UKAS TESTING
4041

Environmental Science

Egniol Environmental Ltd
Llys Onnen
Ffordd Y Llyn
Parc Menai
Bangor
Gwynedd

e: ian.roberts@egniol.com
michelle.moran@egniol.com
connall.darlington@egniol.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-050564

Project / Site name:	Penhesgyn	**Samples received on:**	30/10/2024
Your job number:	10022	**Samples instructed on/ Analysis started on:**	30/10/2024
Your order number:	POP002581	**Analysis completed by:**	04/11/2024
Report Issue Number:	1	**Report issued on:**	04/11/2024
Samples Analysed:	7 water samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

UKAS TESTING
4041

Analytical i2 Environmental Science

Analytical Report Number: 24-050564
Project / Site name: Penhesgyn

Your Order No: POP002581

Lab Sample Number				362684	362685	362686	362687	362688
Sample Reference				BH 2/88	BH 96/B	SW9	L13	L14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/10/2024	29/10/2024	29/10/2024	29/10/2024	29/10/2024
Time Taken				1120	1140	1150	1030	1045
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
General Inorganics								
Sulphate as SO_4	mg/l	0.045	ISO 17025	8.45	14.9	-	34.8	8.26
Chloride	mg/l	0.15	ISO 17025	-	-	38	-	-
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	-	-	310	-	-
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	1.45	0.89	-	43.1	603
Nitrate as N	mg/l	0.01	ISO 17025	< 0.01	0.33	-	-	-
Nitrate as NO_3	mg/l	0.05	ISO 17025	< 0.05	1.46	-	-	-
Alkalinity as $CaCO_3$	mgCaCO3/l	3	ISO 17025	320	380	-	3700	4900
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	< 0.020	0.33	-	0.047	U/S *U/S g
Heavy Metals / Metalloids								
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	-	< 0.02	-
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.3	-	4.3	-
Copper (dissolved)	µg/l	0.5	ISO 17025	2.5	3.2	-	3.9	-
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	-	< 0.2	-
Manganese (dissolved)	µg/l	0.05	ISO 17025	580	97	-	380	-
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.6	0.7	-	11	-
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.1	8.7	-	6.6	-
Cadmium (dissolved)	µg/l	0.08	ISO 17025	-	-	-	-	< 0.08
Calcium (dissolved)	mg/l	0.012	ISO 17025	120	120	-	84	15
Chromium (dissolved)	µg/l	0.4	ISO 17025	-	-	-	-	100
Copper (dissolved)	µg/l	0.7	ISO 17025	-	-	-	-	8.6
Iron (dissolved)	mg/l	0.004	ISO 17025	0.22	0.013	-	0.14	10
Lead (dissolved)	µg/l	1	ISO 17025	-	-	-	-	27
Magnesium (dissolved)	mg/l	0.005	ISO 17025	13	25	-	11	9.6
Manganese (dissolved)	µg/l	0.06	ISO 17025	-	-	-	-	200
Nickel (dissolved)	µg/l	0.3	ISO 17025	-	-	-	-	170
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.7	1.8	-	7.1	720
Sodium (dissolved)	mg/l	0.01	ISO 17025	18	31	-	21	1500 $$
Zinc (dissolved)	µg/l	0.4	ISO 17025	-	-	-	-	38
VOCs								
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	-	45.7	10.9
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	-	10.4	8

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-050564
Project / Site name: Penhesgyn

Your Order No: POP002581

Lab Sample Number				362689	362690
Sample Reference				MH3A	L60
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				29/10/2024	29/10/2024
Time Taken				1015	0940
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
General Inorganics					
Sulphate as SO_4	mg/l	0.045	ISO 17025	20	16.9
Chloride	mg/l	0.15	ISO 17025	-	-
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	-	-
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	17	62.1
Nitrate as N	mg/l	0.01	ISO 17025	-	-
Nitrate as NO_3	mg/l	0.05	ISO 17025	-	-
Alkalinity as $CaCO_3$	mgCaCO3/l	3	ISO 17025	620	1800
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	0.272	1.54
Heavy Metals / Metalloids					
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.8	2.9
Copper (dissolved)	µg/l	0.5	ISO 17025	3.4	1.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	990	2800
Nickel (dissolved)	µg/l	0.5	ISO 17025	4.1	6.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	11	79
Cadmium (dissolved)	µg/l	0.08	ISO 17025	-	-
Calcium (dissolved)	mg/l	0.012	ISO 17025	150	120
Chromium (dissolved)	µg/l	0.4	ISO 17025	-	-
Copper (dissolved)	µg/l	0.7	ISO 17025	-	-
Iron (dissolved)	mg/l	0.004	ISO 17025	0.035	0.16
Lead (dissolved)	µg/l	1	ISO 17025	-	-
Magnesium (dissolved)	mg/l	0.005	ISO 17025	24	34
Manganese (dissolved)	µg/l	0.06	ISO 17025	-	-
Nickel (dissolved)	µg/l	0.3	ISO 17025	-	-
Potassium (dissolved)	mg/l	0.025	ISO 17025	41	150
Sodium (dissolved)	mg/l	0.01	ISO 17025	140	520
Zinc (dissolved)	µg/l	0.4	ISO 17025	-	-
VOCs					
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-050564
Project / Site name: Penhesgyn

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited matrices: SW, PW, GW, except B - SW,GW, Hg - SW,PW, Al - SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Total Organic Carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR Analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, FSE, LL; PrW, DI PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
BTEX and/or Volatile Organic Compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078-PL/L082B	W	NONE
Alkalinity of water (discrete analyser)	Determination of alkalinity of water by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Chloride in water	Determination of chloride in water by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Ammoniacal Nitrogen as N in water	Determination of ammonium/ammonia/ammoniacal nitrogen by the colorimetric salicylate/nitroprusside method using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

*U/S g - Unsuitable for analysis due to high colour intensity.

$$ - Result was reported from high dilution. The result should be interpreted with caution.