01						0.01				-				30.00	-	-
Faecal coliform	100/l			461						816				50				-	0	-
Total coliform	100/l			816						1986				987				-	0	-

Table 5.10 Groundwater Monitoring Results MW-5 (2020-2023)

PARAMETER	UNITS	MW5				MW5				MW5				MW5				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	17-Nov-21	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.01	0.04	0.05	0.05	0.04	0.04	0.05	0.09	0.05	0.06	0.05	<0.05	0.29	<0.050	0.15	0.065-0.175
Conductivity	µS/cm	228	194	217	222	156	215	226	227	243	222	228	254	215	163	210	210	1000	800-1875
pH	pH Units	6.60	6.30	6.60	6.60	6.10	6.40	6.00	6.50	6.70	6.40	6.10	6.60	6.70	6.30	6.20	5.50	6.5-9.5	-
Temperature	°C	10.9	11.9	15.5	11.3	10.9	12.0	12.1	11.6	10.6	12.0	12.3	10.0	11.7	10.8	14.8	12.2	25	-
Visual/odour	-					None	None	None	None	None	None	None	None	None	None	None	None	-	-
Chloride	mg/l	30.05	30.83	23.09	22.82	16.01	26.22	29.37	25.94	30.31	31.00	37.43	35.02	22.80	28.30	29.60	24.20	30	24-187.5
DO	mg/l	1.95	2.53	3.45	1.16	3.72	1.64	1.98	2.78	3.66	2.20	1.99	3.97	2.46	-	4.60	20.30	-	-
Potassium	mg/l	1.07	1.20	1.15	1.06	1.35	1.10	<1.0	<1.0	1.83	1.18	<1.0	0.79	1.01	0.79	0.86	0.71	5	-
Sodium	mg/l	17.30	18.80	17.50	16.90	14.80	16.30	21.00	18.25	19.60	16.70	20.50	19.00	16.49	18.46	18.94	18.97	150	150
Total oxidised nitrogen	mg/l	0.64	0.89	<0.5	<0.5	<0.5	<0.5	6.66	0.67	0.72	1.07	2.31	0.50	<1.0	1.95	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	7.90	0.50	2.30	2.20	4.00	2.20	3.80	2.10	2.70	2.00	1.70	2.30	1.90	1.81	1.93	4.11	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	0.00	<0.050	<0.050			<0.001	<0.01	<0.01	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.23					<0.23				<0.23				<0.21	1	0.75
Cadmium	mg/l			<0.0006					<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			22.00					26.40				26.00				24.02	200	
Chromium – Tot	mg/l			<0.002					<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002					<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.20					<0.20				<0.23				0.04	0.2	-
Lead	mg/l			<0.006					<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			3.71					4.28				4.51				4.66	50	-
Zinc	mg/l			<0.018					<0.018				<0.018				0.01	0.1	-
Mercury	mg/l			0.0001					<0.00001				0.00002				<0.00003	0.001	0.00075
Manganese	mg/l			0.93					0.84				0.96				0.59	0.05	-
Phosphate	mg/l			<0.010					<0.010				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<0.009					<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.07					<0.080				<0.080				<0.200	1	-
Sulphate	mg/l			10.29					10.54				10.49				8.54	200	-
Total Alkalinity	mg/l			63.45					80.93				70.72				53.00	NAC	-
Total Phosphorous	mg/l			0.01					0.01				<0.120				<0.020	0.03	0.035
Residue on evaporation	mg/l			0.01					0.01				-				335.00	-	-
Faecal coliform	100/l			0					0				35				-	0	-
Total coliform	100/l			2					9				43				-	0	-

Table 5.11 Groundwater Monitoring Results MW-6 (2020-2023)

PARAMETER	UNITS	MW6				MW6					MW6				MW6				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	27-May-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.01	0.09	0.15	<0.020	0.04	0.11	0.04	0.05	0.09	0.23	0.06	3.11	<0.05	<0.05	<0.05	0.15	0.065-0.175
Conductivity	µS/cm	354.0	362.0	364.0	325.0	322.0	393.0	359.0	349.0	343.0	323.0	362.0	326.0	347.0	335.0	339.3	280.0	310.0	1000	800-1875
pH	pH Units	7.40	7.40	7.40	7.30	7.00	6.90	7.30	7.40	7.30	7.20	7.20	7.20	7.40	7.30	7.60	6.70	7.00	6.5-9.5	-
Temperature	°C	10.7	12.1	12.9	11.1	11.0	10.4	11.6	12.0	11.4	10.9	11.8	12.3	10.0	11.4	12.8	14.2	10.8	25	-
Visual/odour	-					None		None	None	None	None	None	None	None	None	None	None	Earthy	-	-
Chloride	mg/l	26.80	29.27	29.88	25.98	24.71	30.80	29.72	28.39	29.60	30.33	29.42	29.03	28.87	30.50	32.00	28.40	30.20	30	24-187.5
DO	mg/l	3.80	2.21	2.38	1.85	1.61	29% Sat	3.20	2.12	2.38	1.98	2.51	2.97	3.62	5.48	-	4.70	20.80	-	-
Potassium	mg/l	1.00	1.30	<0.5	10.50	1.29		<1.0	<1.0	1.47	1.50	1.06	1.14	1.30	1.71	0.74	0.71	0.78	5	-
Sodium	mg/l	16.60	14.50	17.60	16.00	18.60		16.50	16.90	14.80	17.70	20.70	15.90	18.00	16.39	18.04	16.44	18.01	150	150
Total oxidised nitrogen	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	8.40	<0.3	<0.3	3.20	2.60		1.20	2.00	0.90	2.60	0.80	1.50	<0.7	<0.3	<1.0	<1.0	<1.0	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002		0.01	<0.050	<0.050			<0.001	<0.010	<0.010	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.230						<0.230				<0.230				<0.210	1	0.75
Cadmium	mg/l			<0.0006						<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			4.27						45.10				44.60				36.72	200	
Chromium – Tot	mg/l			<0.002						<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002						<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.23						<0.23				<0.23				<0.005	0.2	-
Lead	mg/l			<0.006						<0.006				<0.006				<0.0051	0.01	0.01875
Magnesium	mg/l			2.19						10.80				10.50				10.24	50	-
Zinc	mg/l			<0.018						0.02				<0.018				0.01	0.1	-
Mercury	mg/l			<0.00001						<0.000010				<0.000010				<0.00003	0.001	0.00075
Manganese	mg/l			<0.007						0.88				0.29				0.00	0.05	-
Phosphate	mg/l			<0.010			<0.010			<0.010				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<9.000						<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.09						<0.080				0.09				<0.200	1	-
Sulphate	mg/l			32.97			35.00			36.96				34.43				28.10	200	-
Total Alkalinity	mg/l			120.49						125.63				126.10				97.00	NAC	-
Total Phosphorous	mg/l			0.47						0.16				<0.12				<0.02	0.03	0.035
Residue on evaporation	mg/l			0.21						% 0.05				-				370.00	-	-
Faecal coliform	100/l			<10						2				6				-	0	-
Total coliform	100/l			63						96				29				-	0	-

Table 5.12 Groundwater Monitoring Results MW-7 (2020-2023)

PARAMETER	UNITS	MW7				MW7				MW7				MW7				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	02-Jun-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.02	0.05	0.05	0.04	0.02	0.10	0.10	0.18	0.21	0.10	0.02	0.14	0.69	<0.050	0.15	0.065-0.175
Conductivity	µS/cm	264	276	284	272	273	267	256	268	214	277	267	262	283	218	120	270	1000	800-1875
pH	pH Units	7.00	7.00	7.00	7.00	7.00	6.90	7.00	7.00	6.80	7.10	7.00	7.00	7.10	7.10	6.00	6.00	6.5-9.5	-
Temperature	°C	10.7	11.5	14.0	11.2	10.3	11.2	11.8	11.0	10.6	11.9	11.1	9.9	11.3	12.3	14.0	11.1	25	-
Visual/odour	-					None	None	None	None	None	None	None	None	None	None	None	Earthy	-	-
Chloride	mg/l	30.11	28.85	31.49	27.45	27.87	28.72	24.13	29.83	28.67	26.48	28.96	44.60	28.50	25.10	9.52	28.80	30	24-187.5
DO	mg/l	2.90	1.45	2.44	1.62	2.13	1.42	1.20	1.19	2.29	2.98	2.02	5.15	1.26	-	4.60	20.30	-	-
Potassium	mg/l	0.93	1.36	1.77	2.87	1.06	1.22	1.96	1.24	2.05	1.18	1.19	8.50	1.14	1.86	7.07	1.31	5	-
Sodium	mg/l	17.00	16.40	17.90	16.40	19.30	15.70	15.00	16.20	19.30	16.60	15.90	22.00	16.58	14.20	6.17	18.30	150	150
Total oxidised nitrogen	mg/l	0.61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.72	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	NAC	-
Total organic carbon	mg/l	6.40	1.90	<0.3	0.80	2.60	1.50	2.00	1.00	4.80	5.20	3.60	5.70	9.50	3.59	<1.0	4.45	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	0.02	0.06	<0.050			<0.001	<0.010	<0.010	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.23					<0.23				<0.23				<0.21	1	0.75
Cadmium	mg/l			<0.0006					<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			33.30					34.40				26.90				31.73	200	
Chromium – Tot	mg/l			<0.002					<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002					<0.009				<0.009				<0.003	0.03	1.5
Iron	mg/l			<0.300					0.91				1.10				<0.005	0.2	-
Lead	mg/l			<0.006					<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			6.46					6.34				5.24				6.82	50	-
Zinc	mg/l			<0.018					<0.018				<0.018				0.00	0.1	-
Mercury	mg/l			0.0001					<0.000010				<0.000010				<0.00003	0.001	0.00075
Manganese	mg/l			0.91					0.85				0.86				0.08	0.05	-
Phosphate	mg/l			0.01					0.01				0.03				<0.05	0.03	0.035
Cyanide – Tot	mg/l			<0.009					<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.08					<0.08				0.11				<0.2	1	-
Sulphate	mg/l			12.30					13.32				12.62				19.00	200	-
Total Alkalinity	mg/l			93.52					103.48				97.14				75.00	NAC	-
Total Phosphorous	mg/l			0.20					0.10				<0.12				0.17	0.03	0.035
Residue on evaporation	mg/l			0.04					% 0.02				-				675.0	-	-
Faecal coliform	100/l			1071					1986				91				-	0	-
Total coliform	100/l			>24000					>2420				2420				-	0	-

Table 5.13 Groundwater Monitoring Results SPJ-1 (2020-2023)

PARAMETER	UNITS	SPJ1				SPJ1				SPJ1				SPJ1				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.02	0.04	0.49	0.07	0.04	0.10	0.12	0.05	0.09	0.04	<0.01	0.05	<0.050	<0.050	0.15	0.065-0.175
Conductivity	µS/cm	278	353	261	244	306	197	201	222	225	375	211	243	208	192	200	190	1000	800-1875
pH	pH Units	6.5	7.1	6.3	6.0	6.9	6.0	6.1	5.9	6.0	7.1	5.9	5.9	6.1	6.2	5.2	5.5	6.5-9.5	-
Temperature	°C	8.5	12.8	13.8	9.8	8.9	11.7	12.4	10.6	10.0	12.0	12.2	10.1	11.3	12.8	14.5	10.9	25	-
Visual/odour	-					None	None	None	None	None	None	None	None	None	None	None	Earthy	-	-
Chloride	mg/l	25.31	28.58	31.36	26.75	21.38	21.60	23.64	19.04	26.26	29.53	24.73	33.30	20.20	27.30	21.50	18.20	30	24-187.5
DO	mg/l	5.80	2.32	6.72	7.86	4.56	3.27	2.31	6.80	4.11	3.38	7.52	9.66	6.26	-	-	20.60	-	-
Potassium	mg/l	1.41	1.16	1.63	1.88	1.44	1.38	2.21	1.96	2.37	1.08	<1.000	1.90	1.23	0.72	1.69	1.75	5	-
Sodium	mg/l	12.70	21.60	16.40	14.50	17.50	14.10	15.60	12.90	15.50	14.70	14.60	16.00	13.79	14.70	15.54	14.84	150	150
Total oxidised nitrogen	mg/l	3.09	<0.500	5.52	6.64	0.84	2.22	3.99	4.29	4.57	<0.500	2.53	6.11	<1.000	1.83	3.70	4.73	NAC	-
Total organic carbon	mg/l	6.00	0.30	1.40	1.00	3.20	1.70	1.90	1.40	1.90	0.70	0.80	1.00	<0.300	<1.000	1.38	1.25	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	<0.05	<0.05			<0.0005	<0.01	<0.01	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.23					<0.23				<0.23				<0.21	1	0.75
Cadmium	mg/l			<0.0006					<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			28.90					23.30				26.30				22.14	200	
Chromium – Tot	mg/l			<0.002					<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<0.002					0.05				0.04				0.13	0.03	1.5
Iron	mg/l			0.38					0.23				<0.230				<0.005	0.2	-
Lead	mg/l			<0.006					<0.006				<0.006				0.002	0.01	0.01875
Magnesium	mg/l			4.38					2.46				2.87				2.77	50	-
Zinc	mg/l			0.35					0.07				0.43				0.214	0.1	-
Mercury	mg/l			0.00001					<0.000010				<0.000010				<0.00003	0.001	0.00075
Manganese	mg/l			0.02					<0.007				<0.007				0.002	0.05	-
Phosphate	mg/l			<0.010					<0.010				<0.010				<0.050	0.03	0.035
Cyanide – Tot	mg/l			<0.009					<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.09					<0.080				<0.080				<0.200	1	-
Sulphate	mg/l			12.96					12.73				11.37				12.60	200	-
Total Alkalinity	mg/l			52.31					46.06				36.29				42.00	NAC	-
Total Phosphorous	mg/l			0.10					0.02				<0.12				<0.02	0.03	0.035
Residue on evaporation	mg/l			0.02					% 0.02				-				255.00	-	-
Faecal coliform	100/l			1					0				3				-	0	-
Total coliform	100/l			93					34				687				-	0	-

Table 5.14 Groundwater Monitoring Results SPM-2 (2020-2023)

PARAMETER	UNITS	SPM2				SPM2				SPM2				SPM2				IGV	GTV
		23-Mar-20	09-Jun-20	22-Sep-20	16-Nov-20	24-Mar-21	23-Jun-21	21-Sep-21	17-Nov-21	21-Mar-22	24-May-22	24-Aug-22	23-Nov-22	29-Mar-23	29-Jun-23	02-Oct-23	15-Dec-23		
Ammoniacal nitrogen	mg/l		0.01	0.01	0.04	0.04	0.05	0.01	0.10	0.02	0.09	0.17	0.05	0.01	<0.050	<0.050	<0.050	0.15	0.065-0.175
Conductivity	µS/cm	665	324	299	320	274	290	296	286	291	294	280	272	236	244	210	320	1000	800-1875
pH	pH Units	6.60	6.20	6.40	6.60	6.60	6.50	6.40	6.60	6.60	6.60	6.40	6.80	6.80	6.80	5.80	6.30	6.5-9.5	-
Temperature	°C	10.6	11.2	14.2	9.5	10.3	11.2	12.8	12.2	10.1	11.8	11.6	9.6	10.9	12.5	14.1	13.5	25	-
Visual/odour	-									None	None	None	None	None	None	None	Earthy	-	-
Chloride	mg/l	39.61	34.82	26.23	27.87	21.02	29.32	27.07	23.99	28.45	27.46	29.36	31.78	15.20	25.50	20.90	25.50	30	24-187.5
DO	mg/l	6.63	5.63	6.43	8.50	2.95	1.83	1.94	7.70	2.94	4.73	5.62	6.82	7.63	-	-	20.20	-	-
Potassium	mg/l	14.60	13.10	13.00	13.80	12.40	11.90	13.80	14.20	13.20	12.50	13.40	13.00	10.48	12.68	11.57	12.98	5	-
Sodium	mg/l	17.70	17.30	15.50	17.20					16.20	14.70	14.70	17.00	14.19	14.96	14.94	15.57	150	150
Total oxidised nitrogen	mg/l	15.85	10.75	11.07	11.53	9.61	6.50	9.25	10.43	9.96	12.40	9.18	11.21	<1.000	9.13	5.77	8.22	NAC	-
Total organic carbon	mg/l	7.10	<0.300	2.10	4.00	2.80	1.60	1.40	2.20	2.40	2.10	1.10	2.00	0.80	1.12	2.48	2.02	NAC	-
Phenols	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	0.01	<0.05	<0.05			<0.001	<0.01	<0.01	<0.0002	<0.0002	<0.0002	0.0005	-
Boron	mg/l			<0.23					<0.23				<0.23				<0.21	1	0.75
Cadmium	mg/l			<0.0006					<0.0006				<0.0006				<0.0001	0.005	0.00375
Calcium	mg/l			31.70					31.00				27.40				25.35	200	
Chromium – Tot	mg/l			<2.000					<0.002				<0.002				<0.001	0.03	0.0375
Copper	mg/l			<2.000					<0.009				<0.009				0.00	0.03	1.5
Iron	mg/l			0.38					<0.230				<0.230				0.01	0.2	-
Lead	mg/l			<0.006					<0.006				<0.006				<0.00051	0.01	0.01875
Magnesium	mg/l			3.32					<0.007				2.77				2.94	50	-
Zinc	mg/l			0.03					<0.018				<0.018				0.01	0.1	-
Mercury	mg/l			0.00					<0.000010				<0.000010				<0.00003	0.001	0.00075
Manganese	mg/l			0.01					3.09				<0.007				<0.001	0.05	-
Phosphate	mg/l			0.05					0.05				0.06				0.06	0.03	0.035
Cyanide – Tot	mg/l			<0.009					<0.000009				<0.009				<0.001	0.01	0.0375
Fluoride	mg/l			0.08					<0.080				<0.080				<0.200	1	-
Sulphate	mg/l			16.82					18.75				17.06				17.10	200	-
Total Alkalinity	mg/l			48.22					44.56				29.92				41.00	NAC	-
Total Phosphorous	mg/l			0.07									<0.120				0.05	0.03	0.035
Residue on evaporation	mg/l			0.02					% 0.03				-				250.00	-	-
Faecal coliform	100/l			51					219				62				-	0	-
Total coliform	100/l			>2420					2420				2420				-	0	-

Table 5.15 Groundwater Monitoring Results S-1 (2008 – 2023)

PARAMETER	UNITS	S-1								IGV	GTV
		18-Jun-19	13-Nov-19	23-Jun-21	17-Nov-21	24-May-22	23-Nov-22	27-Jul-23	15-Dec-23		
Ammoniacal nitrogen	mg/l	1.19	0.11	2.24	0.38	1.53	0.46	0.55	0.08	0.15	0.065-0.175
Conductivity	µS/cm	769	679	669	680	706	594	440	510	1000	800-1875
Temperature	°C	15.5	9.1	11.6	11.4	13.0	10.1	15.1	12.4	25	-
Visual/odour	-			No	None	No	No	No	Earthy	-	-
Chloride	mg/l	30.95	22.27	27.52	26.20	34.78	22.79	18.00	16.30	30	24-187.5
DO	mg/l	3.16	5.41	1.93	2.41	3.28	4.74		21.30	-	-
Faecal coliform	100/l	0	0	0	1	2	1	>100	-	0	-
Total coliform	100/l	250	152	>2420	1414	629	1553	>2400	-	0	-
BOD	mg/l	<1.0	<1.0	9.0	1.0	1.0	1.0	2.0	11.0	-	-
COD	mg/l	13.0	<1.0	57.0	7.0	4.0	7.0	11.0	<8.0	-	-
Suspended Solids	mg/l	21.0	1.0	198.0	46.0	14.0	3.0	<5.0	<5.0	-	-

Monitoring well MW-5 is generally indicative of groundwater quality up hydraulic gradient of the landfill. However it is possible given its proximity to the landfill that it may be affected by leachate migrating away from the landfill in the bedrock to the east of the site. The intermittent presence of Manganese and Phosphorous in this well could be associated with agricultural activity in the catchment upstream of the site. The water quality in this well was generally good in 2023.

Monitoring well MW-4 may actually be up hydraulic gradient of the landfill to the south as there is a hydraulic gradient from this well toward MW-6 to the northeast and MW-5 and MW-3 further to the northeast. However, because of the proximity to the landfill MW-4 may be slightly impacted by leachate in the groundwater. Similarly to 2022 the water quality was good in this well in 2023.

Monitoring well MW-3 is down hydraulic gradient of the landfill to the east. Elevated Ammonia, Iron and Manganese, Faecal and Total Coliforms have been intermittently detected in this well between 2008 and 2022. Only iron and manganese were slightly elevated in 2023 indicating an improvement in water quality in 2023. pH in the groundwater here is slightly acidic but this is associated with the bedrock geology and not the presence of the landfill

Monitoring wells MW-1, MW-2 and MW-7 are down hydraulic gradient of the landfill to the west.

Elevated Ammonia, Manganese, Potassium, Faecal and Total Coliforms have been detected intermittently in MW-1. In 2023 elevated Ammonia was detected in all monitoring rounds. Potassium is marginally above the IGV in MW-1.

Elevated Ammonia, Chloride, Faecal and Total Coliforms had been detected intermittently in MW-2. In 2023 the water quality has improved with chloride within the GTV and marginally above the IGV and ammonia only exceeding the GTV June 2023.

MW-7 is located approximately 250m to the west of the landfill adjacent to the public road which runs along the southern side of the landfill. Manganese, Chloride, Iron, Faecal and Total Coliforms have been detected intermittently in this well. In 2023 Ammonia was above GTV limits in June and October 2023 only. In 2022 Ammonia was detected above the GTV in all monitoring rounds. It is possible that Ammonia and occasionally Total Phosphorous in the down gradient wells could be associated with agricultural activity in the lands adjacent to these monitoring location but may also be indicative of the presence of a weak leachate in the groundwater. The groundwater quality does generally improve moving from MW-1 to MW-7 down hydraulic gradient to the west. Slightly elevated Potassium and Phosphorus were also detected in MW-7 in 2023. Manganese exceeded the IGV in the annual suite of testing. Manganese may be naturally occurring given the nature of the bedrock beneath the site.

Figure 5.6- 5.9 show the trends in Ammonia, Chloride, Electrical Conductivity and Manganese between 2008 and 2023 for all of the monitoring wells. The graphs indicate a generally declining trend in ammonia and while concentrations of Chloride, Electrical Conductivity and Manganese fluctuate seasonally they do not show a generally increasing concentration over time.

Monitoring wells SPJ-1 and SPM-2 are located at private dwellings 290m to the south and 270m southeast of the landfill respectively.

Potassium has been persistently detected above the IGV in SPM-2. Faecal and Total Coliforms have been detected in both wells in previous rounds. In 2023 Zinc was above the IGV and Orthophosphate above the IGV in SPJ-1.

Given the hydraulic gradient between these wells and the landfill, it is unlikely that the groundwater quality in these wells is affected by leachate from the landfill site. It is more likely that the wells are affected by agricultural activities in the vicinity of the wells.

Table 5.16 shows the trend analysis results of ammonia, chloride and electrical conductivity and Appendix 3 shows the trend analysis graphs. The correlation interpretation key is given below table 5.16.

Table 5.16 Groundwater Monitoring Correlation (2008 – 2023)

Trends 2008 - 2023		MW1	MW2	MW3	MW4	MW5	MW6	MW7	SPJ1	SPM2	S1
Ammoniacal nitrogen	Correlation	Average	Very weak	Strong	Very weak	Very weak	Very weak	Very weak	Very weak	Very weak	Average
	r	-0.53	-0.09	-0.76	-0.20	-0.11	0.13	-0.01	0.10	-0.15	-0.53
	r2(%)	28%	1%	57%	4%	1%	2%	0%	1%	2%	28%
Conductivity	Correlation	Average	Very weak	Average	Very weak	Weak	Weak	Weak	Very weak	Very weak	Strong
	r	-0.57	-0.17	-0.54	-0.06	-0.24	0.22	-0.34	0.07	0.06	-0.74
	r2(%)	32%	3%	29%	0%	6%	5%	12%	1%	0%	55%
pH	Correlation	Average	Very weak	Strong	Average	Average	Weak	Average	Very weak	Weak	Weak
	r	-0.42	0.08	-0.63	-0.47	-0.47	-0.26	-0.57	-0.02	-0.36	-0.31
	r2(%)	18%	1%	39%	22%	22%	7%	33%	1%	13%	10%
Chloride	Correlation	Very weak	Very weak	Weak	Very weak	Very weak	Weak	Very weak	Very weak	Weak	Weak
	r	0.03	-0.18	0.34	0.06	0.10	0.34	0.07	0.18	0.35	-0.35
	r2(%)	0%	3%	11%	0%	1%	12%	0%	3%	12%	12%
Potassium	Correlation	Strong	No correlation	Average	Weak	Very weak	Very weak	Very weak	Very weak	Very weak	Average
	r	-0.64	0.00	-0.50	0.32	0.10	0.17	-0.16	-0.16	-0.10	-0.60
	r2(%)	41%	0%	25%	10%	1%	3%	3%	2%	1%	36%
Manganese	Correlation	Weak	Very weak	Strong	Very weak	Average	Very weak	Weak	Very weak	Weak	Strong
	r	0.22	0.19	-0.63	0.14	0.51	0.01	0.37	0.20	0.32	-0.63
	r2(%)	5%	3%	40%	2%	26%	0%	13%	4%	10%	39%

Correlation strength	r [dimensionless], +/-	r ² [%]
Perfect correlation	1	100
Very strong correlation	0.8 - < 1	64 - < 100
Strong correlation	0.6 - ≤ 0.8	36 - ≤ 64
Average correlation	0.4 - ≤ 0.6	16 - ≤ 36
Weak correlation	0.2 - ≤ 0.4	4 - ≤ 16
Very weak correlation	> 0 - ≤ 0.2	> 0 - ≤ 4
No correlation	0	0

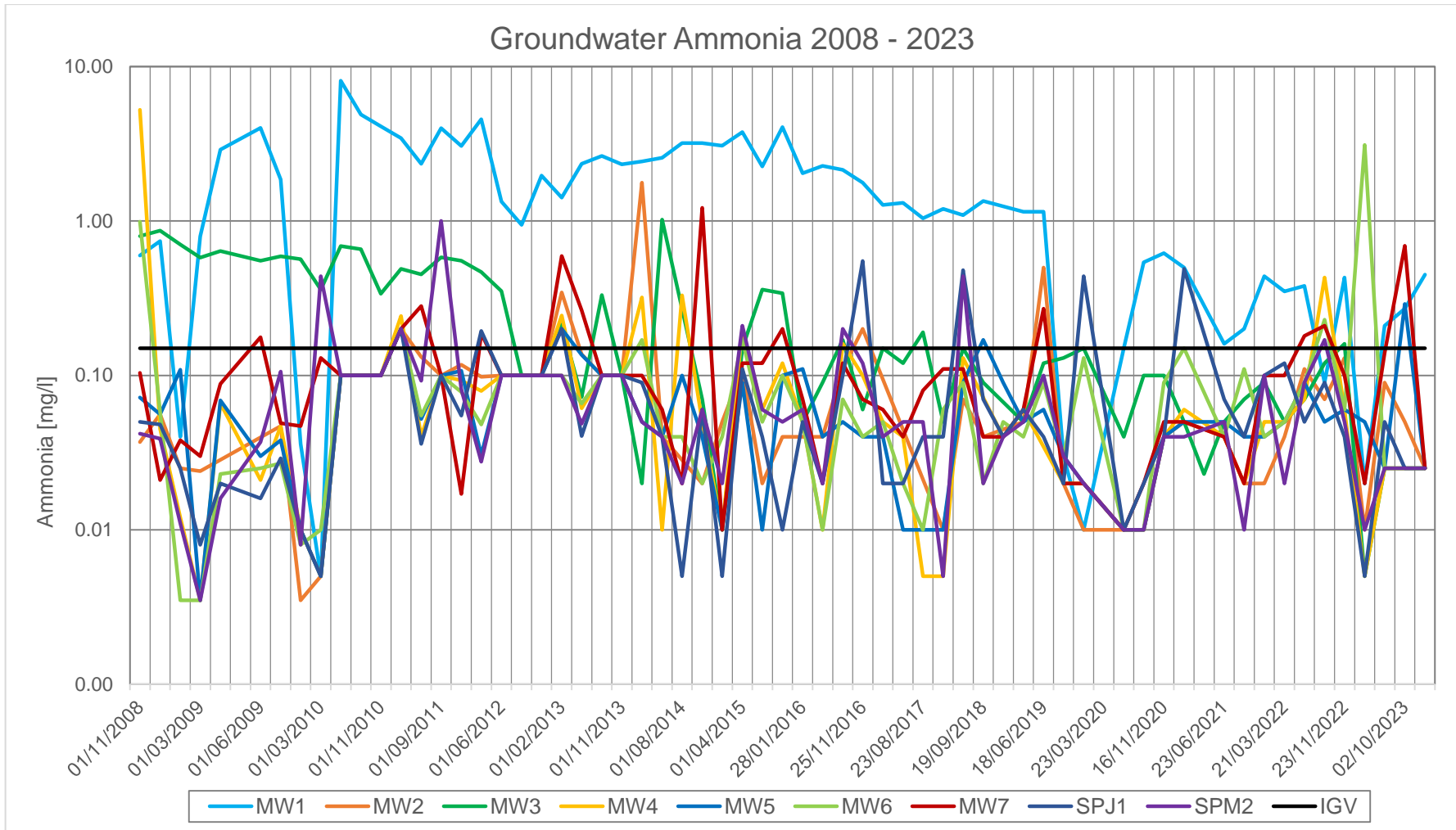


Figure 5.6 Ammonia Trends in Groundwater 2008 – 2023

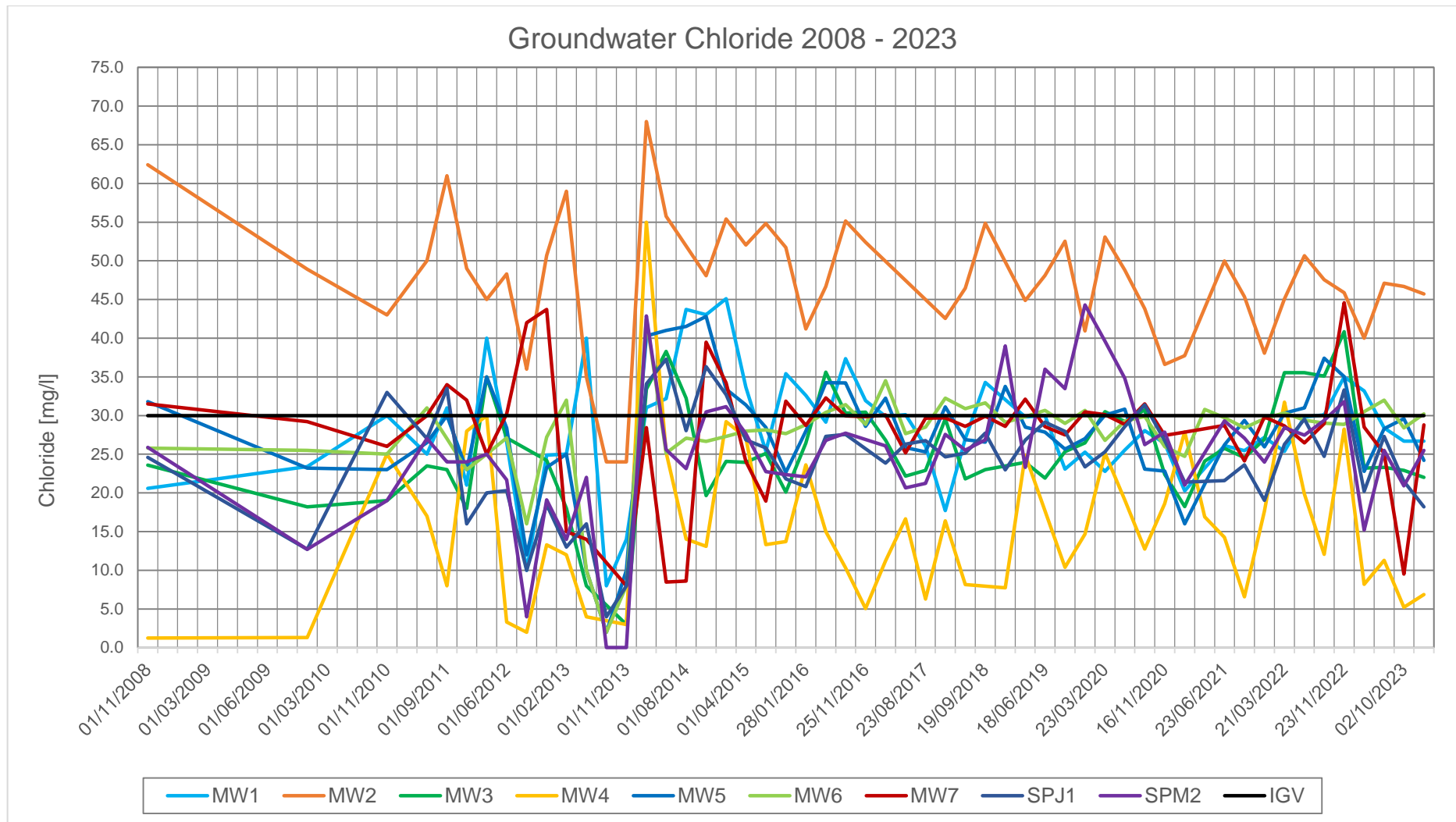


Figure 5.7 Chloride Trends in Groundwater 2008 – 2023

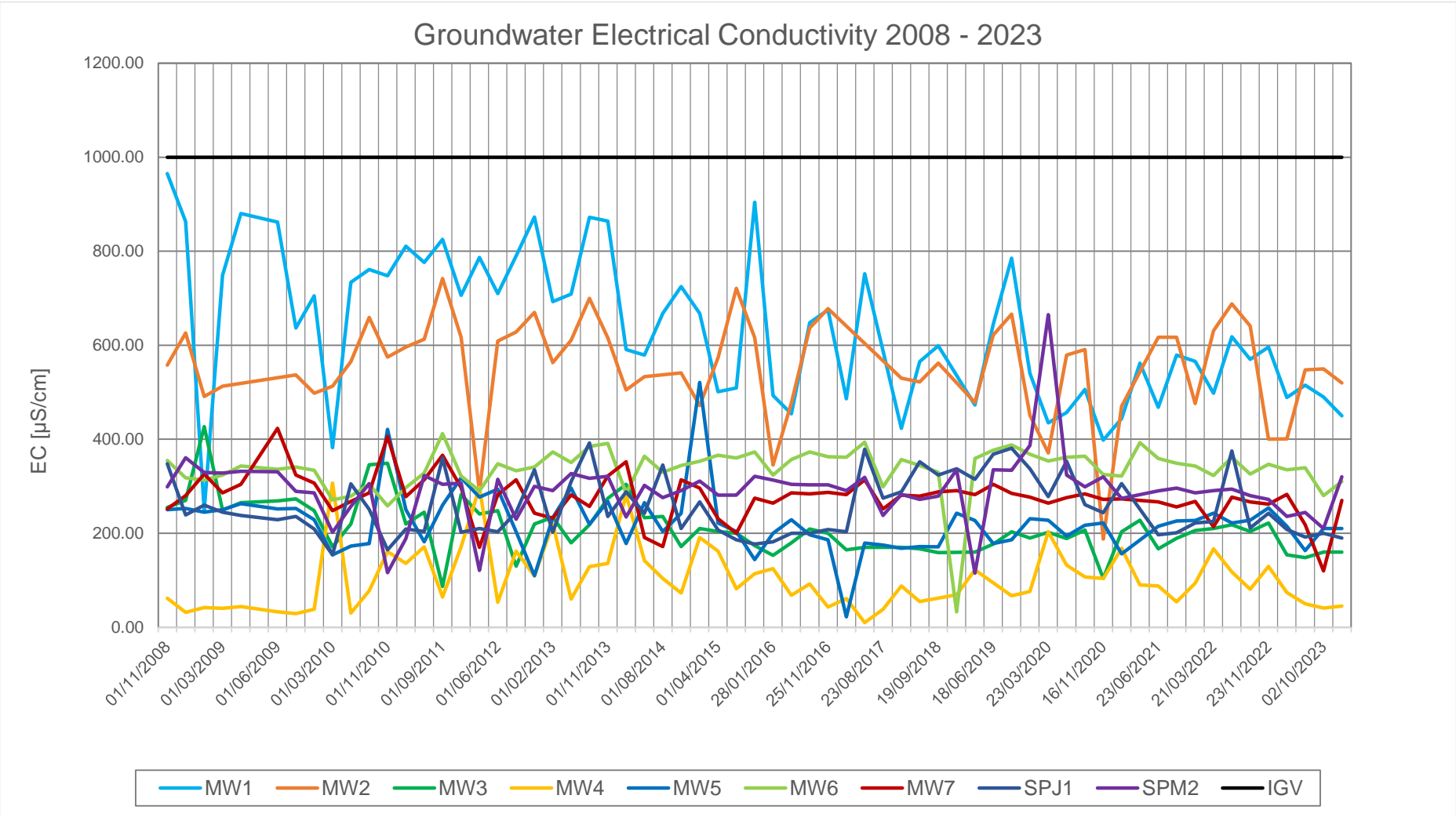


Figure 5.8 Electrical Conductivity Trends in Groundwater 2008 – 2023

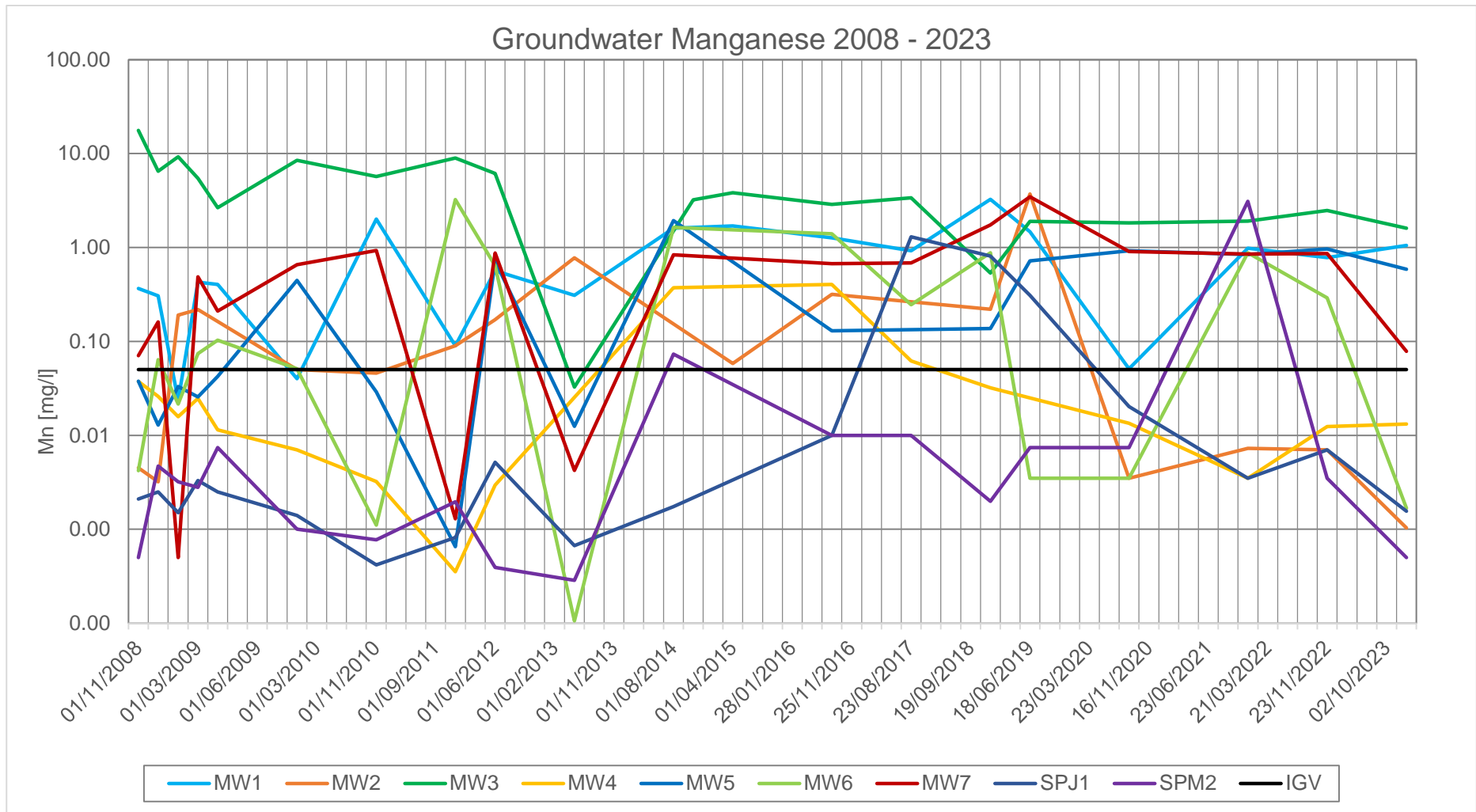


Figure 5.9 Manganese Trends in Groundwater 2008 - 2023

5.3 Leachate Quality

Leachate monitoring is undertaken quarterly at leachate wells LW-1 and LW-2 and Bi-Annually at S-1 which is located 15m east of LW1 which is outside the waste body (approximately midway between MW1 and the western boundary of the landfill). S-1 was installed as a temporary leachate collection sump prior to the installation of the landfill cap and the leachate collection wells in the landfill.

The monitoring results for S-1 are shown with the other groundwater monitoring wells on Table 5.15 and show that water quality is currently above the IGV and GTV limits for Ammonia in second half of 2023. Pumping leachate from this well is not recommended as it could result in drawing leachate away from the landfill area toward the bedrock aquifer to the west of the site.

The monitoring results for 2020 – 2023 are summarised on Tables 5.16 to 5.19 below. The Laboratory Analysis Reports are included in Appendix 2. The results are compared to the concentration ranges for landfill leachate presented in the EPA Landfill Monitoring Manual. The data indicates that the leachate is continuing to weaken over time.

The leachate level in LW-1 in 2013 ranged from approximately 9 to 13m below landfill cap level while in LW-2 it ranged from dry to 31m below cap level. Council staff monitoring the leachate generation indicate that leachate production is reducing over time indicating that the cap has been effective in diverting rainfall away from the landfill area. In 2023 leachate in Lagoon, LW-1 monitoring points were dry, LW-1 was dry apart from first round of monitoring program in March.

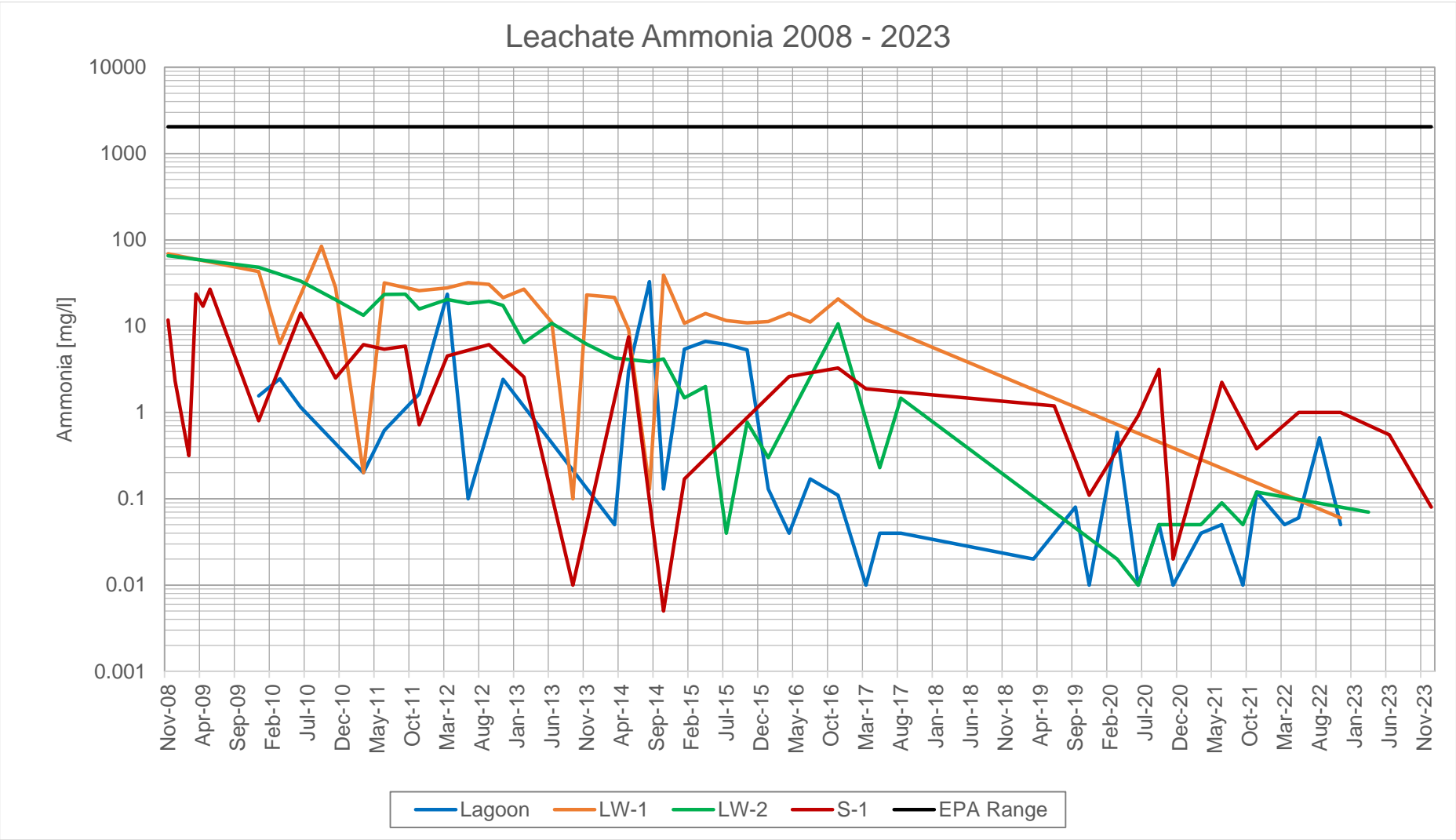


Figure 5.10 Ammonia trends in Leachate in years 2008 – 2023

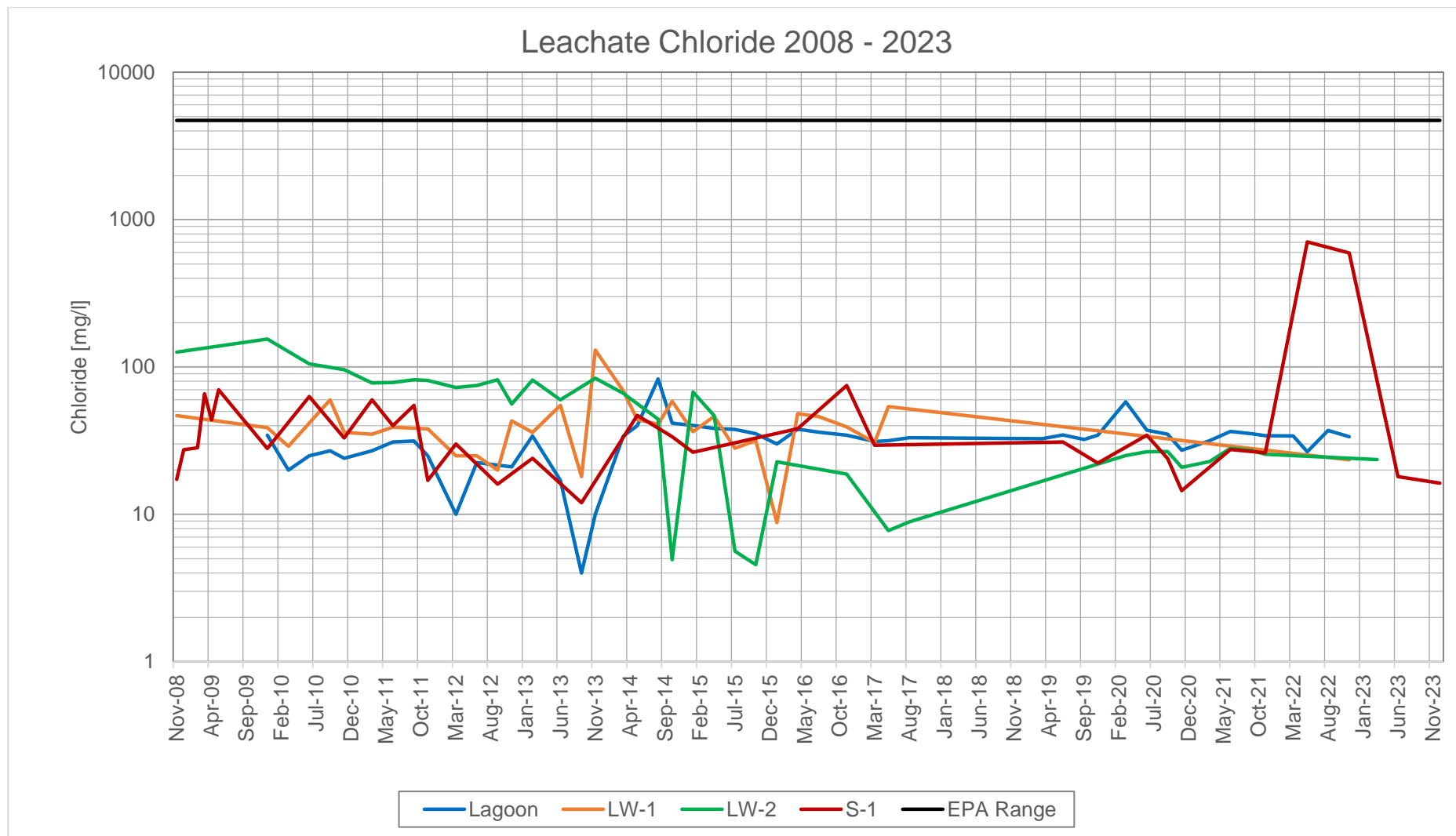


Figure 5.11 Chloride trends in Leachate in years 2008 – 2023

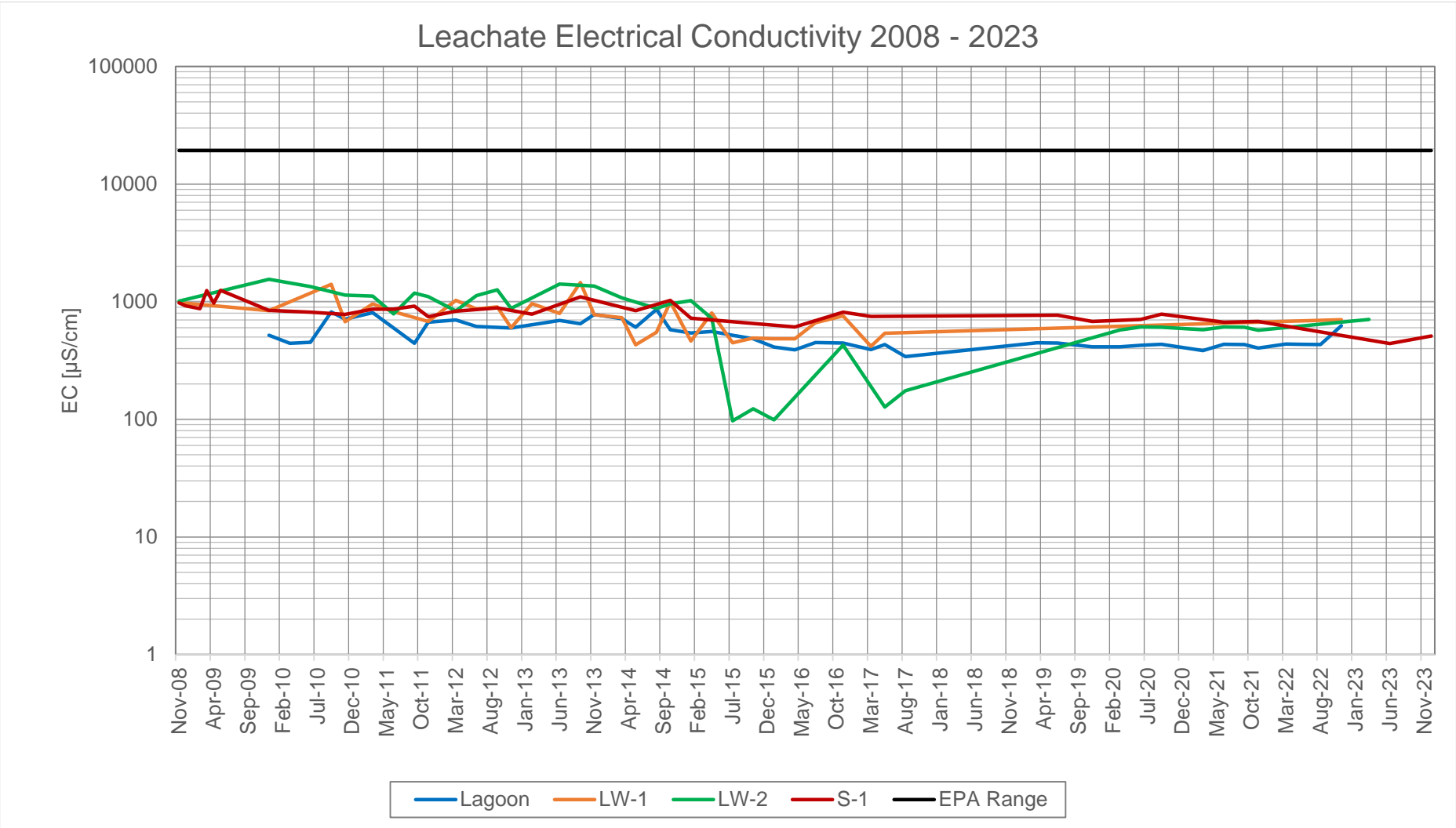


Figure 5.11 Electrical Conductivity trends in Leachate in years 2008 – 2023

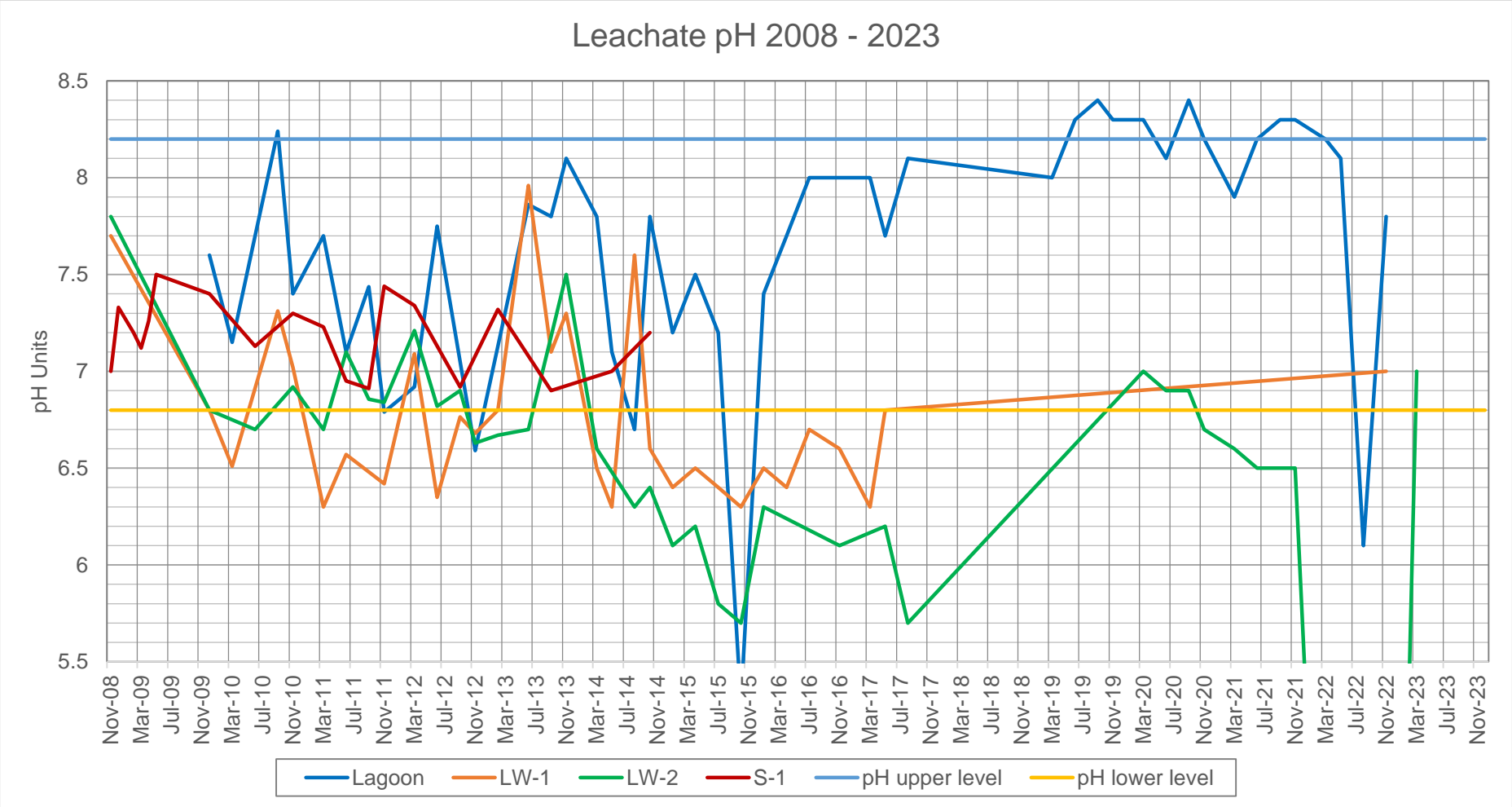


Figure 5.11 Ph trends in Leachate in years 2008 – 2023

Table 5.16 Leachate Quality 2020-2023, Lagoon

PARAMETER	UNITS	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	Lagoon	EPA Range
		Jun-20	Sep-20	Nov-20	Mar-21	Jun-21	Sep-21	Nov-21	Mar-22	May-22	Aug-22	Nov-22	Mar-23	Jun-23	Oct-23	
Visual/odour	-	none	none	none	-	-	-	-	None	None	None	None	None	None	None	-
Ammoniacal nitrogen	mg/l	0.01	0.05	0.01	0.04	0.05	0.01	0.12	0.05	0.06	0.51	0.05	-	-	-	283 - 2,040
BOD	mg/l	<1.0	<1.0	1.0	1.0	1.0	<1.0	<1.0	2.0	1.0	1.0	1.0	-	-	-	110 - 1,900
COD	mg/l	8.0	<1.0	4.0	8.0	20.0	13.0	9.0	15.0	9.0	16.0	8.0	-	-	-	622 - 8,000
Chloride	mg/l	37.28	35.04	27.19	31.64	36.50	35.31	34.19	33.99	26.57	37.07	33.71	-	-	-	570 - 4,710
Conductivity	µS/cm	425	435	-	384	435	433	403	436	435	432	626	-	-	-	5,990 - 19,300
pH	pH Units	8.10	8.40	8.20	7.90	8.20	8.30	8.30	8.20	8.10	6.10	7.80	-	-	-	6.8-8.2
Temperature	°C	12.4	15.2	9.7	10.1	12.8	12.1	11.8	10.6	16.5	18.8	10.2	-	-	-	-
Iron	mg/l	<0.01	<0.01	0.02	0.03	<0.01	10.00	<0.01	0.05	0.02	0.01	<0.23	-	-	-	1.6-160
Potassium	mg/l	14.30	15.40	15.80	15.80	14.80	17.20	17.30	18.20	16.80	17.80	5.17	-	-	-	100 - 1,580
Sodium	mg/l	26.20	26.20	25.60	27.30	24.50	26.40	25.20	27.50	24.60	25.10	14.90	-	-	-	474 - 3,650
Total oxidised nitrogen	mg/l	8.80	8.36	9.04	8.93	6.55	9.65	8.72	8.68	8.37	9.46	5.74	-	-	-	-
Magnesium	mg/l	-	8.62	-	-	-	-	8.55	-	-	-	16.80	-	-	-	40 - 1,580
Zinc	mg/l	-	<0.018	-	-	-	-	0.03	-	-	-	0.06	-	-	-	<0.03 - 6.7
Mercury	mg/l	-	0.00	-	-	-	-	<0.00001	-	-	-	<0.00001	-	-	-	<0.0001 - 0.0008
Orthophosphate	mg/l	-	0.01	-	-	-	-	<0.010	-	-	-	<0.01	-	-	-	0.3 - 18.4
Total Phosphorus	mg/l	-	0.10	-	-	-	-	0.01	-	-	-	<0.120	-	-	-	-
Manganese	mg/l	-	0.01	-	-	-	-	<0.007	-	-	-	29.70	-	-	-	0.04 - 3.59
Total coliform	MPN/100ml	-	93.30	-	-	-	-	461.10	-	-	-	613.00	-	-	-	-
Faecal coliform	MPN/100ml	-	39.90	-	-	-	-	166.40	-	-	-	8.40	-	-	-	-
Suspended Solids	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide – Tot	mg/l	-	<0.009	-	-	-	-	<0.009	-	-	-	<0.000009	-	-	-	-
Fluoride	mg/l	-	0.09	-	-	-	-	0.07	-	-	-	<0.080	-	-	-	-
Sulphate	mg/l	-	20.88	-	-	-	-	25.50	-	-	-	160.93	-	-	-	<5 - 322
Boron	mg/l	-	<0.230	-	-	-	-	<0.230	-	-	-	<0.230	-	-	-	-
Cadmium	mg/l	-	<0.0006	-	-	-	-	<0.0006	-	-	-	<0.0006	-	-	-	<0.01 - 0.08
Calcium	mg/l	-	46.60	-	-	-	-	47.00	-	-	-	86.50	-	-	-	23 - 501
Chromium (Tot)	mg/l	-	0.002	-	-	-	-	0.002	-	-	-	0.002	-	-	-	<0.03 - 0.56
Copper	mg/l	-	<0.009	-	-	-	-	0.01	-	-	-	<0.009	-	-	-	<0.02 - 0.62
Lead	mg/l	-	<0.006	-	-	-	-	<0.006	-	-	-	<0.006	-	-	-	<0.04 - 1.9
Depth	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9

Table 5.17 Leachate Quality 2020-2023, LW-1

PARAMETER	UNITS	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	LW-1	EPA Range	
		Jun-20	Sep-20	Nov-20	Mar-21	Jun-21	Sep-21	Nov-21	Mar-22	May-22	Aug-22	Nov-22	Mar-23	Jun-23	Oct-23	Dec-23		
Visual/odour	-	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	None	DRY	DRY	DRY	DRY	-
Ammoniacal nitrogen	mg/l	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	-	-	283 - 2,040
BOD	mg/l	-	-	-	-	-	-	-	-	-	-	-	<1.0	-	-	-	-	110 - 1,900
COD	mg/l	-	-	-	-	-	-	-	-	-	-	-	<5.0	-	-	-	-	622 - 8,000
Chloride	mg/l	-	-	-	-	-	-	-	-	-	-	-	23.42	-	-	-	-	570 - 4,710
Conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	-	704	-	-	-	-	5,990 - 19,300
pH	pH Units	-	-	-	-	-	-	-	-	-	-	-	7.00	-	-	-	-	6.8-8.2
Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	10.1	-	-	-	-	-
Iron	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.23	-	-	-	-	1.6-160
Potassium	mg/l	-	-	-	-	-	-	-	-	-	-	-	5.98	-	-	-	-	100 - 1,580
Sodium	mg/l	-	-	-	-	-	-	-	-	-	-	-	16.5	-	-	-	-	474 - 3,650
Total oxidised nitrogen	mg/l	-	-	-	-	-	-	-	-	-	-	-	3.65	-	-	-	-	-
Magnesium	mg/l	-	-	-	-	-	-	-	-	-	-	-	24.6	-	-	-	-	40 - 1,580
Zinc	mg/l	-	-	-	-	-	-	-	-	-	-	-	0.126	-	-	-	-	<0.03 - 6.7
Mercury	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.00001	-	-	-	-	<0.0001 - 0.0008
Orthophosphate	mg/l	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	0.3 - 18.4
Total Phosphorus	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.12	-	-	-	-	-
Manganese	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.007	-	-	-	-	0.04 - 3.59
Total coliform	MPN/100ml	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-
Faecal coliform	MPN/100ml	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Suspended Solids	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide – Tot	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.000009	-	-	-	-	-
Fluoride	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.08	-	-	-	-	-
Sulphate	mg/l	-	-	-	-	-	-	-	-	-	-	-	189.31	-	-	-	-	<5 - 322
Boron	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.23	-	-	-	-	-
Cadmium	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.006	-	-	-	-	<0.01 - 0.08
Calcium	mg/l	-	-	-	-	-	-	-	-	-	-	-	110.0	-	-	-	-	23 - 501
Chromium (Tot)	mg/l	-	-	-	-	-	-	-	-	-	-	-	0.00327	-	-	-	-	<0.03 - 0.56
Copper	mg/l	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-	<0.02 - 0.62
Lead	mg/l	-	-	-	-	-	-	-	-	-	-	-	<0.006	-	-	-	-	<0.04 - 1.9
Depth	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 5.18 Leachate Quality 2020-2023, LW-2

PARAMETER	UNITS	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	LW-2	EPA Range
		Jun-20	Sep-20	Nov-20	Mar-21	Jun-21	Sep-21	Nov-21	Mar-22	May-22	Aug-22	Nov-22	Mar-23	Jun-23	Oct-23	Dec-23	
Visual/odour	-	No	No	No	No	No	No	No	DRY	DRY	DRY	DRY	None	DRY	DRY	DRY	-
Ammoniacal nitrogen	mg/l	0.01	0.05	0.05	0.05	0.09	0.05	0.12	-	-	-	-	0.07	-	-	-	283 - 2,040
BOD	mg/l	1.0	<1.0	1.0	<1.0	1.0	<1.0	<1.0	-	-	-	-	1.0	-	-	-	110 - 1,900
COD	mg/l	8.0	<1.0	6.0	6.0	1.0	<1.0	4.0	-	-	-	-	5.0	-	-	-	622 - 8,000
Chloride	mg/l	26.64	26.65	20.89	22.83	28.13	27.12	25.54	-	-	-	-	23.50	-	-	-	570 - 4,710
Conductivity	µS/cm	610	607	-	578	611	608	573	-	-	-	-	705	-	-	-	5,990 - 19,300
pH	pH Units	6.90	6.90	6.70	6.60	6.50	6.50	6.50	-	-	-	-	7.00	-	-	-	6.8-8.2
Temperature	°C	12.0	15.1	9.5	9.7	14.4	13.3	11.9	-	-	-	-	10.6	-	-	-	-
Iron	mg/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	-	-	-	-	<0.01	-	-	-	1.6-160
Potassium	mg/l	5.39	5.43	5.47	5.44	20.40	5.54	18.00	-	-	-	-	6.36	-	-	-	100 - 1,580
Sodium	mg/l	17.10	17.60	16.80	17.80	15.90	17.00	16.20	-	-	-	-	17.96	-	-	-	474 - 3,650
Total oxidised nitrogen	mg/l	2.49	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	4.00	-	-	-	-
Magnesium	mg/l	-	20.50	-	-	-	-	20.10	-	-	-	-	-	-	-	-	40 - 1,580
Zinc	mg/l	-	0.76	-	-	-	-	0.56	-	-	-	-	-	-	-	-	<0.03 - 6.7
Mercury	mg/l	-	0.00019	-	-	-	-	<0.00001	-	-	-	-	-	-	-	-	<0.0001 - 0.0008
Orthophosphate	mg/l	-	0.01	-	-	-	-	0.01	-	-	-	-	-	-	-	-	0.3 - 18.4
Total Phosphorus	mg/l	-	0.02	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-
Manganese	mg/l	-	0.22	-	-	-	-	0.02	-	-	-	-	-	-	-	-	0.04 - 3.59
Total coliform	MPN/100ml	-	0.00	-	-	-	-	0.00	-	-	-	-	-	-	-	-	-
Faecal coliform	MPN/100ml	-	0.00	-	-	-	-	0.00	-	-	-	-	-	-	-	-	-
Suspended Solids	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide – Tot	mg/l	-	<0.009	-	-	-	-	<0.009	-	-	-	-	-	-	-	-	-
Fluoride	mg/l	-	0.12	-	-	-	-	0.09	-	-	-	-	-	-	-	-	-
Sulphate	mg/l	-	136.00	-	-	-	-	139.22	-	-	-	-	-	-	-	-	<5 - 322
Boron	mg/l	-	<0.230	-	-	-	-	<0.230	-	-	-	-	-	-	-	-	-
Cadmium	mg/l	-	<0.0006	-	-	-	-	<0.0006	-	-	-	-	-	-	-	-	<0.01 - 0.08
Calcium	mg/l	-	87.10	-	-	-	-	90.00	-	-	-	-	-	-	-	-	23 - 501
Chromium (Tot)	mg/l	-	0.002	-	-	-	-	<0.002	-	-	-	-	-	-	-	-	<0.03 - 0.56
Copper	mg/l	-	0.04	-	-	-	-	32.30	-	-	-	-	-	-	-	-	<0.02 - 0.62
Lead	mg/l	-	<0.006	-	-	-	-	<0.006	-	-	-	-	-	-	-	-	<0.04 - 1.9
Depth	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

6. RISK ASSESSMENT

Risk assessment is a scientific mechanism that allows the various hazards, pathways and receptors present at a site to be evaluated. It uses a systematic approach to identify the risks at a site, with the aim of establishing a pollutant linkage from a hazard (source) via a pathway to a receptor. If a pathway does not exist linking the hazard to a receptor there is no risk.

Source(s)

The source is leachate from the landfill. Analysis of the leachate indicates the presence of a weak and aged leachate.

The landfill does not have an engineered basal liner but there may be some overburden or quarry spoil overlying the bedrock based on observations of the old quarry to the west of the fill area. The landfill has an engineered cap and surface water is diverted away from the landfill area. The water table is considered to be below the base of the landfill. Leachate generation is declining and leachate concentrations are relatively low with leachate in monitoring point L-1 being dry since August 2017. Some increases in leachate concentrations do occur during the winter months. This is most likely associated with groundwater through put from the high ground to the north of the landfill when water table concentrations in the bedrock are typically higher in the winter months. Over time it is expected that the leachate will dilute as a result of declining rainfall infiltration and natural degradation.

Pathway(s):

The pathways for leachate movement are infiltration into the bedrock beneath the site and migration down hydraulic gradient to the surface water courses to the west and to the east.

Receptors

The potential receptors are the bedrock aquifer and groundwater users beneath and down hydraulic gradient of the landfill and surface water courses downstream to the west and east of the site.

Monitoring of water quality in the down hydraulic gradient monitoring wells indicates that the groundwater is slightly impacted by leachate migration way from the landfill in the immediate vicinity of the site but dilution is occurring along the groundwater pathway as indicated by the improvement in water quality between MW-1, MW-2 and MW-7 moving away to the west down hydraulic gradient of the landfill.

To the east of the landfill at MW-3 groundwater quality is also improving indicating little or no impact from the landfill area..

Monitoring wells SPJ-1 and SPM-2 are located at private dwellings to the south and southeast of the landfill respectively. Potassium has regularly been detected above the IGV in SPM-2 but only occasionally in SPJ-1. Zinc has been intermittently detected slightly above the IGV in this well.

Given the hydraulic gradient between SPJ-1 and SPM-2 and the wells at the landfill it is unlikely that the groundwater quality in these wells is affected by leachate from the landfill site. It is more likely that these wells are affected by agricultural activities in the vicinity of the wells. The topography and hydraulic gradient along the southern landfill boundary indicates that these wells are be up hydraulic gradient of the landfill.

It is likely that the groundwater beneath the site discharges to the surface water courses to the west and east of the landfill site. The surface water monitoring results indicate that the landfill is not impacting significantly on surface water quality downstream of the landfill. Ammoniacal nitrogen and total phosphorous has been detected above the EQS both up and downstream of the landfill and is most likely associated with run-off from agricultural lands in the vicinity of the landfill.

The surface water is not impacted by the landfill. Given that this is the pathway by which a potential impact could occur in the Estuary at Rosscarbery there is no risk posed to the NHA from the landfill site.

7. GROUNDWATER COMPLIANCE MONITORING

7.1 Extent of Plume and Trends

Figures 7.1 to 7.4 show the trends in the concentrations of ammonia, chloride, electrical conductivity and manganese in monitoring wells MW-1, 2 and 7 as requested by the Agency.

Figure 7.1 show that the ammonia concentrations are declining over time in these wells.

Figure 7.2 shows that chloride concentrations in MW-2 are persistently above the IGV but do not show an increasing trend.

Figure 7.3 shows the electrical conductivity trends. The concentrations are below the GTV and fluctuate seasonally. The concentrations generally decline with distance away from the landfill.

Figure 7.4 shows the manganese concentrations which all exceed the IGV. Manganese concentrations also are higher closer to the landfill and lower further away. The elevated manganese concentrations can be attributed groundwater derived from Old Red Sandstone due to the dissolution of manganese from the sandstone/shale where reducing conditions occur. 2018 data set is not plotted because it is for Total and not Dissolved Manganese.

The “prevent or limit “objectives of the WFD are being met. While there are intermittent exceeding concentrations of the GTV there is no trend of increasing concentrations over time in the groundwater that is significant in terms of compliance with the Groundwater Regulations. A trend assessment is included in Appendix 3. There is no evidence to indicate the presence of a significant contaminant plume.

7.2 Impact on Receptors

As outlined in Section 6 above monitoring of offsite groundwater wells and surface water quality indicate that off-site receptors are not being impacted by the landfill.

The 2023 monitoring results indicate that while concentrations exceeding the GTV are being detected intermittently in the groundwater for the COPCs their concentrations do not exceed 100 times the GAC.

The 2023 monitoring programme shows that there has been a general improvement in groundwater quality over the monitoring period.

7.3 Compliance Monitoring

Given the complicated groundwater flow direction at the site as illustrated on Figure 3.6, OCM recommend that MW-2 be nominated as the compliance monitoring point for groundwater migrating away from the site to the west and that MW-3 be nominated as the compliance monitoring point for groundwater migrating away to the east of the site. Compliance monitoring with regard to compliance with the Groundwater Regulations should be undertaken for the potential contaminants of concern (pCOCs), Ammonia, Chloride, Manganese and Electrical Conductivity.

Table 7.1 shows the proposed COPCs and recommended compliance limits. Compliance monitoring should be undertaken annually as part of the larger annual suite of monitoring undertaken at the facility.

Table 7.1 Potential CoCs and Proposed Compliance Limits

Parameter	Compliance (mg/L)	IGV (mg/L)	GTV (mg/L)
Ammoniacal Nitrogen (mg/L)	0.175	0.15	0.065-0.175
Chloride (mg/L)	60	30	24-187.5
Electrical Conductivity (uS/cm)	1000	1000	800-1875
Manganese (mg/L)	0.05	0.05	N/A

7.4 Remedial Strategy

The Council completed the following remedial measures in 2004

- A Landfill Cap comprising:
 - Terram 1B1 geocomposite gas collection layer over the re-profiled landfill
 - Bentomat Cap-75 barrier/protection layer over the gas collection layer
 - Terram 1B1 geocomposite surface water drainage layer over the barrier layer
 - 850mm deep layer of imported subsoil over the drainage layer
 - 150mm deep layer of topsoil over the subsoil, subsequently grass seeded

- B An eco-web honey comb geogrid was installed on the steep western side slope to assist in establishing vegetation growth in that area.

- C A surface water swale was constructed around the perimeter of the landfill which terminated at a low point along the south eastern boundary from where a 450mm stormwater pipe was laid to an existing stream, approximately 400m east of the site.

- D Two leachate collection wells were installed in the waste with leachate pumped to the leachate storage tank located near in the southern side of the landfill near the site entrance.

The available groundwater and surface water monitoring results indicate that these measures have been effective at mitigating the risk of impact on groundwater receptors down hydraulic gradient of the site. No further remedial measures are considered necessary at the site.

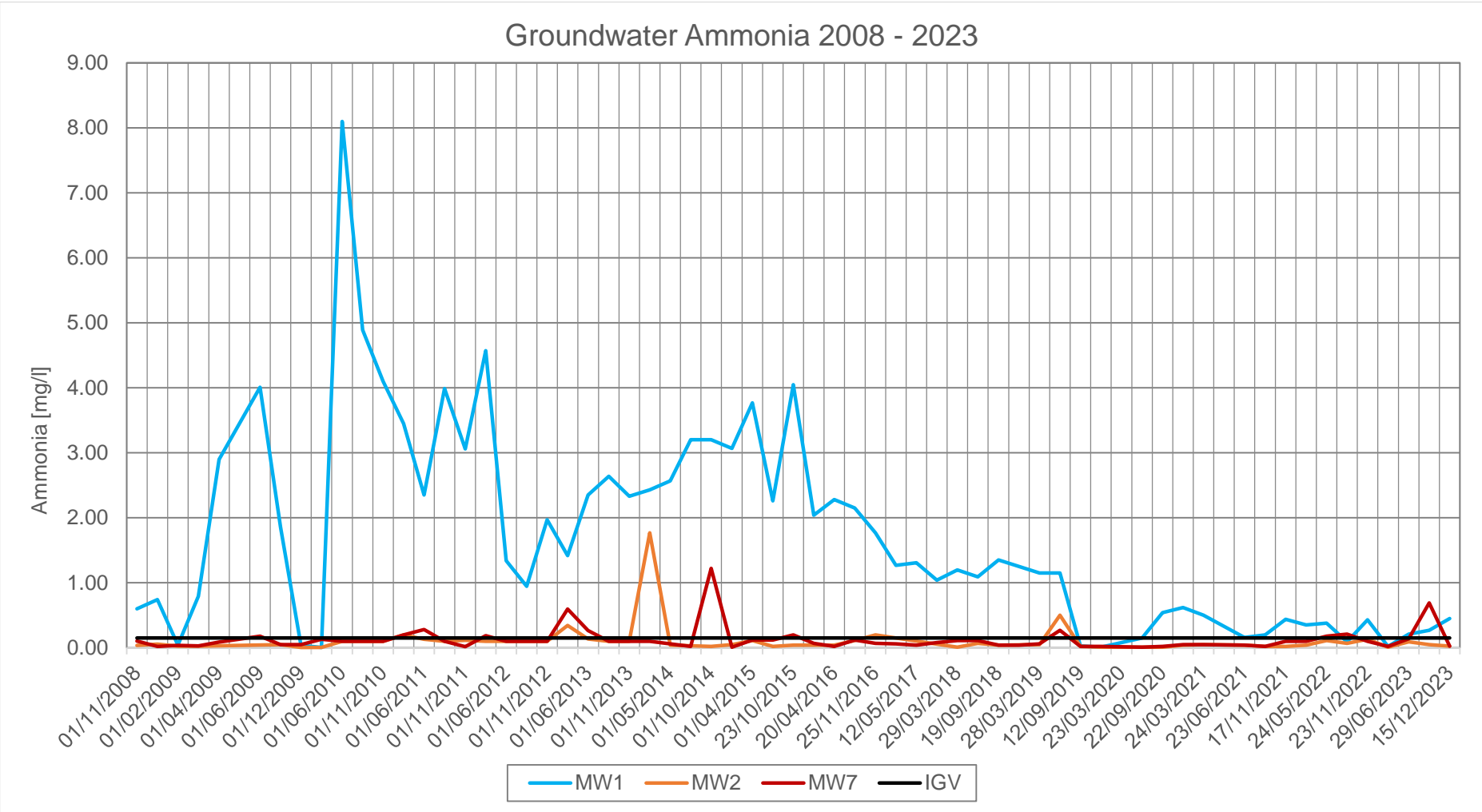


Figure 7.1 Ammonia Trends for MW-1, MW-2 and MW-7 in Groundwater 2008 – 2023

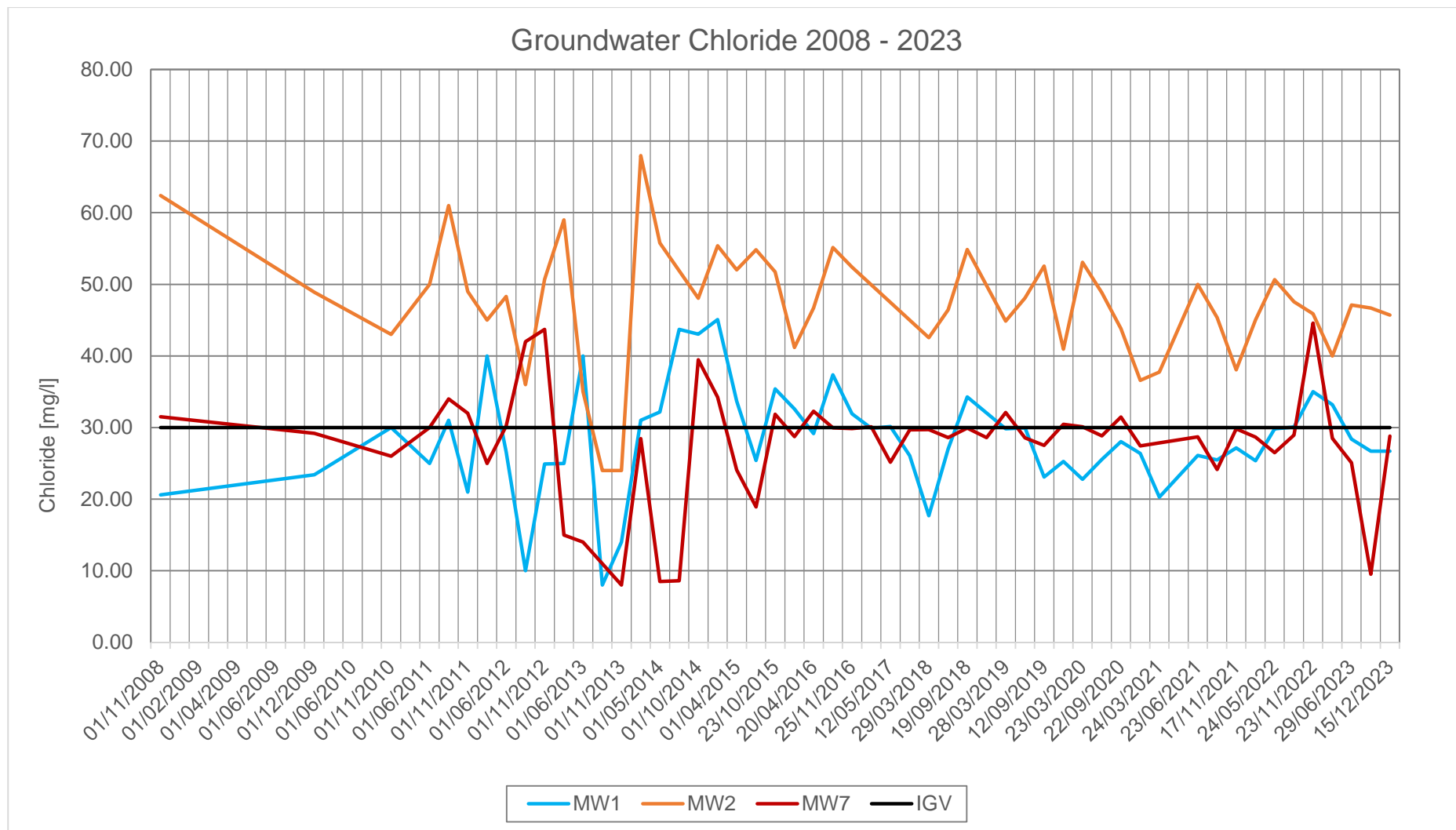


Figure 7.2 Chloride Trends for MW-1, MW-2 and MW-7 in Groundwater 2008 – 2023

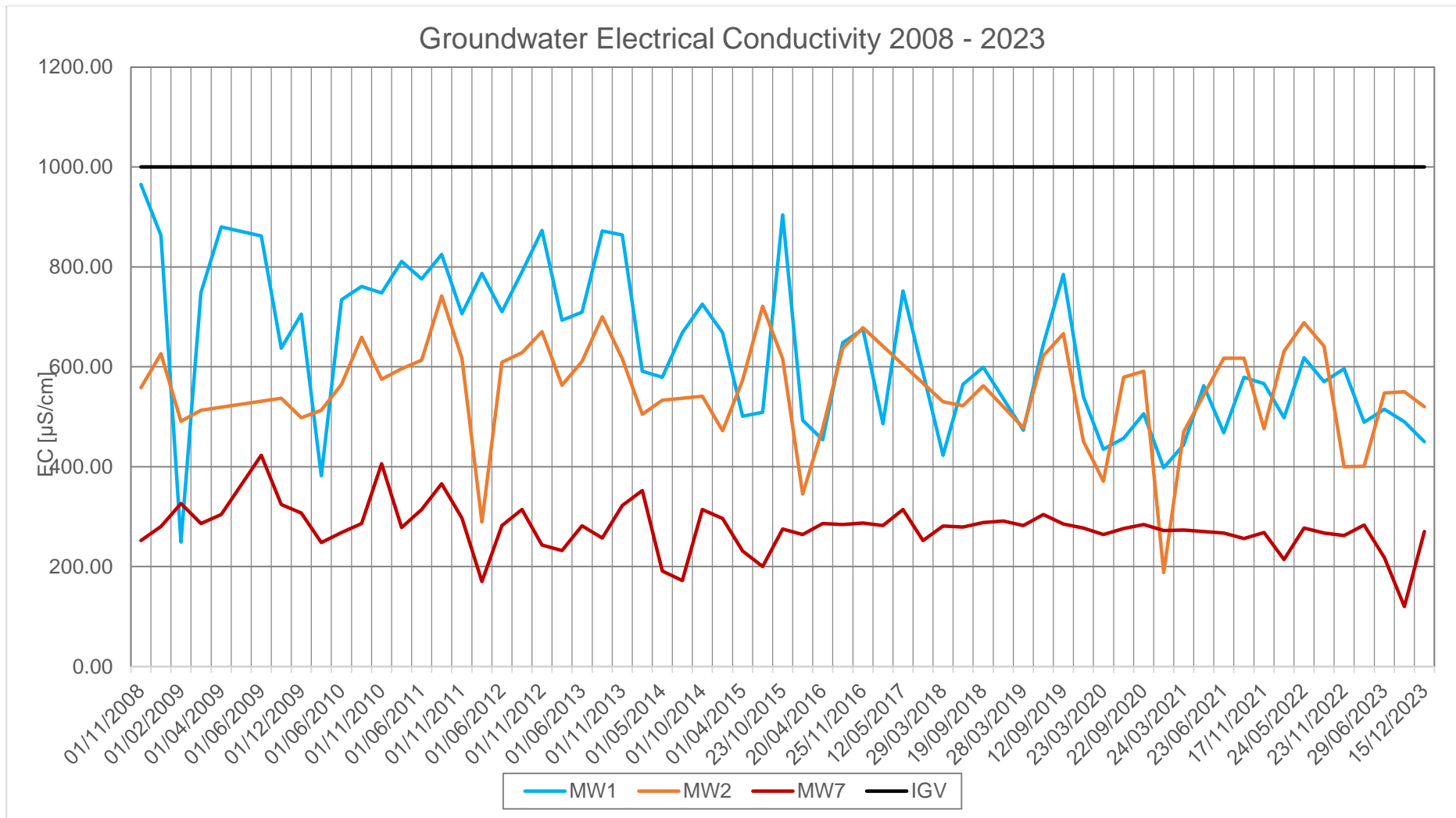


Figure 7.3 Electrical Conductivity Trends for MW-1, MW-2 and MW-7 in Groundwater 2008 – 2023

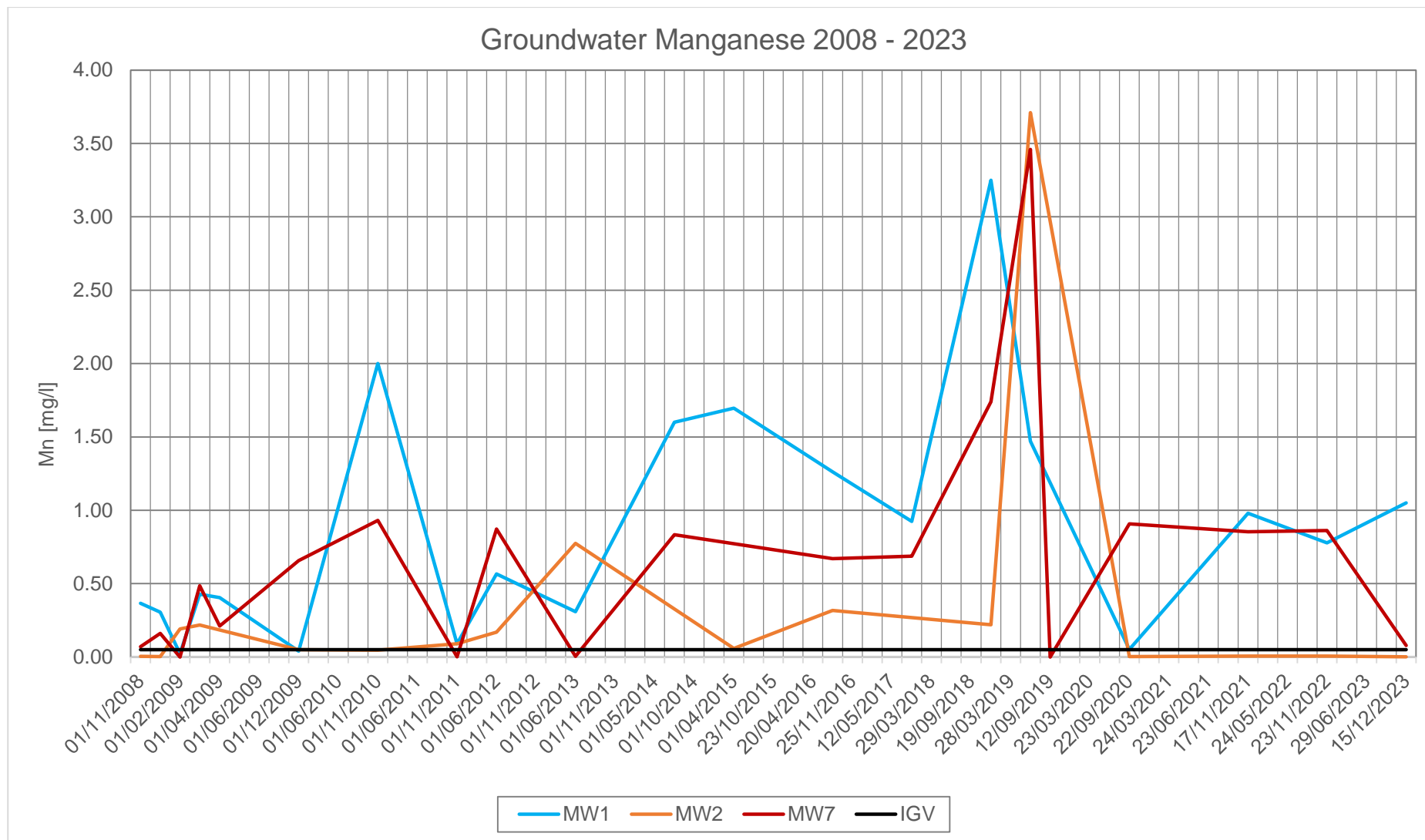


Figure 7.4 Manganese Trends for MW-1, MW-2 and MW-7 in Groundwater 2008 – 2023

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The landfill does not have an engineered basal liner but there may be some overburden or quarry spoil overlying the bedrock based on observations of the old quarry to the west of the fill area.

The engineered landfill cap also extends to the east and west containing the waste in these directions. Based on the old quarry area to the west the landfill is confined between the quarry walls to the north and south.

The source of leachate generation is groundwater through put from the north and very limited infiltration of rainfall through the cap.

Leachate concentrations are low and appear to be declining since the capping was completed in 2004.

The receptors at risk from the leachate are the shallow groundwater beneath and down hydraulic gradient of the landfill and surface water courses into which the groundwater discharges to the west and east of the site.

Groundwater quality is slightly impacted by the presence of a very weak leachate in the immediate vicinity of the site. However the impact reducing with distance away from the landfill most likely as a result of dilution affects.

It is unlikely that the wells at the farm dwellings to the south (SPJ-1) and southeast (SPM-2) are impacted by leachate migration based on the hydraulic gradient from these wells toward the landfill.

Monitoring results for 2023 indicate that the landfill is not impacting on surface water quality downstream of the landfill.

The Updated Tier 3 Risk Assessment indicates that the landfill site does not present a significant environmental risk to off-site receptors.

The 2023 monitoring programme indicates a continued general improvement in surface and groundwater quality.

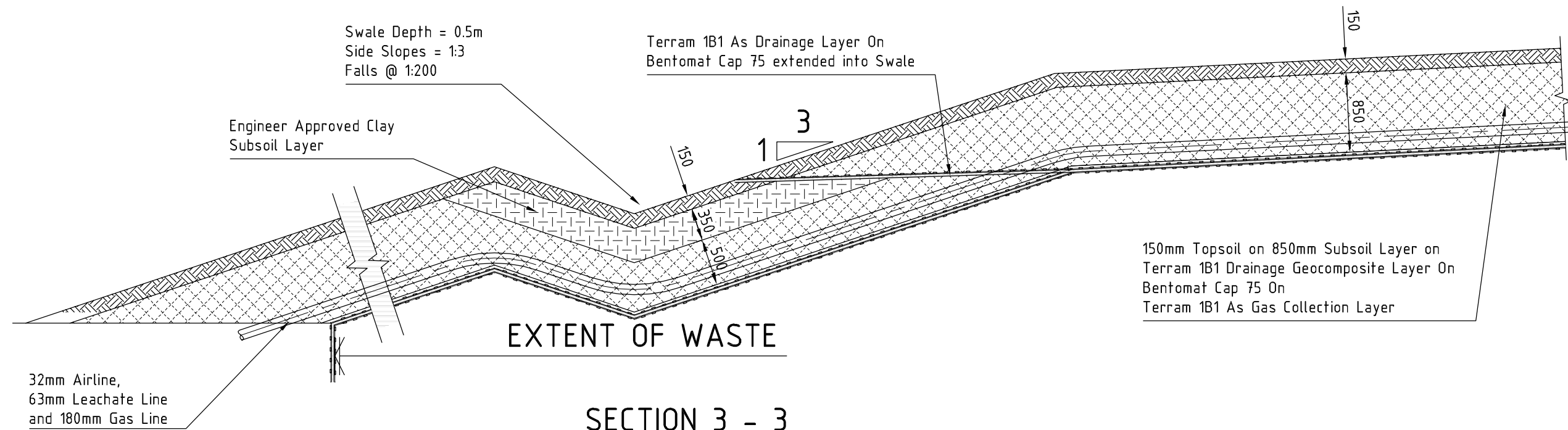
8.2 Recommendations

The surface and groundwater monitoring programme should continue to be used to confirm that the landfill is not impacting on surface water quality and to determine if the impacts on groundwater are reducing over time as leachate generation reduces.

Monitoring wells MW-2 and MW-3 should be used in the future as compliance monitoring wells. Compliance monitoring should be undertaken for pCOCs Electrical Conductivity, Ammonia, Chloride, and Manganese as outlined on Table 7.1.

The private wells SPJ-1 and SPM-2 should be assessed to establish the source of contamination in these wells. It is likely that improved well head protection and or well construction measures are required at both locations to improve groundwater quality. The wells should not be used for potable supply without treatment to remove bacterial contamination.

Appendix 1



EXTENT OF WASTE

SECTION 3 - 3

Scale 1:25

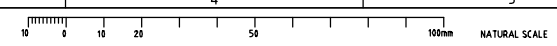
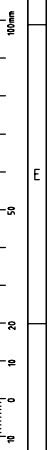
32mm Airline,
63mm Leachate Line
and 180mm Gas Line

Swale Depth = 0.5m
Side Slopes = 1:3
Falls @ 1:200

Terram 1B1 As Drainage Layer On
Bentomat Cap 75 extended into Swale

150mm Topsoil on 850mm Subsoil Layer on
Terram 1B1 Drainage Geocomposite Layer On
Bentomat Cap 75 On
Terram 1B1 As Gas Collection Layer

NATURAL SCALE



Rev.	Drawn	Checked	Approved	Date	Description
B	CH	KL	PK	11.06.04	ISSUE FOR TENDER
A	SK	KL	PK	03.06.04	ISSUE FOR APPROVAL

Name of Client
CORK COUNTY COUNCIL

Name of Job
BENDUFF LANDFILL SITE

Title of Drawing
DETAIL SECTION THROUGH
LANDFILL AT FLARE COMPOUND

Scales Used
A3-1:50

Dwg. No.
2002-004-07-009

Rev.
B

**FEHILY
TIMONEY
& COMPANY**

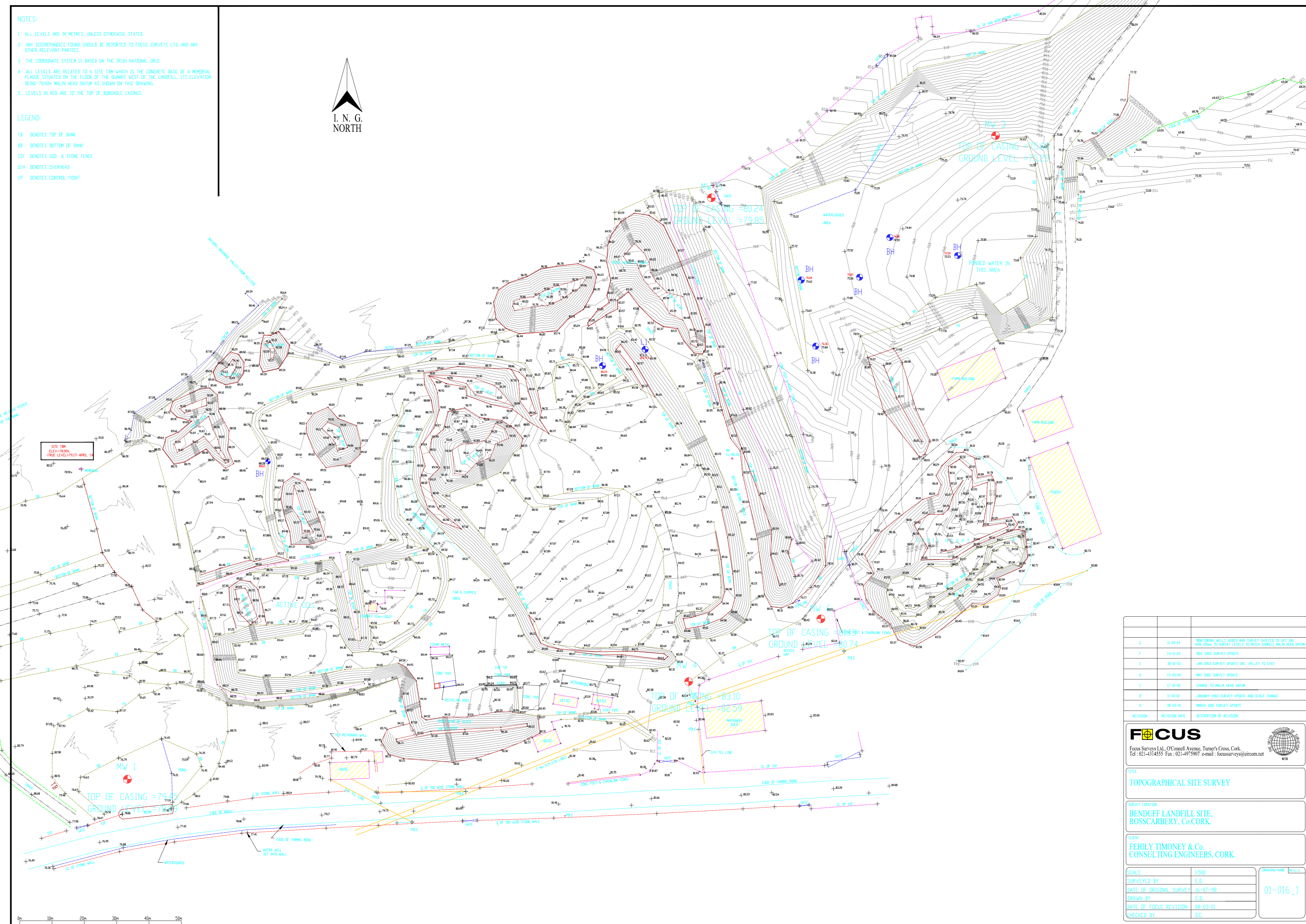
CONSULTANTS IN
ENGINEERING &
ENVIRONMENTAL
SCIENCES

CORE HOUSE, POULADUFF Rd, CORK, IRELAND.
Phone: +353-21-4964133. Fax: +353-21-4994464. Email: htk@ftco.ie
WEB SITE: www.fehilytimoney.com

MV 7
COVER LEVEL / GROUND LEVEL +57.30

MV 2
TOP OF CASING +76.49
GROUND LEVEL +76.49

- NOTES:**
1. ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.
 2. ANY DISCREPANCIES FOUND SHOULD BE REFERRED TO THE SURVEYOR'S LISTS AND NOT THIS DRAWING.
 3. THE COORDINATE SYSTEM IS BASED ON THE IRISH NATIONAL GRID.
 4. ALL LEVELS ARE REFERRED TO THE POINT OF THE CONCRETE FACE OF A MONUMENT PLACED ON THE FLOOR OF THE QUARRY OFFICE OF THE LANDFILL. THE ELEVATION BEING 76.49 METERS ABOVE SEAP TO THE MONUMENT.
 5. LEVELS IN RED ARE TO THE TOP OF BOREHOLE CASINGS.
- LEGEND:**
- BS BENCHMARK
 - BM BENCHMARK
 - CP CONTROL POINT



NO.	DATE	DESCRIPTION
1	10/10/2010	TOPOGRAPHICAL SURVEY OF LANDFILL SITE
2	10/10/2010	REVISION TO DRAWING NO. 01-016_1
3	10/10/2010	REVISION TO DRAWING NO. 01-016_1
4	10/10/2010	REVISION TO DRAWING NO. 01-016_1
5	10/10/2010	REVISION TO DRAWING NO. 01-016_1
6	10/10/2010	REVISION TO DRAWING NO. 01-016_1
7	10/10/2010	REVISION TO DRAWING NO. 01-016_1
8	10/10/2010	REVISION TO DRAWING NO. 01-016_1
9	10/10/2010	REVISION TO DRAWING NO. 01-016_1
10	10/10/2010	REVISION TO DRAWING NO. 01-016_1

FICUS
FICUS SERVICES LTD, 100 Canal Street, Temple Bar, Dublin 2, Ireland
Tel: 01 454 4444 Fax: 01 454 4444 Email: fikus@fikus.ie

TOPOGRAPHICAL SITE SURVEY

CLIENT:
BENEFIT LANDFILL SITE,
RONSABBERRY, CO. CORK.

DATE:
10/10/2010

SCALE:
1:100

DRAWN BY:
D.J.

CHECKED BY:
D.J.

DATE OF ISSUE:
10/10/2010

DATE OF NEXT REVIEW:
10/10/2011

ISSUE NO.:
01-016_1

SPM2
(INSIDE HOUSING)
COVER LEVEL / GROUND LEVEL +90.60

SPM1
LEVEL ON CDIC ADJACENT MONITORING POINT = 87.39

Appendix 2



Test Report

Lab Report Number: 19193S001

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW1	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.6	pH units
Conductivity	SOP 2076	489	µS/cm 20°C
Depth*	Site	2.21	per 1000 gallons
Dissolved Oxygen*	Site	2.47	mg/l O ₂
Temperature Lab*	In -house Method	11.8	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	LIGHT BROW	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	18.80	mg/l
Potassium	SOP 2125	5.38	mg/l
Chloride	SOP 2131	33.2	mg/l
TOC*	In -house Method	0.9	mg/l
Ammonia	SOP 2130	0.02	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

IAS LABORATORIES

Lab Report Number: 19193S001

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW1	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

* = not INAB Accredited ^ = Subcontracted

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 Opinions and interpretations expressed herein are outside the scope of INAB accreditation.
 Uncertainty of Measurement is not taken into account for any test results reported.





Test Report

Lab Report Number: 19193S002

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW2	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	7.7	pH units
Conductivity	SOP 2076	401	µS/cm 20°C
Depth*	Site	18.21	per 1000 gallons
Dissolved Oxygen*	Site	5.24	mg/l O ₂
Temperature Lab*	In -house Method	11.2	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	LIGHT BROW	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	23.76	mg/l
Potassium	SOP 2125	1.45	mg/l
Chloride	SOP 2131	40.0	mg/l
TOC*	In -house Method	3.2	mg/l
Ammonia	SOP 2130	0.01	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

IAS LABORATORIES

Lab Report Number: 19193S002

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW2	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

Lab Report Number: 19193S003

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW3	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.2	pH units
Conductivity	SOP 2076	154	µS/cm 20°C
Depth*	Site	0.71	per 1000 gallons
Dissolved Oxygen*	Site	2.09	mg/l O ₂
Temperature Lab*	In -house Method	11.1	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	CLEAR	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	16.18	mg/l
Potassium	SOP 2125	1.35	mg/l
Chloride	SOP 2131	23.2	mg/l
TOC*	In -house Method	2.0	mg/l
Ammonia	SOP 2130	<0.01	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

IAS LABORATORIES

Lab Report Number: 19193S003

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW3	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

* = not INAB Accredited ^ = Subcontracted

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Test Report

Lab Report Number: 19193S004

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW4	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.2	pH units
Conductivity	SOP 2076	74	µS/cm 20°C
Depth*	Site	1.71	per 1000 gallons
Dissolved Oxygen*	Site	9.89	mg/l O ₂
Temperature Lab*	In -house Method	11.1	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	CLEAR	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	8.47	mg/l
Potassium	SOP 2125	0.51	mg/l
Chloride	SOP 2131	8.2	mg/l
TOC*	In -house Method	1.0	mg/l
Ammonia	SOP 2130	<0.01	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

Lab Report Number: 19193S004

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW4	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

IAS LABORATORIES

Lab Report Number: 19193S005

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW5	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.7	pH units
Conductivity	SOP 2076	215	µS/cm 20°C
Depth*	Site	0.00	per 1000 gallons
Dissolved Oxygen*	Site	2.46	mg/l O ₂
Temperature Lab*	In -house Method	11.7	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	CLEAR	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	16.49	mg/l
Potassium	SOP 2125	1.01	mg/l
Chloride	SOP 2131	22.8	mg/l
TOC*	In -house Method	1.9	mg/l
Ammonia	SOP 2130	0.05	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<2.00	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

Lab Report Number: 19193S005

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW5	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

Lab Report Number: 19193S006

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW6	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	7.3	pH units
Conductivity	SOP 2076	335	µS/cm 20°C
Depth*	Site	1.12	per 1000 gallons
Dissolved Oxygen*	Site	5.48	mg/l O ₂
Temperature Lab*	In -house Method	11.4	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	BLACK	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	16.39	mg/l
Potassium	SOP 2125	1.71	mg/l
Chloride	SOP 2131	30.5	mg/l
TOC*	In -house Method	<0.3	mg/l
Ammonia	SOP 2130	3.11	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

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Test Report

IAS LABORATORIES

Lab Report Number: 19193S006

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW6	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

Lab Report Number: 19193S007

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW7	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity	SOP 2076	283	µS/cm 20°C
Depth*	Site	0.24	per 1000 gallons
Dissolved Oxygen*	Site	1.26	mg/l O ₂
Temperature Lab*	In -house Method	11.3	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	LIGHT BROW	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	16.58	mg/l
Potassium	SOP 2125	1.14	mg/l
Chloride	SOP 2131	28.5	mg/l
TOC*	In -house Method	9.5	mg/l
Ammonia	SOP 2130	0.02	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<2.00	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

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Test Report

IAS LABORATORIES

Lab Report Number: 19193S007

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	MW7	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

Lab Report Number: 19193S008

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	SPJ1	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.1	pH units
Conductivity	SOP 2076	208	µS/cm 20°C
Depth*	Site	N/A	per 1000 gallons
Dissolved Oxygen*	Site	6.26	mg/l O ₂
Temperature Lab*	In -house Method	11.3	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	CLEAR	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	13.79	mg/l
Potassium	SOP 2125	1.53	mg/l
Chloride	SOP 2131	20.2	mg/l
TOC*	In -house Method	<0.3	mg/l
Ammonia	SOP 2130	<0.01	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

IAS LABORATORIES

Lab Report Number: 19193S008

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	SPJ1	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Test Report

Lab Report Number: 19193S009

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	SPM2	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
pH	SOP 2004	6.8	pH units
Conductivity	SOP 2076	236	µS/cm 20°C
Depth*	Site	2.20	per 1000 gallons
Dissolved Oxygen*	Site	7.63	mg/l O ₂
Temperature Lab*	In -house Method	10.9	Degree Celsius
Odour*	Site	NONE	-
Visual*	Site	CLEAR	-
Total Oxidised Nitrogen	SOP 2137	<1.0	mg/l N
Sodium	SOP 2125	14.19	mg/l
Potassium	SOP 2125	10.48	mg/l
Chloride	SOP 2131	15.2	mg/l
TOC*	In -house Method	0.8	mg/l
Ammonia	SOP 2130	0.01	mg/l NH ₃
2,4,3,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,3,5,6 TETRACHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2,4 DINITROPHENOL*^	Subcontracted	<100	µg/l
2,4,5-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4,6-Trichlorophenol*^	Subcontracted	<2.00	µg/l
2,4-Dichlorophenol*^	Subcontracted	<2.00	µg/l
2,6 DICHLOROPHENOL*^	Subcontracted	<2.00	µg/l
2-Chlorophenol*^	Subcontracted	<2.00	µg/l
3,5 DIMETHYLPHENOL*^	Subcontracted	<2.00	µg/l
4,6 DINITRO-2-METHYLPHENOL*^	Subcontracted	<40.0	µg/l
4-Nitrophenol*^	Subcontracted	<100	µg/l
4 CHLOROPHENOL*^	Subcontracted	<2.00	µg/l
Pentachlorophenol*^	Subcontracted	<20.0	µg/l

* = not INAB Accredited ^ = Subcontracted





Test Report

IAS LABORATORIES

Lab Report Number: 19193S009

Customer ID:	CORK.C2	Analysis Type:	CORK BENDUFF QTRLY GW (CK)
Contact Name:	MAIREAD HALES	Delivery By:	IAS COLLECTION CHARGABLE
Company Name:	CORK CO.CO- ZONE 1	Sample Card Number:	2903CK6
Address:	HUME HOUSE WOLF TONE STREET CLONAKILTY CO.CORK	Condition on Receipt:	Acceptable
Sample Type:	GROUND WATER	Date Sample Received:	29/03/2023
Sample Reference:	BENDUFF QUARTERLY GW	Date Analysis Commenced:	29/03/2023
Sample Description:	SPM2	Date Certificate Issued:	21/02/2024

Parameter	Method	Result	Unit
4-Chloro-3-methylphenol*^	Subcontracted	<2.00	µg/l
2,4-Dimethylphenol*^	Subcontracted	<2.00	µg/l
2-methylphenol*^	Subcontracted	<2.00	µg/l
3&4-Methylphenol*^	Subcontracted	<2.00	µg/l
2-Nitrophenol*^	Subcontracted	<2.00	µg/l
Phenol*^	Subcontracted	<10.0	µg/l

Signed: Laura Kavanagh
Laura Kavanagh - Laboratory Manager

Date: 21/02/2024

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Client: Cork Co Council
Hume House
Wolfe Tone Street
Clonakilty
Co. Cork
Cork
P85 PX88
IRELAND

Certificate Code: AR-23-M3-024845-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024845-01 dated 13/07/2023

Sample number	966-2023-00029800	Received on	29/06/2023
Your sample reference	MW1	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	15:15	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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14/07/2023

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- 7A. This result is compromised as it was tested outside of stability times.
- 7C. Sample not received in appropriate containers, therefore results may be compromised.
- 7D. This result is comprised as the sample was received by the laboratory outside of the holding time.
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Certificate Code: AR-23-M3-024845-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	28.4	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	1.339	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	0.21	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	3.7	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		13.1	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:18	Site Test		n/a	m	
Water Level		06/07/23 19:18	Site Test		2.9	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Cloudy		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	6.17	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	18.642	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024845-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.8		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	514.8	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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Certificate Code: AR-23-M3-024844-02

Page Number: Page 1 of 3

PO reference:


Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024844-01 dated 13/07/2023

Sample number	966-2023-00029799	Received on	29/06/2023
Your sample reference	MW2	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	15:00	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024844-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	47.1	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	0.09	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		12.7	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:17	Site Test		n/a	m	
Water Level		06/07/23 19:17	Site Test		10.6	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Cloudy		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	1.411	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	28.014	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024844-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		7.8		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	547.6	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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Certificate Code: AR-23-M3-024849-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024849-01 dated 13/07/2023

Sample number	966-2023-00029804	Received on	29/06/2023
Your sample reference	MW3	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	17:10	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:50		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:50		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:50		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:50		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:50		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:50		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:50		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:50		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:50		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:50		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:50		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024849-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:50		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:50		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	23.3	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	1.71	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		10.9	°C	
GW Levels (Site) [M3037]							
Borehole Depth		05/07/23 16:14	Site Test		n/a	m	
Water Level		05/07/23 16:14	Site Test		2.8	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	1.486	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	15.902	mg/l	C6
pH [M3282]							

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Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.4		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	148.5	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-024846-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024846-01 dated 13/07/2023

Sample number	966-2023-00029801	Received on	29/06/2023
Your sample reference	MW4	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	16:00	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024846-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	11.3	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	1.03	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 12:04	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		15.1	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:14	Site Test		n/a	m	
Water Level		06/07/23 19:14	Site Test		28.6	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	0.459	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	7.379	mg/l	C6
pH [M3282]							

Signed: _____



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Certificate Code: AR-23-M3-024846-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.3		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	<100	µS/cm	

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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Certificate Code: AR-23-M3-024848-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024848-01 dated 13/07/2023

Sample number	966-2023-00029803	Received on	29/06/2023
Your sample reference	MW5	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	16:40	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

Signed: _____

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Certificate Code: AR-23-M3-024848-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	28.3	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	1.949	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	1.81	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		10.8	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:13	Site Test		n/a	m	
Water Level		06/07/23 19:13	Site Test		2.8	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	0.787	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	18.456	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024848-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.3		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	163.2	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-024847-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024847-01 dated 13/07/2023

Sample number	966-2023-00029802	Received on	29/06/2023
Your sample reference	MW6	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	16:15	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024847-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 18:52	EW175	5	32.0	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 18:52	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 18:52	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		12.8	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:13	Site Test		n/a	m	
Water Level		06/07/23 19:13	Site Test		2.7	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	0.736	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	18.044	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024847-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		7.6		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	339.3	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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Certificate Code: AR-23-M3-024843-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024843-01 dated 13/07/2023

Sample number	966-2023-00029798	Received on	29/06/2023
Your sample reference	MW7	Analysis started on	29/06/2023
Sample Matrix	Ground water	Sample Date	29/06/2023
Sample Condition on Arrival	Satisfactory	Site	Benduff
Time Sampled	14:40		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024843-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	25.1	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	0.14	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	3.59	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		12.3	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:17	Site Test		n/a	m	
Water Level		06/07/23 19:17	Site Test		8.5	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Cloudy		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	1.863	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	14.197	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024843-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		7.1		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	218.3	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-024842-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024842-01 dated 13/07/2023

Sample number	966-2023-00029797	Received on	29/06/2023
Your sample reference	SPJ1	Analysis started on	29/06/2023
Sample Matrix	Ground water	Sample Date	29/06/2023
Sample Condition on Arrival	Satisfactory	Site	Benduff
Time Sampled	14:30		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024842-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 16:37	EW175	5	27.3	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 16:37	EW175	1	1.834	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 16:37	EW175	0.05	0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		12.8	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:16	Site Test		n/a	m	
Water Level		06/07/23 19:16	Site Test		n/a	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		03/07/23 10:39	EW188	0.15	0.722	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		03/07/23 10:39	EW188	1.5	14.703	mg/l	C6
pH [M3282]							

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Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.2		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	192.1	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-024841-02

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

This Certificate Of Analysis supersedes Certificate AR-23-M3-024841-01 dated 13/07/2023

Sample number	966-2023-00029796	Received on	29/06/2023
Your sample reference	SPM2	Analysis started on	29/06/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	29/06/2023
Time Sampled	14:15	Site	Benduff

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
Cresols (sum)	*	30/06/23 09:38		0.8		<0.8	µg/l	
m-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
m-Ethylphenol	*	30/06/23 09:38		0.02		<0.02	µg/l	
o-Cresol	*	30/06/23 09:38		0.3		<0.3	µg/l	
o-Ethylphenol	*	30/06/23 09:38		0.03		<0.03	µg/l	
p-Cresol	*	30/06/23 09:38		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-024841-02

Page Number: Page 2 of 3

PO reference:

Phenol	*	30/06/23 09:38		0.2	<0.2	µg/l	
Thymol	*	30/06/23 09:38		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		30/06/23 18:52	EW175	5	25.5	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		30/06/23 18:52	EW175	1	9.125	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		30/06/23 18:52	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/06/23 20:08	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		30/06/23 11:58	EW123	1	1.12	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/06/23 20:08	Site Test		12.5	°C	
GW Levels (Site) [M3037]							
Borehole Depth		06/07/23 19:15	Site Test		n/a	m	
Water Level		06/07/23 19:15	Site Test		n/a	m	
Visual Inspection (Site) [M3100]							
Visual inspection		29/06/23 20:08	Site Test		Clear		
Potassium - Dissolved [M3180]							
Potassium (K)		04/07/23 10:14	EW188	0.15	12.675	mg/l	C6
Sodium - Dissolved [M3184]							
Sodium (Na)		04/07/23 10:14	EW188	1.5	14.955	mg/l	C6
pH [M3282]							

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Certificate Code: AR-23-M3-024841-02

Page Number: Page 3 of 3

PO reference:

pH	30/06/23 09:38	EW158		6.8		C6
Conductivity [M3283]						
Conductivity	30/06/23 09:38	EW153	100	244.2	µS/cm	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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Certificate Code: AR-23-M3-033340-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042247	Received on	02/10/2023
Your sample reference	MW1 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	12:15	Site	-

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Certificate Code: AR-23-M3-033340-01

Page Number: Page 2 of 3

PO reference:

Thymol	*	03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		03/10/23 17:43	EW175	5	26.7	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		03/10/23 17:43	EW175	0.05	0.27	mg/l	C6
Odour [M3015]							
Odour (qualitative)		02/10/23 16:52	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		04/10/23 16:55	EW123	1	1.84	mg/l	C6
Temperature (Site) [M3036]							
Temperature		02/10/23 16:52	Site Test		14.1	°C	
GW Levels (Site) [M3037]							
Water Level		16/10/23 11:57	Site Test		2.9	m	
pH (Robotic Method) [M3051]							
pH		03/10/23 08:17	EW152R	4	6.3		C6
Conductivity at 20°C (Robotic Method) [M3052]							
Conductivity at 20°C		03/10/23 08:17	EW152R	5	490	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]							
Dissolved oxygen		18/10/23 10:37	Site Test		4.9	mg/l	
Visual Inspection (Site) [M3100]							
Visual inspection		02/10/23 16:52	Site Test		clear		
Potassium - Dissolved [M3180]							

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	5.558	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	19.241	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-033341-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042248	Received on	02/10/2023
Your sample reference	MW2 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	13:30		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	46.7	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	0.05	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	1.31	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		11.5	°C	
GW Levels (Site) [M3037]						
Water Level	16/10/23 12:00	Site Test		10.8	m	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	7.0		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	550	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	18/10/23 12:02	Site Test		4.5	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	1.646	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	28.851	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-033342-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042249	Received on	02/10/2023
Your sample reference	MW3 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	13:00		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	22.9	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	1.66	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14.3	°C	
GW Levels (Site) [M3037]						
Water Level	16/10/23 12:04	Site Test		2.5	m	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	5.6		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	160	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	18/10/23 12:02	Site Test		3.2	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	1.583	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	16.527	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-033343-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042250	Received on	02/10/2023
Your sample reference	MW4 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	12:30		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	*	03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		03/10/23 17:43	EW175	5	5.22	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		03/10/23 17:43	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		04/10/23 16:55	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		02/10/23 17:20	Site Test		14.2	°C	
GW Levels (Site) [M3037]							
Water Level		16/10/23 12:06	Site Test		29.1	m	
pH (Robotic Method) [M3051]							
pH		03/10/23 08:17	EW152R	4	5.2		C6
Conductivity at 20°C (Robotic Method) [M3052]							
Conductivity at 20°C		03/10/23 08:17	EW152R	5	41	µS/cm	
Dissolved Oxygen (Site Test) [M3054]							
Dissolved oxygen		18/10/23 12:03	Site Test		4.6	mg/l	
Visual Inspection (Site) [M3100]							
Visual inspection		02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]							

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	0.346	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	4.874	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-033344-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042251	Received on	02/10/2023
Your sample reference	MW5 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	13:55		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	29.6	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	0.29	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	1.93	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14.8	°C	
GW Levels (Site) [M3037]						
Water Level	16/10/23 12:09	Site Test		3.1	m	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	6.2		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	210	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	18/10/23 12:03	Site Test		4.6	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	0.862	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	18.936	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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Certificate Code: AR-23-M3-033345-01

Page Number: Page 1 of 3

PO reference:

Certificate of Analysis

Sample number	966-2023-00042252	Received on	02/10/2023
Your sample reference	MW6 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	12:25		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	28.4	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14.2	°C	
GW Levels (Site) [M3037]						
Water Level	16/10/23 12:10	Site Test		2.7	m	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	6.7		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	280	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	18/10/23 12:06	Site Test		4.7	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						

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Page Number: Page 3 of 3

PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	0.707	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	16.444	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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PO reference:

Certificate of Analysis

Sample number	966-2023-00042253	Received on	02/10/2023
Your sample reference	MW7 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	11:50		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	9.52	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	<1	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	0.69	mg/l	
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	12.61	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14	°C	
GW Levels (Site) [M3037]						
Water Level	16/10/23 12:11	Site Test		8.9	m	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	6.0		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	120	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	18/10/23 12:06	Site Test		4.6	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, Some odour		
Potassium - Dissolved [M3180]						

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PO reference:

Potassium (K)	03/10/23 13:44	EW188	0.15	7.066	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	6.166	mg/l	C6

⁴ Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T

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PO reference:

Certificate of Analysis

Sample number	966-2023-00042254	Received on	02/10/2023
Your sample reference	SPJ1 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	11:45		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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Page Number: Page 2 of 3

PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	21.5	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	3.70	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	1.38	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14.5	°C	
pH (Robotic Method) [M3051]						
pH	02/10/23 21:04	EW152R	4	5.2		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	02/10/23 21:04	EW152R	5	200	µS/cm	C6
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						
Potassium (K)	03/10/23 13:44	EW188	0.15	1.687	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	15.542	mg/l	C6

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PO reference:

Certificate of Analysis

Sample number	966-2023-00042255	Received on	02/10/2023
Your sample reference	SPM2 Benduff Landfill	Analysis started on	02/10/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	02/10/2023
Time Sampled	11:40		

Test Code Analyte	SUB ⁵	Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Phenols (10) and Cresols (3) [F6536]								
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,5-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
2,6-Dimethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
3,4-Dimethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
Cresols (sum)	*	03/10/23 14:45		0.8		<0.8	µg/l	
m-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
m-Ethylphenol	*	03/10/23 14:45		0.02		<0.02	µg/l	
o-Cresol	*	03/10/23 14:45		0.3		<0.3	µg/l	
o-Ethylphenol	*	03/10/23 14:45		0.03		<0.03	µg/l	
p-Cresol	*	03/10/23 14:45		0.2		<0.2	µg/l	
Phenol	*	03/10/23 14:45		0.2		<0.2	µg/l	

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PO reference:

Thymol	* 03/10/23 14:45		0.01	<0.01	µg/l	
Chloride mg/L - Gallery [M300S]						
Chloride mg/L - Gallery	03/10/23 17:43	EW175	5	20.9	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]						
Total Oxidised Nitrogen (TON) as N - Gallery	03/10/23 17:43	EW175	1	5.77	mg/l	C6
Ammonia as N - Gallery [M300Z]						
Ammonia as N - Gallery	03/10/23 17:43	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]						
Odour (qualitative)	02/10/23 17:17	Site Test		None		
Total Organic Carbon (TOC) [M3022]						
TOC (total organic carbon)	04/10/23 16:55	EW123	1	2.48	mg/l	C6
Temperature (Site) [M3036]						
Temperature	02/10/23 17:20	Site Test		14.1	°C	
pH (Robotic Method) [M3051]						
pH	03/10/23 08:17	EW152R	4	5.8		C6
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	03/10/23 08:17	EW152R	5	210	µS/cm	C6
Visual Inspection (Site) [M3100]						
Visual inspection	02/10/23 17:21	Site Test		Clear, No odour		
Potassium - Dissolved [M3180]						
Potassium (K)	03/10/23 13:44	EW188	0.15	11.568	mg/l	C6
Sodium - Dissolved [M3184]						
Sodium (Na)	03/10/23 13:44	EW188	1.5	14.939	mg/l	C6

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PO reference:

Certificate of Analysis

Sample number	966-2023-00051126	Received on	15/12/2023
Your sample reference	MW1 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3,3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	3.0	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	0.06	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	0.08	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 14:47	EW175	1	95.7	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 14:47 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 14:47	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 14:47	EW175	5	26.7	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 14:47 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 14:47	EW175	0.05	0.45	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		None		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	510.3243	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	1.53	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		10.2	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		10.2	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	0.02	mg/l	C6
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	6.1		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	450	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.5	mg/l	
Alkalinity as CaCO₃ [M30D3]						
Alkalinity as CaCO ₃	21/12/23 14:48	EW175	30	120	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	57.993	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	<0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	<5	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	14.663	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		1051.316	µg/l	
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	5.344	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	19.933	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	1.84	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051127	Received on	15/12/2023
Your sample reference	MW2 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 21/12/23 15:14		0.1		<0.1	µg/l	
Atrazine	* 21/12/23 15:14		0.08		<0.08	µg/l	
Cyanazine	* 21/12/23 15:14		0.1		<0.1	µg/l	
Desmetryn	* 21/12/23 15:14		0.1		<0.1	µg/l	
Prometryn	* 21/12/23 15:14		0.1		<0.1	µg/l	
Propazine	* 21/12/23 15:14		0.08		<0.08	µg/l	
Simazine	* 21/12/23 15:14		0.2		<0.2	µg/l	
Terbuthylazine	* 21/12/23 15:14		0.06		<0.06	µg/l	
Terbutryn	* 21/12/23 15:14		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 21/12/23 15:14		0.06		<0.06	µg/l	
PCB (7) Sum)	* 21/12/23 15:14		0.07		<0.07	µg/l	
PCB 101	* 21/12/23 15:14		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	21/12/23 15:14	0.01	<0.01	µg/l
PCB 138	*	21/12/23 15:14	0.01	<0.01	µg/l
PCB 153	*	21/12/23 15:14	0.01	<0.01	µg/l
PCB 180	*	21/12/23 15:14	0.01	<0.01	µg/l
PCB 28	*	21/12/23 15:14	0.01	<0.01	µg/l
PCB 52	*	21/12/23 15:14	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	21/12/23 15:14	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	21/12/23 15:14	0.02	<0.02	µg/l
4,4 -DDT	*	21/12/23 15:14	0.2	<0.2	µg/l
4,4-DDE	*	21/12/23 15:14	0.01	<0.01	µg/l
Aldrin	*	21/12/23 15:14	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	21/12/23 15:14	0.03	<0.03	µg/l
Chlordane (total)	*	21/12/23 15:14	0.02	<0.02	µg/l
Chlordane, cis-	*	21/12/23 15:14	0.01	<0.01	µg/l
Chlordane, trans-	*	21/12/23 15:14	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	21/12/23 15:14	0.25	<0.25	µg/l
DDD, o,p-	*	21/12/23 15:14	0.01	<0.01	µg/l
Dieldrin	*	21/12/23 15:14	0.02	<0.02	µg/l
Endosulfan, alpha-	*	21/12/23 15:14	0.05	<0.05	µg/l
Endrin	*	21/12/23 15:14	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	21/12/23 15:14	0.1	<0.1	µg/l
HCH, alpha-	*	21/12/23 15:14	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	21/12/23 15:14	0.07	<0.07	µg/l
HCH, delta-	*	21/12/23 15:14	0.04	<0.04	µg/l
Heptachlor	*	21/12/23 15:14	0.01	<0.01	µg/l
Heptachlor epoxide	*	21/12/23 15:14	0.03	<0.03	µg/l
Hexachlorobutadiene	*	21/12/23 15:14	0.1	<0.1	µg/l
Isodrin	*	21/12/23 15:14	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	21/12/23 15:14	0.29	<0.29	µg/l
Sum Drins	*	21/12/23 15:14	0.06	<0.06	µg/l
Tedion	*	21/12/23 15:14	0.07	<0.07	µg/l
Telodrin	*	21/12/23 15:14	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3,3,5-Dimethylphenol + 4-Ethylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	21/12/23 15:14	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
Cresols (sum)	*	21/12/23 15:14	0.8	<0.8	µg/l
m-Cresol	*	21/12/23 15:14	0.3	<0.3	µg/l
m-Ethylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
o-Cresol	*	21/12/23 15:14	0.3	<0.3	µg/l
o-Ethylphenol	*	21/12/23 15:14	0.03	<0.03	µg/l
p-Cresol	*	21/12/23 15:14	0.2	<0.2	µg/l
Phenol	*	21/12/23 15:14	0.2	<0.2	µg/l

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Cork
P85 PX88
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PO reference:

Thymol	* 21/12/23 15:14	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 21/12/23 15:14	0.1	<0.1	µg/l
Azinphos-methyl	* 21/12/23 15:14	0.07	<0.07	µg/l
Bromophos-ethyl	* 21/12/23 15:14	0.07	<0.07	µg/l
Bromophos-methyl	* 21/12/23 15:14	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 21/12/23 15:14	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 21/12/23 15:14	0.1	<0.1	µg/l
Coumaphos	* 21/12/23 15:14	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 21/12/23 15:14	0.1	<0.1	µg/l
Diazinon	* 21/12/23 15:14	0.04	<0.04	µg/l
Dichlorvos	* 21/12/23 15:14	0.1	<0.1	µg/l
Disulfoton	* 21/12/23 15:14	0.04	<0.04	µg/l
Fenitrothion	* 21/12/23 15:14	0.1	<0.1	µg/l
Fenthion	* 21/12/23 15:14	0.1	<0.1	µg/l
Malathion	* 21/12/23 15:14	0.1	<0.1	µg/l
Parathion	* 21/12/23 15:14	0.2	<0.2	µg/l
Parathion-methyl	* 21/12/23 15:14	0.2	<0.2	µg/l
Pyrazophos	* 21/12/23 15:14	0.2	<0.2	µg/l
Triazophos	* 21/12/23 15:14	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 21/12/23 15:14	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 21/12/23 15:14	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	21/12/23 15:14	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	21/12/23 15:14	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	21/12/23 15:14	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	21/12/23 15:14	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	21/12/23 15:14	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	21/12/23 15:14	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	21/12/23 15:14	0.11	<0.11	µg/l
m-Chlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	21/12/23 15:14	0.14	<0.14	µg/l
o-Chlorophenol	*	21/12/23 15:14	0.1	<0.1	µg/l
p-Chlorophenol	*	21/12/23 15:14	0.02	<0.02	µg/l
Pentachlorophenol	*	21/12/23 15:14	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	21/12/23 15:14	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	21/12/23 15:14	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	21/12/23 15:14	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	21/12/23 15:14	0.1	<0.1	µg/l
Acenaphthylene	*	21/12/23 15:14	0.04	<0.04	µg/l
Anthracene	*	21/12/23 15:14	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	21/12/23 15:14	0.04	<0.04	µg/l
Benzo(a)pyrene	*	21/12/23 15:14	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	21/12/23 15:14	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	21/12/23 15:14	0.03	<0.03	µg/l
Chrysene	*	21/12/23 15:14	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	21/12/23 15:14	0.04	<0.04	µg/l
Fluoranthene	*	21/12/23 15:14	0.02	<0.02	µg/l
Fluorene	*	21/12/23 15:14	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	21/12/23 15:14	0.04	<0.04	µg/l
Naphthalene	*	21/12/23 15:14	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	21/12/23 15:14	0.91	<0.91	µg/l
Phenanthrene	*	21/12/23 15:14	0.02	<0.02	µg/l
Pyrene	*	21/12/23 15:14	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	21/12/23 15:14	0.01	<0.01	µg/l
Dibenzofurane	*	21/12/23 15:14	0.1	<0.1	µg/l
Diphenyl ether	*	21/12/23 15:14	0.04	<0.04	µg/l
Nitrobenzene	*	21/12/23 15:14	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	21/12/23 15:14	0.08	<0.08	µg/l
Carbaryl	*	21/12/23 15:14	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	21/12/23 15:14	0.2	<0.2	µg/l
Deltamethrin	*	21/12/23 15:14	0.2	<0.2	µg/l

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PO reference:

Linuron	*	21/12/23 15:14	0.1	<0.1	µg/l
Permethrin A	*	21/12/23 15:14	0.06	<0.06	µg/l
Permethrin B	*	21/12/23 15:14	0.06	<0.06	µg/l
Permethrins (sum)	*	21/12/23 15:14	0.12	<0.12	µg/l
Propachlor	*	21/12/23 15:14	0.02	<0.02	µg/l
Trifluralin	*	21/12/23 15:14	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	21/12/23 15:14	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	21/12/23 15:14	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	21/12/23 15:14	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	21/12/23 15:14	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	21/12/23 15:14	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	21/12/23 15:14	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	21/12/23 15:14	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	21/12/23 15:14	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	21/12/23 15:14	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	21/12/23 15:14	0.03	<0.03	µg/l
Pentachlorobenzene	*	21/12/23 15:14	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	21/12/23 15:14	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	21/12/23 15:14	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	21/12/23 15:14	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	21/12/23 15:14	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	21/12/23 15:14	0.2	<0.2	µg/l
1,1-Dichloroethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,1-Dichloroethene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,1-Dichloropropene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	21/12/23 15:14	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2-Dibromoethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	21/12/23 15:14	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,2-Dichloropropane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	21/12/23 15:14	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	21/12/23 15:14	0.1	<0.1	µg/l
1,3-Dichloropropane	*	21/12/23 15:14	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	21/12/23 15:14	0.1	<0.1	µg/l
1-chloroethane	*	21/12/23 15:14	1	<1	µg/l
2,2-Dichloropropane	*	21/12/23 15:14	0.1	<0.1	µg/l
2-Chlorotoluene	*	21/12/23 15:14	0.1	<0.1	µg/l
4-Chlorotoluene	*	21/12/23 15:14	0.1	<0.1	µg/l
Benzene	*	21/12/23 15:14	0.05	<0.05	µg/l
Bromobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
Bromochloromethane	*	21/12/23 15:14	0.1	<0.1	µg/l
Bromodichloromethane	*	21/12/23 15:14	0.1	<0.1	µg/l
Chlorobenzene	*	21/12/23 15:14	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	21/12/23 15:14	0.1	<0.1	µg/l
Chloromethane	*	21/12/23 15:14	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	21/12/23 15:14	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	21/12/23 15:14	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	21/12/23 15:14	0.1	<0.1	µg/l
Dibromochloromethane	*	21/12/23 15:14	0.1	<0.1	µg/l
Dibromomethane	*	21/12/23 15:14	0.2	<0.2	µg/l

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PO reference:

Dichlorobenzenes (sum)	*	21/12/23 15:14	0.3	<0.3	µg/l
Dichloromethane	*	21/12/23 15:14	0.2	<0.2	µg/l
Ethylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
Hexachlorobutadiene	*	21/12/23 15:14	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	21/12/23 15:14	0.05	<0.05	µg/l
m-/p-Xylene	*	21/12/23 15:14	0.05	<0.05	µg/l
Methyl bromide	*	21/12/23 15:14	0.1	<0.1	µg/l
Naphthalene	*	21/12/23 15:14	0.1	<0.1	µg/l
n-Butylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
n-Propylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
o-Xylene	*	21/12/23 15:14	0.05	<0.05	µg/l
p-Isopropyltoluene	*	21/12/23 15:14	0.05	<0.05	µg/l
sec-Butylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
Styrene	*	21/12/23 15:14	0.1	<0.1	µg/l
tert-Butylbenzene	*	21/12/23 15:14	0.05	<0.05	µg/l
Tetrachloroethene	*	21/12/23 15:14	0.1	<0.1	µg/l
Tetrachloromethane	*	21/12/23 15:14	0.05	<0.05	µg/l
Toluene	*	21/12/23 15:14	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	21/12/23 15:14	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	21/12/23 15:14	0.1	<0.1	µg/l
Tribromomethane	*	21/12/23 15:14	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	21/12/23 15:14	0.3	<0.3	µg/l
Trichloroethene	*	21/12/23 15:14	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	21/12/23 15:14		0.1	<0.1	µg/l	
Vinyl chloride	*	21/12/23 15:14		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 12:44	EW175	1	41.6	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 12:44 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 12:44	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 12:44	EW175	5	45.7	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 12:44 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 12:44	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		None		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	825	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	4.7	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		12.4	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		9.5	m	

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GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	0.11	mg/l	C6
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	6.8		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	520	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.6	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 12:44	EW175	30	130	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		cloudy		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	80.961	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	<0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	<5	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	10.95	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		1.034	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	1.65	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	28	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	2.53	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051128	Received on	15/12/2023
Your sample reference	MW3 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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PO reference:

Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 12:44	EW175	1	9.03	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 12:44 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 12:44	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 12:44	EW175	5	22.0	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 12:44 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 12:44	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		None		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	270	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	1.92	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		8.5	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		6.2	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	<0.02	mg/l	
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	5.6		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	160	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.3	mg/l	
Alkalinity as CaCO₃ [M30D3]						
Alkalinity as CaCO ₃	21/12/23 12:44	EW175	30	49	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	13.337	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	<0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	209.323	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	4.143	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		1605.637	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	1.617	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	17.699	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	15.0	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051129	Received on	15/12/2023
Your sample reference	MW4 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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Certificate Code: AR-24-M3-001254-01

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 12:44	EW175	1	9.57	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 12:44 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 12:44	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 12:44	EW175	5	6.87	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 12:44 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 12:44	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		Earthy		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	30	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	1.18	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		11.6	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		27.2	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	0.02	mg/l	C6
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	5.7		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	45	µS/cm	
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		21.9	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 12:44	EW175	30	<30	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		0.102	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	5.624	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	7.421	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	2.827	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	1.445	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		13.226	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	0.663	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	5.407	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	100	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051130	Received on	15/12/2023
Your sample reference	MW5 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 21/12/23 15:46		0.1		<0.1	µg/l	
Atrazine	* 21/12/23 15:46		0.08		<0.08	µg/l	
Cyanazine	* 21/12/23 15:46		0.1		<0.1	µg/l	
Desmetryn	* 21/12/23 15:46		0.1		<0.1	µg/l	
Prometryn	* 21/12/23 15:46		0.1		<0.1	µg/l	
Propazine	* 21/12/23 15:46		0.08		<0.08	µg/l	
Simazine	* 21/12/23 15:46		0.2		<0.2	µg/l	
Terbuthylazine	* 21/12/23 15:46		0.06		<0.06	µg/l	
Terbutryn	* 21/12/23 15:46		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 21/12/23 15:46		0.06		<0.06	µg/l	
PCB (7) Sum)	* 21/12/23 15:46		0.07		<0.07	µg/l	
PCB 101	* 21/12/23 15:46		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	21/12/23 15:46	0.01	<0.01	µg/l
PCB 138	*	21/12/23 15:46	0.01	<0.01	µg/l
PCB 153	*	21/12/23 15:46	0.01	<0.01	µg/l
PCB 180	*	21/12/23 15:46	0.01	<0.01	µg/l
PCB 28	*	21/12/23 15:46	0.01	<0.01	µg/l
PCB 52	*	21/12/23 15:46	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	21/12/23 15:46	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	21/12/23 15:46	0.02	<0.02	µg/l
4,4 -DDT	*	21/12/23 15:46	0.2	<0.2	µg/l
4,4-DDE	*	21/12/23 15:46	0.01	<0.01	µg/l
Aldrin	*	21/12/23 15:46	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	21/12/23 15:46	0.03	<0.03	µg/l
Chlordane (total)	*	21/12/23 15:46	0.02	<0.02	µg/l
Chlordane, cis-	*	21/12/23 15:46	0.01	<0.01	µg/l
Chlordane, trans-	*	21/12/23 15:46	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	21/12/23 15:46	0.25	<0.25	µg/l
DDD, o,p-	*	21/12/23 15:46	0.01	<0.01	µg/l
Dieldrin	*	21/12/23 15:46	0.02	<0.02	µg/l
Endosulfan, alpha-	*	21/12/23 15:46	0.05	<0.05	µg/l
Endrin	*	21/12/23 15:46	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	21/12/23 15:46	0.1	<0.1	µg/l
HCH, alpha-	*	21/12/23 15:46	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	21/12/23 15:46	0.07	<0.07	µg/l
HCH, delta-	*	21/12/23 15:46	0.04	<0.04	µg/l
Heptachlor	*	21/12/23 15:46	0.01	<0.01	µg/l
Heptachlor epoxide	*	21/12/23 15:46	0.03	<0.03	µg/l
Hexachlorobutadiene	*	21/12/23 15:46	0.1	<0.1	µg/l
Isodrin	*	21/12/23 15:46	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	21/12/23 15:46	0.29	<0.29	µg/l
Sum Drins	*	21/12/23 15:46	0.06	<0.06	µg/l
Tedion	*	21/12/23 15:46	0.07	<0.07	µg/l
Telodrin	*	21/12/23 15:46	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	21/12/23 15:46	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
Cresols (sum)	*	21/12/23 15:46	0.8	<0.8	µg/l
m-Cresol	*	21/12/23 15:46	0.3	<0.3	µg/l
m-Ethylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
o-Cresol	*	21/12/23 15:46	0.3	<0.3	µg/l
o-Ethylphenol	*	21/12/23 15:46	0.03	<0.03	µg/l
p-Cresol	*	21/12/23 15:46	0.2	<0.2	µg/l
Phenol	*	21/12/23 15:46	0.2	<0.2	µg/l

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PO reference:

Thymol	* 21/12/23 15:46	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 21/12/23 15:46	0.1	<0.1	µg/l
Azinphos-methyl	* 21/12/23 15:46	0.07	<0.07	µg/l
Bromophos-ethyl	* 21/12/23 15:46	0.07	<0.07	µg/l
Bromophos-methyl	* 21/12/23 15:46	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 21/12/23 15:46	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 21/12/23 15:46	0.1	<0.1	µg/l
Coumaphos	* 21/12/23 15:46	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 21/12/23 15:46	0.1	<0.1	µg/l
Diazinon	* 21/12/23 15:46	0.04	<0.04	µg/l
Dichlorvos	* 21/12/23 15:46	0.1	<0.1	µg/l
Disulfoton	* 21/12/23 15:46	0.04	<0.04	µg/l
Fenitrothion	* 21/12/23 15:46	0.1	<0.1	µg/l
Fenthion	* 21/12/23 15:46	0.1	<0.1	µg/l
Malathion	* 21/12/23 15:46	0.1	<0.1	µg/l
Parathion	* 21/12/23 15:46	0.2	<0.2	µg/l
Parathion-methyl	* 21/12/23 15:46	0.2	<0.2	µg/l
Pyrazophos	* 21/12/23 15:46	0.2	<0.2	µg/l
Triazophos	* 21/12/23 15:46	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 21/12/23 15:46	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 21/12/23 15:46	0.02	<0.02	µg/l

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2,3,4-Trichlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	21/12/23 15:46	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	21/12/23 15:46	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	21/12/23 15:46	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	21/12/23 15:46	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	21/12/23 15:46	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	21/12/23 15:46	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	21/12/23 15:46	0.11	<0.11	µg/l
m-Chlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	21/12/23 15:46	0.14	<0.14	µg/l
o-Chlorophenol	*	21/12/23 15:46	0.1	<0.1	µg/l
p-Chlorophenol	*	21/12/23 15:46	0.02	<0.02	µg/l
Pentachlorophenol	*	21/12/23 15:46	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	21/12/23 15:46	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	21/12/23 15:46	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	21/12/23 15:46	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	21/12/23 15:46	0.1	<0.1	µg/l
Acenaphthylene	*	21/12/23 15:46	0.04	<0.04	µg/l
Anthracene	*	21/12/23 15:46	0.01	<0.01	µg/l

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Benz(a)anthracene	*	21/12/23 15:46	0.04	<0.04	µg/l
Benzo(a)pyrene	*	21/12/23 15:46	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	21/12/23 15:46	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	21/12/23 15:46	0.03	<0.03	µg/l
Chrysene	*	21/12/23 15:46	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	21/12/23 15:46	0.04	<0.04	µg/l
Fluoranthene	*	21/12/23 15:46	0.02	<0.02	µg/l
Fluorene	*	21/12/23 15:46	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	21/12/23 15:46	0.04	<0.04	µg/l
Naphthalene	*	21/12/23 15:46	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	21/12/23 15:46	0.91	<0.91	µg/l
Phenanthrene	*	21/12/23 15:46	0.02	<0.02	µg/l
Pyrene	*	21/12/23 15:46	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	21/12/23 15:46	0.01	<0.01	µg/l
Dibenzofurane	*	21/12/23 15:46	0.1	<0.1	µg/l
Diphenyl ether	*	21/12/23 15:46	0.04	<0.04	µg/l
Nitrobenzene	*	21/12/23 15:46	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	21/12/23 15:46	0.08	<0.08	µg/l
Carbaryl	*	21/12/23 15:46	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	21/12/23 15:46	0.2	<0.2	µg/l
Deltamethrin	*	21/12/23 15:46	0.2	<0.2	µg/l

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PO reference:

Linuron	*	21/12/23 15:46	0.1	<0.1	µg/l
Permethrin A	*	21/12/23 15:46	0.06	<0.06	µg/l
Permethrin B	*	21/12/23 15:46	0.06	<0.06	µg/l
Permethrins (sum)	*	21/12/23 15:46	0.12	<0.12	µg/l
Propachlor	*	21/12/23 15:46	0.02	<0.02	µg/l
Trifluralin	*	21/12/23 15:46	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	21/12/23 15:46	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	21/12/23 15:46	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	21/12/23 15:46	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	21/12/23 15:46	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	21/12/23 15:46	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	21/12/23 15:46	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	21/12/23 15:46	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	21/12/23 15:46	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	21/12/23 15:46	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	21/12/23 15:46	0.03	<0.03	µg/l
Pentachlorobenzene	*	21/12/23 15:46	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	21/12/23 15:46	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	21/12/23 15:46	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	21/12/23 15:46	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	21/12/23 15:46	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	21/12/23 15:46	0.2	<0.2	µg/l
1,1-Dichloroethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,1-Dichloroethene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,1-Dichloropropene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	21/12/23 15:46	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2-Dibromoethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	21/12/23 15:46	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,2-Dichloropropane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	21/12/23 15:46	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	21/12/23 15:46	0.1	<0.1	µg/l
1,3-Dichloropropane	*	21/12/23 15:46	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	21/12/23 15:46	0.1	<0.1	µg/l
1-chloroethane	*	21/12/23 15:46	1	<1	µg/l
2,2-Dichloropropane	*	21/12/23 15:46	0.1	<0.1	µg/l
2-Chlorotoluene	*	21/12/23 15:46	0.1	<0.1	µg/l
4-Chlorotoluene	*	21/12/23 15:46	0.1	<0.1	µg/l
Benzene	*	21/12/23 15:46	0.05	<0.05	µg/l
Bromobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
Bromochloromethane	*	21/12/23 15:46	0.1	<0.1	µg/l
Bromodichloromethane	*	21/12/23 15:46	0.1	<0.1	µg/l
Chlorobenzene	*	21/12/23 15:46	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	21/12/23 15:46	0.1	<0.1	µg/l
Chloromethane	*	21/12/23 15:46	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	21/12/23 15:46	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	21/12/23 15:46	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	21/12/23 15:46	0.1	<0.1	µg/l
Dibromochloromethane	*	21/12/23 15:46	0.1	<0.1	µg/l
Dibromomethane	*	21/12/23 15:46	0.2	<0.2	µg/l



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PO reference:

Dichlorobenzenes (sum)	*	21/12/23 15:46	0.3	<0.3	µg/l
Dichloromethane	*	21/12/23 15:46	0.2	<0.2	µg/l
Ethylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
Hexachlorobutadiene	*	21/12/23 15:46	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	21/12/23 15:46	0.05	<0.05	µg/l
m-/p-Xylene	*	21/12/23 15:46	0.05	<0.05	µg/l
Methyl bromide	*	21/12/23 15:46	0.1	<0.1	µg/l
Naphthalene	*	21/12/23 15:46	0.1	<0.1	µg/l
n-Butylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
n-Propylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
o-Xylene	*	21/12/23 15:46	0.05	<0.05	µg/l
p-Isopropyltoluene	*	21/12/23 15:46	0.05	<0.05	µg/l
sec-Butylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
Styrene	*	21/12/23 15:46	0.1	<0.1	µg/l
tert-Butylbenzene	*	21/12/23 15:46	0.05	<0.05	µg/l
Tetrachloroethene	*	21/12/23 15:46	0.1	<0.1	µg/l
Tetrachloromethane	*	21/12/23 15:46	0.05	<0.05	µg/l
Toluene	*	21/12/23 15:46	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	21/12/23 15:46	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	21/12/23 15:46	0.1	<0.1	µg/l
Tribromomethane	*	21/12/23 15:46	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	21/12/23 15:46	0.3	<0.3	µg/l
Trichloroethene	*	21/12/23 15:46	0.1	<0.1	µg/l

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Trichlorofluoromethane	*	21/12/23 15:46		0.1	<0.1	µg/l	
Vinyl chloride	*	21/12/23 15:46		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 11:24	EW175	1	8.54	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 11:24 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 11:24	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 11:24	EW175	5	24.2	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 11:24 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 11:24	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		None		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	335	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	4.11	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		12.2	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		12.2	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	<0.02	mg/l	
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	5.5		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	210	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.3	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 11:24	EW175	30	53	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	24.02	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	39.298	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	4.661	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		586.352	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	0.707	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	18.967	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	8.84	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051131	Received on	15/12/2023
Your sample reference	MW6 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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PO reference:

Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 14:47	EW175	1	28.1	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 14:47 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 14:47	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 14:47	EW175	5	30.2	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 14:47 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 14:47	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		Earthy		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	370	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	<1	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		10.8	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		6.2	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	<0.02	mg/l	
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	7.0		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	310	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.8	mg/l	
Alkalinity as CaCO₃ [M30D3]						
Alkalinity as CaCO ₃	21/12/23 14:48	EW175	30	97	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	36.719	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	<0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	<5	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	10.244	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		1.678	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	0.783	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	18.011	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	9.64	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051132	Received on	15/12/2023
Your sample reference	MW7 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 14:47	EW175	1	19.0	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 14:47 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 14:47	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 14:47	EW175	5	28.8	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 14:47 ^{7D}	EW175	1	<1	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 14:47	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		Earthy		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	675	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	4.45	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		11.1	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		0.6	m	

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GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	0.17	mg/l	C6
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	6.0		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	270	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.3	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 14:48	EW175	30	75	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		cloudy		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	31.73	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	<0.003	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	<5	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	6.82	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		78.166	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	1.306	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	18.302	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	4.96	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051133	Received on	15/12/2023
Your sample reference	SPJ1 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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Cork
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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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PO reference:

Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 14:47	EW175	1	12.6	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 14:47 ^{7D}	EW175	0.05	<0.05	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 14:47	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 14:47	EW175	5	18.2	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 14:47 ^{7D}	EW175	1	4.73	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 14:47	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		Earthy		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	255	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	1.25	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		10.9	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		na	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	<0.02	mg/l	
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	5.5		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	190	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.6	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 14:48	EW175	30	42	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		clear		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	22.14	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	0.127	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	<5	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	2.224	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	2.77	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		1.559	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	1.754	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	14.839	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	214	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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PO reference:

Certificate of Analysis

Sample number	966-2023-00051134	Received on	15/12/2023
Your sample reference	SPM2 Benduff Landfill	Analysis started on	21/12/2023
Sample Matrix	Ground water		
Sample Condition on Arrival	Satisfactory	Sample Date	15/12/2023
Time Sampled	10:30		

Test Code Analyte	SUB ⁵ Analysis Started	Method	LOQ ³	SPEC ²	Result	Units	ACCRED ⁴
Organic nitrogen herbicides (ONP) [F2306]							
Ametryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Atrazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Cyanazine	* 22/12/23 10:48		0.1		<0.1	µg/l	
Desmetryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Prometryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
Propazine	* 22/12/23 10:48		0.08		<0.08	µg/l	
Simazine	* 22/12/23 10:48		0.2		<0.2	µg/l	
Terbuthylazine	* 22/12/23 10:48		0.06		<0.06	µg/l	
Terbutryn	* 22/12/23 10:48		0.1		<0.1	µg/l	
PCB 7 [F6532]							
PCB (6) Sum)	* 22/12/23 10:48		0.06		<0.06	µg/l	
PCB (7) Sum)	* 22/12/23 10:48		0.07		<0.07	µg/l	
PCB 101	* 22/12/23 10:48		0.01		<0.01	µg/l	

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PO reference:

PCB 118	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 138	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 153	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 180	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 28	*	22/12/23 10:48	0.01	<0.01	µg/l
PCB 52	*	22/12/23 10:48	0.01	<0.01	µg/l
Chloropesticides [F6533]					
2,4 -DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
4,4 -DDD + 2,4 -DDT	*	22/12/23 10:48	0.02	<0.02	µg/l
4,4 -DDT	*	22/12/23 10:48	0.2	<0.2	µg/l
4,4-DDE	*	22/12/23 10:48	0.01	<0.01	µg/l
Aldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
alpha-Endosulfansulphate	*	22/12/23 10:48	0.03	<0.03	µg/l
Chlordane (total)	*	22/12/23 10:48	0.02	<0.02	µg/l
Chlordane, cis-	*	22/12/23 10:48	0.01	<0.01	µg/l
Chlordane, trans-	*	22/12/23 10:48	0.01	<0.01	µg/l
DDD ,DDE, DDT	*	22/12/23 10:48	0.25	<0.25	µg/l
DDD, o,p-	*	22/12/23 10:48	0.01	<0.01	µg/l
Dieldrin	*	22/12/23 10:48	0.02	<0.02	µg/l
Endosulfan, alpha-	*	22/12/23 10:48	0.05	<0.05	µg/l
Endrin	*	22/12/23 10:48	0.02	<0.02	µg/l
gamma-HCH (Lindane)	*	22/12/23 10:48	0.1	<0.1	µg/l
HCH, alpha-	*	22/12/23 10:48	0.08	<0.08	µg/l

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PO reference:

HCH, beta-	*	22/12/23 10:48	0.07	<0.07	µg/l
HCH, delta-	*	22/12/23 10:48	0.04	<0.04	µg/l
Heptachlor	*	22/12/23 10:48	0.01	<0.01	µg/l
Heptachlor epoxide	*	22/12/23 10:48	0.03	<0.03	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isodrin	*	22/12/23 10:48	0.1	<0.1	µg/l
Sum 4 HCH-compounds	*	22/12/23 10:48	0.29	<0.29	µg/l
Sum Drins	*	22/12/23 10:48	0.06	<0.06	µg/l
Tedion	*	22/12/23 10:48	0.07	<0.07	µg/l
Telodrin	*	22/12/23 10:48	0.07	<0.07	µg/l
Phenols (10) and Cresols (3) [F6536]					
2,3/3,5-Dimethylphenol + 4-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,5-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,6-Dimethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4-Dimethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Cresols (sum)	*	22/12/23 10:48	0.8	<0.8	µg/l
m-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
m-Ethylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
o-Cresol	*	22/12/23 10:48	0.3	<0.3	µg/l
o-Ethylphenol	*	22/12/23 10:48	0.03	<0.03	µg/l
p-Cresol	*	22/12/23 10:48	0.2	<0.2	µg/l
Phenol	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Thymol	* 22/12/23 10:48	0.01	<0.01	µg/l
Organic phosphorous pesticides (13) (OPP) [F6704]				
Azinphos-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Azinphos-methyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-ethyl	* 22/12/23 10:48	0.07	<0.07	µg/l
Bromophos-methyl	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos (-ethyl)	* 22/12/23 10:48	0.06	<0.06	µg/l
Chlorpyrifos-methyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Coumaphos	* 22/12/23 10:48	0.02	<0.02	µg/l
Demeton-S/demeton-O-ethyl	* 22/12/23 10:48	0.1	<0.1	µg/l
Diazinon	* 22/12/23 10:48	0.04	<0.04	µg/l
Dichlorvos	* 22/12/23 10:48	0.1	<0.1	µg/l
Disulfoton	* 22/12/23 10:48	0.04	<0.04	µg/l
Fenitrothion	* 22/12/23 10:48	0.1	<0.1	µg/l
Fenthion	* 22/12/23 10:48	0.1	<0.1	µg/l
Malathion	* 22/12/23 10:48	0.1	<0.1	µg/l
Parathion	* 22/12/23 10:48	0.2	<0.2	µg/l
Parathion-methyl	* 22/12/23 10:48	0.2	<0.2	µg/l
Pyrazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Triazophos	* 22/12/23 10:48	0.2	<0.2	µg/l
Chlorophenols (20) [F7156]				
2,3,4,5-Tetrachlorophenol	* 22/12/23 10:48	0.01	<0.01	µg/l
2,3,4,6 / 2,3,5,6-Tetrachlorophenol	* 22/12/23 10:48	0.02	<0.02	µg/l

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PO reference:

2,3,4-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,5+2,4,5-Trichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,3,6-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
2,3-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
2,4,6-Trichlorophenol	*	22/12/23 10:48	0.05	<0.05	µg/l
2,6-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
3,4,5-Trichlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
3,4-Dichlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
3,5-Dichlorophenol	*	22/12/23 10:48	0.03	<0.03	µg/l
4-Chloro-3-Methylphenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Dichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
m-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Monochlorophenols (sum)	*	22/12/23 10:48	0.14	<0.14	µg/l
o-Chlorophenol	*	22/12/23 10:48	0.1	<0.1	µg/l
p-Chlorophenol	*	22/12/23 10:48	0.02	<0.02	µg/l
Pentachlorophenol	*	22/12/23 10:48	0.01	<0.01	µg/l
Sum (2,4- and 2,5-Dichlorophenol)	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorophenols (sum)	*	22/12/23 10:48	0.03	<0.03	µg/l
Trichlorophenols (sum)	*	22/12/23 10:48	0.11	<0.11	µg/l
PAH (16 EPA) [F8126]					
Acenaphthene	*	22/12/23 10:48	0.1	<0.1	µg/l
Acenaphthylene	*	22/12/23 10:48	0.04	<0.04	µg/l
Anthracene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Benz(a)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Benzo(a)pyrene	*	22/12/23 10:48	0.03	<0.03	µg/l
Benzo(b+k)fluoranthene	*	22/12/23 10:48	0.05	<0.05	µg/l
Benzo(g,h,i)perylene	*	22/12/23 10:48	0.03	<0.03	µg/l
Chrysene	*	22/12/23 10:48	0.02	<0.02	µg/l
Dibenz(a,h)anthracene	*	22/12/23 10:48	0.04	<0.04	µg/l
Fluoranthene	*	22/12/23 10:48	0.02	<0.02	µg/l
Fluorene	*	22/12/23 10:48	0.01	<0.01	µg/l
Indeno(1,2,3-cd)pyrene	*	22/12/23 10:48	0.04	<0.04	µg/l
Naphthalene	*	22/12/23 10:48	0.4	<0.4	µg/l
PAH 16 EPA (sum)	*	22/12/23 10:48	0.91	<0.91	µg/l
Phenanthrene	*	22/12/23 10:48	0.02	<0.02	µg/l
Pyrene	*	22/12/23 10:48	0.06	<0.06	µg/l
Other organic pollutants [F8247]					
Biphenyl	*	22/12/23 10:48	0.01	<0.01	µg/l
Dibenzofurane	*	22/12/23 10:48	0.1	<0.1	µg/l
Diphenyl ether	*	22/12/23 10:48	0.04	<0.04	µg/l
Nitrobenzene	*	22/12/23 10:48	0.3	<0.3	µg/l
Other pesticides [F8249]					
Bifenthrin	*	22/12/23 10:48	0.08	<0.08	µg/l
Carbaryl	*	22/12/23 10:48	0.1	<0.1	µg/l
Cypermethrin A, B, C and D	*	22/12/23 10:48	0.2	<0.2	µg/l
Deltamethrin	*	22/12/23 10:48	0.2	<0.2	µg/l

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PO reference:

Linuron	*	22/12/23 10:48	0.1	<0.1	µg/l
Permethrin A	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrin B	*	22/12/23 10:48	0.06	<0.06	µg/l
Permethrins (sum)	*	22/12/23 10:48	0.12	<0.12	µg/l
Propachlor	*	22/12/23 10:48	0.02	<0.02	µg/l
Trifluralin	*	22/12/23 10:48	0.02	<0.02	µg/l
Chloronitrobenzenes [F8250]					
2,3-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
2,5-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,4-Dichloronitrobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
3,5-Dichloronitrobenzene	*	22/12/23 10:48	0.06	<0.06	µg/l
Dichloronitrobenzenes (sum)	*	22/12/23 10:48	0.46	<0.46	µg/l
m-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Monochloronitrobenzenes (sum)	*	22/12/23 10:48	0.4	<0.4	µg/l
o/p-Chloronitrobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
Chlorobenzenes [F8395]					
1,2,3,4-Tetrachlorobenzene	*	22/12/23 10:48	0.02	<0.02	µg/l
1,2,3,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4,5-Tetrachlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trichlorobenzene	*	22/12/23 10:48	0.01	<0.01	µg/l

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PO reference:

Hexachlorobenzene (HCB)	*	22/12/23 10:48	0.03	<0.03	µg/l
Pentachlorobenzene	*	22/12/23 10:48	0.005	<0.005	µg/l
Tetrachlorobenzene (1,2,3,5 & 1,2,4,5)	*	22/12/23 10:48	0.02	<0.02	µg/l
Tetrachlorobenzenes (sum)	*	22/12/23 10:48	0.04	<0.04	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.21	<0.21	µg/l
Cyanides total [FF01Q]					
Cyanides total	*	22/12/23 10:48	1	<1	µg/l
VOC59 EPA 8260b [FF0P7]					
1,1,1,2-Tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,1-Trichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2,2-tetrachloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1,2-Trichloroethane	*	22/12/23 10:48	0.2	<0.2	µg/l
1,1-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,1-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trichlorobenzene	*	22/12/23 10:48	0.2	<0.2	µg/l
1,2,3-Trichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,3-Trimethylbenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trichlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2,4-Trimethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
1,2-Dibromo-3-chloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dibromoethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichlorobenzene (o-)	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

1,2-Dichloroethane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3,5-Trimethylbenzene (Mesitylene)	*	22/12/23 10:48	0.05	<0.05	µg/l
1,3-Dichlorobenzene (m-dichlorobenzene)	*	22/12/23 10:48	0.1	<0.1	µg/l
1,3-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
1,4-Dichlorobenzene (p-)	*	22/12/23 10:48	0.1	<0.1	µg/l
1-chloroethane	*	22/12/23 10:48	1	<1	µg/l
2,2-Dichloropropane	*	22/12/23 10:48	0.1	<0.1	µg/l
2-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
4-Chlorotoluene	*	22/12/23 10:48	0.1	<0.1	µg/l
Benzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Bromobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Bromodichloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Chlorobenzene	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloroform (Trichloromethane)	*	22/12/23 10:48	0.1	<0.1	µg/l
Chloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
cis+trans 1,2-Dichloroethenes (sum)	*	22/12/23 10:48	0.2	<0.2	µg/l
cis-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
cis-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromochloromethane	*	22/12/23 10:48	0.1	<0.1	µg/l
Dibromomethane	*	22/12/23 10:48	0.2	<0.2	µg/l



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PO reference:

Dichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Dichloromethane	*	22/12/23 10:48	0.2	<0.2	µg/l
Ethylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Hexachlorobutadiene	*	22/12/23 10:48	0.1	<0.1	µg/l
Isopropylbenzene (Cumene)	*	22/12/23 10:48	0.05	<0.05	µg/l
m-/p-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
Methyl bromide	*	22/12/23 10:48	0.1	<0.1	µg/l
Naphthalene	*	22/12/23 10:48	0.1	<0.1	µg/l
n-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
n-Propylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
o-Xylene	*	22/12/23 10:48	0.05	<0.05	µg/l
p-Isopropyltoluene	*	22/12/23 10:48	0.05	<0.05	µg/l
sec-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Styrene	*	22/12/23 10:48	0.1	<0.1	µg/l
tert-Butylbenzene	*	22/12/23 10:48	0.05	<0.05	µg/l
Tetrachloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tetrachloromethane	*	22/12/23 10:48	0.05	<0.05	µg/l
Toluene	*	22/12/23 10:48	0.05	<0.05	µg/l
trans-1,2-Dichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l
trans-1,3-Dichloropropene	*	22/12/23 10:48	0.1	<0.1	µg/l
Tribromomethane	*	22/12/23 10:48	0.5	<0.5	µg/l
Trichlorobenzenes (sum)	*	22/12/23 10:48	0.3	<0.3	µg/l
Trichloroethene	*	22/12/23 10:48	0.1	<0.1	µg/l

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PO reference:

Trichlorofluoromethane	*	22/12/23 10:48		0.1	<0.1	µg/l	
Vinyl chloride	*	22/12/23 10:48		0.2	<0.2	µg/l	
Sulphate mg/L - Gallery [M300N]							
Sulphate mg/L - Gallery		21/12/23 14:47	EW175	1	17.1	mg/l	C6
Phosphate (Ortho/MRP) as P - Gallery [M300P]							
Phosphate (Ortho/MRP) as P - Gallery		21/12/23 14:47 ^{7D}	EW175	0.05	0.064	mg/l	
Fluoride mg/L - Gallery [M300Q]							
Fluoride mg/L - Gallery		21/12/23 14:47	EW175	0.2	<0.2	mg/l	
Chloride mg/L - Gallery [M300S]							
Chloride mg/L - Gallery		21/12/23 14:47	EW175	5	25.5	mg/l	C6
Total Oxidised Nitrogen (TON) as N - Gallery [M300U]							
Total Oxidised Nitrogen (TON) as N - Gallery		21/12/23 14:47 ^{7D}	EW175	1	8.22	mg/l	
Ammonia as N - Gallery [M300Z]							
Ammonia as N - Gallery		21/12/23 14:47	EW175	0.05	<0.05	mg/l	C6
Odour [M3015]							
Odour (qualitative)		29/12/23 11:42	Site Test		Earthy		
Residue on Evaporation (Tot Solids-TS) [M3017]							
Residue of evaporation (105°C)		29/12/23 18:33	EW060	10	250	mg/l	
Total Organic Carbon (TOC) [M3022]							
TOC (total organic carbon)		24/12/23 09:09	EW123	1	2.02	mg/l	C6
Temperature (Site) [M3036]							
Temperature		29/12/23 11:42	Site Test		13.5	°C	
GW Levels (Site) [M3037]							
Borehole Depth		29/12/23 11:42	Site Test		na	m	

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PO reference:

GW Depth (Calc)	29/12/23 11:42	Site Test		PASS	m	
Water Level	29/12/23 11:42	Site Test		na	m	
Total Phosphorus-TP [M3045]						
Total Phosphorus-TP	22/12/23 09:41	EW146	0.02	0.05	mg/l	C6
pH (Robotic Method) [M3051]						
pH	21/12/23 12:14 ^{7D}	EW152R	4	6.3		
Conductivity at 20°C (Robotic Method) [M3052]						
Conductivity at 20°C	21/12/23 12:14	EW152R	5	320	µS/cm	C6
Dissolved Oxygen (Site Test) [M3054]						
Dissolved oxygen	29/12/23 11:42	Site Test		20.2	mg/l	
Alkalinity as CaCO3 [M30D3]						
Alkalinity as CaCO3	21/12/23 14:48	EW175	30	41	mg/l	
Visual Inspection (Site) [M3100]						
Visual inspection	29/12/23 11:42	Site Test		cloudy		
Boron - Dissolved [M3163]						
Boron (B)	27/12/23 11:31	EW188	0.21	<0.21	mg/l	C6
Cadmium - Dissolved [M3164]						
Cadmium (Cd)	27/12/23 11:31	EW188		<0.1	µg/l	C6
Calcium - Dissolved [M3165]						
Calcium (Ca)	27/12/23 11:31	EW188	1.08	25.535	mg/l	C6
Chromium - Dissolved [M3166]						
Chromium (Cr)	27/12/23 11:31	EW188		<1	µg/l	C6
Copper - Dissolved [M3168]						
Copper (Cu)	27/12/23 11:31	EW188	0.003	0.004	mg/l	C6

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PO reference:

Iron - Dissolved [M3172]

Iron (Fe)	27/12/23 11:31	EW188	5	9.302	µg/l	C6
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Lead - Dissolved [M3173]

Lead (Pb)	27/12/23 11:31	EW188	0.51	<0.51	µg/l	C6
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Magnesium - Dissolved [M3174]

Magnesium (Mg)	27/12/23 11:31	EW188	1.11	2.942	mg/l	C6
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Manganese - Dissolved [M3175]

Manganese (Mn)	27/12/23 11:31	EW188		<1	µg/l	C6
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Mercury - Dissolved [M3176]

Mercury	27/12/23 11:31	EW188	0.03	<0.03	µg/l	C6
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Potassium - Dissolved [M3180]

Potassium (K)	27/12/23 11:31	EW188	0.15	12.978	mg/l	C6
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Sodium - Dissolved [M3184]

Sodium (Na)	27/12/23 11:31	EW188	1.5	15.568	mg/l	C6
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Zinc - Dissolved [M3194]

Zinc (Zn)	27/12/23 11:31	EW188	1	13.0	µg/l	C6
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4 Accreditation Information

C6: ISO/IEC 17025:2017 INAB 138-T



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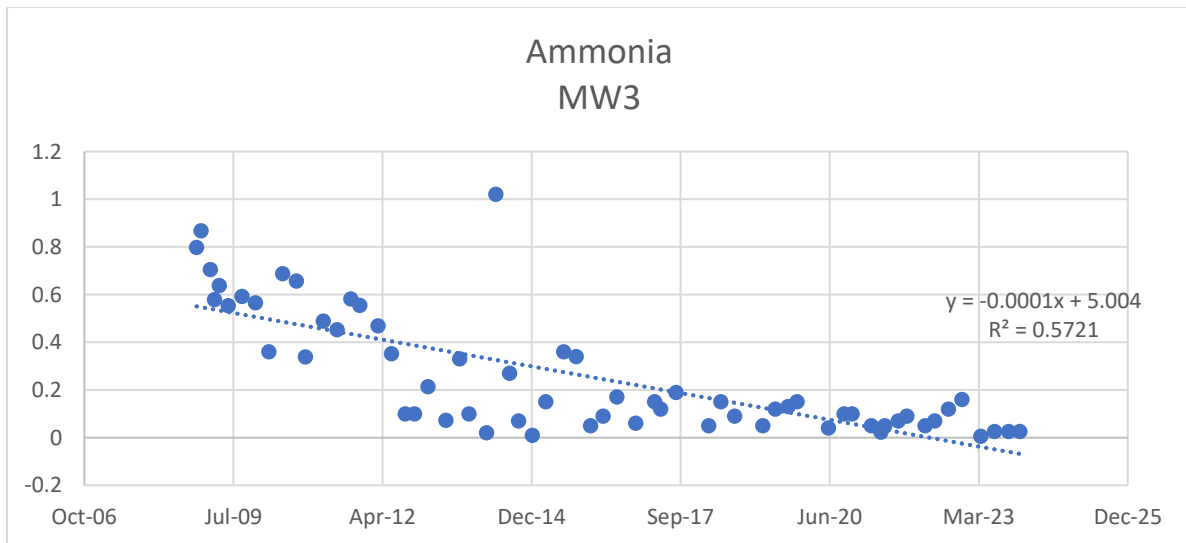
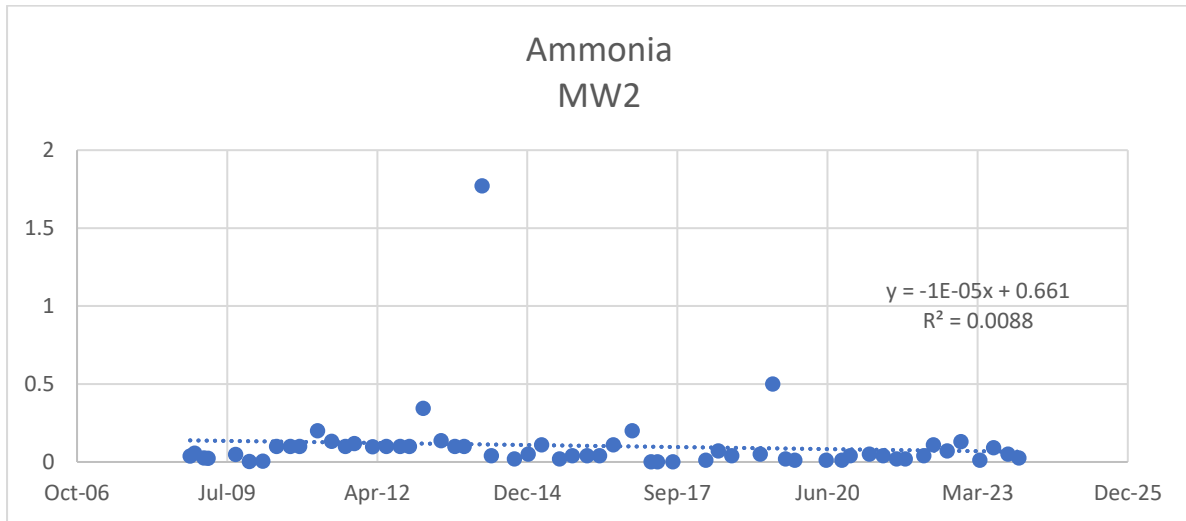
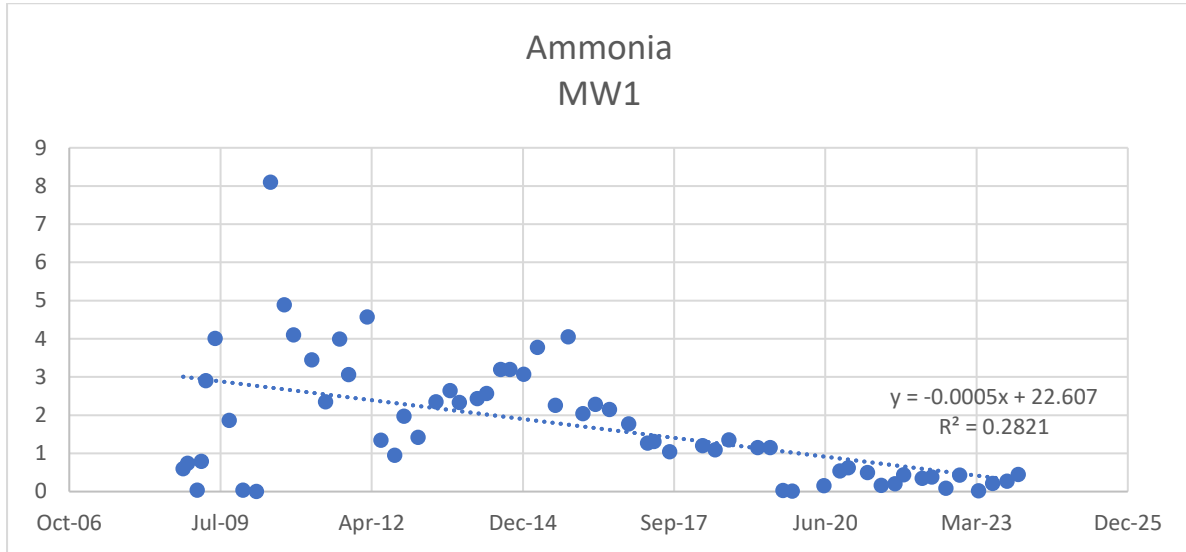
16/01/2024

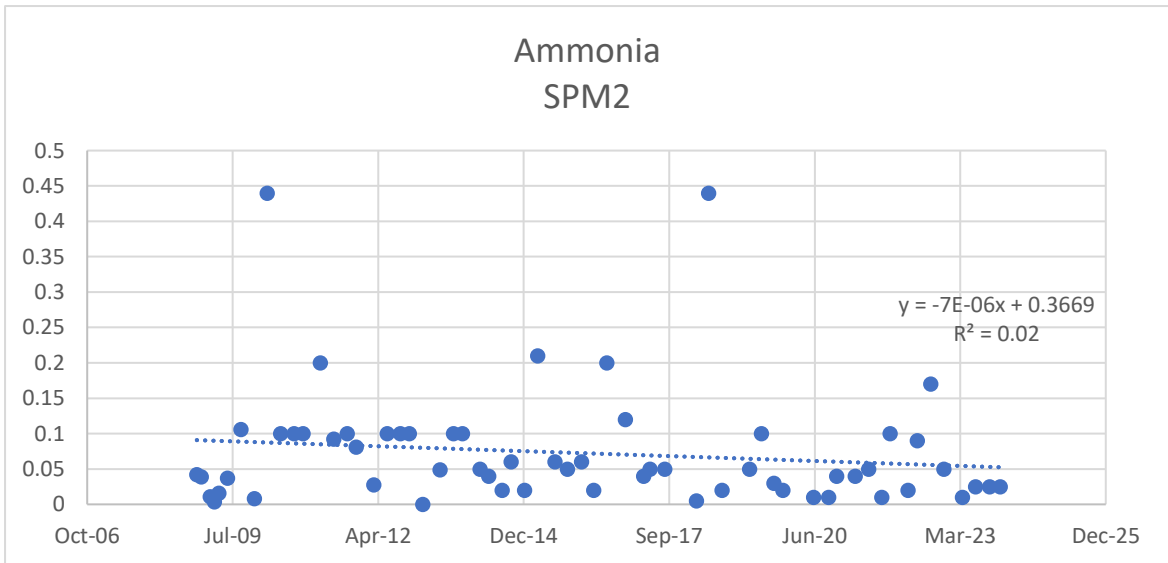
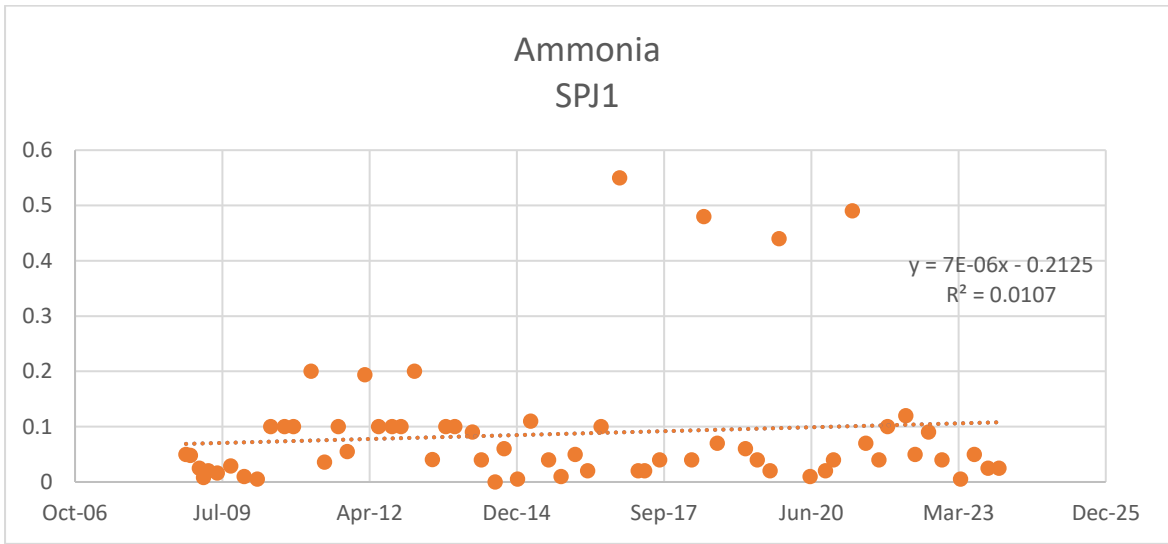
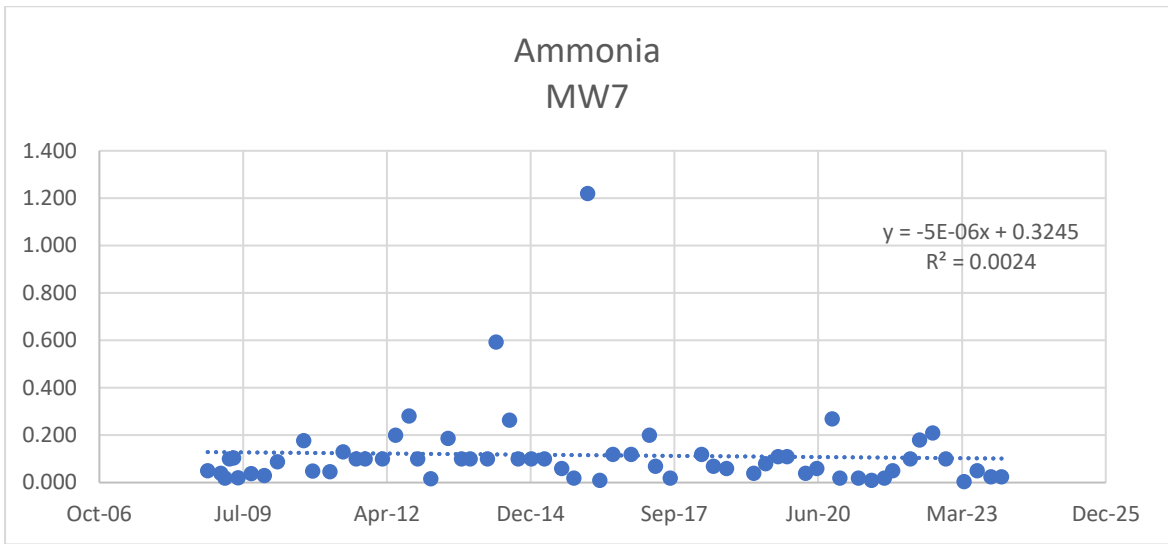
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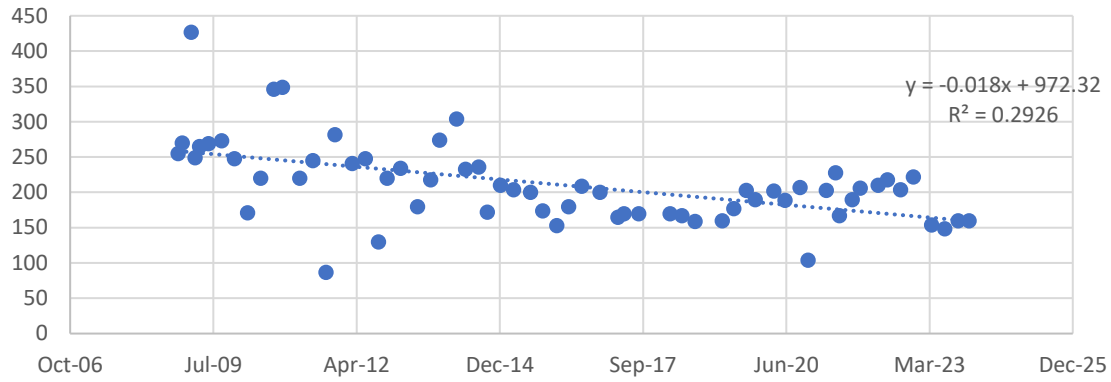
Appendix 3

APPENDIX 3 Groundwater Trend Analysis Graphs

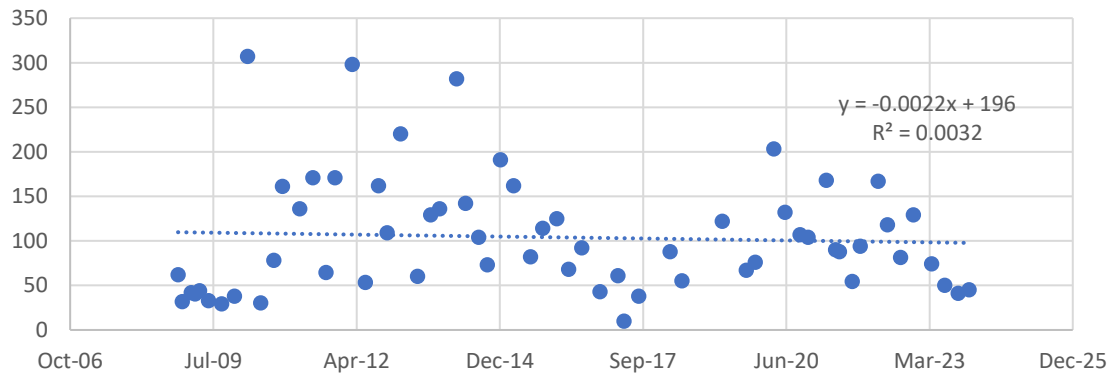




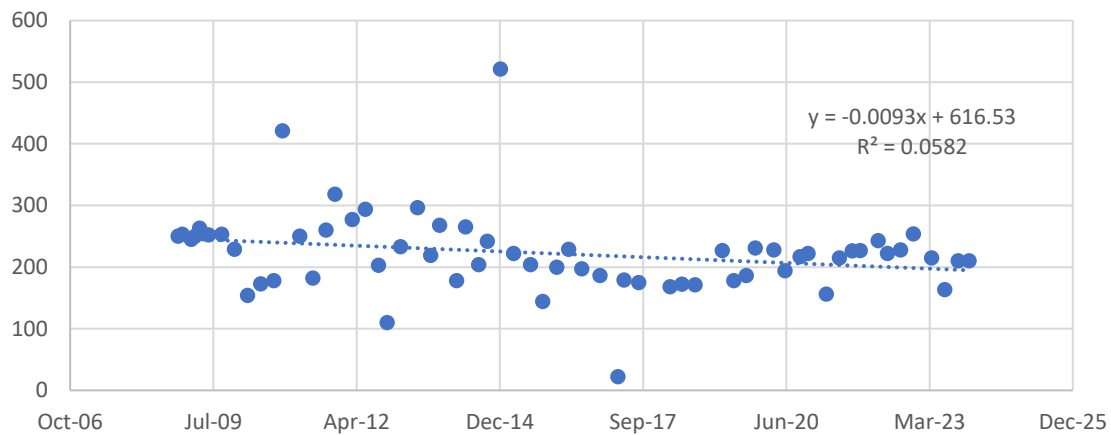
Conductivity
MW3

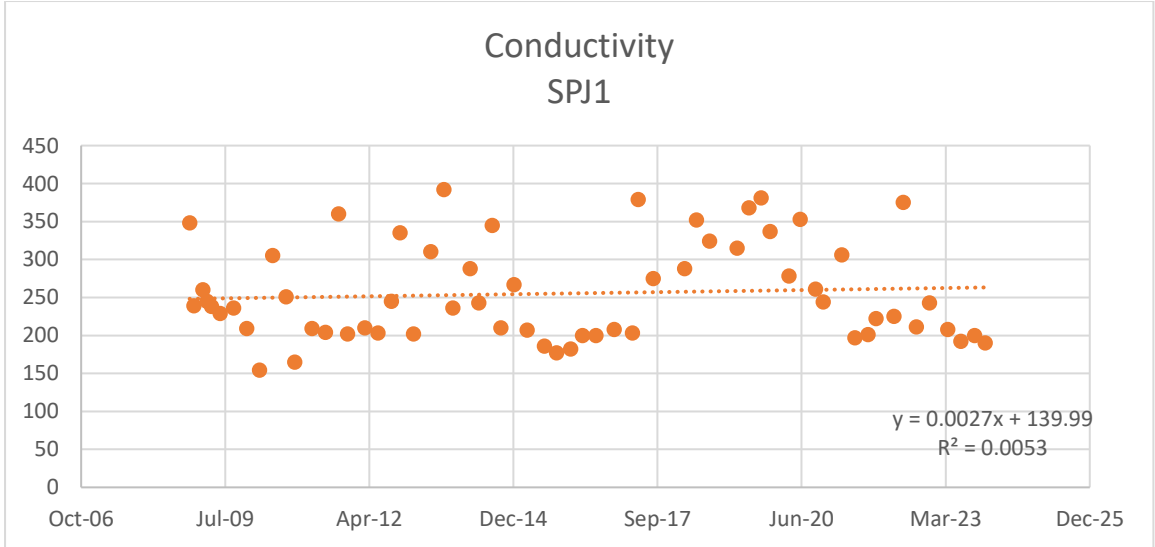
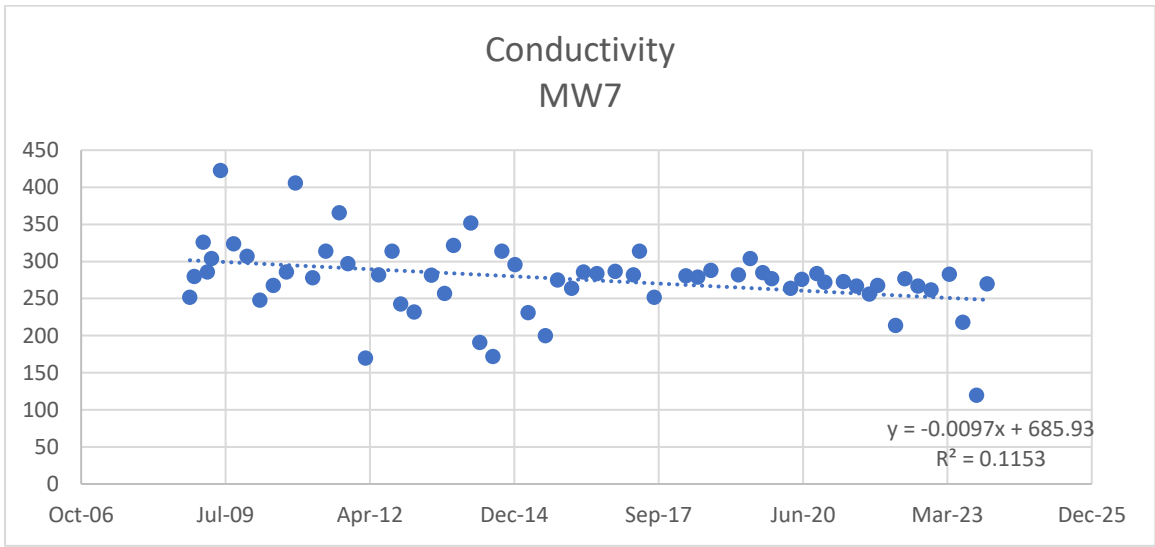
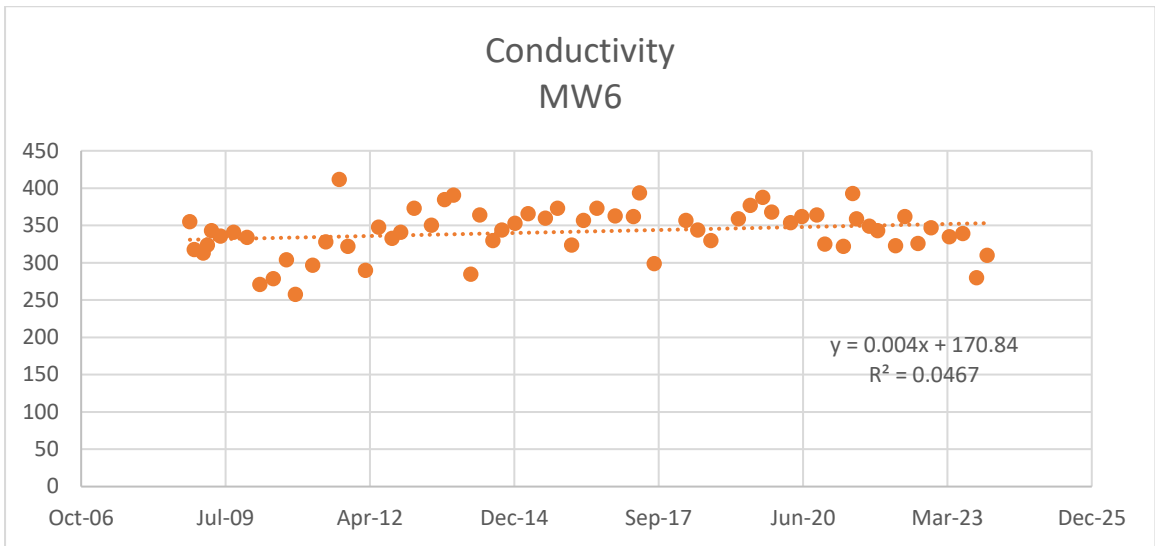


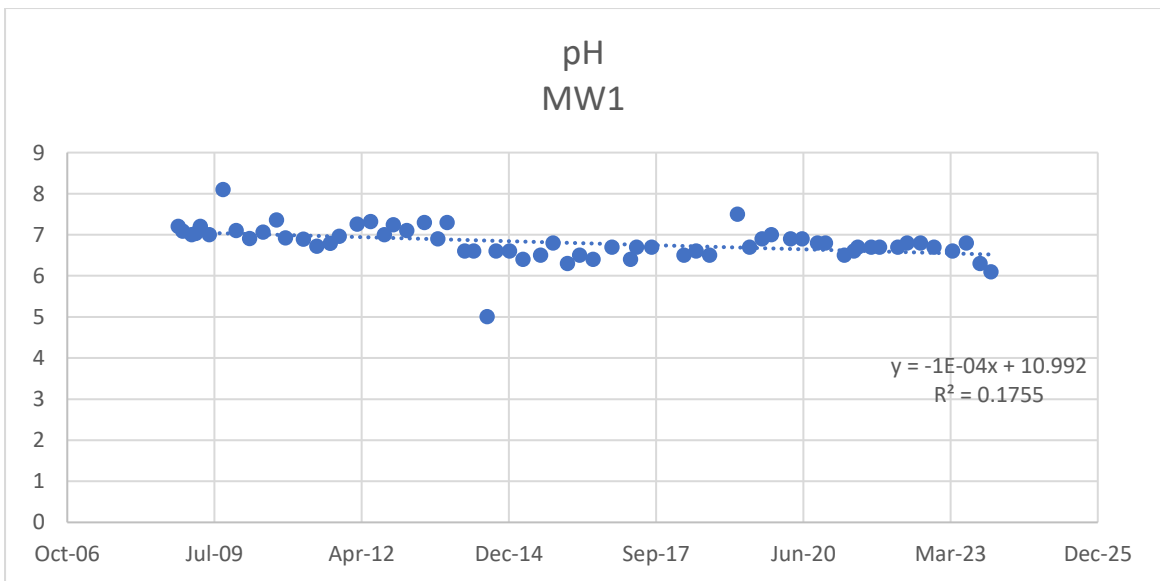
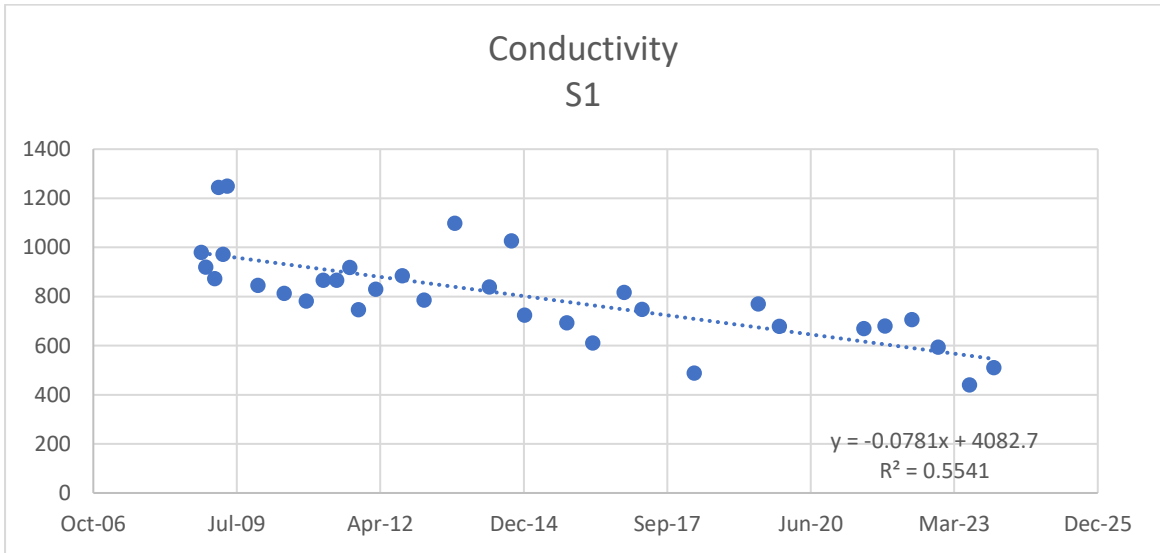
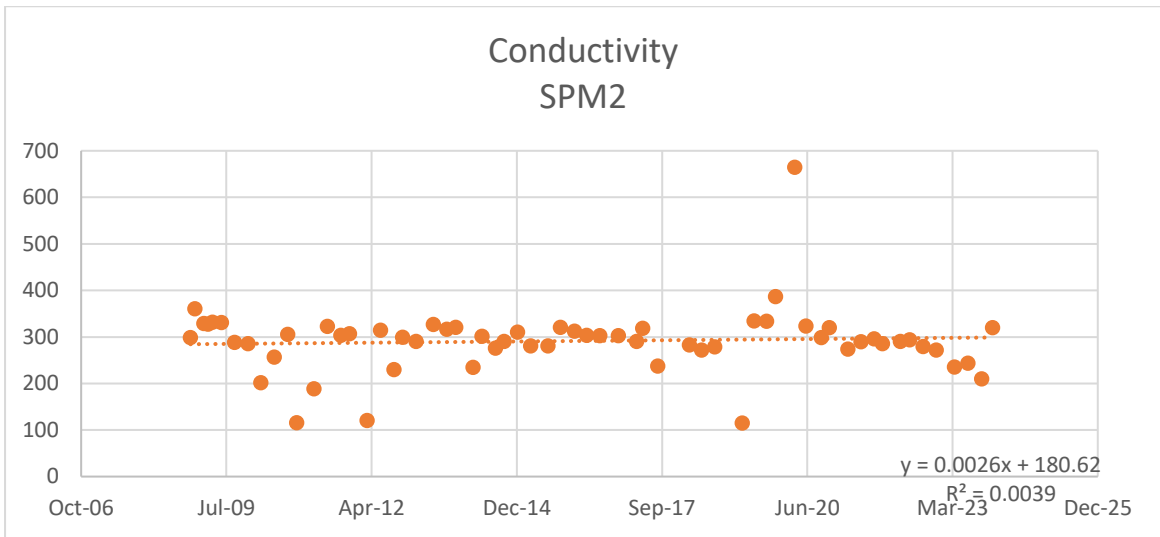
Conductivity
MW4

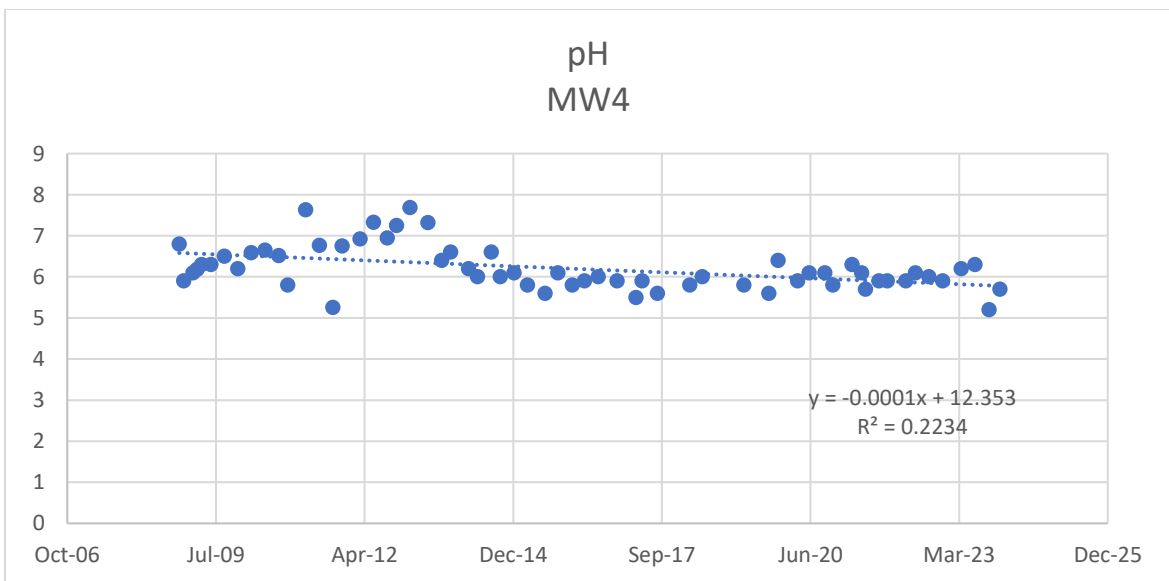
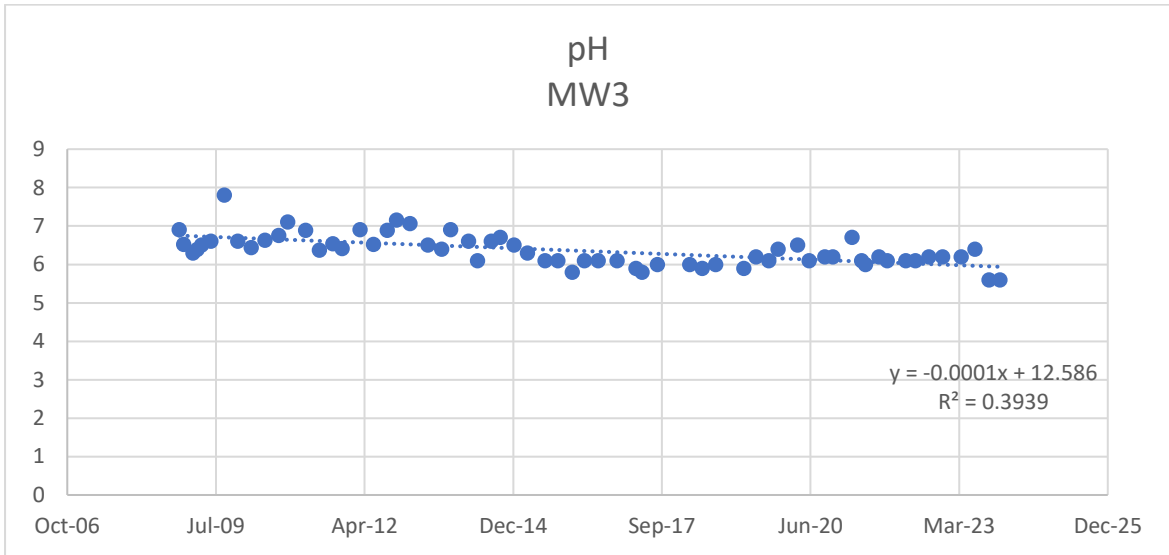
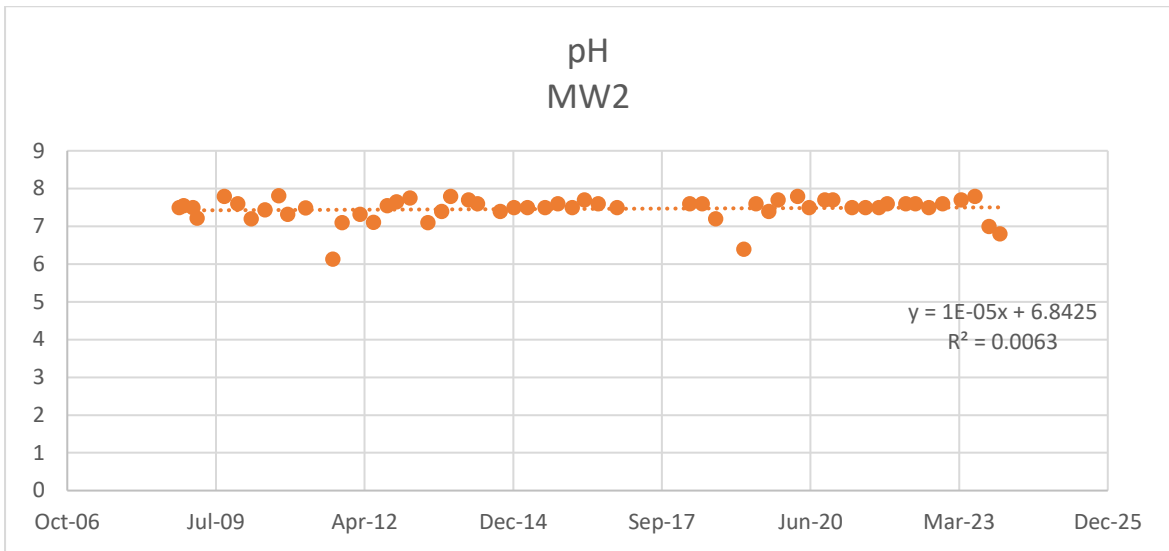


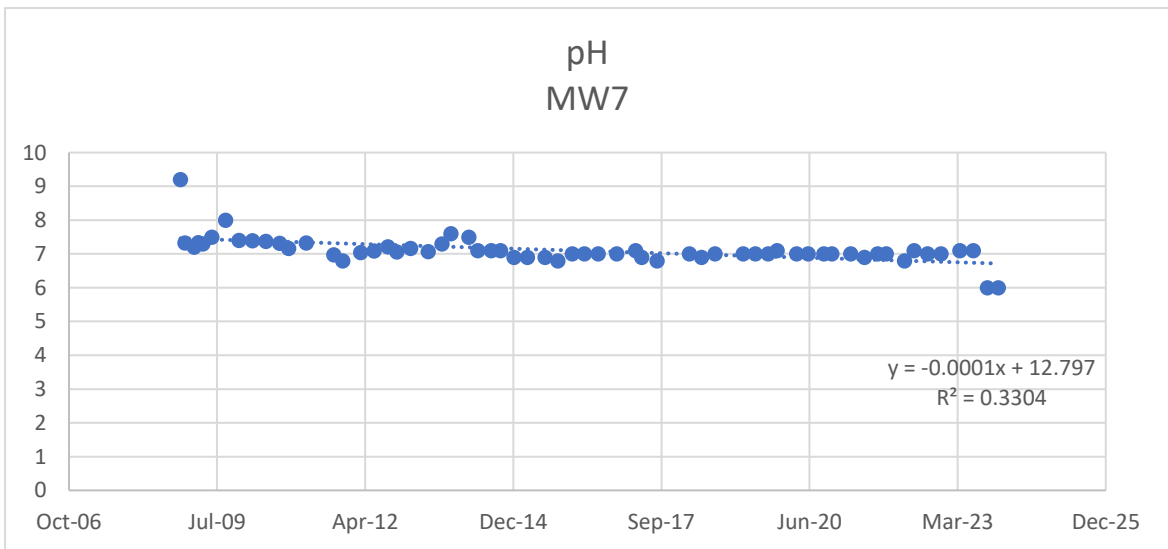
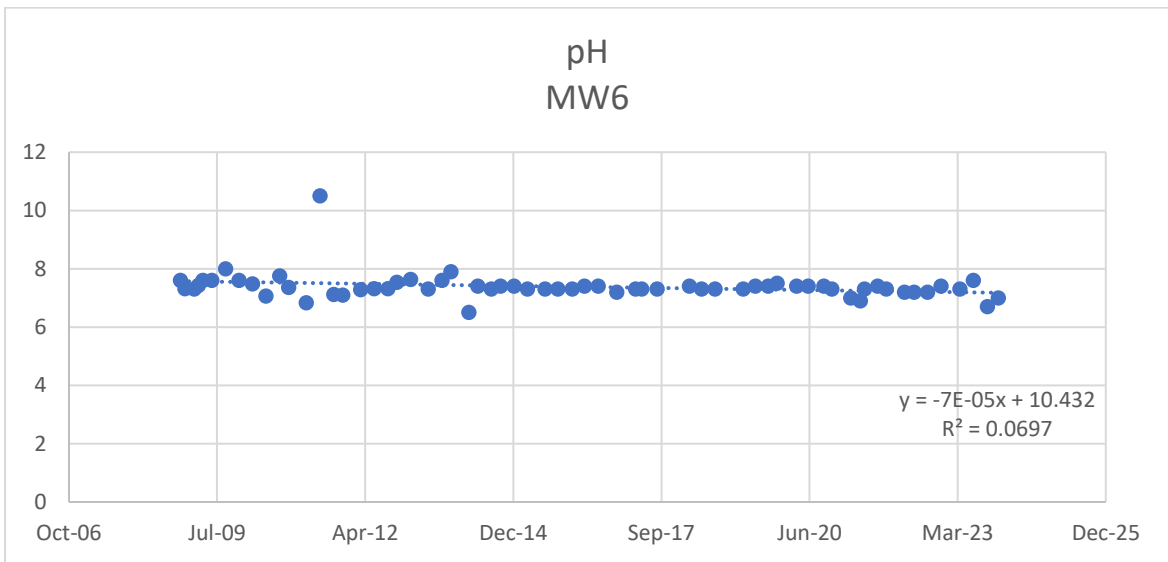
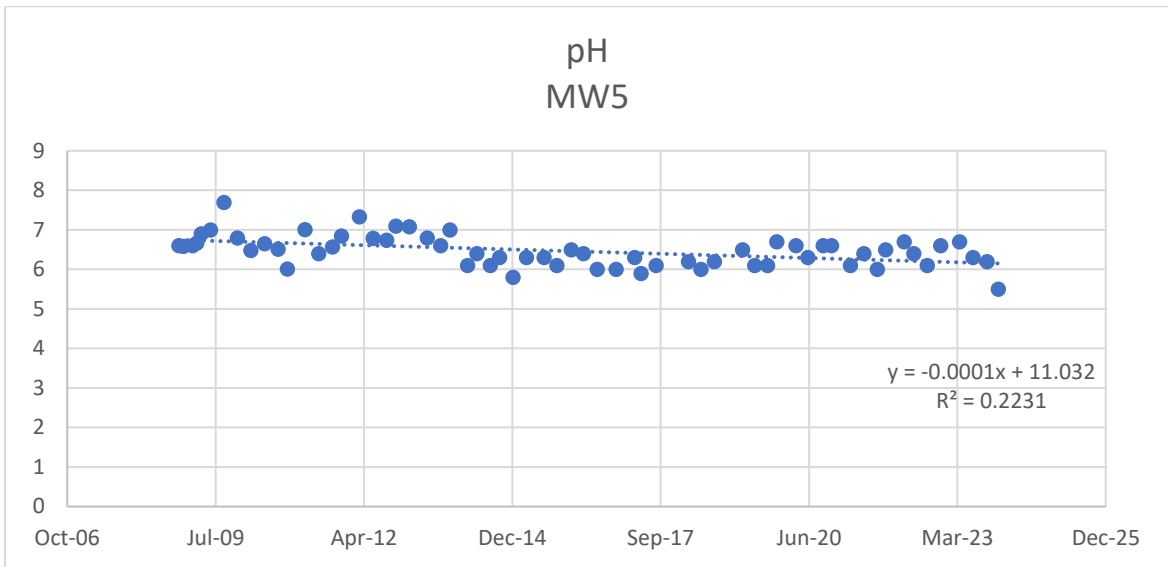
Conductivity
MW5

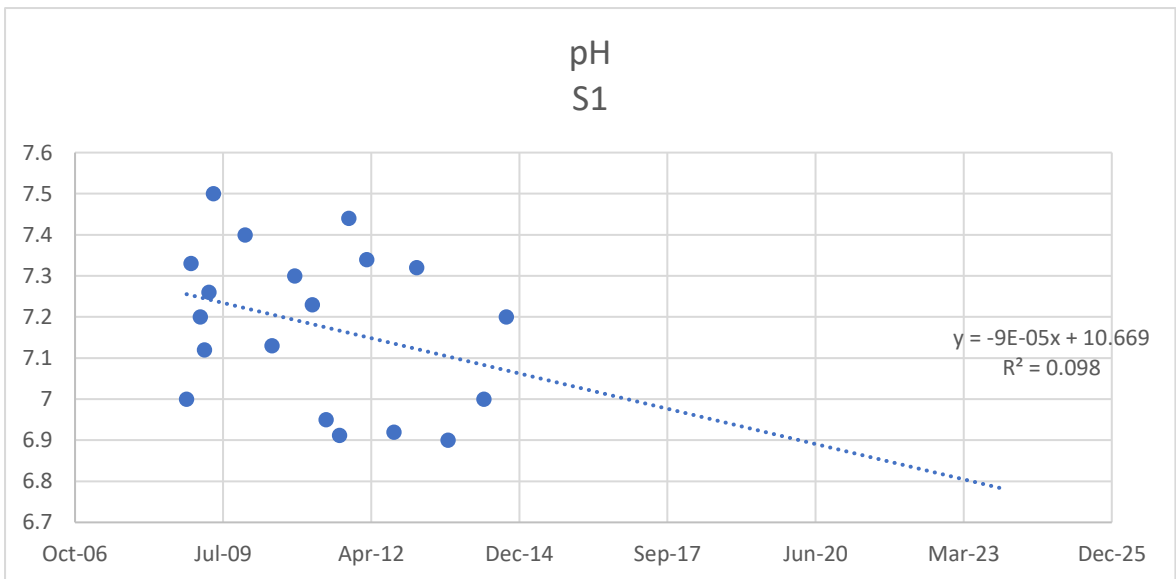
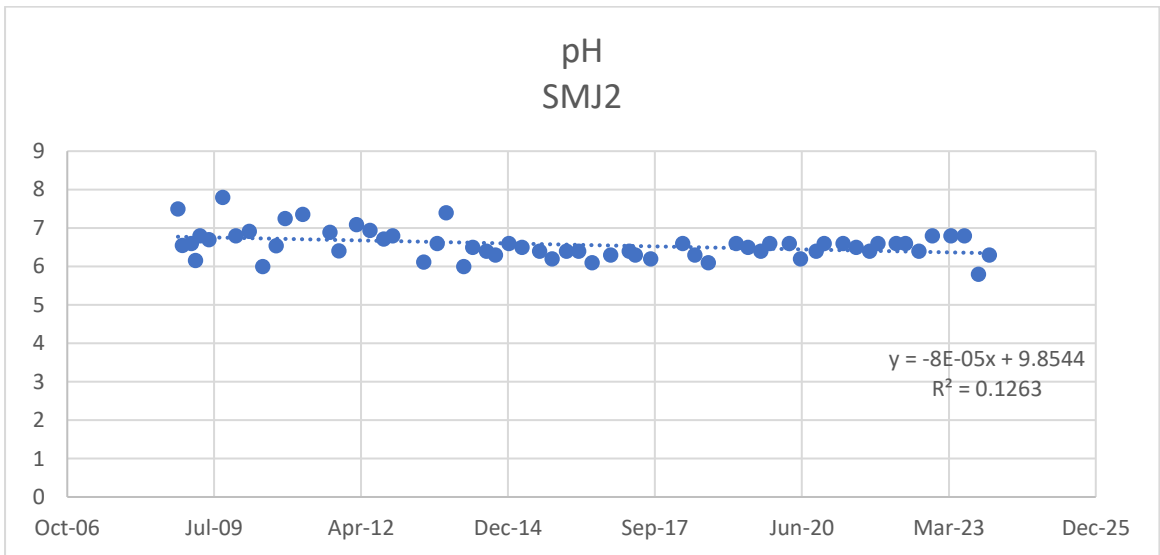
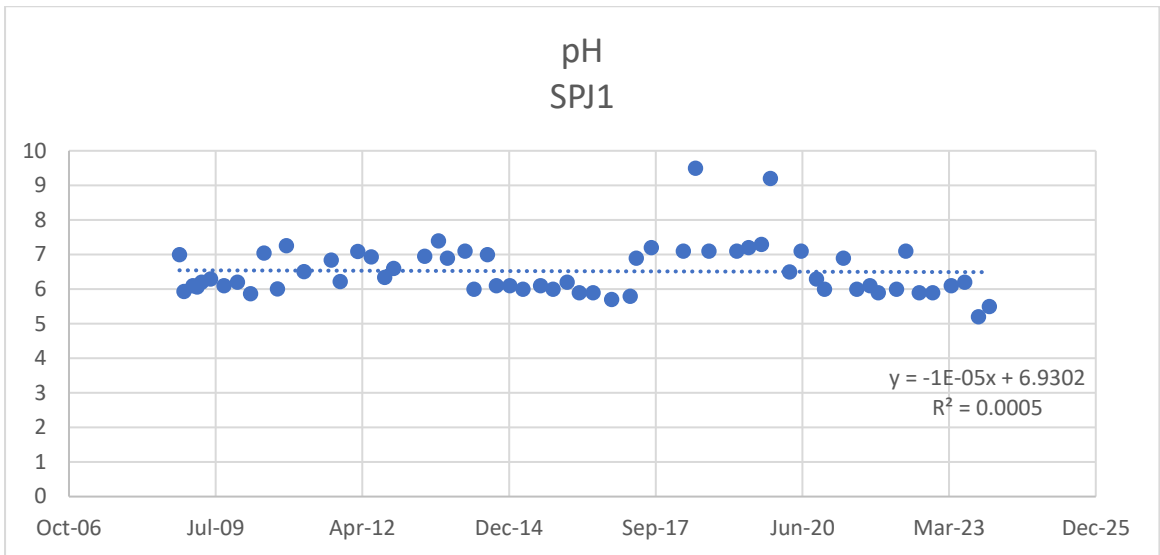


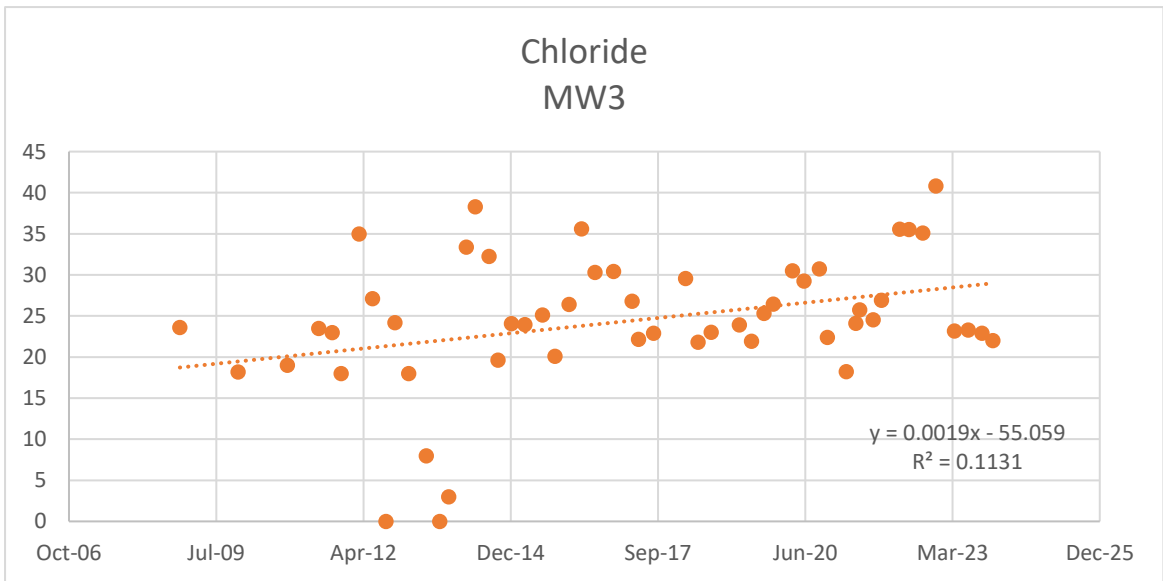
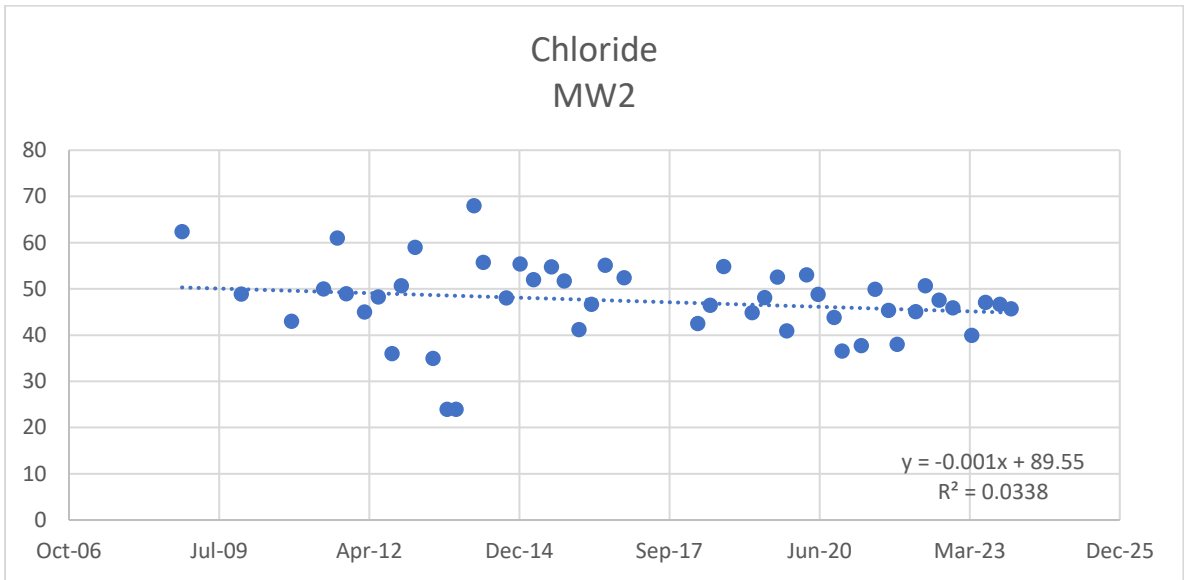
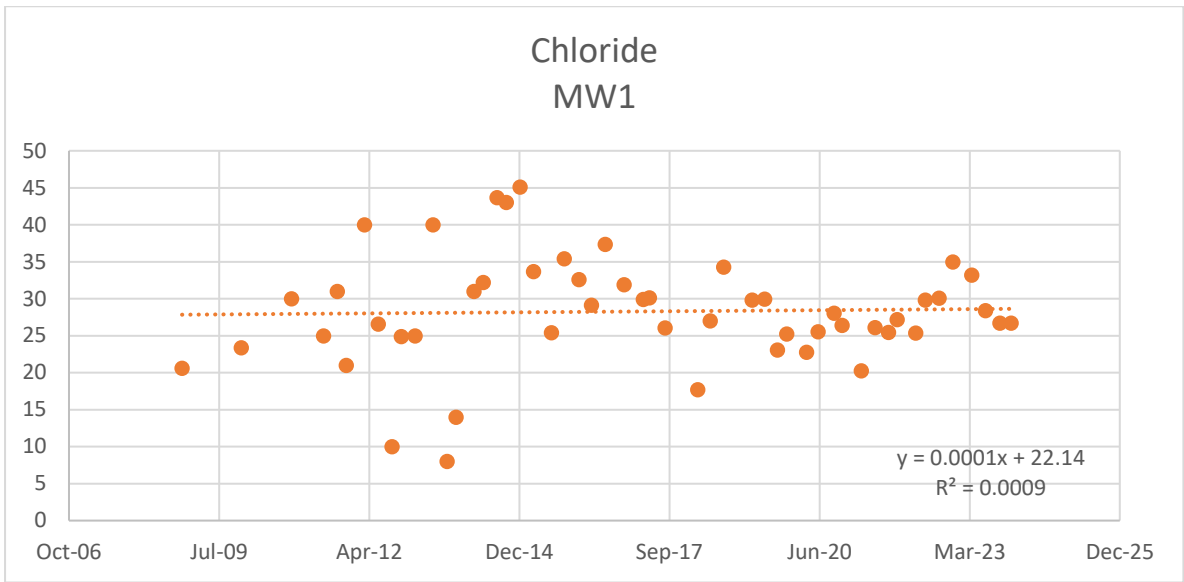


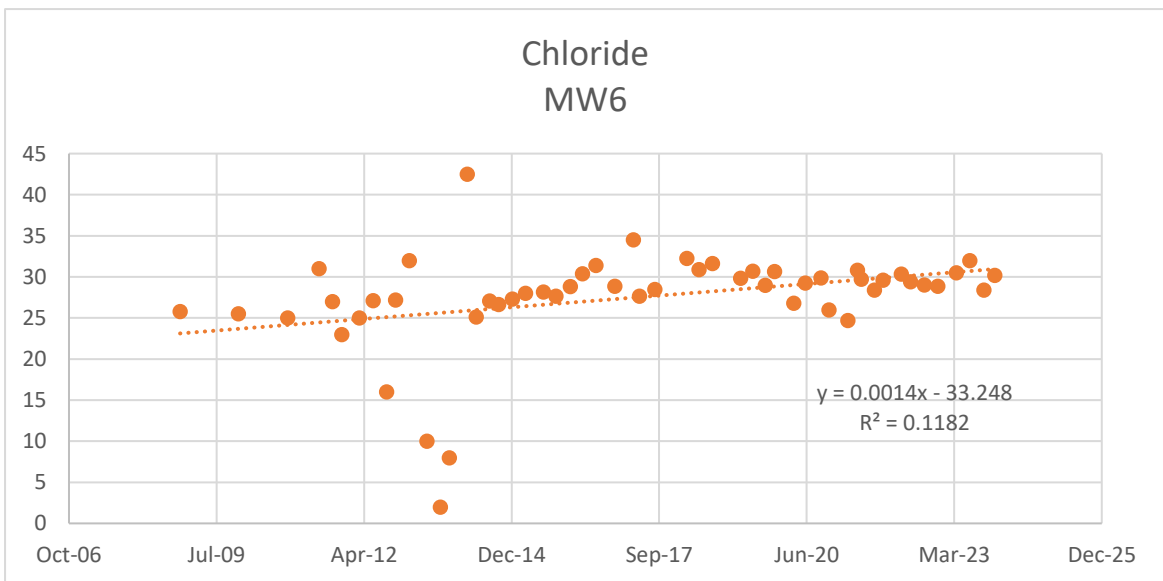
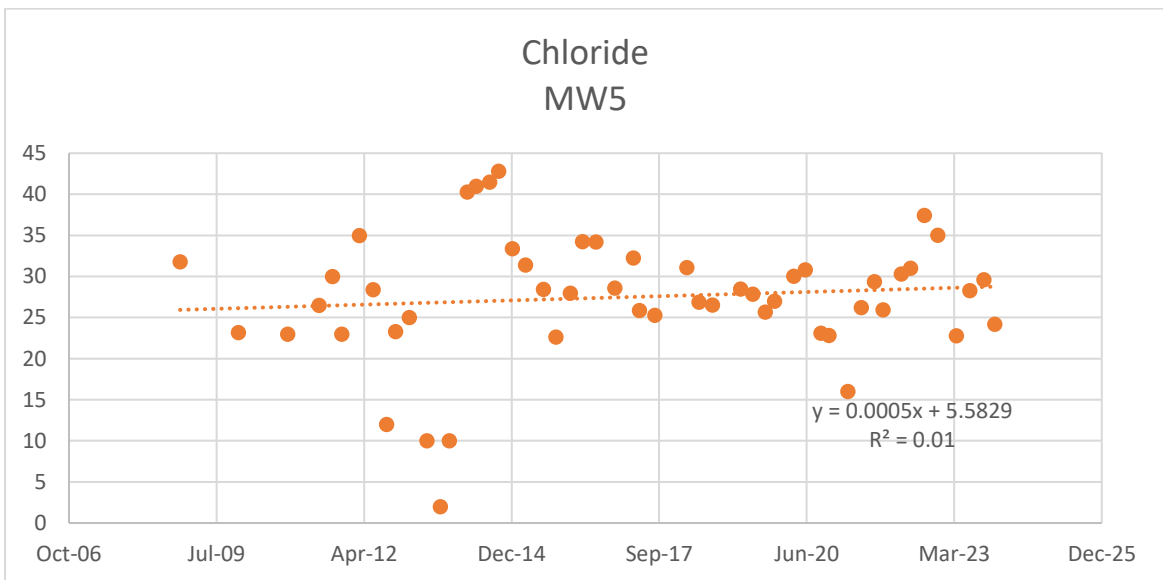
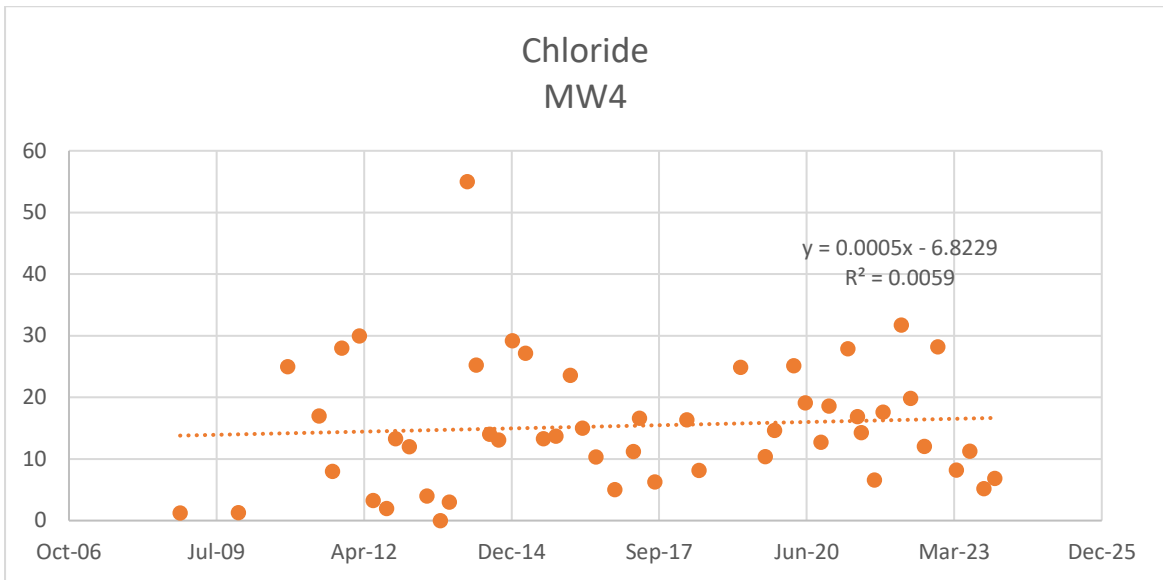




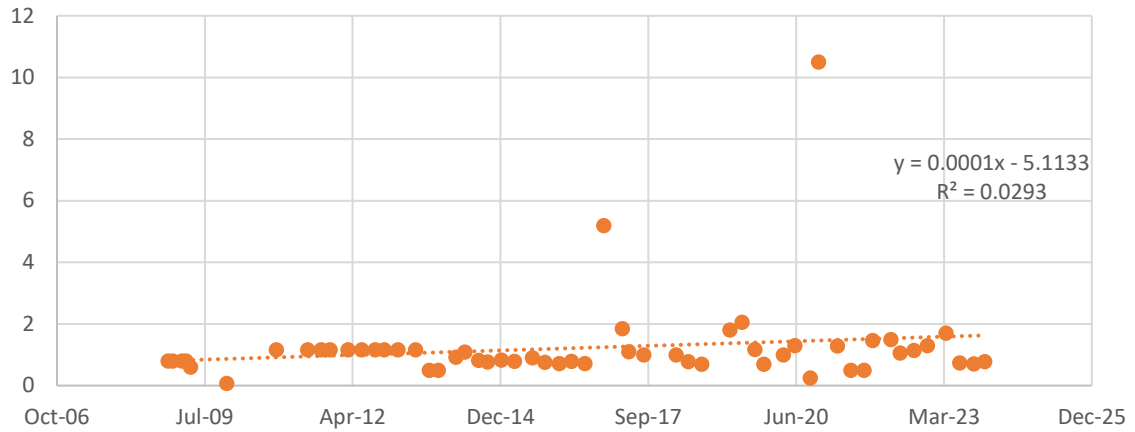




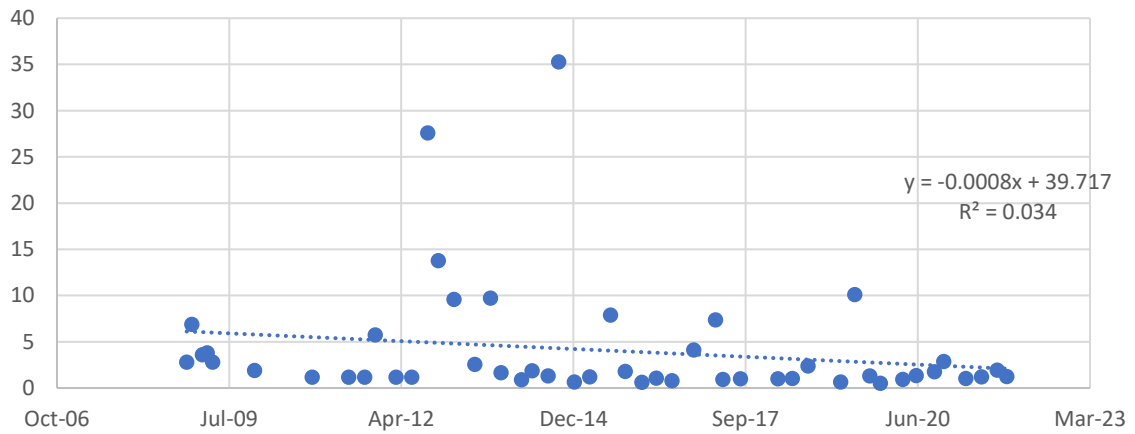




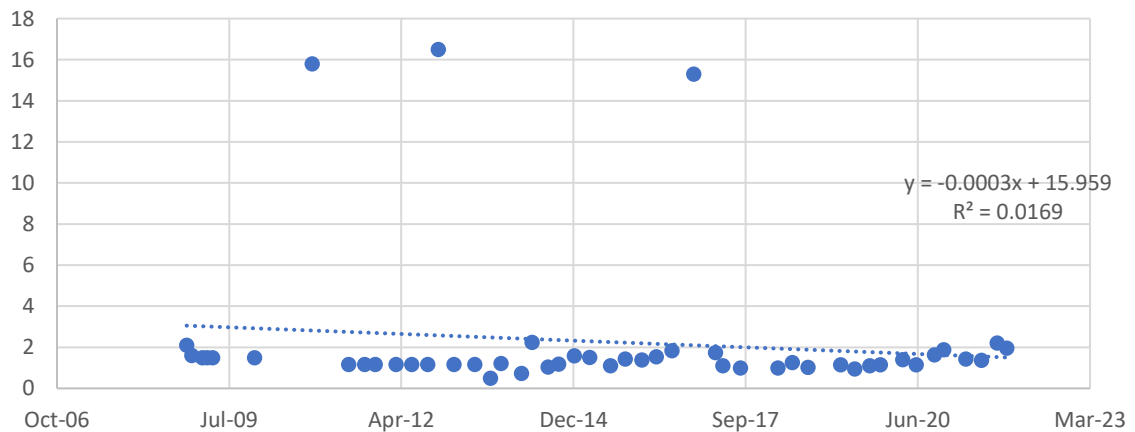
Potassium MW6

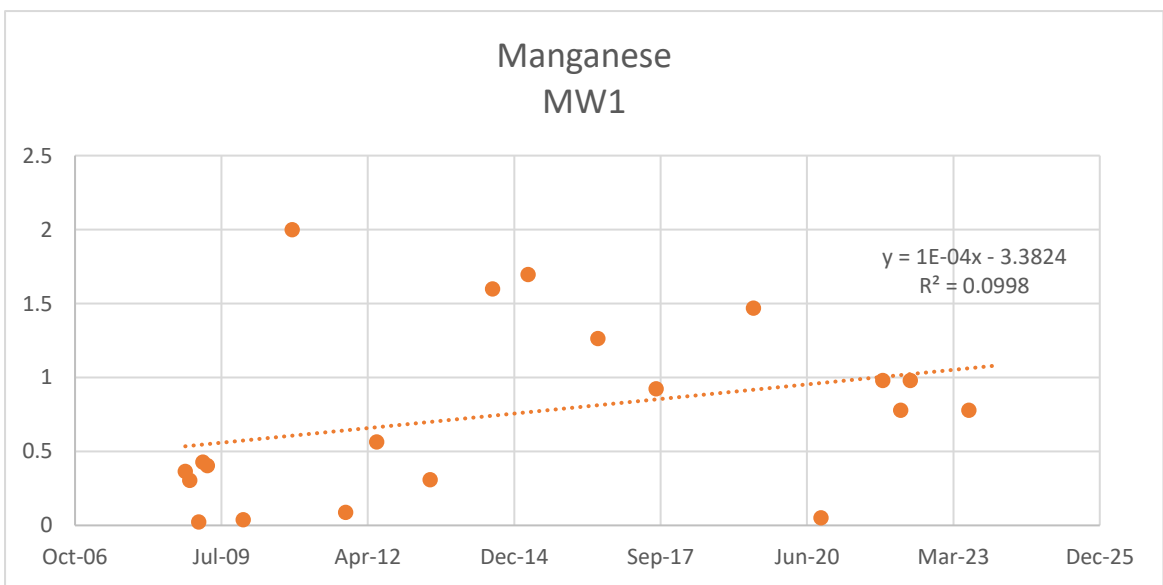
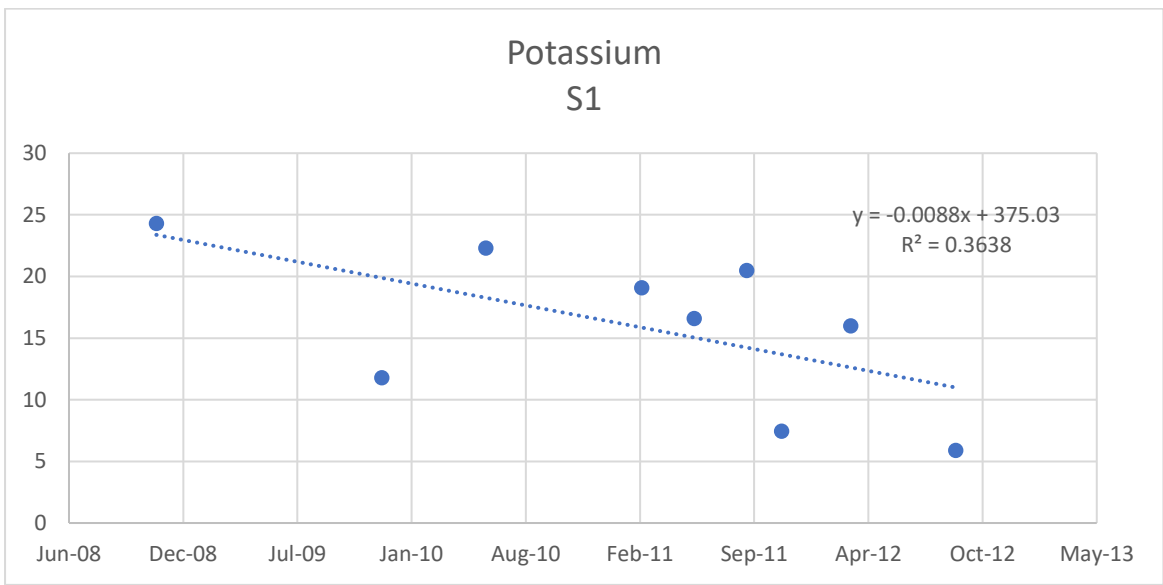
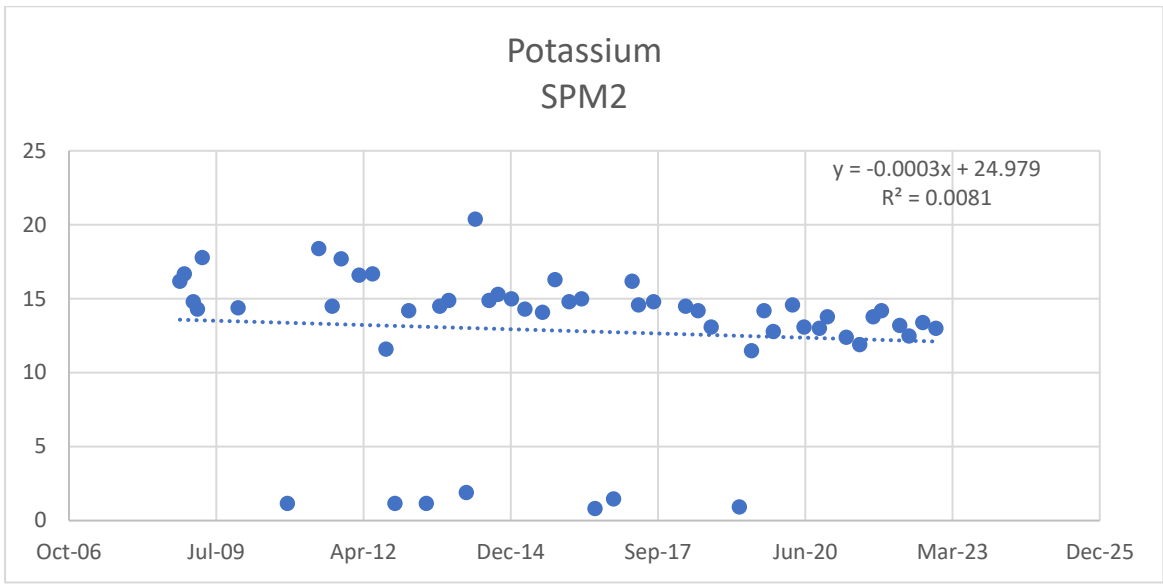


Potassium MW7

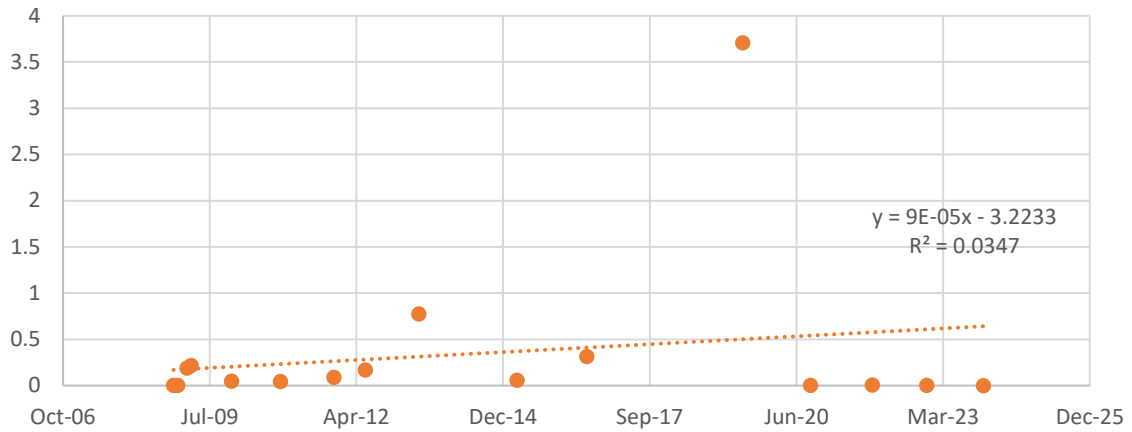


Potassium SPJ1

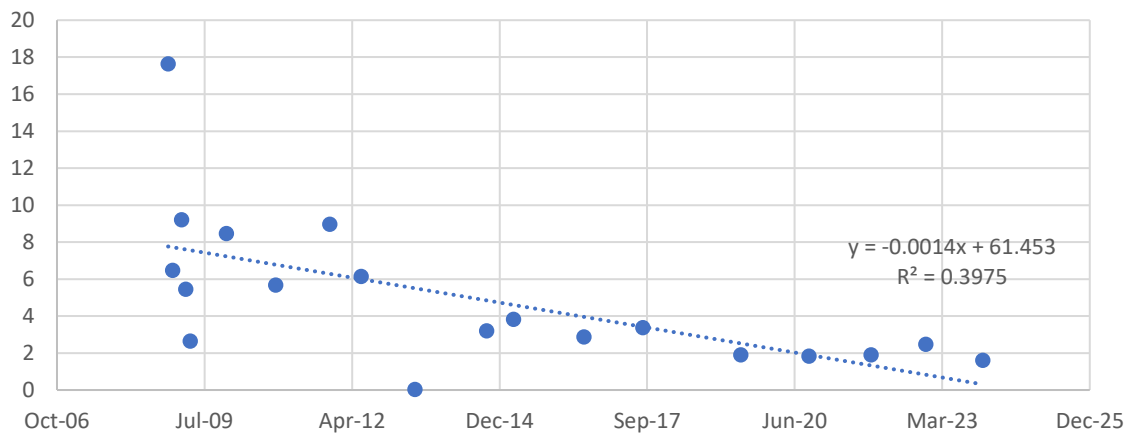




Manganese MW2



Manganese MW3



Manganese MW4

