ESC Environmental Ltd

Monitoring Results June 2023
HI-Volt Ireland Ltd
Ballyduff
Thurles
Co. Tipperary
IPPC Licence Register Number: W0267-01

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Document Control Sheet

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Contents

Section 1: Introduction

ESC Environmental Ltd have been commissioned by Hi Volt Ireland Ltd. to carry out a review of the results of the surface and ground water results at the Waste Facility at Ballyduff, Thurles, Co. Tipperary

Hi-volt carries out groundwater and surface water monitoring as specified in its Waste Licence number W0267-01.

This report presents the results of June 2023 groundwater monitoring and surface water monitoring carried out by ESC Environmental Ltd.

Monitoring and Reporting requirements

The monitoring and reporting requirements which have been agreed with the Environmental Protection Agency (EPA) are presented in **Appendix 1**.

This report was prepared by Mr. Peter McCormick and reviewed and checked by Mr Martijn Leenheer. The report is accurate, and representative of the monitoring completed in June 2023.

Section 2: Site Description

Site Location and Surrounding Land use

The Hi-Volt site is located in the townland of Ballyduff, Thurles, Co. Tipperary and is surrounded by agricultural land with the nearest off-site dwelling house approximately 50 metres to the northeast of the site.

The site is approximately 4 km west of the M8 motorway and approximately 7.5 km northeast of Thurles town. The River Drish, a tributary of the River Suir, is located approximately 30 metres east of the site boundary and flows in a north-south direction.

The facility has operated since 2000 and has held an EPA waste licence since May 2011. Prior to operating as a waste recycling facility, the battery retail part of the business operated at the site on a smaller scale. Metal processing activities (including catalytic convertors) take place within an enclosed building in the northern region of the site. Batteries are stored indoors and filling of dry batteries with acid is undertaken in a segregated workshop. Currently surface water from the site flows into a surface water drainage system which comprises an oil/water separator and retention tanks before discharging to a soak pit. Two groundwater abstractions wells are present on the site, GW2 is located in the northern region of the site and GW1 is located in the southern region of the site.

Site Layout

The site layout is shown in Figure 1. It covers an area of approximately 9,100 m^2 and includes a car park, administration offices, a Catalytic convertor building, a Battery Distribution facility, and warehouses. The River Drish, which is a tributary of the River Suir, flows from north to south along the eastern boundary of the site.

Two groundwater abstraction wells are located at the Hi-Volt facility (i.e. GW1 and GW2). GW1 well is located adjacent to the Hi-Volt reception building, to the southwest of the Hi-Volt site. GW2 is located within a pump house located immediately to the east of the out building.

The locations of these monitoring points are shown in Figure 1.

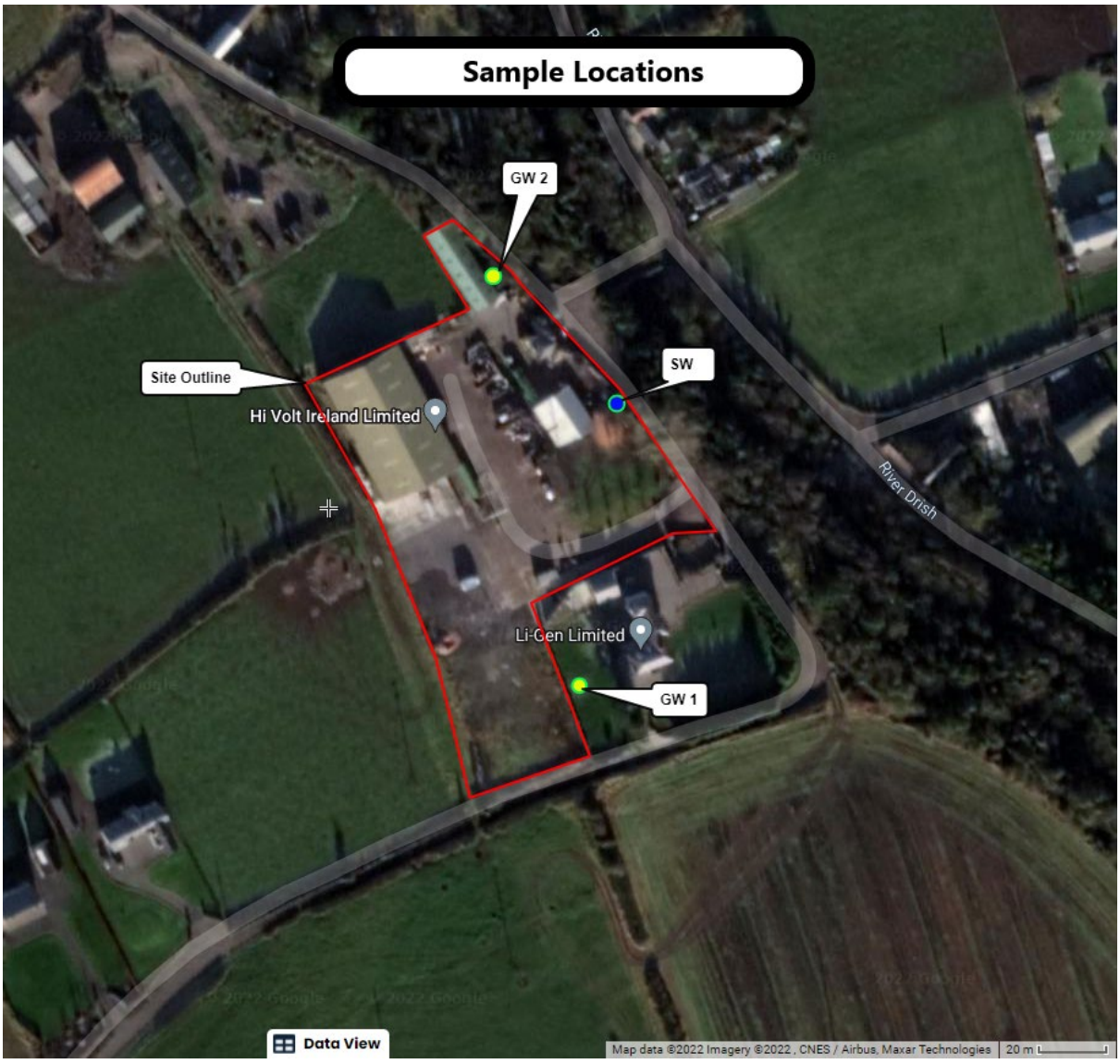


Figure 1: Site layout and sample locations

Section 3: Groundwater Monitoring

Groundwater Wells

Locations

There are two groundwater wells on site. GW1 is located on the south side of the site, and GW2 is in the north side of the site next to the copper shed.

Groundwater sampling was carried out on the 30th of June 2023 at the two monitoring wells as shown on **Figure 1**.

Groundwater Levels and Flow Direction

Groundwater levels were measured to the nearest centimetre relative to the top of the steel casing using a standard dip meter probe that emits a high pitch signal upon contact with water. The top of each well has been measured to ordnance datum and the measurements to the ordnance datum are illustrated in the graph in Appendix 2.

Groundwater Quality

Sampling Method

Wells were either purged a minimum of 3 well volumes or purged dry and allowed to refill before sample collection.

The samples for chemical analysis were submitted to BHP Laboratories Ireland within 24 hours of sampling. The methodologies used were all ISO/CEN approved or equivalent.

Laboratory Results

Groundwater samples were analysed for the parameter list.

The laboratory results are presented in full in Appendix 4 and summarised in Table 2. Table 2 includes Interim Guideline Values (IGV) published by the EPA. The IGVs are not statutory, however, they 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 results are also compared to the Groundwater Regulations Threshold Value (GTV), which were introduced in 2010 (S.I. 9 of 2010) on foot of requirements from the Water Framework Directive and have evolved from the IGVs. It should be noted however, that while the GTVs provide an indication of potential contamination, they are not generally applicable to small unpumped well water quality data. They were developed to assess groundwater quality for large water bodies using large drinking water supply wells which are generally more representative of larger areas of aquifers/groundwater bodies.

Parameter	U	GW-1	GW-2	IGV[3]	GTV
Chloride	mg/L	16	38	30	24-187.5[2]
Electrical Conductivity	µS/cm	566	745	1000	800-1875[2]
pH		7.18	7.03	6.5 - 9.5	-
Total Ammonia	mg/L	<0.01	<0.01	0.15	-
Ammonium	mg/L	0.42	<0.129	-	0.065-0.175[1]
Total Nitrogen	mg/L	10	9.9	-	-
Iron	mg/L	0.56	0.25	0.2	-
Mercury	mg/L	<0.00025	<0.00025	0.001	0.0075[2]
Manganese	mg/L	0.13	0.083	0.05	-
Lead	mg/L	<0.0025	<0.0025	0.01	0.0075[2]
Boron	mg/L	<0.025	0.035	1	0.750[1]
Calcium	mg/L	57	107	200	-
Cadmium	mg/L	<0.005	<0.005	0.005	0.00375[2]
Chromium	mg/L	<0.005	0.007	0.03	0.0375[2]
Copper	mg/L	<0.025	<0.025	0.03	1.5[1]
Potassium	mg/L	<5	<5	5	-
Magnesium	mg/L	23	17	50	-
Sodium	mg/L	<10	<10	150	150[1]
Nickel	mg/L	<0.01	<0.01	0.02	0.015[1]
Zinc	mg/L	<0.025	0.037	0.1	-
Mineral Oil	mg/L	<0.01	<0.01	0.01	0.0075[2]

Table 2: Results of Laboratory Analysis for Groundwater Monitoring for June 2023

[1] S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010.

[2] S.I. No. 366/2016 - European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016

[3] Environmental Protection Agency (EPA) report 'Towards Setting Guideline Values for the Protection of Groundwater; Interim Report' (2003). Note these standards are presented for guideline purposes only, therefore, due care should be exercised in cross-referencing these standards with the groundwater results obtained.

Section 4: Surface Water Data

These samples are taken from a designated sample point before discharge to the 9m^3 soakaway. Where the results are not shown it means that no flow was observed, and representative samples could not be taken.

The surface water sampling requires a less expansive suite of tests, with the parameters tested being, pH, Chemical Oxygen Demand, Total Suspended Solids, and Mineral Oil.

There was no flow on the surface water in June, so sampling was not able to be carried out.

Section 5: Discussion

The analytical data collected by Environmental Science Consultancy has been collated and presented graphically in **Appendix 2**.

Groundwater

The trend of Iron and Manganese exceeding the IGV in GW1 continues this month. GW2 has a rise in the levels of both manganese and iron above the IGV also which is unusual.

This is the first time GW2 has exceeded the IGV in Manganese since 30/07/2021, and the first time Iron has exceeded the IVG since 30/04/2021.

The irregular results for Conductivity and pH from the May sampling event have returned to their baseline levels.

Surface Water

Warning Levels and Action Levels were presented to the Agency and acknowledged by the Agency on 14 October 2020, see Appendix 3.

There was no flow on the surface water in June, so sampling was not able to be carried out.

Section 7: Conclusions

The groundwater sampling results have few exceedances for the IGV levels set namely Iron and Manganese in the groundwater well GW1 which is not near the activity of the site.

Manganese and Iron exceeded the IGV in GW2 also and it will be seen if this continues next month, or if it returns to baseline concentrations.

The surface water sampling in June was not carried out due to lack of flow.

Overall, the results from June follow the usual trends established for the site.

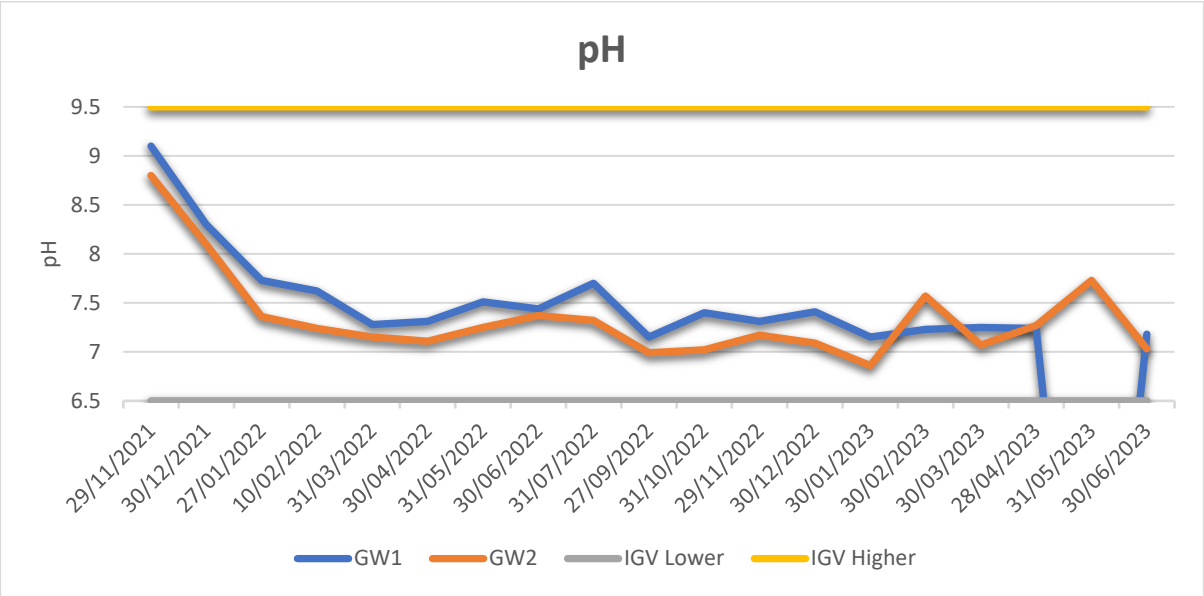
Appendix 1: Monitoring Requirements

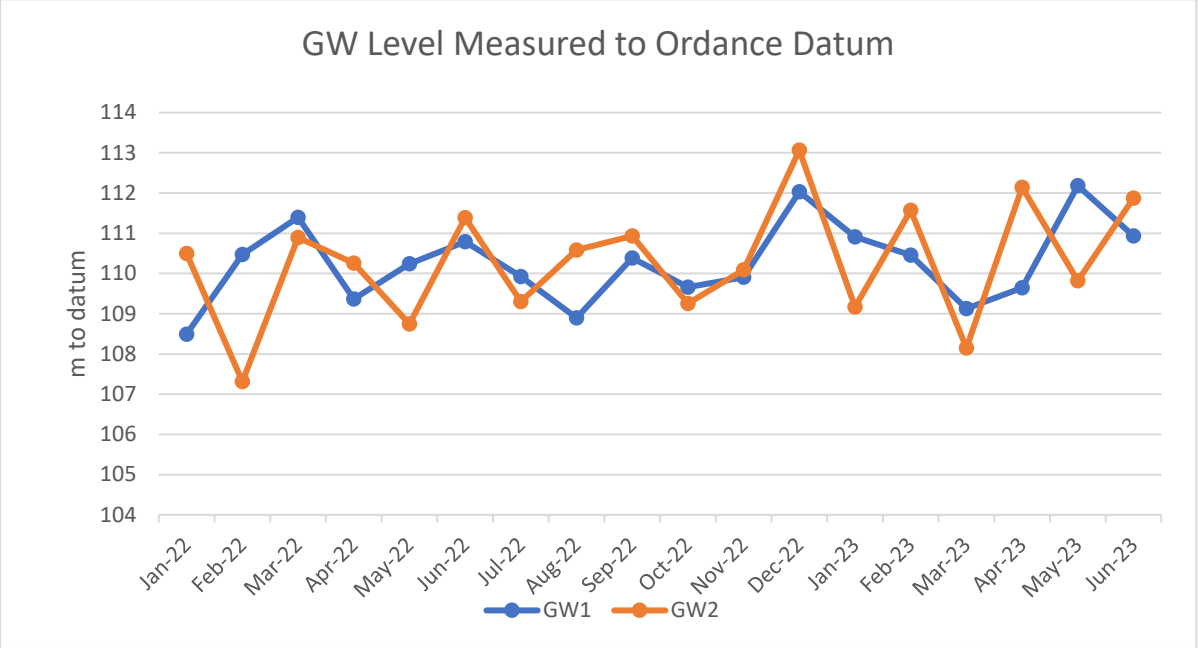
Parameters for Groundwater	Monitoring Frequency
pH	Monthly
Electrical Conductivity	Monthly
Mineral Oil	Monthly
Total Nitrogen	Monthly
Boron	Monthly
Copper	Monthly
Iron	Monthly
Manganese	Monthly
Zinc	Monthly
Chloride	Monthly
Total Ammonia	Monthly
Ammonium	Monthly
Potassium	Monthly
Magnesium	Monthly
Sodium	Monthly
Cadmium	Monthly
Chromium	Monthly
Mercury	Monthly
Nickel	Monthly
Calcium	Monthly
Lead	Monthly

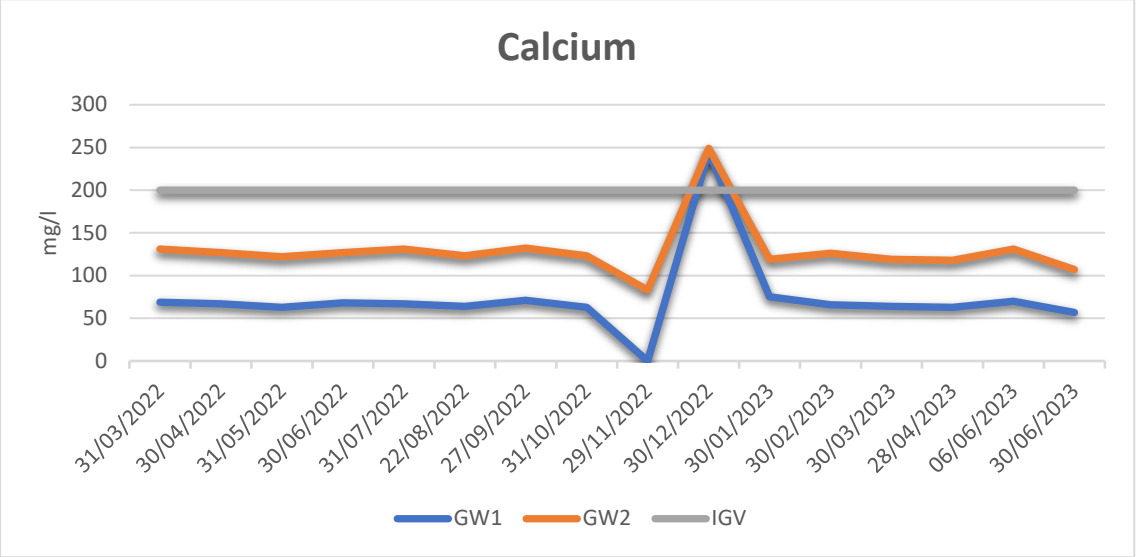
Parameters for Surface Water	Monitoring Frequency
pH	Monthly
Suspended Solids	Monthly
Chemical Oxygen Demand	Monthly
Mineral Oil	Monthly

Appendix 2: Trend Data

Groundwater Graphs



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250
200
150
100
50
0
mg/l
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30/04/2022
31/05/2022
30/06/2022
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22/08/2022
27/09/2022
31/10/2022
29/11/2022
30/12/2022
30/01/2023
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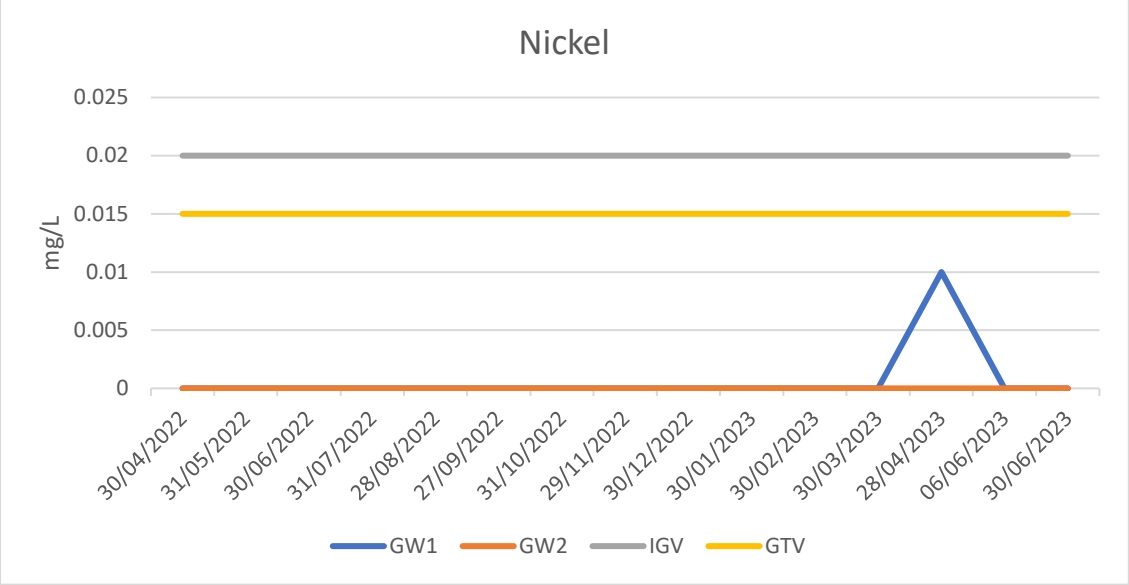
30/03/2023
28/04/2023
06/06/2023
30/06/2023
GW1
GW2
IGV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0.02
0.015
0.01
0.005
0
mg/L
30/04/2022
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28/08/2022
27/09/2022
31/10/2022
29/11/2022
30/12/2022
30/01/2023
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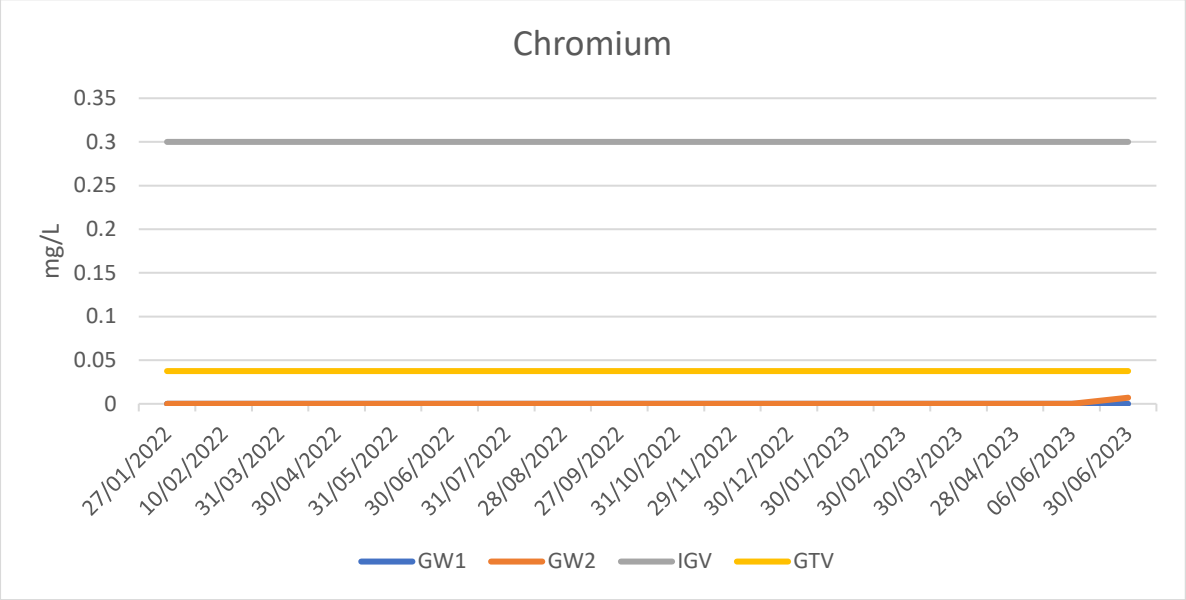
06/06/2023
30/06/2023
GW1
GW2
IGV
GTV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0.05
0
mg/L
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30/04/2022
31/05/2022
30/06/2022
31/07/2022
28/08/2022
27/09/2022
31/10/2022
29/11/2022
30/12/2022
30/01/2023
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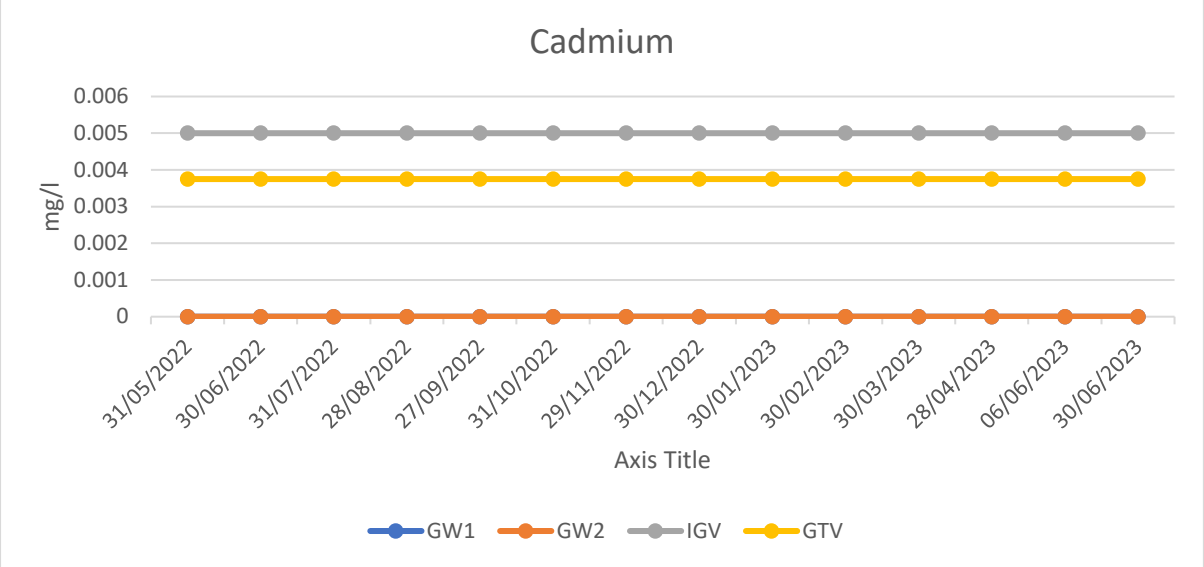
30/06/2023
GW1
GW2
IGV
GTV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0.001
0
mg/l
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31/10/2022
29/11/2022
30/12/2022
30/01/2023
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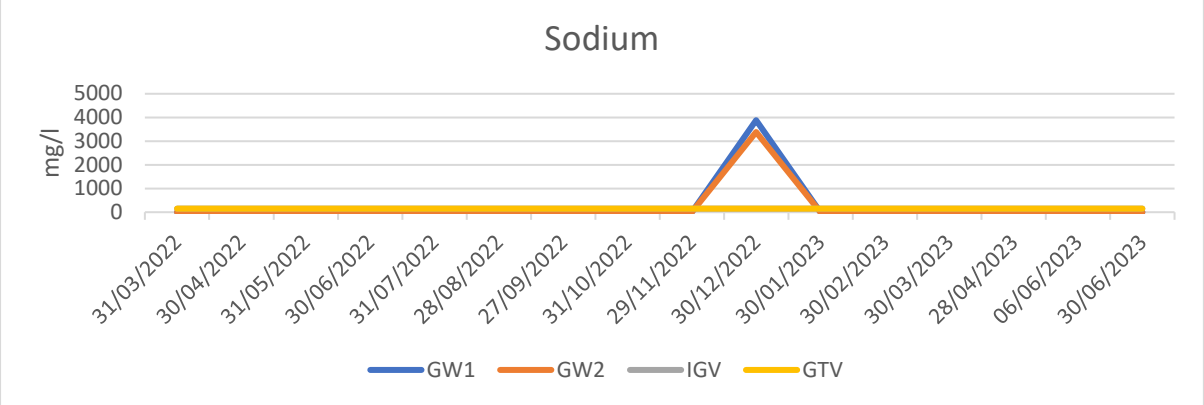
30/03/2023
28/04/2023
06/06/2023
30/06/2023
Axis Title
GW1
GW2
IGV
GTV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mg/l
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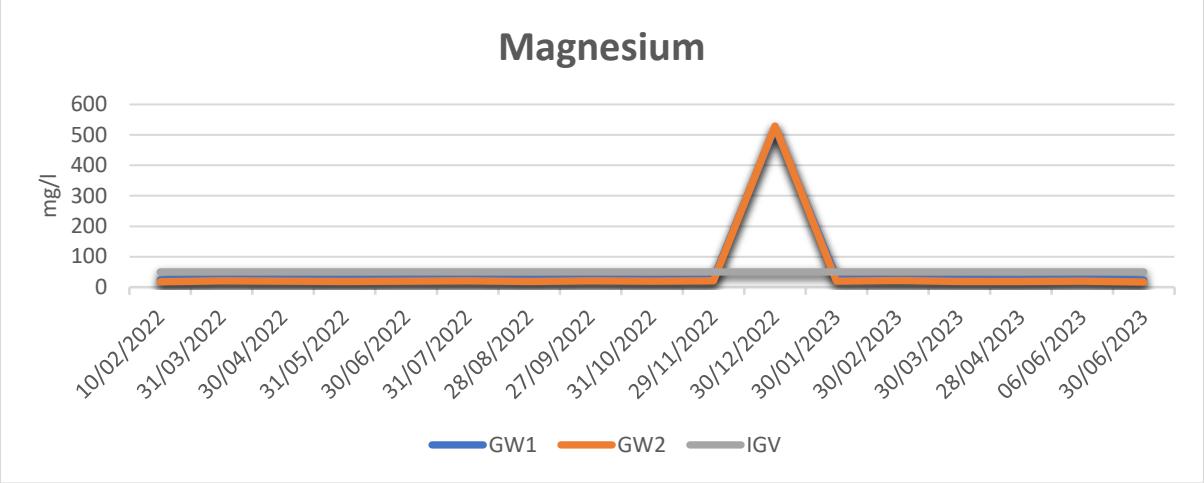
30/06/2023
GW1
GW2
IGV
GTV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27/09/2022
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29/11/2022
30/12/2022
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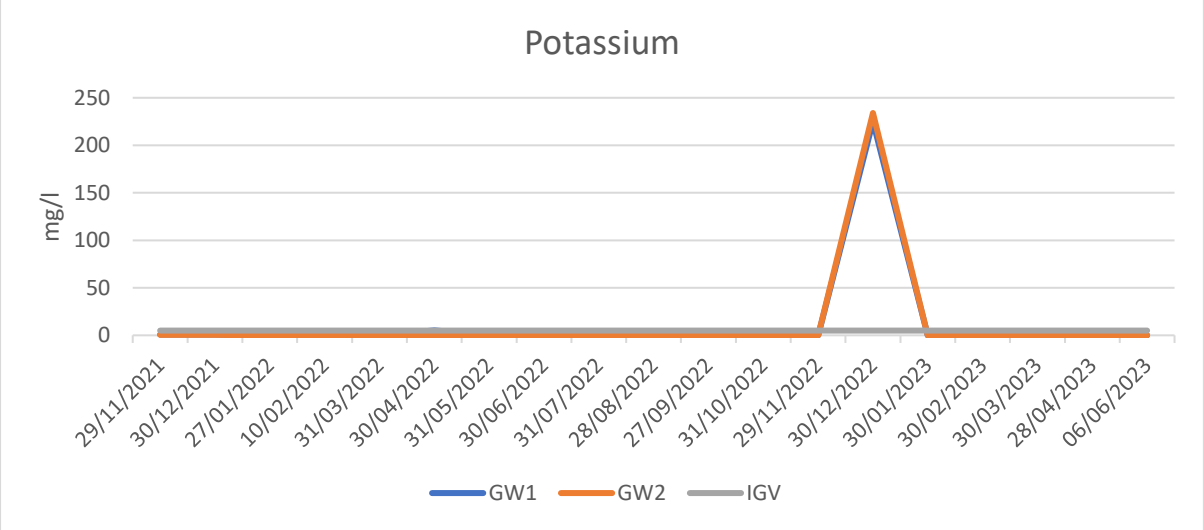
06/06/2023
30/06/2023
GW1
GW2
IGV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150
100
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30/06/2022
31/07/2022
28/08/2022
27/09/2022
31/10/2022
29/11/2022
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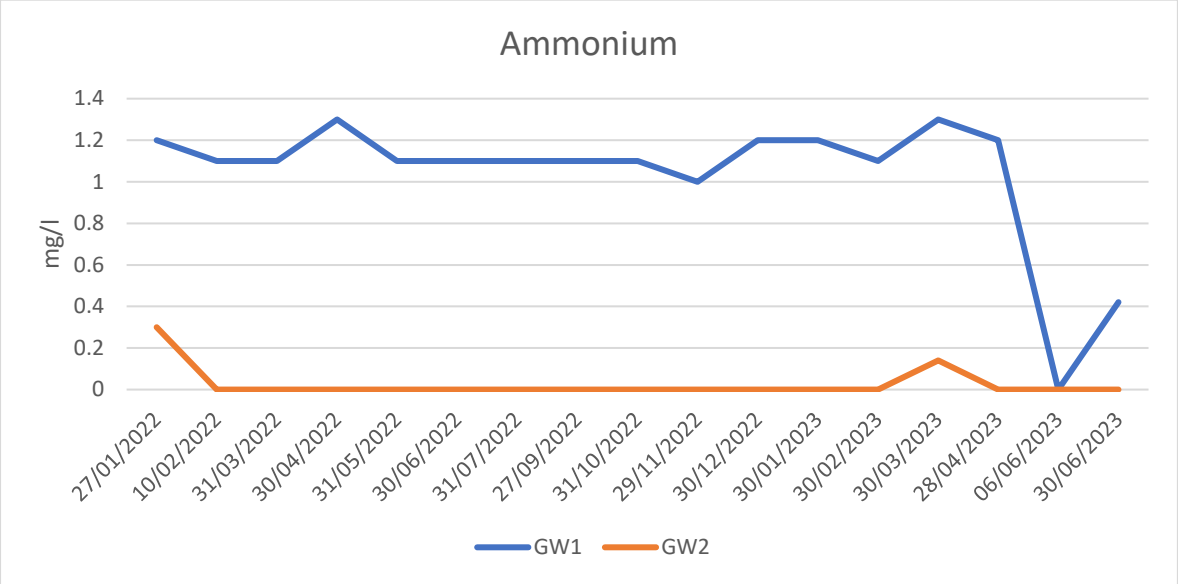
28/04/2023
06/06/2023
GW1
GW2
IGV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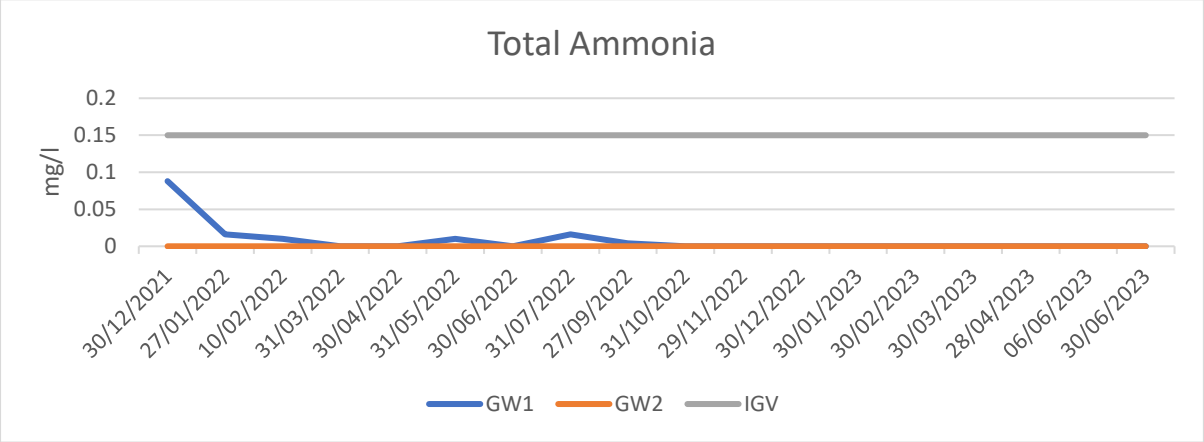
30/06/2023
GW1
GW2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30/12/2022
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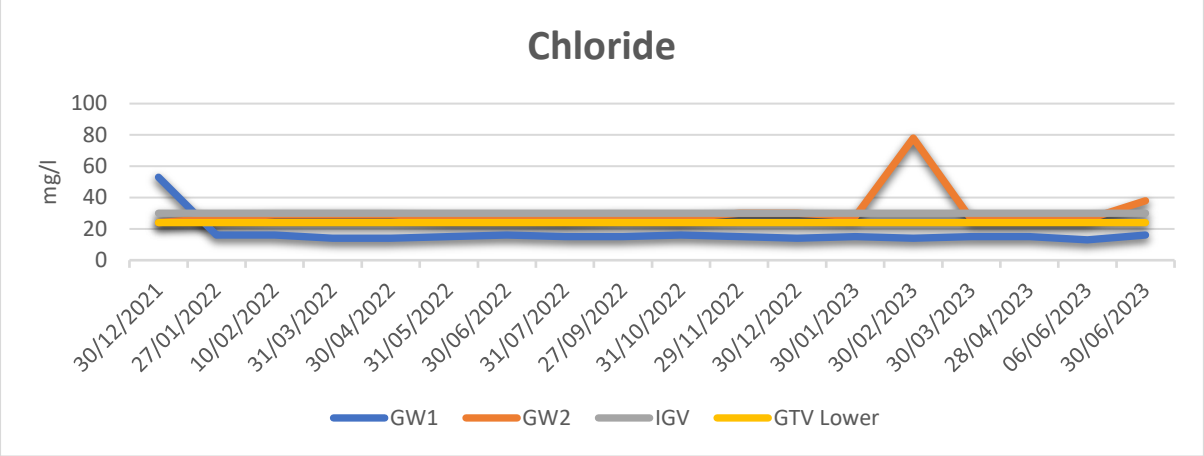
GW1
GW2
IGV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30/01/2023
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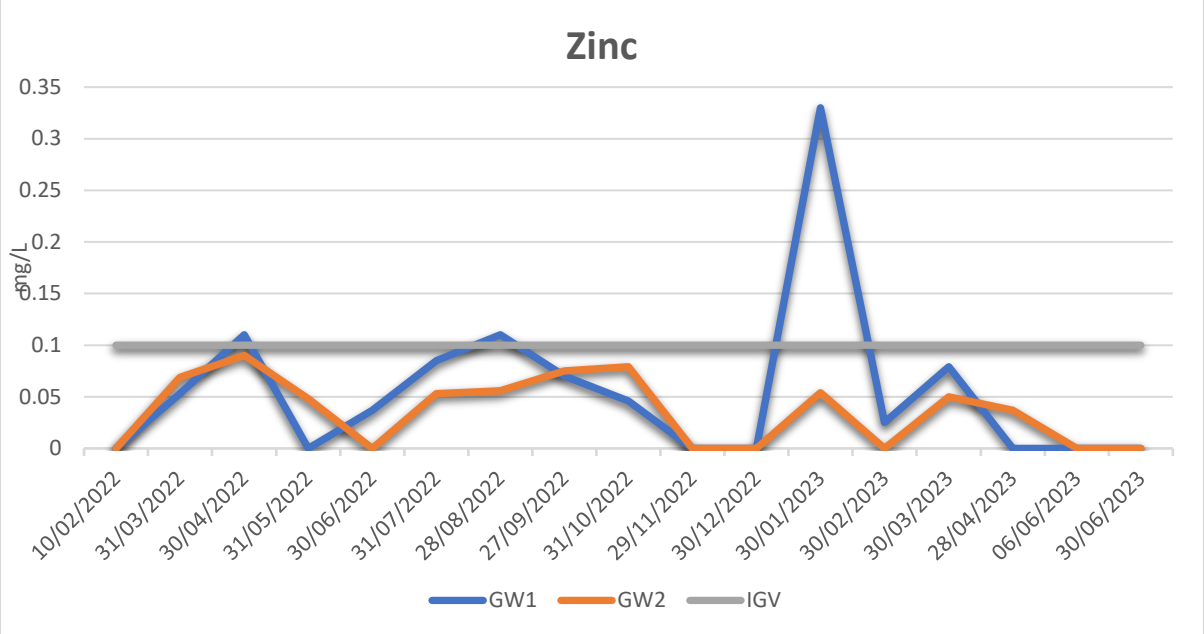
GW1
GW2
IGV
GTV Lower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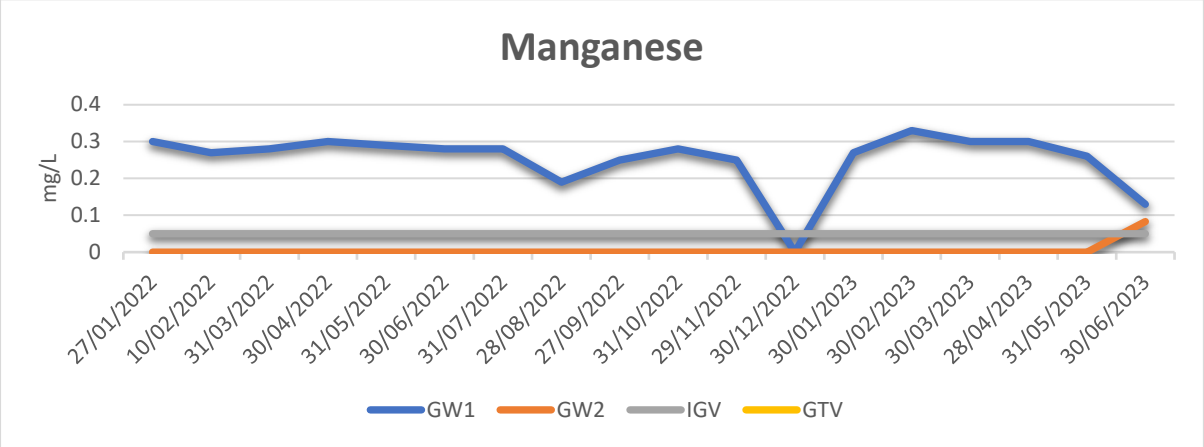
GW1
GW2
IGV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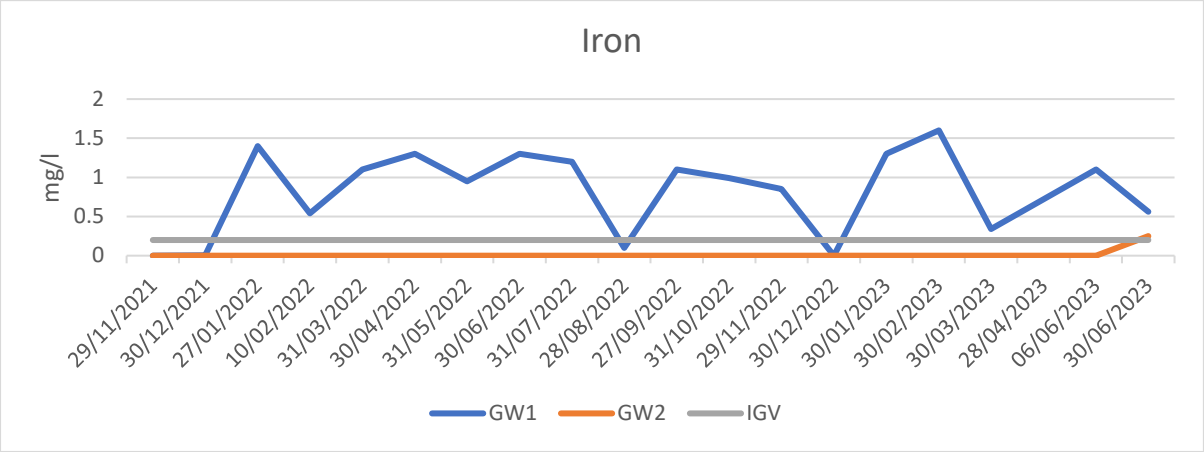
GW2
IGV
GTV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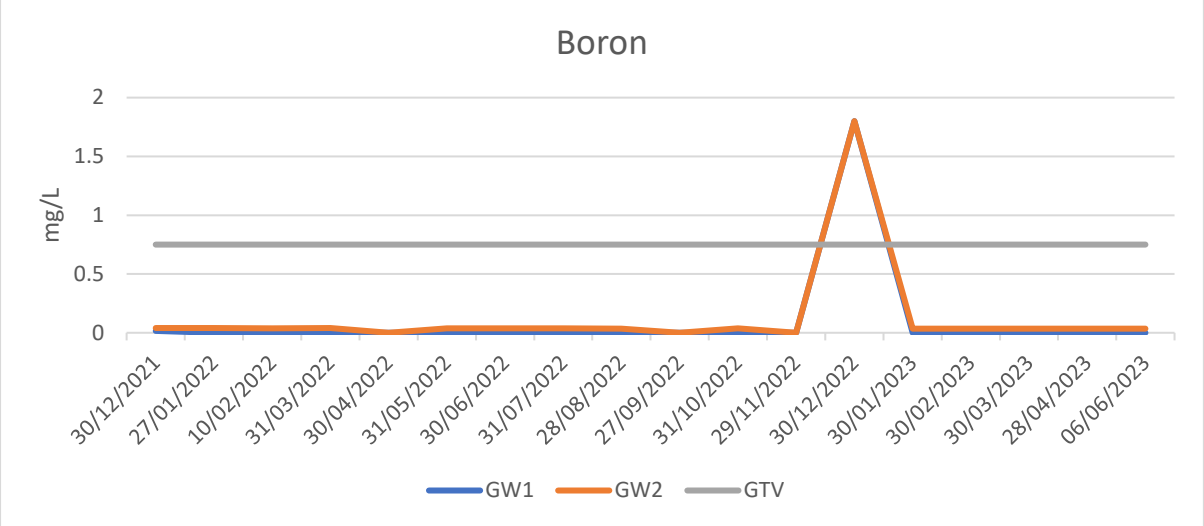
GW1
GW2
IGV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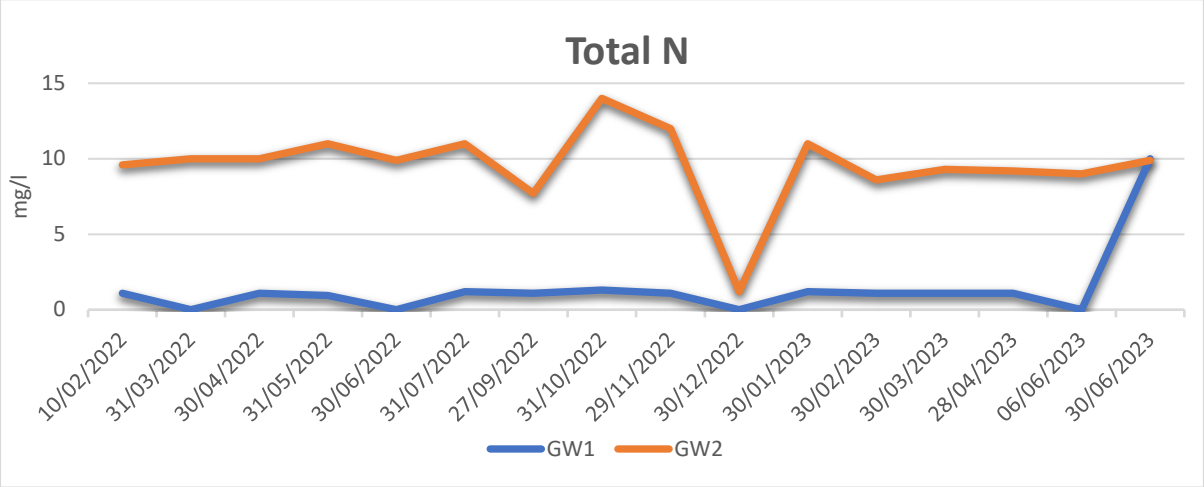
GW1
GW2
GTV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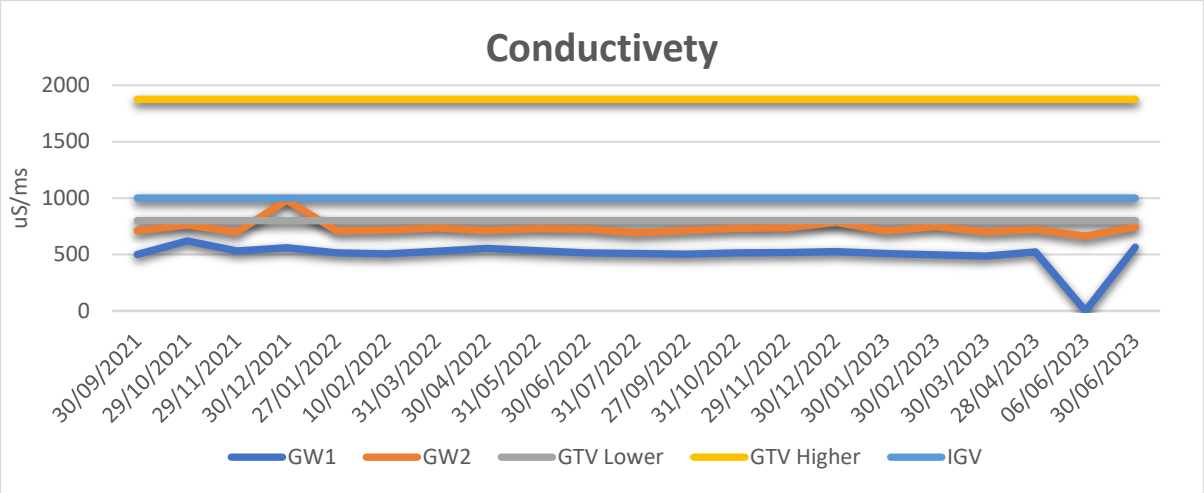
GW1
GW2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30/12/2022
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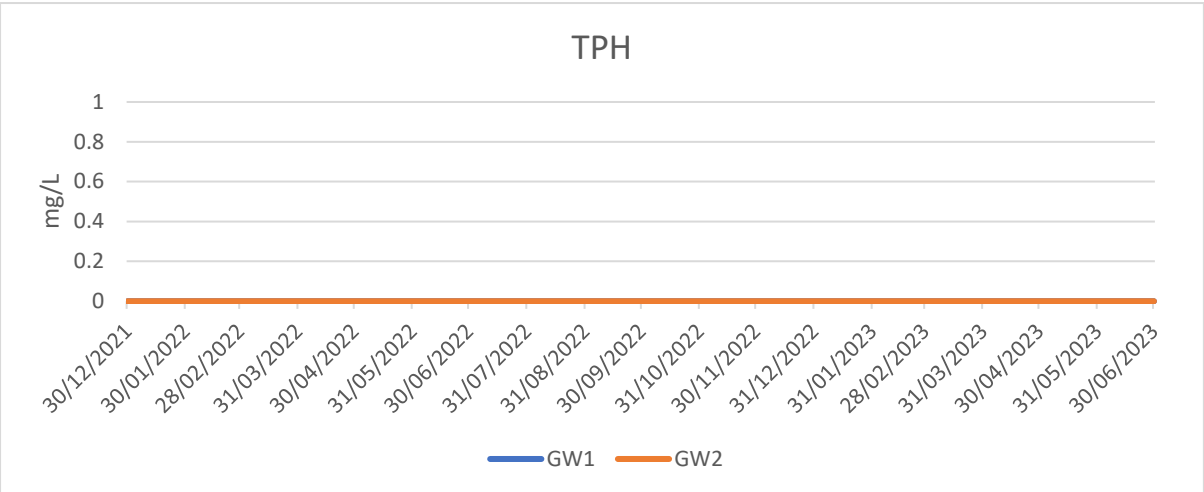
GW1
GW2
GTV Lower
GTV Higher
IGV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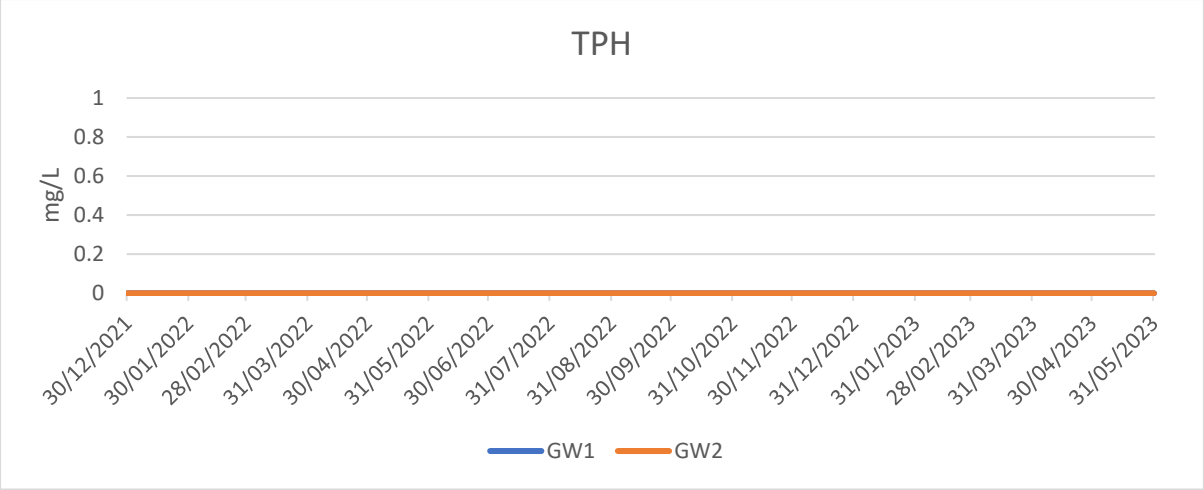
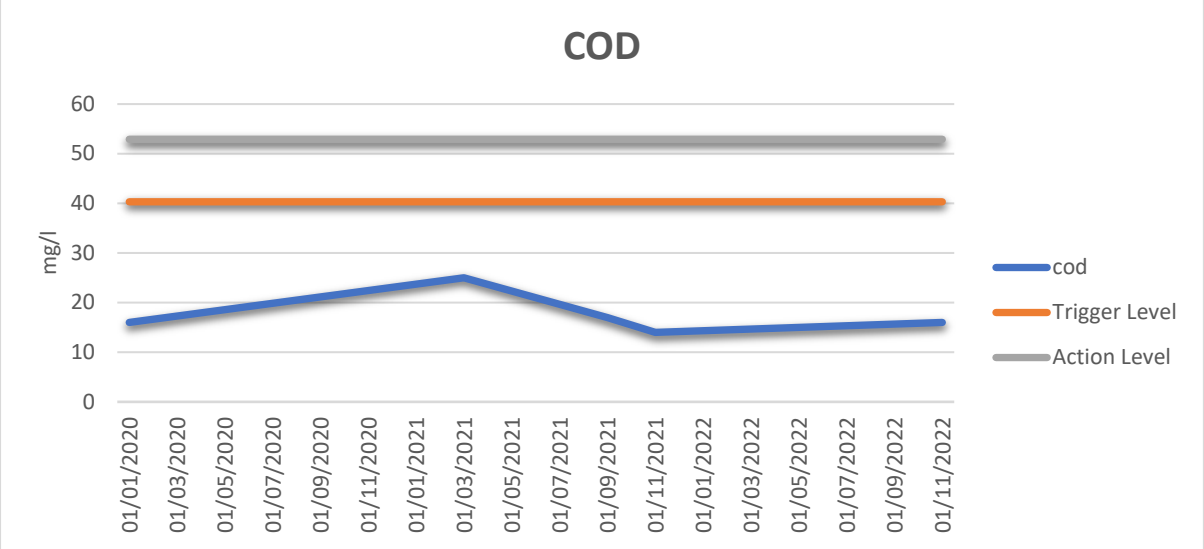
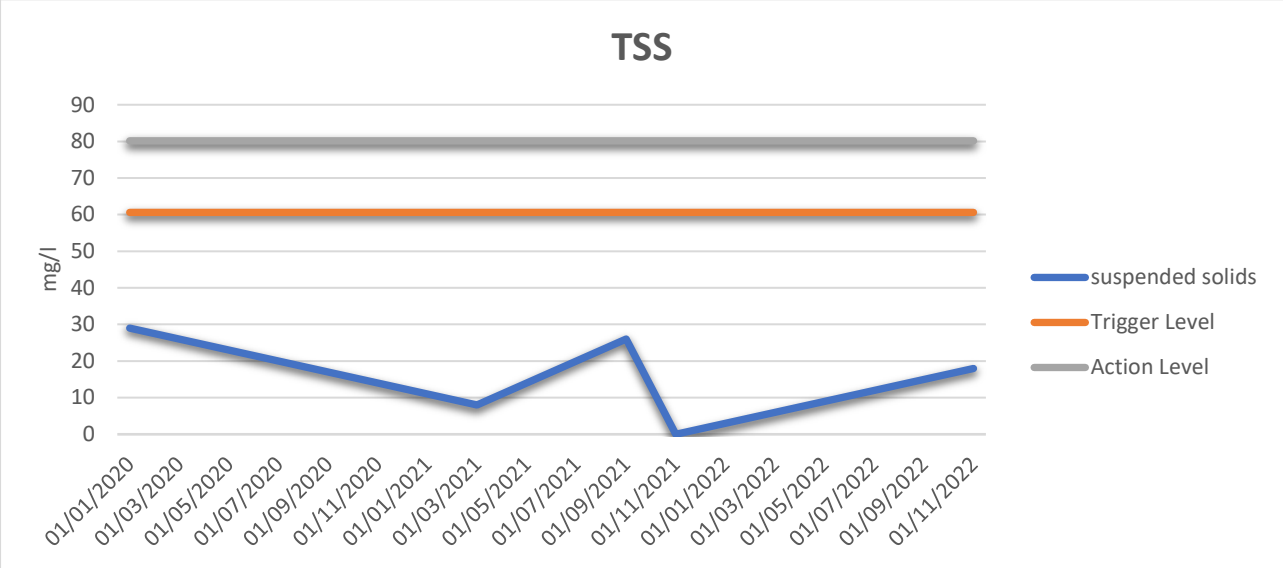
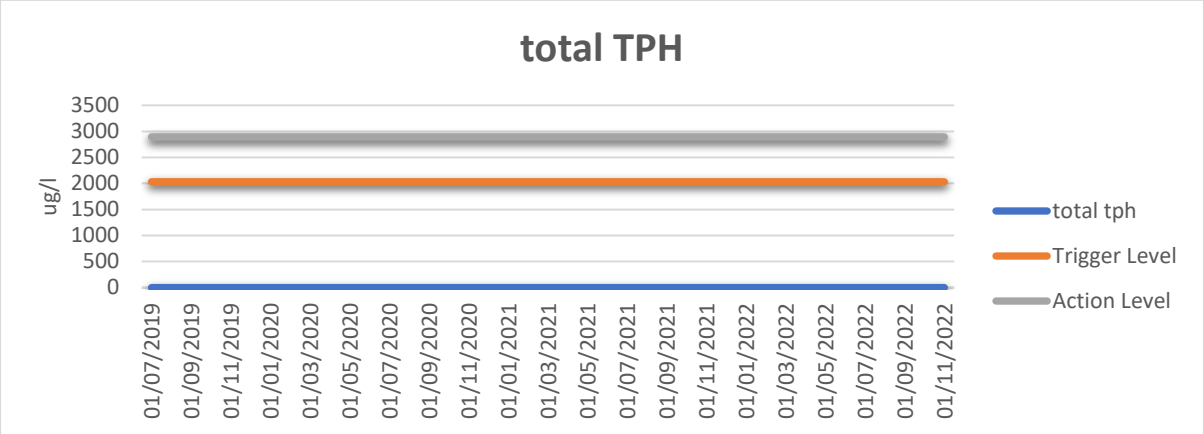
0
30/12/2021
30/01/2022
28/02/2022
31/03/2022
30/04/2022
31/05/2022
30/06/2022
31/07/2022
31/08/2022
30/09/2022
31/10/2022
30/11/2022
31/12/2022
31/01/2023
28/02/2023
31/03/2023
30/04/2023
31/05/2023
30/06/2023
GW1
GW2

Surface Water Graphs






TSS
mg/l
90
80
70
60
50
40
30
20
10
0
01/01/2020
01/03/2020
01/05/2020
01/07/2020
01/09/2020
01/11/2020
01/01/2021
01/03/2021
01/05/2021
01/07/2021
01/09/2021
01/11/2021
01/01/2022
01/03/2022
01/05/2022
01/07/2022
01/09/2022
01/11/2022
suspended solids
Trigger Level
Action Level


total TPH
ug/l
3500
3000
2500
2000
1500
1000
500
0
01/07/2019
01/09/2019
01/11/2019
01/01/2020
01/03/2020
01/05/2020
01/07/2020
01/09/2020
01/11/2020
01/01/2021
01/03/2021
01/05/2021
01/07/2021
01/09/2021
01/11/2021
01/01/2022
01/03/2022
01/05/2022
01/07/2022
01/09/2022
01/11/2022
total tph
Trigger Level
Action Level

Appendix 3: Warning and Action Levels SW

Licensing Notice Details

Eden >> All Licences >> Hi-Volt Ireland Limited (W0267-01) >> All Actions & Notices >>
Licensee Return EPA Initiated One Way Correspondence

Subject
Licensee Return EPA Initiated One Way Correspondence

Created Date
14/10/2020

Re: Trigger Levels

Dear Sir/Madam

The Agency wishes to advise you of the following:

The submitted trigger levels have been acknowledged.

	Warning level	Action level
pH	8.77	9.07
TPH	1745.24	2517.85
COD	30.27	39.37
TSS	43.9	57.52

Include these warning and action levels in all surface water reports going forward.

Yours sincerely
Aoife Stafford
Inspector
Office of Environmental Enforcement

Appendix 4: Laboratory Results