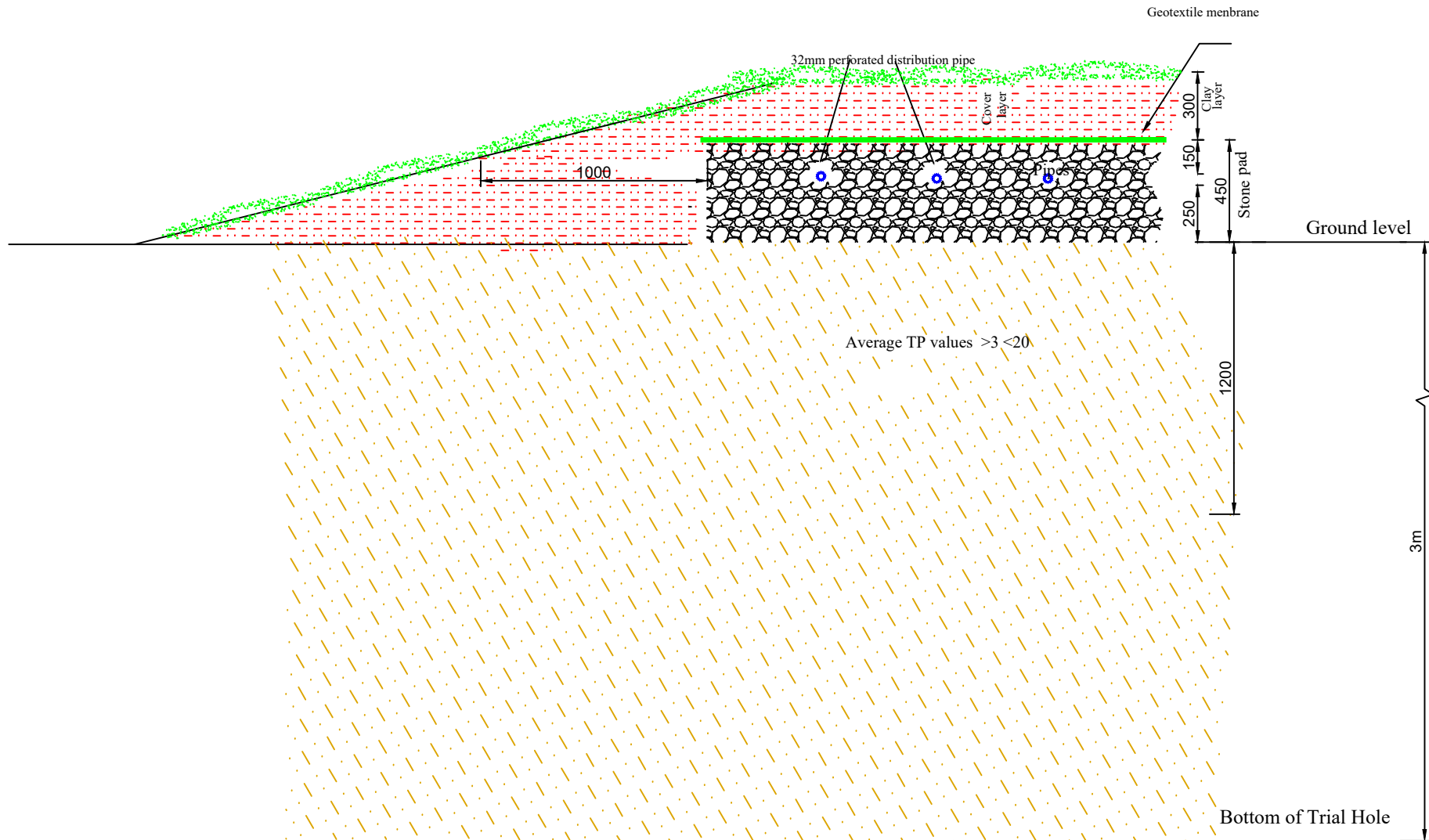


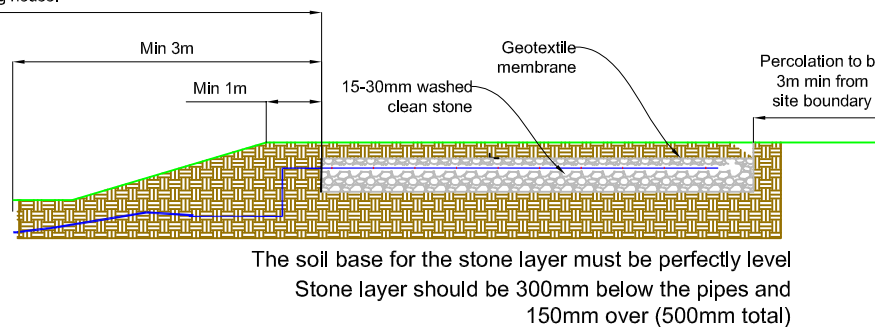
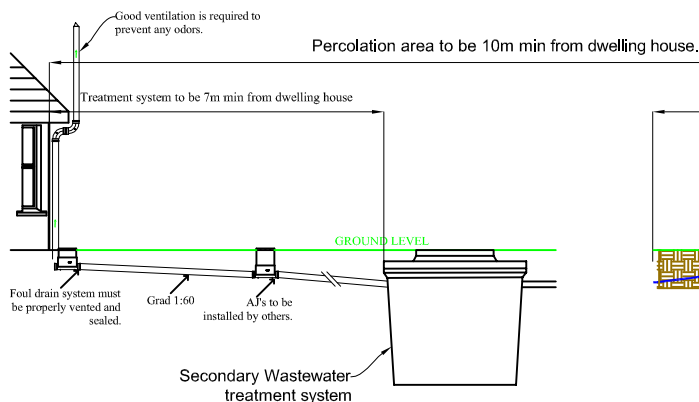
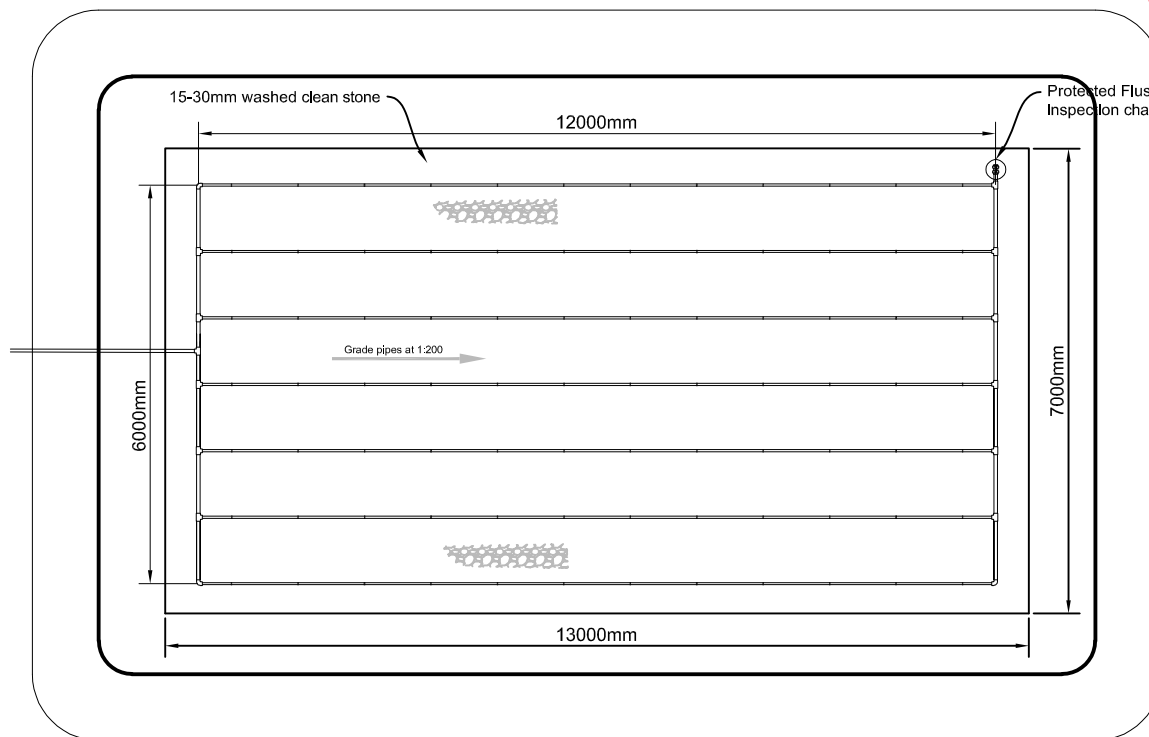
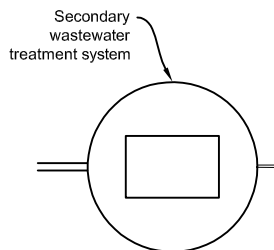
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Suggested generic section profile for a Soil Polishing Filter construction installed at ground level
(Check site Engineer's instructions for final construction details).

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Notes:

- This drawing is ©. All rights reserved.
- Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time.
- Specify any specific requirements prior to ordering. All civil works by customer.
- Do not scale from this drawing. Only for illustration purposes.
- The construction of all soil polishing filters should comply with the applicable soil characterisation and site suitability reports as well as the EPA CoP

Minimum separation details EPA 2009 CoP Table 6.1

	Tanks	Percolation
Water Course	10m	10m
Well	10m	15-60m
Lake	50m	50m
Boundary	3m	3m
Road	4m	4m
House	7m	10m

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F: 057 9326060 W: www.molloyprecast.com



Title: 90m² above ground soil polishing filter

Drg. no.: SPF-AG-90-100719

Date: 01/11/2019

Drawn by: SF Checked by: KR

Size: 13m by 7m, 90m²

Holes: 84 no. 5mm dia.

Spacing: 1,000mm by 1,000mm

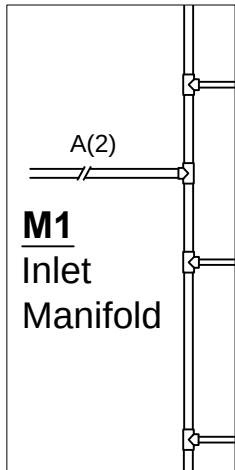
Req. flow: 142.8 l/min (with 1.8m static head)

Rising main: 50mm (max 12m length)

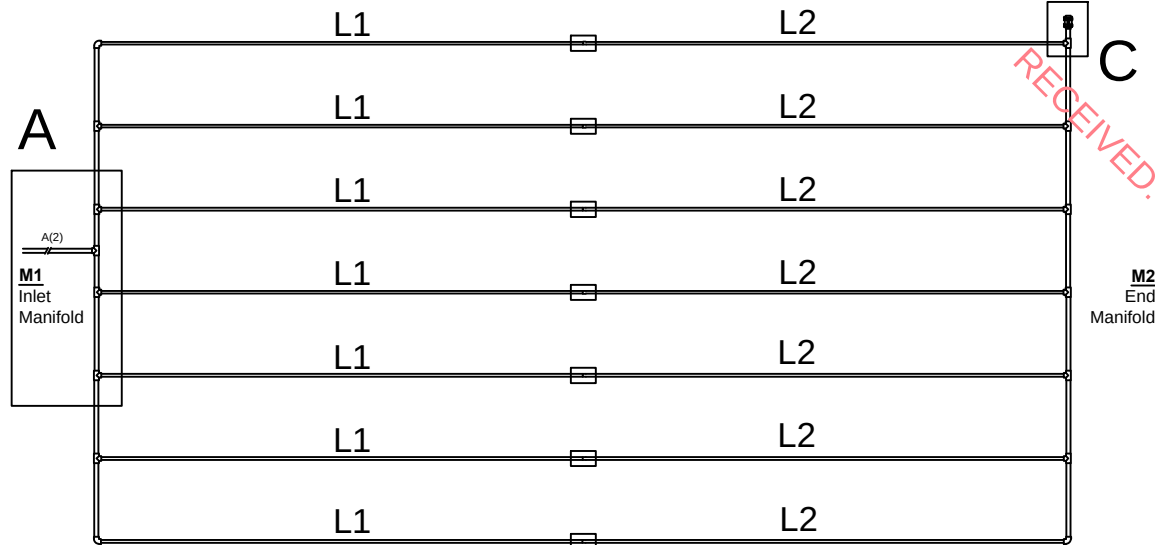
Manifold: 50mm

Laterals: 32mm

90m2 Percolation

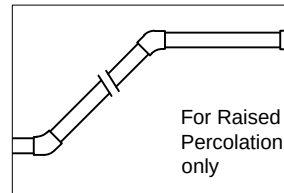


A



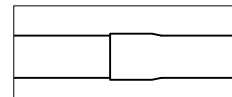
A

A(2) Elevation



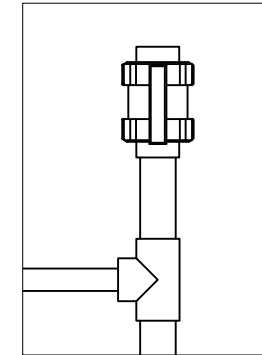
B

B



**M2
End
Manifold**

C



Note: The Flushing Valve should be left open for one day only, twice per year.

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Laying Out Pipes

Make sure pipes are clean internally as debris big or small will block holes in pipes.

1. Place M1 (50mm) at start of stone pad.
2. Place pipe L1 (32mm) along pad after M1.
3. Place pipe L2 (32mm) along pad after L1.
4. Place M2 (50mm) at end of pad.
5. Face holes downwards on 32m pipe (L1, L2).

Sort out all pipes prior to gluing as glue will stick immediately.

Gluing Pipes with the holes facing down

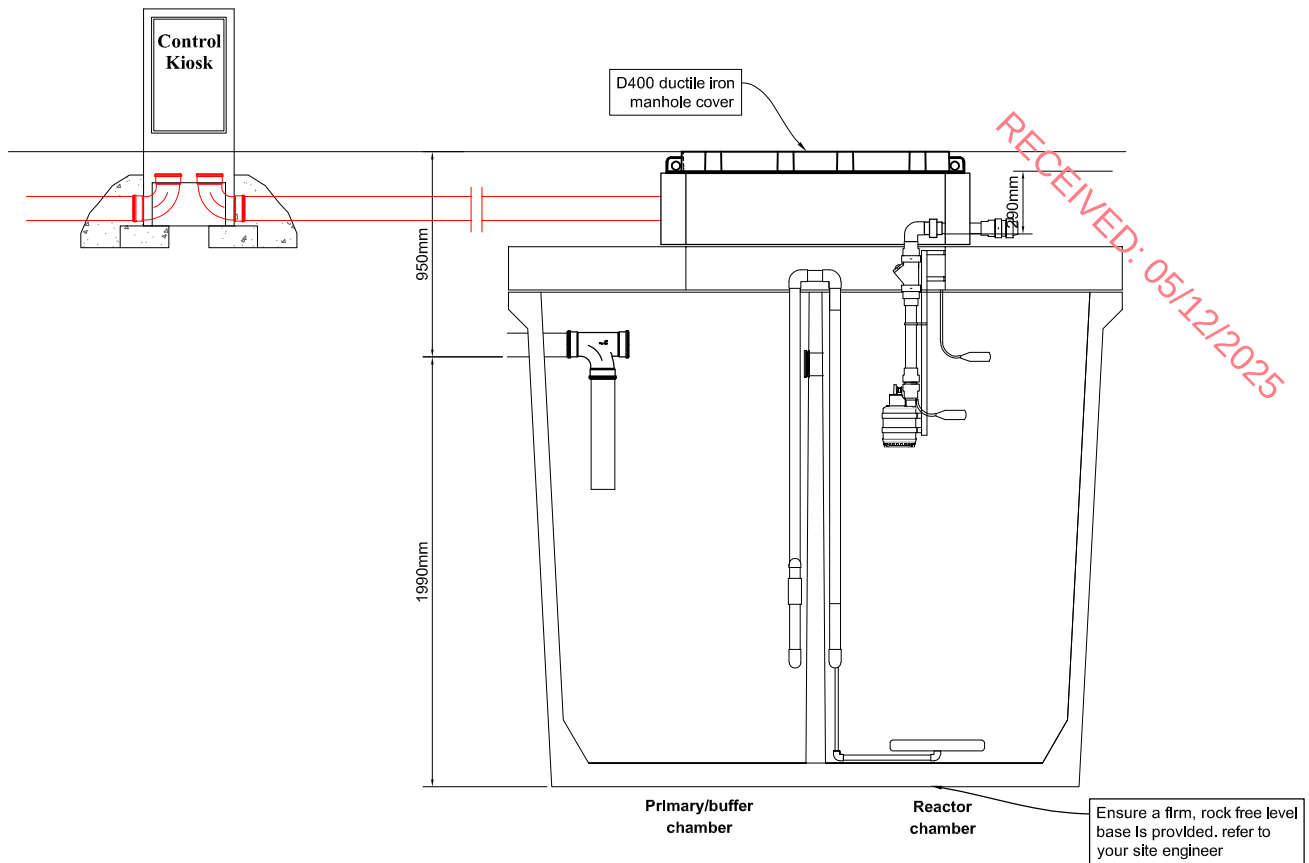
Make sure to glue around outside of pipes and inside connectors.

6. Glue and fix L1 pipes into M1
7. Glue and fix L2 pipes into L1 pipes.
8. Glue other end of L2 pipes into M2.
9. Glue flush valve on to end of M2.

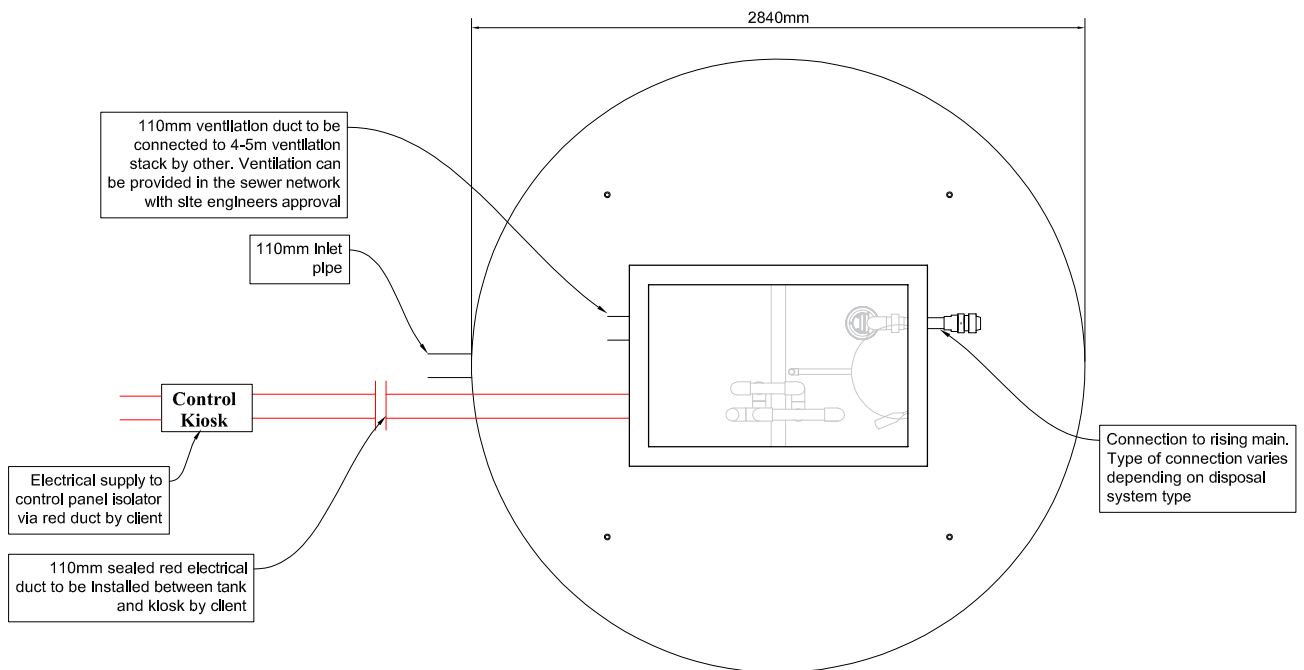


Finishing

10. Remove bar across opening before placing valve box over flush valve.
11. Slope pipes to recommended gradient falling away from inlet (M1).



SECTION



PLAN

Notes:

- Observe all safety regulations in regard to excavation and lifting requirements. Never leave opening uncovered or unattended at any time
- Specify any specific requirements prior to ordering. All civil works by customer
- Do not scale from this drawing. Only for illustration purposes

APPENDIX D

Treatment System Related Tables form the EPA CoP 2021

Table 6.2 extract, distancing requirements.
Refer to the full table for well distancing and other features.

Watercourse/stream	10
Open drain or drainage ditch	10
Adjacent tank/plant and percolation area, polishing filter or infiltration area	10
On-site dwelling house	7 (tank/plant)
	10 (free water surface constructed wetland)
	10 (infiltration/treatment area)
Neighbouring dwelling house	7 (tank/plant)
	25 (free water surface constructed wetland)
	10 (infiltration/treatment area)
Surface water soakaway ^a	5
Road	4
Slope break/cuts	4
Trees ^b	3
Site boundary	3

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Table 10.1: Infiltration/treatment area and trench length design for tertiary treatment, per PE

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m ²)	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m ²)	Area required per person (m ²)
$3 \leq PV \leq 20$	≥ 7.5	≥ 6	≥ 6	≥ 5	≥ 3.75
$21 < PV \leq 40$	≥ 15	≥ 12	≥ 12	≥ 14	≥ 7.5
$41 < PV \leq 50$	≥ 30	≥ 17	≥ 17	≥ 16	≥ 15
$51 < PV \leq 75$	≥ 50	≥ 19	≥ 19	≥ 22	≥ 25
$76 < PV \leq 90$	–	–	≥ 28	≥ 34	–
$91 < PV \leq 120$	–	–	–	≥ 54	–

Table E2: Recommended Minimum Distance between a Receptor and a Percolation Area or Polishing Filter

Percolation value ^a	Type of soil/subsoil ^b	Depth of soil/subsoil (m) above bedrock (see notes 1, 2, 3, 4 and 6)	Minimum distance (m) from receptor to percolation area or polishing filter ^c				
			Public/ group water supply abstraction points/wells	Karst feature	Down- gradient domestic well or flow direction is unknown (see note 5)	Domestic well alongside (no gradient)	Up-gradient domestic well
>30	CLAY; sandy CLAY (e.g. clayey till); SILT/CLAY, sandy SILT/CLAY	1.2 >3.0	60	15	40 30	25	15
10–30	SILT; sandy SILT; clayey SAND; clayey, silty GRAVEL (e.g. sandy till)	1.2 >8.0	60	15	45 30	25	15
<10	SAND; GRAVEL; silty SAND	2.0c 2.0d >8.0d	60	15	60 40 30	25	15

- a) The percolation value (expressed as min/25 mm) is the time taken for the water level to drop a specified distance in a percolation test hole.
- b) BS 5930 descriptions.
- c) Water table 1.2–2.0 m.
- d) Water table > 2.0 m.
- e) The distance from the percolation area or polishing filter means the distance from the periphery of the percolation area or polishing filter and not the centre.

Notes:

1. Depths are measured from the invert level of the percolation trench.
2. Depths and distances can be related by interpolation, e.g. when the thickness of sandy CLAY is 1.2 m, the minimum recommended distance from the well to percolation area is 40 m; when the thickness is 3.0 m, the distance is 30 m; distances for intermediate depths can be approximated by interpolation.
3. When bedrock is shallow (<2 m below the invert of the trench), greater distances may be necessary when there is evidence of the presence of PFPs (e.g. cracks, roots) in the subsoil.
4. When the minimum subsoil thicknesses are less than those given above, site improvements and systems other than systems as described in Chapters 8 and 9 may be used to reduce the likelihood of contamination.
5. If effluent and bacteria enter bedrock rapidly (within 1–2 days), the distances given may not be adequate when the percolation area is in the ZOC of a well. Further site-specific evaluation is necessary.
6. When bedrock is known to be karstified or highly fractured, greater depths of subsoil may be advisable to minimise the likelihood of contamination.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m ³)	3.5	Percolation Area	Mounded Percolation Area
No. of Trenches		No. of Trenches	
Length of Trenches (m)		Length of Trenches (m)	
Invert Level (m)		Invert Level (m)	

SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m ²)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type	SBR
Capacity PE	12
Sizing of Primary Compartment	5 m ³

Polishing Filter*: (Section 10.1)

Surface Area (m ²)*		Option 3 - Gravity Discharge Trench length (m)	
Option 1 - Direct Discharge Surface area (m ²)		Option 4 - Low Pressure Pipe Distribution Trench length (m)	
Option 2 - Pumped Discharge Surface area (m ²)	90	Option 5 - Drip Dispersal Surface area (m ²)	

SYSTEM TYPE: Tertiary Treatment System and infiltration / treatment area (Section 10.2)

Identify purpose of tertiary treatment

Provide performance information demonstrating system will provide required treatment levels

Provide design information

DISCHARGE ROUTE:

Groundwater	☒	Hydraulic Loading Rate * (l/m ² .d)	20	Surface area (m ²)	90
Surface Water **	☐	Discharge Rate (m ³ /hr)			

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

6.0 TREATMENT SYSTEM DETAILS

QUALITY ASSURANCE:

Installation & Commissioning

Install as specified & supervised by appropriately qualified person

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On-going Maintenance

Regular desludging & Maintenance contract with supplier or installer

7.0 SITE ASSESSOR DETAILS

Company:

Appendix 7-B EU Directives / National Legislation and Regulations / Guidelines / Technical Standards

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European Directives

- Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment;
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment;
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy;
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration;
- Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks;
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (recast); and
- Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC.

Irish Government Acts, National Legislation and Regulations

- S.I. No. 349/1989, European Communities (Environmental Impact Assessment) Regulations, as amended;
- Planning and Development Act 2000, as amended;
- S.I. No. 600/2001 - Planning and Development Regulations, 2001, as amended.
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended;
- S.I. No. 272/2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended;
- S.I. No. 684/2007 Waste Water Discharge (Authorisation) Regulations, 2007, as amended;
- S.I. No. 122/2010 European Communities (Assessment and Management of Flood Risks) Regulations 2010, as amended;
- S.I. No. 457/2008 European Communities (Environmental Liability) Regulations 2008, as amended;
- S.I. No. 404/2018 - European Union (Planning and Development) (Environmental Impact Assessment) (No. 2) Regulations 2018;
- Local Government (Water Pollution) Acts 1977, as amended;
- S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988;
- S.I. No. 268/2006 - European Communities (Quality of Shellfish Waters) Regulations 2006, as amended;
- S.I. No. 79/2008 - Bathing Water Quality Regulations 2008, as amended; and
- S.I. No. 99/2023 - European Union (Drinking Water) Regulations 2023, as amended.
- Water Environment (Abstractions and Associated Impoundments) Act 2022.
- S.I. No. 418/2024 - Water Environment (Abstractions and Associated Impoundments) Licencing Fees Regulations 2024
- S.I. No. 419/2024 - Water Environment (Abstractions and Associated Impoundments) Regulations 2024

Guidelines

- European Commission (2007). Common Implementation Strategy (CIS) for the Water Framework Directive (2000/60/EC) Guidance on preventing or limiting direct and indirect

- inputs in the context of the Groundwater Directive 2006/118/EC. Guidance Document No. 17.
- European Commission (2010). Common Implementation Strategy (CIS) for the Water Framework Directive (2000/60/EC). Guidance on risk assessment and the use of conceptual models for groundwater. Guidance document No. 26.
 - DEHLG (2004). National Urban Waste Water Study. National Report.
 - DEHLG (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.
 - DELG/EPA/GSI (1999). Groundwater Protection Schemes. Document prepared jointly by the Geological Survey of Ireland (GSI), the Environmental Protection Agency, and the Department of Environment, Heritage and Local Government.
 - EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
 - EPA (2010). Methodology for Establishing Groundwater Threshold Values and the Assessment of Chemical and Quantitative Status of Groundwater, Including and Assessment of Pollution Trends and Trend Reversal.
 - EPA (2011). Guidance on the Authorisation of Direct Discharges to Groundwater.
 - EPA (2003). Towards Setting Guideline Values for the Protection of Groundwater in Ireland. Interim Report.
 - EPA (2006). Ireland Water Framework Directive Monitoring Programme.
 - Fitzsimons, V., Daly, D. and Deakin, J. (2003). Draft GSI guidelines for assessment and mapping of groundwater vulnerability to contamination. Groundwater Chapter, Geological Survey of Ireland.
 - GSI (2006). Criteria used in aquifer classification. Available from <http://www.gsi.ie/Programmes/Groundwater/Aquifer+Classification.htm>
 - IGI (2007). Guidelines on Water Well Construction. Available from <http://www.igi.ie/assets/files/Water%20Well%20Guidelines/Guidelines.pdf>
 - Kilroy, G., Dunne, F., Ryan, J., O'Connor, A., Daly, D., Craig, M., Coxon, C., Johnston, P. and Moe, H. (2008). A Framework for the Assessment of Groundwater – Dependent Terrestrial Ecosystems under the Water Framework Directive. Environmental Research Centre Report Series No. 12.
 - Institute of Geologists of Ireland (2007). Recommended collection, presentation and interpretation of geological and hydrogeological information for quarry developments.

Technical Standards

- British Standards Institute (2015). Code of Practice for Ground Investigations BS 5930:2015+A1:2020.

Appendix 7-C Borehole Logs

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH1

CORE 1

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0			Core box comments 'overburden to 3m'. None recovered.		1	1	1
03.0							
04.0			Light grey C bioclastic crystalline limestone with brachiopod float 1cm from base.	Badly broken and drill rounded pebbles. Occ. core string with drill breaks. [prob. till]	38	41	15
04.5							
06.0			Light grey M bioclastic crystalline limestone with thin shale partings. Minor calcitic joints.	Top 0.3m section very broken and pebbly. Some drill rounding. Lower 1.5m is good core with stylolites, drill breaks and v. thin shale partings. [upper part till]	24	57	40
07.5							
08.0			Light grey bioclastic crystalline limestone with some stylolites and crinoid float. Minor calcitic joints.	Good core with breaks on stylolites and drill breaks. Occ. broken on calcitic joint fractures.	5	105	97
10.0							
10.5			Light grey M bioclastic crystalline limestone with occ. brachiopod bands. Hairline stylolites and crinoid float present.	Gen. good core with stylolites, drill breaks and occ. pre-drill weathered fracture.	6	100	85
12.0							
13.5			Dark M-C bioclastic crystalline limestone. Upper 0.5m is laminated and burrowed. stylolites are well spaced. Many solitary corals at 0.45 and 2.5m down.	V. good core with mainly stylolite and drill breaks.	3	100	97
14.0							
16.0			Massive dark C-M bioclastic crystalline limestone with well developed stylolites and minor float incl. crinoids at 1.3-1.5m down.	V. good core with stylolite associated breaks and some drill breaks.	3	98	95
16.5							
18.0							
19.5			F-M bioclastic crystalline limestone with occ. floating brachiopods. Some subvertical calcitic jointing. Stylolites developed and well spaced.	V. good core with breaks on stylolites and horizontal and oblique drill breaks.	4	100	98
20.0							
22.0							
22.5			M bioclastic crystalline limestone with coarse band 1.2-1.5m down. Stylolites developed and well spaced. Minor calcitic joints.	V. good core with breaks on drill breaks and rare stylolite.	3	99	98
24.0							

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH3

CORE 3

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC	R.Q.D.
02.0			No core box comments. Assume overburden of glacial till.		/	/	/
03.0							
04.0			Top pebbles of F black limestone. Below, core is M-F bioclastic crystalline limestone with stylolites developed.	V. good core excl. top and base 0.05m. Top pebbles [prob till derived] drill worn and broken. Remainder is stylolite breaks and fractures on calcitic joints.	10	95	84
04.5							
06.0			M-F bioclastic crystalline limestone with crinoid and brachiopods large floating fossils. Fine stylolites are concentrated towards base of core string.	Good core but shattered to top along fine calcitic joints. Further breaks are on oblique joints and stylolites.	13	90	76
07.5							
08.0			Light grey F-M bioclastic crystalline limestone with occ. coarse bands. Fine stylolites and float incl. solitary corals and crinoid ossicles.	V. good core with few breaks on stylolites and occ. drill break.	4	100	100
10.0							
10.5			Dark M-F bioclastic crystalline limestone with some float incl. corals and crinoids. Freq. fine stylolites. Single 1cm thick calcite band 2.7m down. Single well developed stylolite at base with high amplitude.	V. good core broken rarely on stylolites and drill breaks.	3	100	100
12.0							
13.5			Dark M-F bioclastic crystalline limestone with some float incl. corals, crinoids and brachiopods. Freq. and fine stylolites.	V. good core broken rarely on stylolites and drill breaks.	3	99	96
14.0							
16.0			Dark M-F bioclastic crystalline limestone with solitary corals and crinoidal float. Stylolites are freq. and fine.	V. good core broken on stylolites and occ. drill breaks.	4	100	95
16.5							
18.0							
19.5			Dark F-M bioclastic crystalline limestone with minor float. Shell band at 1.0m down containing gastropods and brachiopods. Group of stylolites with severe dissolution 1.6m down makes rock friable. V fine calcitic joints some void infilling.	Upper 0.6m broken along calcitic joints, remainder is good core. Main breaks on stylolites and drill breaks.	12	99	86
20.0							
22.0							

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48.0		F-M grey bioclastic crystalline limestone with well developed stylolites. Calcitic veins up to 4mm and minor vugs with pink calcitic infill. Base slightly friable.	Broken up core with majority of breaks on stylolites some on joint fractures and smaller drill breaks.	8	100	85
49.5		M-F bioclastic crystalline limestone with well developed stylolites. Pink calcitic subvertical joints and some veins. Clast replacement in calcite. Minor dissolution in upper 0.1m.	Good core excl. jointed zone. Many drill breaks and stylolites various joint fractures esp. near calcitic veins.	10	103	86
52.0		Gen. M-F dark bioclastic crystalline limestone with float but coarse zone 1.5-1.8m down. 1cm calcitic band and various minor calcitic joints.	Good core with breaks on drill breaks and some on stylolites.	6	98	90
52.5						
54.0						
55.5		M-F bioclastic crystalline limestone with some float. Stylolites developed. Some subvertical calcitic joints. Some oblique joints show slickensides.	Fair core with many stylolites and oblique joints, some drill breaks.	7	95	73
56.0						
58.0						
58.5		M bioclastic crystalline limestone with some stylolites and calcitic joints.	Fair core with number of drill breaks often closely related to stylolites and minor joints.	14?	100?	66?
60.0						
??		Final core string 1.74m long. No wood chip depth marker. END OF CORE				
2.0						

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH5

CORE 5

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC FREQ.	CORE REC.	R.Q.D.
02.0			Core box comment 'Overburden to 6m. B. Row at 5m approx' No core recovered assume glacial till.				
04.0							
06.0	06.0			Upper 0.4m badly broken and rubbly. Breaks along stylolites and calcitic joints. Soil filled cavity c0.3m down. Remainder of core is good. Main breaks along stylolites, some show severe dissolution.	9	89	79
07.5							
08.0			C bioclastic crystalline limestone below 1.4m M-F. Stylolites with severe dissolution where crossing calcitic joints.	Fair core broken along subvertical joints with thick calcitic infills. Also on major stylolites. Pebbly drill chippings c 1.4m down.	8	100	97
10.0							
10.5			Light grey, C, v. bioclastic crystalline limestone. Gen massive with few large bioclasts.	Gen. good core with majority drill breaks and some severely dissolved stylolites.	5	100	96
12.0							
13.5							
14.0			C-M bioclastic crystalline limestone grey and massive with rare large bioclasts. Well spaced minor stylolites and occ. with bad dissolution.	Good core excl. 1.5 to 2.3m down. Breaks occur on stylolites and many drill breaks some associated to minor subvertical jointing. Thin shale parting at 0.35m down.	8	97	83
16.0							
16.5			C grey bioclastic crystalline limestone. Gen. massive with rare large bioclasts. Some stylolites occur.	Top 0.4m is jointed and broken remainder is v. good core. Breaks along stylolites and few drill breaks.	4	97	94
18.0							
19.5							
20.0			C bioclastic crystalline limestone light grey. Fine burrows at 0.45m down and shell band at 2.8m down. Subvertical joint has brown calcitic infill up to 3mm thick.	Good core, none missing. Major stylolite at 0.8m down with severe dissolution where crossing vertical joint with brown calcitic infill. Breaks on drill breaks and few stylolites.	4	100	100
22.0							
22.5							

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48.0		M-F dark bioclastic crystalline limestone. Occ. stylolites and some thin impersistent calcitic joints. Rare large bioclasts incl. crinoids. Occasional vugs.	Good core broken on drill breaks and some at stylolites.	5	100	92
49.5						
50.0		F bioclastic crystalline limestone with coarse bands to base. Occ. stylolites up to 2mm residuum, some broken.	Fair core improves to base with drill and stylolite fractures common. Rare weathered pre-drill fractures are subvertical and oblique.	7	98	87
52.0						
52.5		F dark hard bioclastic crystalline limestone with rare floating large bioclasts. Minor brown calcitic joints and v. thin stylolites. At base dolomitised v. coarse.	Good core to 1.13m down then 0.2m drill broken gravel zone pink friable dolomitic then 0.27m pink good core. Breaks are horizontal and oblique drill breaks and occ. stylolite.	10	107	83
54.0		Recrystallised dolomite pink and gen. friable or highly crystalline. Thick calcitic veining. Base good pink dolomitised.	Core poor uppermost as drill broken rubble of calcite vein crystals but towards base core is good though friable.	15	77	35
55.5						
56.0		Pink friable dolomite with large calcite lined vugs (<5cm). Chicken wire veining means easily broken.	Gen good core though many horizontal and oblique drill breaks.	10	100	68
58.0						
58.5		Pink very coarsely recrystallised dolomite with calcite lined vugs. Sugary and friable.	Very broken up core. Vugs split and many drill breaks incl. drillers rubble.	20	100	89
60.0		Pink recrystallised dolomite with large calcite lined vugs. Sugary and friable.	Good core though missing section poss. rubble. Mainly horizontal and oblique drill breaks.	5	66	50
61.5		Pink sugary dolomitised with calcitic vugs and rare stylolites.	Fair core with fractures gen. drill breaks influenced by subvertical calcitic joints and veining. Vugs also broken.	8	100	88
64.0						
64.5		Pink recrystallised friable sugary dolomitic limestone with calcite lined vugs some yellowed.	Good core gen. oblique and pointed drill breaks. Vugs also fractured.	5	100	97
66.0						
67.5		Pink recrystallised sugary dolomitic limestone with calcitic vugs. Occ. stylolite and some veining.	Good core with oblique and pointed drill breaks. Vugs also fractured.	6	98	85
68.0						
70.0						

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH6

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC	R.Q.D.
02.0			No core box comments. Assume overburden to 5.5m. Some core recovered. Pebbles and short unrelated drill strings of C bioclastic crystalline limestone with various weathering artifacts. Rusty coloured weathering, poss. calcitic jointing and minor stylolites.	V. poor core with numerous unrelated drill rounded pebbles.	10	07	2
04.0							
05.5							
06.0			Light grey bioclastic crystalline limestone with brachiopod float 0.7m down. Minor calcitic joints. Some developed stylolites. Coarse calcitic joint infill 1.1m down.	Good core with horizontal drill breaks and stylolites dominant	6	101	82
07.5							
08.0			M-C banded bioclastic crystalline limestone with floating large bioclasts incl. brachiopod and solitary corals 0.3m down and colonial coral 2.3m down. Network of fine calcitic joints in upper portion and some developed stylolites throughout.	Good core with various drill breaks and some stylolites. Subvertical joints not broken.	7	96	84
10.0							
10.5			M-C dark bioclastic crystalline limestone with moderate float incl. solitary corals and crinoid ossicles. Many fine stylolites and fine calcitic joints. Calcite lined vug 1.7m down.	Good core with breaks mainly stylolite related. Also some drill breaks.	7	100	88
12.0							
13.5			M-C bioclastic crystalline limestone with thick bioclastic bands at 1.3, 1.5 and 2.6m down. Some developed stylolites single example with late void infilling calcite. Occ. red weathered fractures.	Good core with stylolite and drill breaks dominant. Pre-drill weathered fracture occurs 0.6m down.	5	100	97
14.0							
16.0			M-C bioclastic crystalline limestone with float incl. crinoids. Minor calcitic jointing. Some severely developed stylolites showing late dissolution.	Good core broken on stylolites and some drill breaks.	7	100	88
18.0							
19.5			Light grey M-C bioclastic crystalline limestone with well spaced stylolites and floating brachiopods. Freq. but thin calcitic joint network.	Good core broken on drill breaks and occ. stylolite.	5	98	93
20.0							
22.0			F-M bioclastic crystalline limestone with well spaced stylolites. 5 calcitic bands 3-10cm thick occur at 0.2, 0.5, 2.1, 2.3 and 2.6m down.	Fair core but drill broken on calcite bands. Remaining breaks on stylolites and further drill breaks.	7	99	89
24.0							

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50.0	50.0	Upper 0.9m are pink crystalline dolomitised limestone with large joint vein and severe dissolution. core smashed from 0.9-1.05m down. Below this large joint continues into grey bioclastic crystalline limestone with severe dissolution adjacent to joint. Single severely dissolute stylolite.	Poor core broken on many drill breaks, most stylolites, freq. subvertical joint fractures. Drill smashed gravel from 0.9-1.05m down.	10	100	73
52.0	52.5	M-C bioclastic crystalline limestone with calcitic joints. Some developed stylolites. Lowest 1.0m M-F bioclastic crystalline limestone without joints.	Fair core with breaks on subvertical joints some on stylolites and a number of drill breaks often associated with joints.	8	100	82
54.0	55.5	F bioclastic crystalline limestone with some well separated coarse bioclastic bands. Freq., fine stylolites. 0.1m thick calcitic band occurs 1.8-1.9m down.	V. good core with rare stylolite and oblique drill breaks. Calcitic band badly broken.	3	100	95
56.0	58.5	F dark grey bioclastic crystalline limestone with rare float and few calcitic joints.	Good core with breaks on oblique drill shears, stylolites and horizontal drill breaks.	7	107	100
58.0	60.0	END OF CORE				
60.0	60.0					

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH7

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0			Core box marked 'Overburden to 9m. Rock and boulder. ?Rock Large bands of clay'. Probably glacial till.				
04.0					1	1	1
06.0							
08.0							
09.0							
10.0			Pebbles and short string of core of F bioclastic crystalline limestone.	Unrelated pebbles with some drill rounded margins.	8	7	7
10.5			Orangey red clay with shards of grey and pale yellow limestone. gen., soft and unlithified. [probably recent clay]	Good core string present but lots missing. Drill breaks.	2	19	10
12.0							
13.5							
14.0			Rusty brown clay with organically mediated Fe staining perhaps iron pan. Tubular pitting possibly root holes. [Part of regolith]	Poor core with drill breaks and crumbling.	3	4	0
16.0							
16.5							
18.0			Grey clay weathering orange with single limestone pebble. [Regolith]	Poor core broken on drill breaks. Lots missing.	1	6	0
19.5							
20.0			Pale grey shale, orange chickenwire weathering and slickensided internally [soil development].	Poor core lots missing. Drill breaks and crumbling.			
22.0					5	17	4
22.5							

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH8

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0			Core box marked 'Overburden to 3m Boulders and clay'. No core recovered. Probably glacial till.	/	/	/	/
03.0							
04.0			Core box marked boulders. C light grey bioclastic crystalline limestone. Some dissolution of clasts. Rare floating bioclasts incl. brachiopods.	Unacquainted core strings. Dominated by pebbles to top and larger boulders to base. Poss. still coring glacial till.	10	31	16
04.5							
06.0			Core box marked boulders. Pebbles of M light grey bioclastic crystalline limestone.	Pebbles some with joint fractures. Badly dissociated strings. Much missing core.	20	17	4
07.5							
08.0			M-C bioclastic crystalline limestone with minor float. 0.2m of contorted pale buff yellow clay to base, prob. recent void infill.	Very broken up core incl. many dissociated pebbles but majority of strings refit. Breaks incl. stylolites and joints but majority are drill breaks.	35	73	28
10.0							
10.5			M-C bioclastic crystalline limestone with minor calcitic joints and numerous stylolites. Some stylolites are well developed and dissolution makes core friable.	Core gen. good but poorly fitting. Stylolites dominate breaks with minor drill breaks.	10	87	59
12.0							
13.5							
14.0			M-C bioclastic crystalline limestone with patchy bands of float incl. brachiopods. Dissolution of stylolites makes adjacent core friable. Pitted as minor dissolution of clasts esp. near stylolites.	Top 0.3m of core broken pebbles. Remainder good core with breaks on stylolites and few drill breaks. Mud filled joint in upper portion of core string.	10	73	58
16.0							
16.5							
18.0			Upper and lowermost 1.0m light grey M-C bioclastic crystalline limestone. Middle 1.0m is M-F bioclastic crystalline limestone with floating large bioclasts in mud enriched bands. Major dissolution of stylolites.	Gen. good core, refits well. Majority of breaks on stylolites with major dissolution. Others incl. horizontal and oblique drill breaks.	7	93	81
19.5							
20.0			M-C light grey bioclastic crystalline limestone with rare floating large bioclasts incl. brachiopods. Lowest 0.5m is M-F crystalline limestone. Friable in shattered zone and at 2.4m down adjacent to stylolite dissolution.	Gen good core but vertical joints at 1.4-1.6m down produce shattered zone of joint and associated drill breaks. Further breaks elsewhere dominated by stylolites.	10	97	77
22.0							
22.5							
24.0			Upper and lowermost 0.3m are M-F bioclastic crystalline limestone remainder is M-C. Large colonial coral at 2m down, appears recrystallised. Minor calcitic joints and some stylolites showing moderate dissolution.	V. good core excl. shattering at 2.3m down associated to minor calcitic jointing. Further breaks dominated by stylolites.	7	102	88

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50.0		C-M banded bioclastic crystalline limestone with rare float incl. corals and crinoids. Pre-drill weathered joints esp. c1.5- 2.0m down. Some dissolution of bioclasts and veins.	Upper 1.5m good core lower 1.5m broken on clay filled joint. Lowest part breaks along pre-drill weathered fractures. Stylolites dominate breaks in longer core strings.	18	100	72
52.0	52.5	M-C bioclastic crystalline limestone with v. coarse bands. Narrow stylolites gen. broken, minor calcitic jointing.	Fair core but some missing. Badly broken in places esp. associated to pre-drill weathered fractures. Breaks thus dominated by weathered fractures and by stylolites with only minor drill breaks.	15	84	58
54.0	55.5	M-C bioclastic crystalline limestone mud enriched at 2.3- 2.6m down. Freq. stylolites are broken. Colonial coral at 2.6m down.	Broken up core. Dominated by stylolites but also with oblique joints and shattering. Pebbles rounded by drill bit.	13	93	68
56.0	58.5	M-C bioclastic crystalline limestone with few stylolites. Some red staining on veinlets.	Badly shattered to pebbles in places esp. along weathered fractures and oblique joints. Occ. drill breaks. Crystalline calcite to base.	28?	77?	27?
58.0						
60.0						
62.0	c60?	Unknown final depth. (Wood chip remarks 37.5m) END OF CORE				

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH9

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0			No core box comments. Assume overburden. No core recovered.		/	/	/
03.0							
04.0			Limestone rubble. F-M, bioclastic, crystalline, minor float and stylolites.	Mostly pebbles and rubble with few refittable strings. Poss. further regolith.	82	40	11
05.0			Limestone rubble. F-M, bioclastic, crystalline, minor float and stylolites.	Gen. pebbly rubble. Poss. further regolith.	72	26	19
06.0			Rubble of dark M bioclastic crystalline limestone with occ. float.	Gen. rubble. Some pebbles show weathered joint evidence. Poss. further regolith.	26	8	8
07.0							
08.0			Rubble of dark F bioclastic crystalline limestone with some floating large bioclasts.	Gen. rubble long strings show subvertical weathered joints and stylolites.	48	70	24
10.0			Rubble of M-F bioclastic crystalline limestone with occ. float.	Gen. pebbles but single long string 24cm long. Poss regolith.	15	12	10
10.5							
12.0			F-M bioclastic crystalline limestone with rare float. Few but well developed stylolites. occ. subvertical joint breaks.	Good core prob. true bedrock. Breaks gen. on stylolites and drill breaks rare joint fractures.	6	99	91
13.5							
14.0			M-F bioclastic crystalline limestone with rare float. In upper 1.5m well developed stylolites are rotten in lower half less developed. Calcitic band occurs 0.5m down associated with most rotten stylolites and minor dissolution of bioclasts.	Good core dominated by stylolites and some drill breaks with minor oblique joint fracturing.	8	103	62
16.0							
17.0							
18.0			M-F bioclastic crystalline limestone with float incl. solitary corals. Minor calcitic veins and vertical joints. 7 well spaced 1-3cm calcitic bands occur at all levels. Calcitic infill of some voids and stylolite zones.	Good core with breaks dominated by stylolites and few drill breaks.	8	99	80
20.0							
20.0			M-F bioclastic crystalline limestone with some float contains minor subvertical calcitic joints.	Good core with some stylolites and fractured zone associated with red, friable pre-drill weathered fractures.	12	100	78
22.0							

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47.0		M-F bioclastic crystalline limestone with some float. Minor vertical calcitic veining and infilling of voids. Stylolites are few and fine.	V. good core. Majority of breaks on drill breaks and a few on stylolites and joints.	5	100	90
48.0						
50.0	50.0	Top 0.3m mud enriched bioclastic crystalline limestone with well developed stylolites and obvious bioclastic clasts. Remainder is M-F bioclastic crystalline limestone with occ. coarse bands incl. shell bed at 1.2m down.	Good core gen. broken on horizontal drill breaks but some on stylolites and oblique joints.	5	98	96
52.0						
53.0		M-F bioclastic crystalline limestone with some float. Minor calcitic joints. Stylolites are few and fine. A single 1cm thick calcitic band occurs 1.0m down.	Good core. broken evenly on horizontal drill breaks and oblique calcitic jointing.	9	100	94
54.0						
56.0	56.0	M-F bioclastic crystalline limestone with increasing float downwards incl. large brachiopods incl. large brachiopods at 1.2 and 2.75m down. Stylolites are few and fine. Minor subvertical calcitic joints present.	V. good core broken on stylolites and horizontal drill breaks and occ. oblique joints.	6	100	90
58.0						
59.0		M-F bioclastic crystalline limestone with some crinoidal float. Stylolites are few and fine.	V. good core. Majority of breaks on horizontal drill breaks. A few on stylolites and calcitic joints.	6	100	95
60.0						
62.0	62.0	END OF CORE				

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH10

DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0			Core box marked 'Overburden to 9m Boulder clay and boulders to 7.4m approx'. First wood chip marked 7.4m.				
04.0					/	/	/
06.0							
08.0	7.4		Gen. pebbles of weathered light grey M-C bioclastic crystalline limestone showing some joints and large bioclast float.	Poor core, great deal missing. Few large sections, mainly pebbles. Pointed and polished drill breaks suggests drilling further glacial fill containing large boulders.	10	24	12
10.0							
12.0	11.9		Top 1.4m is clean bioclastic crystalline limestone with solitary corals, crinoids and brachiopod floating bioclasts. Fine calcitic jointing is present. Lower 0.5m contains calcitic joints, steep angle veins and bands of coarsely crystalline calcite.	Very broken core with many oblique joints and fractures, some pre-drill weathered. Drill breaks very common in crystalline calcite bands. These ground into gravel.	20	90	45
14.0	14.0		Light grey bioclastic crystalline limestone with occ. calcitic bands to top. 1.0m down rock is friable bioclasts weather proud. 1.7m down recent sand is mixed with limestone pebbles and calcite crystal debris.	Badly broken core. Freq. drill breaks esp. in crystalline calcite. Some fracturing of calcitic joints and oblique pre-drill fractures.	14	55	28
16.0							
18.0	17.0		Gen. M-C light grey bioclastic crystalline limestone. Calcitic bands are brecciated and adjacent areas are friable with bioclasts weathering proud.	Badly broken core. Fracturing on veins and calcitic joints, some pre-drill weathered fractures. Drill breaks common throughout. Poss. void present with recent sandy infill.	24	55	30
20.0	20.0		Light grey bioclastic crystalline limestone rich in crinoid debris. Some calcite bands (c3cm) and adjacent friable zones. Base of core is F-M bioclastic crystalline limestone with rare float.	Badly broken core with a great deal missing. Majority of drill breaks in recovered core. Lower portion of core comprises drill rounded pebbles.	13	30	23
22.0							

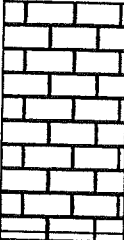
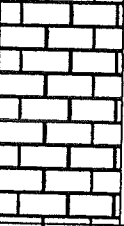
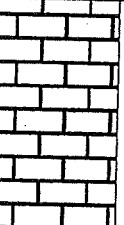
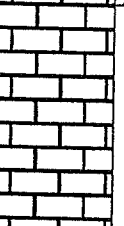
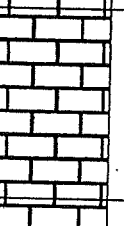
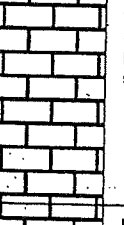
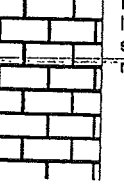
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47.0		F-M bioclastic crystalline limestone with minor stylolites and some float. Minor subvertical joints are present.	Upper 0.4m drill broken. Remainder fair core with majority of drill breaks plus some along stylolites and joints.	9	97	77
48.0						
50.0	50.0	M-C bioclastic crystalline limestone with rare float. Few well developed stylolites many fine.	Good core to 1.5m down then 0.4m shattered remainder broken up core. Main breaks on stylolites and drill breaks. Shattered zone is fractured on subvertical calcite joints.	12	99	77
52.0						
53.0		F-M bioclastic crystalline limestone with fine stylolites oblique to the core. Colonial coral 1.0m down and brachiopod float in upper 0.5m. Calcite veins occur at 1.5m down.	Broken core incl. brecciate at 1.3m down. Breaks mainly drill breaks often related to joints and stylolites. Breccia zone is broken on calcite veins and along pre-drill weathered fractures.	14	90	77
54.0						
56.0	56.0	F-M bioclastic crystalline limestone with occ. float incl. colonial coral 0.7m down. Some calcitic jointing. Stylolites well developed and oblique to core.	Exceptional core with no vertical joint fracturing. Mixture of drill and stylolite breaks.	3	100	96
58.0						
59.0		F bioclastic crystalline limestone with rare float incl. crinoids. No wood chip at base. 1.0m of core minimum.	Good core with oblique stylolite breaks and oblique drill breaks. Single wide subvertical calcitic joint fractured.	8	100	76
60.0	60.0+	Light gray bioclastic crystalline limestone with 1cm thick calcitic banding. Lowest piece of core is calcite band >6cm.	Horizontal drill breaks on calcite bands.	11?	100?	66?
+0.3m						
62.0		Final string is 0.3m long with no final depth wood chip. END OF CORE				

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ROTARY CORE LOG
CURRY / CLOONACALTRY
BOREHOLE BH11

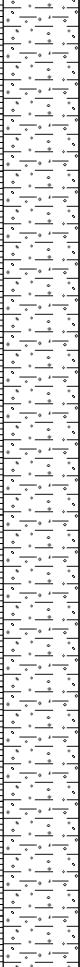
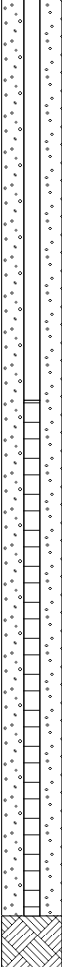
DEPTH	THICK- NESS	GRAPHIC	DESCRIPTION	DISCONTINUITIES	DISC' FREQ.	CORE REC.	R.Q.D.
02.0	02.5		No core box comments. Assume overburden.		/	/	/
04.0			M-F bioclastic crystalline limestone with floating large bioclasts of crinoids and brachiopods. Stylolites are well developed but well spaced.	Top 0.4m rubbly then 1m good core and remainder badly broken. Large subvertical joint from 1.0m down is broken further breaks are on stylolites and many drill breaks.	15	97	77
06.0	05.5		Grey M-F bioclastic crystalline limestone with dissolution esp. along stylolites. Some bioclast float. 2cm thick calcite band at 1.3m down cut by 2mm major calcite filled joints.	Top 1.65m v. good core remainder broken core. Breaks are on stylolites and some drill breaks. Joint fractures at base only.	6	98	93
08.0	08.5		Grey F-M bioclastic crystalline limestone with some float incl. band corals, crinoids and brachiopods at 1.8m down. Major calcitic joints towards base.	Fair core with many stylolite and drill breaks. Joint fracturing at 0.1-0.4m down and 1.3m down.	8	94	82
10.0	11.5		M-C bioclastic crystalline limestone with float. Calcitic veining and 3cm thick steeply angled calcite band 1.0-1.2m down.	Badly broken core esp. upper 1.5m. Stylolites dominate breaks with some drill breaks. Calcite band is drill broken to rubble.	12	95	70
12.0	14.5		F bioclastic crystalline limestone with rare float incl. crinoid ossicles and solitary corals. Occ. coarse bands.	V. good core, none missing. stylolite breaks dominate with occ. drill break.	4	98	78
14.0	17.0		F bioclastic crystalline limestone with some floating solitary corals, crinoids and brachiopods. Well developed stylolites.	V. good core. Breaks dominated by stylolites with occ. drill breaks.	5	100	95
16.0	20.0		F-M bioclastic crystalline limestone with some float. Well spaced developed stylolites and minor calcitic joints throughout.	Good core with stylolite breaks dominant. Occ. drill break.	6	100	90
18.0							
20.0							
22.0							

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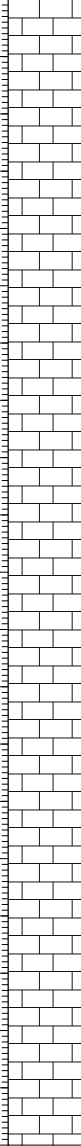
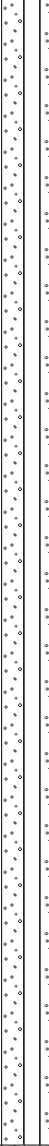
47.0						
48.0		F bioclastic crystalline limestone with minor crinoidal float. Some subvertical jointing with calcitic infill.	Gen. good core but subvertical joint fractured centrally. Stylolites dominate with some drill breaks.	7	100	90
50.0	50.0					
52.0		F-M bioclastic crystalline limestone with developed stylolites. Oblique jointing and crystalline calcite bands. Some void infilling with calcite.	V. good core excl. fractured joints in zone 2.0-2.2m down. Other breaks on stylolites horizontal drill breaks and oblique joints.	5	100	92
53.0						
54.0		F-M bioclastic crystalline limestone with calcitic joints throughout esp. 0.9 - 1.6m down. Some stylolites developed.	Good core excl. 0.9 - 1.6m down where badly broken along severe calcitic joints. Further breaks on stylolites and drill breaks.	11	100	73
56.0	56.0					
END OF CORE						

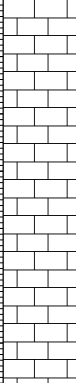
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BOREHOLE LOG										BOREHOLE No MW 3	
Client: Roadstone										RECEIVED: 05/12/2023 SLR	
Project No: 501.065091.00001		Date: 06/06/2023		Ground Level: 84.26m		Co-ordinates: E589943 N744233					
Project: Cam Quarry GW Monitoring 2023											
										Sheet 1 of 2	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
1						(4.20)	[Drillers Description] Medium dense brown very silty gravelly SAND with frequent limestone cobbles and boulders				
2											
3											
4					80.06		4.20				
5								[Drillers Description] Weak to Medium strong weathered grey LIMESTONE with occasional highly fractured joints			
6											
7					76.76		7.50				
8								[Drillers Description] Strong grey LIMESTONE occasional fractures			
9											
10											
11											
12											
13											
14											
15											
16											
17											
18					65.76		18.50				
19								[Drillers Description] Soft to firm orangish brown gravelly CLAY with occasional limestone karst limestone 18.50 - 37.00 Karst limestone with some voids and clay infill			
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
06/06/2023 06/06/2023	0.00 37.00	0.00 5.00	Start of shift End of shift								
All dimensions in metres Scale 1:132					Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm		Logged By: SPD	Approved By: DB
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 3	
Client: Roadstone											
Project No: 501.065091.00001		Date: 06/06/2023		Ground Level: 84.26m		Co-ordinates: E589943 N744233					
Project: Cam Quarry GW Monitoring 2023										Sheet 2 of 2	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
21						(18.50)	[Drillers Description] Soft to firm orangish brown gravelly CLAY with occasional limestone karst limestone				
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37				47.26				37.00		Borehole Complete at 37.00m	
38											
39											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks General; Borehole collapse at 21.5m due to highly unstable clay formation, managed to push 50mm standpipe to 36m	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

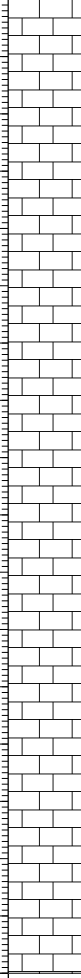
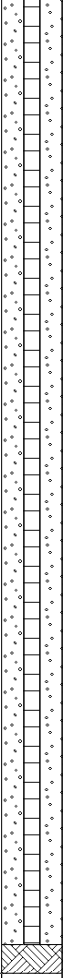
BOREHOLE LOG										BOREHOLE No MW 4	
Client: Roadstone										RECEIVED: 05/12/2023 SLR	
Project No: 501.065091.00001		Date: 08/06/2023		Ground Level: 90.05m		Co-ordinates: E590374 N745365					
Project: Cam Quarry GW Monitoring 2023											
										Sheet 1 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19				89.85		0.20	[Drillers Description] Firm brown TOPSOIL				
							[Drillers Description] Medium dense fine brown silty gravelly SAND with frequent cobbles and boulders				
					(5.90)						
				83.95	6.10	[Drillers Description] Medium strong weathered grey LIMESTONE					
					(1.90)						
	82.05	8.00	[Drillers Description] Strong grey LIMESTONE rare fractures								
							10.50 - 10.80 Fractured rock zone, with some clay infill				
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
08/06/2023	0.00	0.00	Start of shift								
08/06/2023	60.00	6.60	End of shift								
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79		Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB		
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 4	
Client: Roadstone											
Project No: 501.065091.00001		Date: 08/06/2023		Ground Level: 90.05m		Co-ordinates: E590374 N745365					
Project: Cam Quarry GW Monitoring 2023										Sheet 2 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
21							[Drillers Description] Strong grey LIMESTONE rare fractures				
22							22.00 - 22.30 Minor fracture, change in flush to brown				
23											
24											
25											
26											
27											
28											
29											
30							(39.00)				
31								31.00 - 31.40 Fractured rock zone, with some clay infill			
32											
33											
34											
35											
36											
37											
38											
39											
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

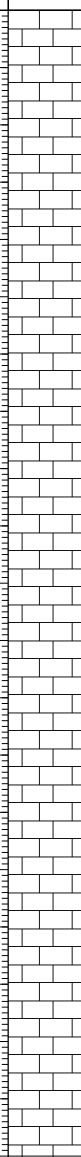
BOREHOLE LOG										BOREHOLE No MW 4	
Client: Roadstone										RECEIVED: 05/12/2023 	
Project No: 501.065091.00001		Date: 08/06/2023		Ground Level: 90.05m		Co-ordinates: E590374 N745365					
Project: Cam Quarry GW Monitoring 2023										Sheet 3 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
41							[Drillers Description] Strong grey LIMESTONE rare fractures				
42											
43											
44											
45											
46											
47						43.05	[Drillers Description] Medium strong occasional Weak brownish grey karst LIMESTONE frequent fractures				
48											
49											
50											
51											
52							51.50 - 53.00 Highly fractured rock				
53											
54						(13.00)					
55											
56											
57											
58							58.00 - 58.50 Highly fractured rock with clay infill				
59											
						30.05	60.00				
Borehole Complete at 60.00m											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

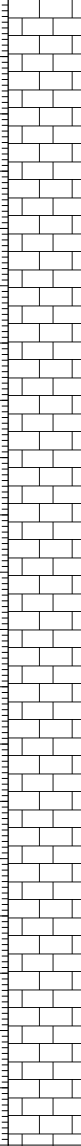
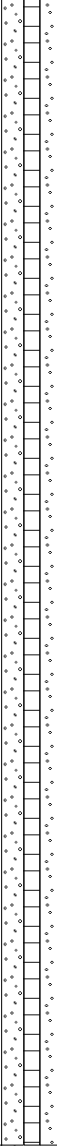
BOREHOLE LOG										BOREHOLE No MW 5	
Client: Roadstone										RECEIVED: 05/12/2023 SLR	
Project No: 501.065091.00001		Date: 02/06/2023		Ground Level: 87.89m		Co-ordinates: E590238 N745008					
Project: Cam Quarry GW Monitoring 2023											
										Sheet 1 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19				87.59		0.30	[Drillers Description] Rock Fill MADE GROUND				
						(1.10)	[Drillers Description] Medium dense fine brown silty slightly gravelly SAND				
				86.49	1.40	[Drillers Description] Weak occasional highly weathered karst light grey LIMESTONE some clayey karst joints					
					(13.60)	5.50 - 7.50 Fractured rock zone, with some clay infill					
						9.00 - 12.00 Highly fractured rock with clay infill					
				72.89		15.00	[Drillers Description] Strong grey LIMESTONE rare fractures				
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
02/06/2023	0.00	0.00	Start of shift								
02/06/2023	57.00	2.00	End of shift								
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79		Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB		
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

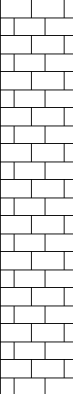
BOREHOLE LOG										BOREHOLE No MW 5	
Client: Roadstone										RECEIVED: 05/12/2025 SLR	
Project No: 501.065091.00001		Date: 02/06/2023		Ground Level: 87.89m		Co-ordinates: E590238 N745008					
Project: Cam Quarry GW Monitoring 2023										Sheet 2 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
21								[Drillers Description] Strong grey LIMESTONE rare fractures			
22											
23							(12.00)				
24											
25											
26											
27					60.89		27.00				
28								[Drillers Description] Very weak highly weathered karst light grey LIMESTONE frequent calcite veins			
29								27.00 - 31.00 Highly fractured rock with clay infill			
30											
31							(8.00)				
32											
33											
34											
35					52.89		35.00				
36								[Drillers Description] Medium strong light grey LIMESTONE occasional karst layers frequent calcite veins			
37											
38											
39											
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 5	
Client: Roadstone											
Project No: 501.065091.00001		Date: 02/06/2023		Ground Level: 87.89m		Co-ordinates: E590238 N745008					
Project: Cam Quarry GW Monitoring 2023										Sheet 3 of 3	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
41						(22.00)	[Drillers Description] Medium strong light grey LIMESTONE occasional karst layers frequent calcite veins				
42							42.50 - 44.00 Highly fractured rock with clay infill				
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57				30.89		57.00	Borehole Complete at 57.00m				
58											
59											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 6	
Client: Roadstone										RECEIVED: 05/12/2023 	
Project No: 501.065091.00001		Date: 07/06/2023		Ground Level: 86.38m		Co-ordinates: E589959 N745326					
Project: Cam Quarry GW Monitoring 2023											
										Sheet 1 of 4	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19				86.18		0.20	[Drillers Description] Firm brown TOPSOIL				
						(4.60)	[Drillers Description] Medium dense fine brown very silty gravelly SAND with frequent cobbles and boulders				
				81.58		4.80	[Drillers Description] Very weak highly weathered grey LIMESTONE				
				80.48		5.90	[Drillers Description] Strong grey LIMESTONE with occasional light brown fractured layers				
				66.38		20.00	Borehole Continued on Next Page				
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
07/06/2023	0.00	0.00	Start of shift								
07/06/2023	67.00	6.40	End of shift								
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79		Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB		
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 6	
Client: Roadstone											
Project No: 501.065091.00001		Date: 07/06/2023		Ground Level: 86.38m		Co-ordinates: E589959 N745326					
Project: Cam Quarry GW Monitoring 2023										Sheet 2 of 4	
SAMPLES & TESTS				Water	STRATA				Instrument Backfill		
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
21							[Drillers Description] Strong grey LIMESTONE rare fractures				
22							21.50 - 21.80 Fractured rock zone, with some clay infill				
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
								Borehole Continued on Next Page			
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79		Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB		
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 6	
Client: Roadstone											
Project No: 501.065091.00001		Date: 07/06/2023		Ground Level: 86.38m		Co-ordinates: E589959 N745326					
Project: Cam Quarry GW Monitoring 2023										Sheet 3 of 4	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			
41						(47.00)	[Drillers Description] Strong grey LIMESTONE rare fractures				
42							41.50 - 42.00 Minor fracture, change in flush to brown				
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
Borehole Continued on Next Page											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD		Approved By: DB	
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

BOREHOLE LOG										BOREHOLE No MW 6	
Client: Roadstone											
Project No: 501.065091.00001		Date: 07/06/2023		Ground Level: 86.38m		Co-ordinates: E589959 N745326					
Project: Cam Quarry GW Monitoring 2023										Sheet 4 of 4	
SAMPLES & TESTS				Water	STRATA					Instrument Backfill	
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
61							[Drillers Description] Strong grey LIMESTONE rare fractures				
62											
63											
64											
65											
66											
67				19.38			67.00				
68								Borehole Complete at 67.00m			
69											
70											
71											
72											
73											
74											
75											
76											
77											
78											
79											
Boring Progress and Water Observations					Chiselling			Water Added		General Remarks	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To		
All dimensions in metres Scale 1:132		Contractor: Stephan Petersen Plant: Knebel HY79			Method: Rotary open hole Hole Size: 120mm			Logged By: SPD	Approved By: DB		
LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020											

Appendix 7-D Field Record Sheets for Groundwater Monitoring and Surface Water Monitoring

RECEIVED 05/12/2025

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GROUNDWATER SAMPLING FIELD RECORD SHEET

Site location: Cam Quarry, Roscommon.

SLR job number: 501.000180.65091 **Date:** 03/08/2023

Time: 10.00– 18:00 on site

Staff: Orlaith Tyrrell, Mairead Brown

Equipment: Watterra, Dip, YSI, Bailer

	MW3	MW4	MW5	MW6
Groundwater level (m toc)	27.35	32.75	31.57	13.52
Total depth (m)	36	59.58	56.50	67
Volume of water in borehole (litres)	47.6	147.6	137.1	294.1
Watterra/bailer	Bailer	Bailer	Watterra	Watterra

Temperature (°C)	-	-	10.8	11.4
Specific conductivity (µS/cm)	-	-	293.7	343.1
Salinity (PSU)	-	-	0.16	0.19
pH	-	-	7.38	7.3
Total Dissolved Solids (ppt)	-	-	0.19	0.22
Turbidity (NTU)	-	-	4599.3	73.7

	MW3	MW4	MW5	MW6
RDO Concentration (mg/L)	-	-	266.1	265.9

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Odour	No	No	No	No
Sheen	No	No	No	No
Silt	Extremely Silty	Medium	Medium	Low
Colour	Brown/Opaque	Light Brown/Opaque	Light Brown/Opaque	Cloudy/Opaque
Free product	No	No	No	No
Volume Purged	-	-	135L	30L
Well purged dry	No	No	No	No

Any other field observations:

MW3 – Clay at base of borehole due to a partial well collapse during installation. Unable to pump due to the extremely high clay content. Attempted to bail but the bailer would not fill, grab sample taken but not enough bailed to fill containers completely. Unable to filter sample due to the high clay content. No Aquatroll data as water was too clayey and not enough bailed.

MW4 – Grab sample taken. No Aquatroll data, not enough water bailed.

MW5 – Pumping started at 10:50 and finished at 11:25 – 35 minutes of pumping. 9 buckets purged.

MW6 – Pumping started at 12.30, after 10 minutes there was very little outflow, which quickly stopped. Tubing was changed but still no water outflow. 2 buckets purged. Grab sample taken.

ONE WELL VOLUME (50mm diameter casing)	BS 10175
Terrier Borehole with 50mm Pipe	4l/m
6" Borehole with 50mm Pipe	5.5l/m
6" Borehole with 100mm Pipe	11.5l/m
8" Borehole with 50mm Pipe	8.25l/m
8" Borehole with 100mm Pipe	14.25l/m
Note : <i>Purging should continue until Removal of at least three well volumes, or pH, conductivity and temperature readings have stabilised (any two successive reading are within 10% of each other). If well is not recovering and it is not possible to meet these criteria then a grab sample should be obtained.</i>	

SURFACE WATER SAMPLING FIELD RECORD SHEET

RECEIVED 05/12/2025

Site location: Cam Quarry, Roscommon.**SLR job number:** 501.000180.65091 **Date:** 03/08/2023**Time:** 10:00 – 18.00 on site**Staff:** Orlaith Tyrrell, Mairead Brown**Equipment:** SW Scoop

	SW2	SW1
Odour	No	No
Sheen	No	No
Silt	V. Low	Low
Colour	Light Yellow/ Transparent	Light Green/ Transparent
Free product	No	No

Any other field observations:**SW1:** Contained free suspended particles.**SW2:** Contained free suspended particles.

SURFACE WATER SAMPLING FIELD RECORD SHEET

RECEIVED 05/12/2025

Site location: Cam Quarry, Roscommon.**SLR job number:** 501.00180.065091 **Date:** 11/01/2024**Time:** 8.45– 15.45 on site**Staff:** Mairead Brown**Equipment:** SW Scoop

	SW2	SW1
Odour	No	No
Sheen	No	No
Silt	V. Low	V. Low
Colour	Light Yellow/ Transparent	Light Green/ Transparent
Free product	No	No

	SW1	SW2
Specific conductivity ($\mu\text{S}/\text{cm}$)	490.06	492.78
Salinity (PSU)	0.23	0.23
Total Dissolved Solids (ppt)	0.32	0.32

RECEIVED: 05/12/2025

	SW1	SW2
Turbidity (NTU)	0.05	0.23
pH (pH)	7.38	7.68
RDO Concentration (mg/L)	10.45	11.95
Temperature (°C)	3.00	3.36

GROUNDWATER SAMPLING FIELD RECORD SHEET

RECEIVED 05/12/2025

Site location: Cam Quarry, Roscommon.

SLR job number: 501.00180.065091 **Date:** 11/01/2024

Time: 8.45– 15.45 on site

Staff: Mairead Brown

Equipment: Waterra, Dip, YSI, Bailer

	MW3	MW4	MW5	MW6
Groundwater level (m toc)	20.60	27.80	25.53	11.35
Total depth (m)	36	59.58	56.50	67
Volume of water in borehole (litres)	86.62	174.35	172.43	308
Waterra/bailer	Waterra	Bailer	Waterra	Waterra

Temperature (°C)	10.15	-	10.26	9.8
Specific conductivity (µS/cm)	555.46	-	316.94	458.85
Salinity (PSU)	0.27	-	0.15	0.22
pH	6.76	-	7.19	6.88
Total Dissolved Solids (ppt)	0.36	-	0.20	0.30
Turbidity (NTU)	1129.36	-	7864.81	5533.63

RECEIVED: 05/12/2025

	MW3	MW4	MW5	MW6
RDO Concentration (mg/L)	6.15	-	9.80	9.09

Odour	No	No	No	No
Sheen	No	No	No	No
Silt	Extremely Silty	Medium	Medium	Low
Colour	Brown/Opaque	Light Brown/Opaque	Light Brown/Opaque	Grey/Transparent
Free product	No	No	No	No
Volume Purged	90	-	180	330
Well purged dry	No	No	No	No

Any other field observations:

MW3 – Pumping started at 10.45 and finished at 11.00 – 15 minutes of pumping. 6 buckets purged. Unable to filter sample completely due to the high clay content (>20 filters used).

MW4 – No aquatroll data due to a connection issue. Pump broke while sampling, grab sample taken.

MW5 – Pumping started at 12.00 and finished at 12:25 – 25 minutes of pumping. 12 buckets purged.

MW6 – Pumping started at 9.15 and finished at 9.55 – 40 minutes of pumping. 22 buckets purged.

ONE WELL VOLUME (50mm diameter casing)	BS 10175
Terrier Borehole with 50mm Pipe	4l/m
6" Borehole with 50mm Pipe	5.5l/m
6" Borehole with 100mm Pipe	11.5l/m
8" Borehole with 50mm Pipe	8.25l/m
8" Borehole with 100mm Pipe	14.25l/m
Note : Purging should continue until Removal of at least three well volumes, or pH, conductivity and temperature readings have stabilised (any two successive reading are within 10% of each other). If well is not recovering and it is not possible to meet these criteria then a grab sample should be obtained.	

Field Record Sheet



Groundwater Sampling Field Record Sheet

Date:	8 October 2024	Time:	8.30 – 16.00 on site	Location:	Cam Quarry, Roscommon
Staff:	Michelle Sherry, Mairead Brown			SLR Project No.:	501.065505.00001
Equipment	Dip meter, Aquatroll, Waterra, Bailer, Scoop				

Table 1- Water Measurements

	MW3	MW4	MW5	MW6
Groundwater level (m bgl)	30.29	34.88	34.53	20.32
Total depth (m)	36	59.58	56.50	67
Volume of water in borehole (litres)	31.41	135.85	120.84	256.74
Volume purged (L)	15	15	15	125
Waterra / Bailer	Bailer	Bailer	Bailer	Waterra

Table 2 – Visual field parameters

Parameter	MW3	MW4	MW5	MW6
Odour	No	No	No	No
Sheen	No	No	No	No
Silt	V. High	Low	No	Low
Colour	Dark Brown, Opaque	Brown, Opaque	Clear, Transparent	Slightly cloudy, Transparent
Free product	No	No	No	No

Table 3 – Aquatroll Field Parameters

Field Record Sheet



Parameter	MW3	MW4	MW5	MW6
Temperature (°C)	11.19	10.86	11.15	10.74
Specific conductivity (µS/cm)	652.87	744.54	297.22	439.6
Salinity (PSU)	0.32	0.36	0.14	0.21
pH	6.94	6.79	7	7.34
Total Dissolved Solids (ppt)	0.42	0.48	0.19	0.29
Turbidity (NTU)	5450.78	70.73	2075.22	34.03
RDO Concentration (mg/L)	7.32	4.43	10.66	9.94

Other field observations:

MW5 – Pump refuelled >10m away.

MW3, MW4, MW5 – Unable to get a sample by Waterra, hence, a bailer was used to obtain a grab sample from these three wells.

Surface Water Sampling Field Record Sheet

Date:	8 October 2024	Time:	8.30– 16.00 on site	Location:	Cam Quarry, Roscommon
Staff:	Mairead Brown, Michelle Sherry			SLR Project No.:	501.065505.00001
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1	SW2
Odour	No	No
Sheen	No	No
Silt	Low	No
Colour	Clear, Transparent	Yellow, Transparent
Free product	Yes, Organic materials (leaves, dirt) in sample	No

Table 2 – Aquatroll Field Parameters

Parameter	SW1	SW2
Temperature (°C)	12.25	12.43
Specific conductivity (µS/cm)	499.02	501.82
Salinity (PSU)	0.24	0.24
pH	6.98	7.59
Total Dissolved Solids (ppt)	0.32	0.33
Turbidity (NTU)	943.22	4.45
RDO Concentration (mg/L)	0.36	9.29

Other field observations:

Surface Water Sampling Field Record Sheet

Date:	17 July 2025	Time:	8.30– 16.00 on site	Location:	Curry, Bridewell, Co. Roscommon
Staff:	Michelle Sherry	SLR Project No.:	501.065512.0001		
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1 Ballyglass US	SW2 Ballyglass DS	SW3 River Suck at Derrycahill Br.
Odour	No	No	No
Sheen	No	No	No
Silt	Low	Low	Low
Colour	Transparent, Clear	Transparent, Yellow	Transparent, Yellow
Free product	Leaves	No	No

Table 2 – Aquatroll Field Parameters

Parameter	SW1 Ballyglass US	SW2 Ballyglass DS	SW3 River Suck at Derrycahill Br.
Temperature (°C)	16.34	16.32	20.32
Specific conductivity (µS/cm)	105.17	105.76	165.20
Salinity (PSU)	0.05	0.05	0.08
pH	6.66	-	7.52
Total Dissolved Solids (ppt)	0.07	0.07	0.11
Turbidity (NTU)	4.55	0	0.03
RDO Concentration (mg/L)	4.27	7.85	8.30

Field Notes:

SW2 – pH sensor didn't work

Surface Water Sampling Field Record Sheet

Date:	16 September 2025	Time:	8.30– 16.00 on site	Location:	Cam quarry, Co. Roscommon
Staff:	Michelle Sherry	SLR Project No.:	501.065512.00001		
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1 Ballyglass Stream US	SW2 Ballyglass Stream US	Quarry Sump
Odour	No	No	No
Sheen	No	No	No
Silt	Low	Low	No
Colour	Transparent, yellow	Transparent, yellow	Clear / Transparent
Free product	No	No	No

Table 2 – Aquatroll Field Parameters

Parameter	SW1 Ballyglass Stream US	SW2 Ballyglass Stream US	Quarry Sump
Temperature (°C)	12.18	12.01	11.64
Specific conductivity (µS/cm)	383.03	375.85	578.30
Salinity (PSU)	0.18	0.18	0.28
pH	6.00	6.18	6.73
Total Dissolved Solids (ppt)	0.25	0.24	0.38
Turbidity (NTU)	509.97	0.76	3.33
RDO Concentration (mg/L)	6.13	9.58	10.06

Appendix 7-E Groundwater Screening Results

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Table 7-18: Groundwater Quality (5th August 2023)

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Inorganics								
Ammoniacal Nitrogen as N (low level)	0.065-0.175		0.15	mg/l	0.288	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₃	0.07891-0.21245		0.1821	mg/l	0.35	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₄	0.083525-1.651225			mg/l	0.37	<0.3	<0.3	<0.3
Chloride	187.5	250	30	mg/l	24.9	63.4	7.8	13.1
Conductivity	0.8 - 1.875	2.5	1	mS/cm	0.581	0.626	0.349	0.414
Cyanide, Free (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Cyanide, Total (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Fluoride		0.8	1	mg/l	<0.5	<0.5	<0.5	<0.5
Nitrate as NO ₃	37.5	50	25	mg/l	6.61	3.9	1.88	12.4
Nitrite as NO ₂	0.375	0.5	0.1	Mg/l	<0.25	<0.05	<0.05	<0.05
pH		6.5-9.5	6.5-9.5	pH Units	7.68	7.76	7.96	8
Phosphate (Ortho as PO ₄)			0.03	mg/l	<0.05	<0.05	<0.05	<0.05
Sulphate	187.5	250	200	mg/l	6.3	5.4	18.8	<2
Sulphide				mg/l	0.0681	0.0378	0.0328	0.0138
Alkalinity, Total as CaCO ₃				mg/l	303	280	260	204
Total Oxidised Nitrogen as N				mg/l	-	-	-	-

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Metals Filtered (Dissolved)								
Aluminium (diss.filt)	150	200	200	µg/l	<10	<10	<10	11.1
Arsenic (diss.filt)	7.5	10	10	µg/l	<0.5	<0.5	<0.5	<0.5
Barium (diss.filt)			100	µg/l	8.08	7.78	3.92	3.92
Boron (diss.filt)	750,000	1000		µg/l	<10	<10	<10	<10
Cadmium (diss.filt)	3.75*	5	5	µg/l	<0.08	<0.08	<0.08	<0.08
Calcium (Dis.Filt)			200	mg/l	96.7	95.7	71.9	87.2
Chromium (diss.filt)	37.5	50	30	µg/l	1.74	<1	<1	<1
Copper (diss.filt)	1500	2000	30	µg/l	1.38	0.692	<0.3	1.62
Iron (Dis.Filt)		200	200	mg/l	<0.019	<0.019	<0.019	<0.019
Lead (diss.filt)	7.5	10	10	µg/l	<0.2	<0.2	<0.2	<0.2
Mercury (diss.filt)	0.75	1	1	µg/l	<0.01	<0.01	<0.01	<0.01
Nickel (diss.filt)	15	20	20	µg/l	5.23	1.51	1.55	0.725
Phosphorus (diss.filt)				µg/l	<10	<10	<10	<10
Potassium (Dis.Filt)			5	mg/l	0.762	0.669	0.213	0.996
Selenium (diss.filt)		10		µg/l	1.9	<1	<1	<1
Sodium (Dis.Filt)				mg/l	7.83	29.3	4.06	6.33
Vanadium (diss.filt)				µg/l	2.74	<1	<1	<1
Zinc (diss.filt)	75		100	µg/l	5.09	9.13	3.73	22.5

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Metals Unfiltered (Total)								
Aluminium (tot.unfilt)				µg/l	-	-	-	-
Magnesium (tot.unfilt)				mg/l	14.5	14	3.81	2.39
Manganese (tot.unfilt)				µg/l	2190	1160	290	14.5
TPH Criteria Working Group (TPH CWG)								
Aliphatics >C10-C12				µg/l	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)				µg/l	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)				µg/l	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)				µg/l	213	<10	<10	<10
Aliphatics >C5-C6				µg/l	<10	<10	<10	<10
Aliphatics >C6-C8				µg/l	<10	<10	<10	<10
Aliphatics >C8-C10				µg/l	<10	<10	<10	<10
Aromatics >EC10-EC12				µg/l	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq)				µg/l	<10	<10	<10	<10
Aromatics >EC16-EC21 (aq)				µg/l	<10	<10	<10	<10
Aromatics >EC21-EC35 (aq)				µg/l	12	<10	<10	<10
Aromatics >EC5-EC7				µg/l	<10	<10	<10	<10
Aromatics >EC7-EC8				µg/l	<10	<10	<10	<10
Aromatics >EC8-EC10				µg/l	<10	<10	<10	<10
GRO >C5-C12				µg/l	<50	<50	<50	<50

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Total Aliphatics & Aromatics >C5-35 (aq)	7.5			µg/l	225	<10	<10	<10
Total Aliphatics >C12-C35 (aq)				µg/l	213	<10	<10	<10
Total Aromatics >EC12-EC35 (aq)				µg/l	12	<10	<10	<10
EPH CWG (Speciated)								
Aliphatics >C16-C35 Aqueous				µg/l	213	<10	<10	<10
Polyaromatic Hydrocarbons (PAHs)								
Acenaphthene (aq)				µg/l	<0.005	<0.005	<0.005	<0.005
Acenaphthylene (aq)				µg/l	<0.005	<0.005	<0.005	<0.005
Anthracene (aq)			10000	µg/l	<0.00525	<0.005	<0.005	<0.005
Benzo(a)anthracene (aq)				µg/l	0.00824	<0.005	<0.005	<0.005
Benzo(a)pyrene (aq)	0.0075	0.01	0.01	µg/l	0.0192	<0.002	<0.002	<0.002
Benzo(b)fluoranthene (aq)			0.5	µg/l	0.0223	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene (aq)			0.05	µg/l	<0.005	<0.005	<0.005	<0.005
Benzo(k)fluoranthene (aq)			0.05	µg/l	<0.005	<0.005	<0.005	<0.005
Chrysene (aq)				µg/l	0.0195	<0.005	<0.005	<0.005
Dibenzo(a,h)anthracene (aq)				µg/l	<0.005	<0.005	<0.005	<0.005
Fluoranthene (aq)			1	µg/l	0.0697	<0.005	<0.005	<0.005
Fluorene (aq)				µg/l	0.0074	<0.005	<0.005	<0.005
Indeno(1,2,3-cd)pyrene (aq)			0.05	µg/l	0.00711	<0.005	<0.005	<0.005

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Naphthalene (aq)			1	µg/l	<0.01	<0.01	<0.01	<0.01
PAH, Total Detected USEPA 16 (aq)		0.075	0.1	µg/l	0.272	<0.082	<0.082	<0.082
Phenanthrene (aq)				µg/l	0.0617	<0.005	<0.005	<0.005
Pyrene (aq)				µg/l	0.0519	<0.005	<0.005	<0.005
Microbiological								
Escherichia coli		0	0	CFU/100 ml	2	>100	0	0
Coliform bacteria		0	0	CFU/100 ml	31	>100	0	2
Highlighted values; exceedances assessment criteria; SI No 366 of 2016 (GW Regs), SI No 122 of 2014 (EC Drinking Water Regs), EPA IGVs (in that order)								

Table 7-19: Groundwater Quality (11th January 2024)

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Inorganics								
Ammoniacal Nitrogen as N (low level)	0.065-0.175		0.15	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₃	0.07891-0.21245		0.1821	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₄	0.083525-1.651225			mg/l	<0.3	<0.3	<0.3	<0.3
Chloride	187.5	250	30	mg/l	16.6	66.8	7.2	10.5
Conductivity	0.8 - 1.875	2.5	1	mS/cm	0.582	0.657	0.281	0.407
Cyanide, Free (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Cyanide, Total (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Fluoride		0.8	1	mg/l	<0.5	<0.5	<0.5	<0.5
Nitrate as NO ₃	37.5	50	25	mg/l	11.8	2.4	2.94	17
Nitrite as NO ₂	0.375	0.5	0.1	Mg/l	<0.25	<0.5	<0.5	<0.5
pH		6.5-9.5	6.5-9.5	pH Units	7.68	7.74	7.88	7.87
Phosphate (Ortho as PO ₄)			0.03	mg/l	<0.05	<0.05	<0.05	<0.05
Sulphate	187.5	250	200	mg/l	4	4.6	21.2	7.3
Sulphide				mg/l	<0.01	<0.01	<0.01	<0.01
Alkalinity, Total as CaCO ₃				mg/l	366	270	143	202
Total Oxidised Nitrogen as N				mg/l	2.66	0.542	0.665	3.85

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Metals Filtered (Dissolved)								
Aluminium (diss.filt)	150	200	200	µg/l	<10	<10	<10	<10
Arsenic (diss.filt)	7.5	10	10	µg/l	0.524	0.577	<0.5	<0.5
Barium (diss.filt)			100	µg/l	16.1	11	3.12	4.41
Boron (diss.filt)	750,000	1000		µg/l	10.5	15.2	<10	10.2
Cadmium (diss.filt)	3.75	5	5	µg/l	0.167	<0.08	<0.08	<0.08
Calcium (Dis.Filt)			200	mg/l	121	98.6	55.5	82.9
Chromium (diss.filt)	37.5	50	30	µg/l	<1	<1	<1	<1
Copper (diss.filt)	1500	2000	30	µg/l	1.99	1.25	1.82	1.37
Iron (Dis.Filt)		200	200	mg/l	<0.019	<0.019	<0.019	<0.019
Lead (diss.filt)	7.5	10	10	µg/l	0.543	0.521	0.334	<0.2
Mercury (diss.filt)	0.75	1	1	µg/l	<0.01	<0.01	<0.01	<0.01
Nickel (diss.filt)	15	20	20	µg/l	4.38	0.801	0.565	<0.4
Phosphorus (diss.filt)				µg/l	<10	<10	11.3	<10
Potassium (Dis.Filt)			5	mg/l	1.91	0.726	0.227	0.835
Selenium (diss.filt)		10		µg/l	2.71	<1	<1	<1
Sodium (Dis.Filt)				mg/l	8.96	32.3	5.03	6.69
Vanadium (diss.filt)				µg/l	5.62	<1	<1	<1
Zinc (diss.filt)	75		100	µg/l	Null	Null	Null	Null

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Metals Unfiltered (Total)								
Aluminium (tot.unfilt)				µg/l	36200	241	9590	46.9
Magnesium (Tot. Unfilt.)				mg/l	13.2	14.2	3.42	2.23
Manganese (tot.unfilt)				µg/l	1340	50.9	416	<1
TPH Criteria Working Group (TPH CWG)								
Aliphatics >C10-C12				µg/l	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)				µg/l	<50	<10	<50	<10
Aliphatics >C16-C21 (aq)				µg/l	<50	<10	<50	<10
Aliphatics >C21-C35 (aq)				µg/l	<50	<10	<50	<10
Aliphatics >C5-C6				µg/l	<10	<10	<10	<10
Aliphatics >C6-C8				µg/l	<10	<10	<10	<10
Aliphatics >C8-C10				µg/l	<10	<10	<10	<10
Aromatics >EC10-EC12				µg/l	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq)				µg/l	<50	<10	<50	<10
Aromatics >EC16-EC21 (aq)				µg/l	<50	<10	<50	<10
Aromatics >EC21-EC35 (aq)				µg/l	<50	12	<50	<10
Aromatics >EC5-EC7				µg/l	<10	<10	<10	<10
Aromatics >EC7-EC8				µg/l	<10	<10	<10	<10
Aromatics >EC8-EC10				µg/l	<10	<10	<10	<10
GRO >C5-C12				µg/l	<50	<50	<50	<50

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Total Aliphatics & Aromatics >C5-35 (aq)	7.5			µg/l	<10	34	<50	<10
Total Aliphatics >C12-C35 (aq)				µg/l	<50	<10	<50	<10
Microbiological								
Escherichia coli		0	0	CFU/100ml	10	46	3	0
Coliform bacteria		0	0	CFU/100ml	3	49	17	11
Highlighted values; exceedances assessment criteria; SI No 366 of 2016 (GW Regs), SI No 122 of 2014 (EC Drinking Water Regs), EPA IGVs (in that order)								

Table 7-20: Groundwater Quality (8th October 2024)

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Inorganics								
Ammoniacal Nitrogen as N (low level)	0.065-0.175		0.15	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₃	0.07891-0.21245		0.1821	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₄	0.083525-1.651225			mg/l	<0.3	<0.3	<0.3	<0.3
Chloride	187.5	250	30	mg/l	17.4	63.7	6.8	10.3
Conductivity	0.8 - 1.875	2.5	1	mS/cm	0.579	0.653	0.293	0.421
Cyanide, Free (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Cyanide, Total (low level)	37.5	50	10	µg/l	<0.05	<0.05	<0.05	<0.05
Fluoride		0.8	1	mg/l	<0.5	<0.5	<0.5	<0.5
Nitrate as NO ₃	37.5	50	25	mg/l	10.8	0.33	2.61	12.4
Nitrite as NO ₂	0.375	0.5	0.1	mg/l	<0.25	0.269	0.062	<0.05
pH		6.5-9.5	6.5-9.5	pH Units	7.54	7.84	7.96	7.76
Phosphate (Ortho as PO ₄)			0.03	mg/l	<0.05	<0.05	<0.05	<0.05
Sulphate	187.5	250	200	mg/l	5.2	6.5	14.2	5.7
Sulphide				mg/l	<0.01	<0.01	<0.01	<0.01
Alkalinity, Total as CaCO ₃				mg/l	312	272	203	534
Total Oxidised Nitrogen as N				mg/l	2.44	0.156	0.607	2.81

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Filtered (Dissolved) Metals								
Aluminium (diss.filt)	150	200	200	µg/l	<10	<10	13.6	<10
Arsenic (diss.filt)	7.5	10	10	µg/l	<0.5	<0.5	<0.5	<0.5
Barium (diss.filt)			100	µg/l	11	9.57	3.4	4.94
Boron (diss.filt)	750,000	1000		µg/l	<10	<10	<10	<10
Cadmium (diss.filt)	3.75	5	5	µg/l	<0.08	<0.08	<0.08	<0.08
Calcium (Dis.Filt)			200	mg/l	115	96	60.3	88.4
Chromium (diss.filt)	37.5	50	30	µg/l	<1	<1	<1	1
Copper (diss.filt)	1500	2000	30	µg/l	0.33	0.589	0.708	0.915
Iron (Dis.Filt)		200	200	mg/l	<0.019	<0.019	0.0227	0.0203
Lead (diss.filt)	7.5	10	10	µg/l	<0.2	<0.2	0.267	1.83
Mercury (diss.filt)	0.75	1	1	µg/l	<0.01	<0.01	<0.01	<0.01
Nickel (diss.filt)	15	20	20	µg/l	2.04	1.29	1	0.851
Phosphorus (diss.filt)				µg/l	<10	13	21.4	<10
Potassium (Dis.Filt)			5	mg/l	1.34	0.716	0.45	0.907
Selenium (diss.filt)		10		µg/l	1.16	<1	<1	<1
Sodium (Dis.Filt)				mg/l	8.4	28.2	4.31	6
Vanadium (diss.filt)				µg/l	2.08	<1	<1	<1
Zinc (diss.filt)	75		100	µg/l	-	-	-	-

Water (Hydrology & Hydrogeology) 7

Parameter	SI No 366 of 2016 (GW Regs)	SI No 122 of 2014 (DW Regs)	EPA IGVs	Units	MW3	MW4	MW5	MW6
Unfiltered (Total) Metals								
Aluminium (tot.unfilt)				µg/l	-	-	-	-
Magnesium (Tot. Unfilt.)			50	mg/l	16.3	12.7	4.84	10.7
Manganese (tot.unfilt)		50	50	µg/l	2190	177	697	692
Microbiological								
Escherichia coli		0	0	CFU/100ml	11	11	15	248
Coliform bacteria		0	0	CFU/100ml	1	4	8	0
Highlighted values: exceedances assessment criteria; SI No 366 of 2016 (GW Regs), SI No 122 of 2014 (EC Drinking Water Regs), EPA IGVs (in that order) Bold values: Exceeds laboratory limit of detection for organics where no assessment criteria exists								

Appendix 7-F Laboratory Results

RECEIVED: 05/12/2025



Unit 7-8 Hawarden Business Park
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Website: www.alsenvironmental.co.uk

SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Dominica Baird

RECEIVED: 05/12/2025

CERTIFICATE OF ANALYSIS

Date of report Generation: 15 August 2023
Customer: SLR Consulting Ireland
Sample Delivery Group (SDG): 230807-27
Your Reference: 501.000180.65091
Location: Cam Quarry Roscommon
Report No: 700217
Order Number: 8784

This report has been revised and directly supersedes 699500 in its entirety.

We received 6 samples on Monday August 07, 2023 and 6 of these samples were scheduled for analysis which was completed on Tuesday August 15, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28441687	MW3		0.00 - 0.00	03/08/2023
28441698	MW4		0.00 - 0.00	03/08/2023
28441711	MW5		0.00 - 0.00	03/08/2023
28441723	MW6		0.00 - 0.00	03/08/2023
28441668	SW1		0.00 - 0.00	03/08/2023
28441678	SW2		0.00 - 0.00	03/08/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217 **Site:** Su
Location: Cam Quarry Roscommon

Superseded Report: 699500

[illegible]

RECEIVED: 05/12/2025

[illegible]

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217 **Site:** Su
Location: Cam Quarry Roscommon

Superseded Report: 699500

Results Legend



Test



No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water
- Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

28441698		MW4	0.00 - 0.00	H2SO4 (ALE244)	CW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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28441678	SW2	0.00 - 0.00	500ml Plastic (ALE208)	SW	X			X												
			250ml BOD (ALE212)	SW																
			0.5l glass bottle (ALE227)	SW																
28441668	SW1	0.00 - 0.00	Vial (ALE297)	SW																X
			HNO3 Unfiltered (ALE204)	SW																
			HNO3 Filtered (ALE204)	SW																X
			500ml Plastic (ALE208)	SW	X															
			250ml BOD (ALE212)	SW																
			0.5l glass bottle (ALE227)	SW																
28441723	MM6	0.00 - 0.00	ZnAc (ALE246)	GW																
			Vial (ALE297)	GW																X
			NaOH (ALE245)	GW																
			HNO3 Unfiltered (ALE204)	GW																
			HNO3 Filtered (ALE204)	GW																X
			H2SO4 (ALE244)	GW																
			500ml Plastic (ALE208)	GW	X															
28441711	MM5	0.00 - 0.00	ZnAc (ALE246)	GW																
			Vial (ALE297)	GW																X
			NaOH (ALE245)	GW																
			HNO3 Unfiltered (ALE204)	GW																
			HNO3 Filtered (ALE204)	GW																X



CERTIFICATE OF ANALYSIS

Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

28441678

Customer Sample Reference

SW2

AGS Reference

Depth (m)

0.00 - 0.00

Container

Vial (ALE297)
HNO3 Unfiltered (ALE204)
HNO3 Filtered (ALE204)

Sample Type

SW SW SW

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

GRO by GC-FID (W)

All

NDPs: 0
Tests: 6

X

Mercury Dissolved

All

NDPs: 0
Tests: 6

X

Total Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

VOC MS (W)

All

NDPs: 0
Tests: 6

X

RECEIVED: 05/12/2025



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Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	MW3	MW4	MW5	MW6	SW1	SW2
# ISO17025 accredited.			0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023
M mCERTS accredited.								
aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.								
tot.unfiltTotal / unfiltered sample.								
* Subcontracted - refer to subcontractor report for accreditation status.								
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F) Trigger breach confirmed								
1-4* Sample deviation (see appendix)								
Component	LOD/Units	Method						
Escherichia Coli (W)*		SUB	See Attached	See Attached	See Attached	See Attached		
Coliforms, Total*		SUB	See Attached	See Attached	See Attached	See Attached		
Suspended solids, Total	<2 mg/l	TM022					189	8.6
BOD, unfiltered	<1 mg/l	TM045					2.36	<1
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	0.288	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	0.35	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	0.37	<0.3	<0.3	<0.3		
Sulphide	<0.01 mg/l	TM101	0.0681	0.0378	0.0328	0.0138		
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107					108	50.2
Aluminium (diss.filt)	<10 µg/l	TM152	<10	<10	<10	11.1	<10	<10
Aluminium (tot.unfilt)	<10 µg/l	TM152	32000	1510	6490	202	151	24.8
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	<0.5	<0.5	<0.5	0.791	0.841
Barium (diss.filt)	<0.2 µg/l	TM152	8.08	7.78	3.92	3.92	10.2	9.56
Boron (diss.filt)	<10 µg/l	TM152	<10	<10	<10	<10	<10	<10
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	<1 µg/l	TM152	1.74	<1	<1	<1	<1	<1
Copper (diss.filt)	<0.3 µg/l	TM152	1.38	0.692	<0.3	1.62	0.403	0.416
Manganese (tot.unfilt)	<1 µg/l	TM152	2190	1160	290	14.5	218	192
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel (diss.filt)	<0.4 µg/l	TM152	5.23	1.51	1.55	0.725	1.54	1.27
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	<10	<10	<10	12.2	10.1
Selenium (diss.filt)	<1 µg/l	TM152	1.9	<1	<1	<1	<1	<1
Vanadium (diss.filt)	<1 µg/l	TM152	2.74	<1	<1	<1	<1	<1
Zinc (diss.filt)	<1 µg/l	TM152	5.09	9.13	3.73	22.5	2.72	2.74
Sodium (Dis.Filt)	<0.076 mg/l	TM152	7.83	29.3	4.06	6.33	8.09	8.31
Potassium (Dis.Filt)	<0.2 mg/l	TM152	0.762	0.669	0.213	0.996	1.37	1.38
Calcium (Dis.Filt)	<0.2 mg/l	TM152	96.7	95.7	71.9	87.2	87.9	88.6
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	<0.019	<0.019	<0.019	0.507	0.457
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152	14.5	14	3.81	2.39	2.52	2.54
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172					<100	<100
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as NO2	<0.05 mg/l	TM184	<0.25	<0.05	<0.05	<0.05		

SDG: 230807-27
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Report Number: 700217 **Site:** Su
Location: Cam Quarry Roscommon

Superseded Report: 699500

[illegible]



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Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

VOC MS (W)

Results Legend			Customer Sample Ref.		MW3	MW4	MW5	MW6	SW1	SW2	
# ISO17025 accredited.	M mCERTS accredited.	aq Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023	
diss.filt Dissolved / filtered sample.	tot.unfilt Total / unfiltered sample.	* Subcontracted - refer to subcontractor report for accreditation status.			07/08/2023 230807-27 28441687	07/08/2023 230807-27 28441698	07/08/2023 230807-27 28441711	07/08/2023 230807-27 28441723	07/08/2023 230807-27 28441668	07/08/2023 230807-27 28441678	
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	(F) Trigger breach confirmed	1-4* Sample deviation (see appendix)									
Component											
LOD/Units											
Method											
Dibromofluoromethane**	%	TM208			111	111	109	112			
Toluene-d8**	%	TM208			100	101	100	99.7			
4-Bromofluorobenzene**	%	TM208			96.7	98.5	102	99.7			
Dichlorodifluoromethane	<1 µg/l	TM208			<1	<1	<1	<1			
Chloromethane	<1 µg/l	TM208			<1	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM208			<1	<1	<1	<1			
Bromomethane	<1 µg/l	TM208			<1	<1	<1	<1			
Chloroethane	<1 µg/l	TM208			<1	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM208			<1	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM208			<1	<1	<1	<1			
Dichloromethane	<3 µg/l	TM208			<3	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1	
trans-1,2-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM208			<1	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1			
Chloroform	<1 µg/l	TM208			<1	<1	<1	<1			
1,1,1-Trichloroethane	<1 µg/l	TM208			<1	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1			
Carbontetrachloride	<1 µg/l	TM208			<1	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM208			<1	<1	<1	<1			
Benzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1	
Trichloroethene	<1 µg/l	TM208			<1	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1			
Dibromomethane	<1 µg/l	TM208			<1	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM208			<1	<1	<1	<1			
cis-1,3-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1			
Toluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1	
trans-1,3-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM208			<1	<1	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

VOC MS (W)

Results Legend			Customer Sample Ref.		MW3	MW4	MW5	MW6	SW1	SW2
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Ground Water (GW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023	0.00 - 0.00 Surface Water (SW) 03/08/2023
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
* Subcontracted - refer to subcontractor report for accreditation status.					07/08/2023 230807-27 28441687	07/08/2023 230807-27 28441698	07/08/2023 230807-27 28441711	07/08/2023 230807-27 28441723	07/08/2023 230807-27 28441668	07/08/2023 230807-27 28441678
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery										
(F) Trigger breach confirmed										
1-4* @ Sample deviation (see appendix)										
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Styrene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,2,3-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		
					#	#	#	#		
1,3,5-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1		



Superseded Report: 699500



CERTIFICATE OF ANALYSIS

Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Table of Results - Appendix

Method No	Description
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM104	Determination of Fluoride using the Kone Analyser
TM174	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Determination of Sulphide in soil and water samples using the Kone Analyser
TM259	Determination of Phenols in Waters and Leachates by HPLC
SUB	Subcontracted Test
TM152	Analysis of Aqueous Samples by ICP-MS
TM172	EPH in Waters
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 230807-27
Client Ref.: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.

Depth

Type

	28441687	28441698	28441711	28441723	28441668	28441678
	MW3	MW4	MW5	MW6	SW1	SW2
	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water	Surface Water
Ammoniacal Nitrogen	09-Aug-2023	08-Aug-2023	09-Aug-2023	09-Aug-2023		
Anions by Kone (w)	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023		
BOD True Total					12-Aug-2023	12-Aug-2023
COD Unfiltered					14-Aug-2023	14-Aug-2023
Coliforms (W)	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023		
Cyanide Comp/Free/Total/Thiocyanate	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023		
Dissolved Metals by ICP-MS	11-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023
EPH CWG (Aliphatic) Aqueous GC (W)	14-Aug-2023	14-Aug-2023	14-Aug-2023	14-Aug-2023	10-Aug-2023	10-Aug-2023
EPH CWG (Aromatic) Aqueous GC (W)	14-Aug-2023	14-Aug-2023	14-Aug-2023	14-Aug-2023	10-Aug-2023	10-Aug-2023
Fluoride	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023		
GRO by GC-FID (W)	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023
Mercury Dissolved	14-Aug-2023	11-Aug-2023	11-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023
Mineral Oil C10-40 Aqueous (W)					10-Aug-2023	10-Aug-2023
Nitrite by Kone (w)	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023		
PAH Spec MS - Aqueous (W)	11-Aug-2023	11-Aug-2023	11-Aug-2023	11-Aug-2023		
pH Value	11-Aug-2023	11-Aug-2023	11-Aug-2023	11-Aug-2023	14-Aug-2023	11-Aug-2023
Phenols by HPLC (W)	09-Aug-2023	09-Aug-2023	09-Aug-2023	09-Aug-2023		
Phosphate by Kone (w)	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023	08-Aug-2023
Sulphide	15-Aug-2023	15-Aug-2023	15-Aug-2023	15-Aug-2023		
Suspended Solids					14-Aug-2023	14-Aug-2023
Total Metals by ICP-MS	11-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023
TPH CWG (W)	14-Aug-2023	14-Aug-2023	14-Aug-2023	14-Aug-2023	10-Aug-2023	10-Aug-2023
VOC MS (W)	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023	10-Aug-2023

RECEIVED: 05/12/2025



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
Telephone: +353 (0) 52 617 8100



Report No: ALSH-240040323

Document No: EF0011

RECEIVED: 05/10/2025

SUPPLEMENTARY CERTIFICATE OF ANALYSIS

Client	ALS Hawarden Units 7-8 Hawarden Business Park Manor Lane Hawarden CH5 3US	Date Submitted	04/08/2023
		Date Reported	08/08/2023
		Order Number	N/A
For the Attention of:	ALS Hawarden		
Sample Reception	4 sample(s) received in good condition.		
Comments	Update required for sample descriptions		

Report Authorised by:

Ann-Marie Fitzgerald

Ann-Marie Fitzgerald
Microbiology Manager

Conditions:

1. Results in this report relate only to the items tested
2. Reports may not be reproduced except in full without the approval of ALS Life Sciences Ltd
3. All queries regarding this report should be addressed to the Technical Manager at the above address
4. A * next to a method reference signifies that ALS Life Sciences Ltd is NOT INAB accredited for this method
5. Results reported as CFU/cm² are calculated based on information supplied by customer regarding area swabbed
6. SUBCON* indicates analysis subcontracted to approved subcontractors who do not hold accreditation for this test
7. SUBCON^ indicates analysis subcontracted to approved subcontractors who hold accreditation for this test
8. Where sampling is undertaken by ALS personnel, sampling activities are outside the scope of INAB accreditation
9. Dil next to a method reference indicates that a dilution of the water sample was undertaken during testing
10. Statement of conformity made against the result does not take into account the uncertainty of measurement associated with the method
11. This supplementary certificate replaces the previous certificate which must be destroyed



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
Telephone: +353 (0) 52 617 8100



RECEIVED: 05/12/2025

Report No: ALSH-240040623

Document No: EF0011

SUPPLEMENTARY CERTIFICATE OF ANALYSIS

Date Submitted 04/08/2023

Date Reported 08/08/2023

Order Number N/A

Sample Type Water
Client ID MW3 (03/08/2023 @ 15.45)
Date Tested 04/08/2023
ALS ID 5692981

Test	Result	Unit	Method
Escherichia coli	2	CFU/100ml	SP140/SP241 MODW Part 4, B 2016
Coliform bacteria	31	CFU/100ml	SP140/SP241 MODW Part 4, B 2016

Sample Type Water
Client ID MW4 (03/08/2023 @ 16.49)
Date Tested 04/08/2023
ALS ID 5692982

Test	Result	Unit	Method
Escherichia coli	>100	CFU/100ml	SP140/SP241 MODW Part 4, B 2016
Coliform bacteria	>100	CFU/100ml	SP140/SP241 MODW Part 4, B 2016

Sample Type Water
Client ID MW5 (03/08/2023 @11.24)
Date Tested 04/08/2023
ALS ID 5692983

Test	Result	Unit	Method
Escherichia coli	0	CFU/100ml	SP 140 MODW Part 4, B 2016
Coliform bacteria	0	CFU/100ml	SP 140 MODW Part 4, B 2016

Sample Type Water
Client ID MW6 (03/08/2023 @ 13.20)
Date Tested 04/08/2023
ALS ID 5692984

Test	Result	Unit	Method
Escherichia coli	0	CFU/100ml	SP140/SP241 MODW Part 4, B 2016
Coliform bacteria	2	CFU/100ml	SP140/SP241 MODW Part 4, B 2016

Report Authorised by:

Ann-Marie Fitzgerald

Ann-Marie Fitzgerald
Microbiology Manager



CERTIFICATE OF ANALYSIS

SDG: 230807-27
Client Ref: 501.000180.65091

Report Number: 700217
Location: Cam Quarry Roscommon

Superseded Report: 699500

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park
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email: hawardencustomerservices@alsglobal.com

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SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Mairead Brown

RECEIVED: 05/12/2025

CERTIFICATE OF ANALYSIS

Date of report Generation: 22 January 2024
Customer: SLR Consulting Ireland
Sample Delivery Group (SDG): 240115-11
Your Reference: 501.000180.65091
Location: Cam Quarry
Report No: 717607
Order Number: 1004

This report has been revised and directly supersedes 716930 in its entirety.

We received 6 samples on Monday January 15, 2024 and 6 of these samples were scheduled for analysis which was completed on Monday January 22, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29208014	MW3		0.00 - 0.00	11/01/2024
29208025	MW4		0.00 - 0.00	11/01/2024
29208037	MW5		0.00 - 0.00	11/01/2024
29208050	MW6		0.00 - 0.00	11/01/2024
29207994	SW1		0.00 - 0.00	11/01/2024
29208005	SW2		0.00 - 0.00	11/01/2024

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

[illegible]

RECEIVED: 05/12/2025

[illegible]

SDG: 240115-11

Report Number: 717607

Superseded Report: 716930

Client Ref.: 501.000180.65091

Location: Cam Quarry

Results Legend



Test



No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water
- Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

Lab Sample No(s)		Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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RECEIVED: 05/12/2025

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

29208005

Customer Sample Reference

SW2

AGS Reference

Depth (m)

0.00 - 0.00

Container

Vial (ALE297)
HNO3 Unfiltered (ALE204)
HNO3 Filtered (ALE204)
500ml Plastic (ALE208)

Sample Type

SW

Anions by Kone (w)

All

NDPs: 0
Tests: 6

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

GRO by GC-FID (W)

All

NDPs: 0
Tests: 6

X

Mercury Dissolved

All

NDPs: 0
Tests: 6

X

pH Value

All

NDPs: 0
Tests: 6

X

Phosphate by Kone (w)

All

NDPs: 0
Tests: 6

X

Suspended Solids

All

NDPs: 0
Tests: 2

X

Total Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

VOC MS (W)

All

NDPs: 0
Tests: 6

X

RECEIVED: 05/12/2025



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	MW3	MW4	MW5	MW6	SW1	SW2
# ISO17025 accredited.			0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024
M mCERTS accredited.								
aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.			15/01/2024 240115-11 29208014	15/01/2024 240115-11 29208025	15/01/2024 240115-11 29208037	15/01/2024 240115-11 29208050	15/01/2024 240115-11 29207994	15/01/2024 240115-11 29208005
tot.unfiltTotal / unfiltered sample.								
* Subcontracted - refer to subcontractor report for accreditation status.								
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F) Trigger breach confirmed								
1-4* Sample deviation (see appendix)								
Component	LOD/Units	Method						
Escherichia Coli (W)*		SUB	See Attached	See Attached	See Attached	See Attached		
Coliforms, Total*		SUB	See Attached	See Attached	See Attached	See Attached		
Suspended solids, Total	<2 mg/l	TM022					<2	<2
BOD, unfiltered	<1 mg/l	TM045					<1	<1
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3	<0.3	<0.3	<0.3		
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01	<0.01		
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107					18	11.7
Aluminium (diss.filt)	<10 µg/l	TM152	<10	<10	13.6	<10	<10	<10
Aluminium (tot.unfilt)	<10 µg/l	TM152	37500	202	12700	12300	<10	10.1
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium (diss.filt)	<0.2 µg/l	TM152	11	9.57	3.4	4.94	7.8	7.77
Boron (diss.filt)	<10 µg/l	TM152	<10	<10	<10	<10	<10	13.4
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1	1	<1	<1
Copper (diss.filt)	<0.3 µg/l	TM152	0.33	0.589	0.708	0.915	0.312	<0.3
Manganese (tot.unfilt)	<1 µg/l	TM152	2190	177	697	692	14.5	13.5
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2	0.267	1.83	<0.2	<0.2
Nickel (diss.filt)	<0.4 µg/l	TM152	2.04	1.29	1	0.851	0.617	0.744
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	13	21.4	<10	<10	<10
Selenium (diss.filt)	<1 µg/l	TM152	1.16	<1	<1	<1	<1	<1
Vanadium (diss.filt)	<1 µg/l	TM152	2.08	<1	<1	<1	<1	<1
Sodium (Dis.Filt)	<0.076 mg/l	TM152	8.4	28.2	4.31	6	6.57	6.57
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.34	0.716	0.45	0.907	2.08	2.03
Calcium (Dis.Filt)	<0.2 mg/l	TM152	115	96	60.3	88.4	94	93.4
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	<0.019	0.0227	0.0203	0.0606	0.0549
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152	16.3	12.7	4.84	10.7	3.24	3.21
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as NO2	<0.05 mg/l	TM184	<0.25	0.269	0.062	<0.05		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	<2 mg/l	TM184	5.2	6.5	14.2	5.7		



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

VOC MS (W)

Results Legend			Customer Sample Ref.	MW3	MW4	MW5	MW6	SW1	SW2		
# ISO17025 accredited.	M mCERTS accredited.	aq Aqueous / settled sample.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024		
diss.filt Dissolved / filtered sample.	tot.unfilt Total / unfiltered sample.	* Subcontracted - refer to subcontractor report for accreditation status.		15/01/2024 240115-11 29208014	15/01/2024 240115-11 29208025	15/01/2024 240115-11 29208037	15/01/2024 240115-11 29208050	15/01/2024 240115-11 29207994	15/01/2024 240115-11 29208005		
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	(F) Trigger breach confirmed	1-4**@ Sample deviation (see appendix)									
Component				LOD/Units	Method						
Dibromofluoromethane**				%	TM208	103	103	105	107	104	106
Toluene-d8**				%	TM208	98.9	99.6	98.6	99.4	99.1	99.4
4-Bromofluorobenzene**			%	TM208	103	102	101	102	98.7	102	
Dichlorodifluoromethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Chloromethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Vinyl chloride			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Bromomethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Chloroethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Trichlorofluoromethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Carbon disulphide			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Dichloromethane			<3 µg/l	TM208	<3	<3	<3	<3	<3	<3	
Methyl tertiary butyl ether (MTBE)			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
trans-1,2-Dichloroethene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,1-Dichloroethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
cis-1,2-Dichloroethene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
2,2-Dichloropropane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Bromochloromethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Chloroform			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,1,1-Trichloroethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,1-Dichloropropene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Carbontetrachloride			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,2-Dichloroethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Benzene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Trichloroethene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,2-Dichloropropane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Dibromomethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Bromodichloromethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
cis-1,3-Dichloropropene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
Toluene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
trans-1,3-Dichloropropene			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,1,2-Trichloroethane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	
1,3-Dichloropropane			<1 µg/l	TM208	<1	<1	<1	<1	<1	<1	



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

VOC MS (W)

Results Legend			Customer Sample Ref.		MW3	MW4	MW5	MW6	SW1	SW2
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Ground Water (GW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024	0.00 - 0.00 Surface Water (SW) 11/01/2024
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
* Subcontracted - refer to subcontractor report for accreditation status.					15/01/2024 240115-11 29208014	15/01/2024 240115-11 29208025	15/01/2024 240115-11 29208037	15/01/2024 240115-11 29208050	15/01/2024 240115-11 29207994	15/01/2024 240115-11 29208005
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery										
(F) Trigger breach confirmed										
1-4* Sample deviation (see appendix)										
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromoform	<1 µg/l	TM208			<2	<2	<2	<1	<1	<1
					#	#	#	#	#	#
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#

16:01:28 22/01/2024

SDG: 240115-11

Report Number: 717607

Superseded Report: 716930

Client Ref.: 501.000180.65091

Location: Cam Quarry

VOC MS (W)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Table of Results - Appendix

Method No	Description
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Determination of Sulphide in soil and water samples using the Kone Analyser
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
SUB	Subcontracted Test
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

RECEIVED: 05/12/2025



CERTIFICATE OF ANALYSIS

Validated

SDG: 240115-11
Client Ref.: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.

Depth

Type

	29208014	29208025	29208037	29208050	29207994	29208005
	MW3	MW4	MW5	MW6	SW1	SW2
	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water	Surface Water
Ammoniacal Nitrogen	17-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024		
Anions by Kone (w)	17-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024
BOD True Total					20-Jan-2024	20-Jan-2024
COD Unfiltered					20-Jan-2024	20-Jan-2024
Coliforms (W)	15-Jan-2024	15-Jan-2024	15-Jan-2024	15-Jan-2024		
Cyanide Comp/Free/Total/Thiocyanate	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024		
Dissolved Metals by ICP-MS	16-Jan-2024	18-Jan-2024	19-Jan-2024	18-Jan-2024	16-Jan-2024	16-Jan-2024
EPH and CWG by FID	22-Jan-2024	19-Jan-2024	22-Jan-2024	19-Jan-2024	19-Jan-2024	19-Jan-2024
Fluoride	17-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024		
GRO by GC-FID (W)	17-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024
Mercury Dissolved	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024
Nitrite by Kone (w)	16-Jan-2024	17-Jan-2024	17-Jan-2024	17-Jan-2024		
PAH Spec MS - Aqueous (W)	19-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024		
pH Value	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	17-Jan-2024	17-Jan-2024
Phenols by HPLC (W)	19-Jan-2024	19-Jan-2024	19-Jan-2024	19-Jan-2024		
Phosphate by Kone (w)	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024
Sulphide	19-Jan-2024	19-Jan-2024	19-Jan-2024	19-Jan-2024		
Suspended Solids					16-Jan-2024	16-Jan-2024
Total Metals by ICP-MS	22-Jan-2024	18-Jan-2024	18-Jan-2024	18-Jan-2024	19-Jan-2024	19-Jan-2024
TPH CWG (W)	22-Jan-2024	19-Jan-2024	22-Jan-2024	19-Jan-2024	19-Jan-2024	19-Jan-2024
VOC MS (W)	16-Jan-2024	16-Jan-2024	16-Jan-2024	16-Jan-2024	16-Jan-2024	16-Jan-2024

RECEIVED: 05/12/2025



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
Telephone: +353 (0) 52 617 8100



Report No: ALSH-717120124

Document No: EF0011

RECEIVED: 05/10/2025

CERTIFICATE OF ANALYSIS

Client	ALS Hawarden Units 7-8 Hawarden Business Park Manor Lane Hawarden CH5 3US	Date Submitted	12/01/2024
		Date Reported	13/01/2024
		Order Number	N/A
For the Attention of:	ALS Hawarden		
Sample Reception	4 sample(s) received in good condition.		
Comments	N/A		

Report Authorised by:

Ann-Marie Fitzgerald

Ann-Marie Fitzgerald
Microbiology Manager

Conditions:

1. Results in this report relate only to the items tested
2. Reports may not be reproduced except in full without the approval of ALS Life Sciences Ltd
3. All queries regarding this report should be addressed to the Technical Manager at the above address
4. A * next to a method reference signifies that ALS Life Sciences Ltd is NOT INAB accredited for this method
5. Results reported as CFU/cm² are calculated based on information supplied by customer regarding area swabbed
6. SUBCON* indicates analysis subcontracted to approved subcontractors who do not hold accreditation for this test
7. SUBCON^ indicates analysis subcontracted to approved subcontractors who hold accreditation for this test
8. Where sampling is undertaken by ALS personnel, sampling activities are outside the scope of INAB accreditation
9. Dil next to a method reference indicates that a dilution of the water sample was undertaken during testing
10. Statement of conformity made against the result does not take into account the uncertainty of measurement associated with the method



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
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RECEIVED: 05/12/2025

Report No: ALSH-717120124

Document No: EF0011

CERTIFICATE OF ANALYSIS

Date Submitted 12/01/2024
Date Reported 13/01/2024
Order Number N/A

Sample Type Water
Client ID MW3 (11/01/2024 @ 10.53 am)
Date Tested 12/01/2024
ALS ID 5935685

Test	Result	Unit	Method
Coliforms	11	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	1	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW4 (11/01/2024 @ 13.59 pm)
Date Tested 12/01/2024
ALS ID 5935686

Test	Result	Unit	Method
Coliforms	11	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	4	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW5 (11/01/2024 @ 12.23 pm)
Date Tested 12/01/2024
ALS ID 5935687

Test	Result	Unit	Method
Coliforms	15	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	8	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW6 (11/01/2024 @ 9.50 am)
Date Tested 12/01/2024
ALS ID 5935688

Test	Result	Unit	Method
Coliforms	248	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	0	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Report Authorised by:

Ann-Marie Fitzgerald

Ann-Marie Fitzgerald
Microbiology Manager



CERTIFICATE OF ANALYSIS

SDG: 240115-11
Client Ref: 501.000180.65091

Report Number: 717607
Location: Cam Quarry

Superseded Report: 716930

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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email: hawardencustomerservices@alsglobal.com

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SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Mairead Brown

RECEIVED: 05/12/2025

CERTIFICATE OF ANALYSIS

Date of report Generation:	17 October 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	241010-56
Your Reference:	501.000180.65091
Location:	Cam Quarry
Report No:	743901
Order Number:	1424

This report has been revised and directly supersedes 743360 in its entirety.

We received 6 samples on Thursday October 10, 2024 and 6 of these samples were scheduled for analysis which was completed on Thursday October 17, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Lauren Ellis

General Manager Western Europe Environmental





CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
30496536	MW3		0.00 - 0.00	08/10/2024
30496552	MW4		0.00 - 0.00	08/10/2024
30496567	MW5		0.00 - 0.00	08/10/2024
30496583	MW6		0.00 - 0.00	08/10/2024
30496517	SW1		0.00 - 0.00	08/10/2024
30496527	SW2		0.00 - 0.00	08/10/2024

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)																																
	Customer Sample Reference																																
	AGS Reference																																
	Depth (m)		0.00 - 0.00																														
	Container		0.5l glass bottle (ALE227)																														
	Sample Type		GW																														
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 4					X																										
Anions by Kone (w)	All	NDPs: 0 Tests: 6				X																											
BOD True Total	All	NDPs: 0 Tests: 2																															
COD Unfiltered	All	NDPs: 0 Tests: 2																															
Coliforms (W)*	All	NDPs: 0 Tests: 4				X																											
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4																															
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7																															
EPH and CWG by FID	All	NDPs: 0 Tests: 6																															
Fluoride	All	NDPs: 0 Tests: 4				X																											
GRO by GC-FID (W)	All	NDPs: 0 Tests: 6																															
Mercury Dissolved	All	NDPs: 0 Tests: 6																															
Nitrite by Kone (w)	All	NDPs: 0 Tests: 4																															
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 4				X																											
pH Value	All	NDPs: 0 Tests: 6					X																										
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4						X																									

RECEIVED: 05/12/2025

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

30496536

MM3

0.00 - 0.00

0.5l glass bottle (ALE227)

GW

30496552

MM4

0.00 - 0.00

0.5l glass bottle (ALE227)

GW

RECEIVED: 05/12/2025

Phosphate by Kone (w)

All

NDPs: 0
Tests: 6

X

X

Sulphide

All

NDPs: 0
Tests: 4

X

X

Suspended Solids

All

NDPs: 0
Tests: 2

Total Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

X

TPH CWG (W)

All

NDPs: 0
Tests: 6

X

X

X

VOC MS (W)

All

NDPs: 0
Tests: 6

X

X

RECEIVED: 05/12/2025

30496517	SW1	0.00 - 0.00	HNO3 Unfiltered (ALE204)	SW				X		
			HNO3 Filtered (ALE204)	SW						
			500ml Plastic (ALE208)	SW	X		X			
			250ml BOD (ALE212)	SW						
			0.5l glass bottle (ALE227)	SW						
30496583	MW6	0.00 - 0.00	ZnAc (ALE246)	GW		X			X	
			Vial (ALE297)	GW						X
			NaOH (ALE245)	GW						
			HNO3 Unfiltered (ALE204)	GW				X		
			HNO3 Filtered (ALE204)	GW						
			H2SO4 (ALE244)	GW						
			500ml Plastic (ALE208)	GW	X					
			250ml Amber Gl. PTFE/PE (ALE219)	GW						
			0.5l glass bottle (ALE227)	GW					X	
30496567	MW5	0.00 - 0.00	ZnAc (ALE246)	GW		X				X
			Vial (ALE297)	GW						X
			NaOH (ALE245)	GW						
			HNO3 Unfiltered (ALE204)	GW				X		
			HNO3 Filtered (ALE204)	GW						
			H2SO4 (ALE244)	GW						
			500ml Plastic (ALE208)	GW	X					



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

30496517

30496527

Customer Sample Reference

SW1

SW2

AGS Reference

Depth (m)

0.00 - 0.00

0.00 - 0.00

Container

Vial (ALE297)
HNO3 Unfiltered (ALE204)
HNO3 Filtered (ALE204)
500ml Plastic (ALE208)
250ml BOD (ALE212)
0.5l glass bottle (ALE227)
Vial (ALE297)

Sample Type

SW SW SW SW SW SW SW

Anions by Kone (w)

All

NDPs: 0
Tests: 6

X

BOD True Total

All

NDPs: 0
Tests: 2

X

COD Unfiltered

All

NDPs: 0
Tests: 2

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 7

X

EPH and CWG by FID

All

NDPs: 0
Tests: 6

X

GRO by GC-FID (W)

All

NDPs: 0
Tests: 6

X

X

Mercury Dissolved

All

NDPs: 0
Tests: 6

X

pH Value

All

NDPs: 0
Tests: 6

X

Phosphate by Kone (w)

All

NDPs: 0
Tests: 6

X

Suspended Solids

All

NDPs: 0
Tests: 2

X

Total Metals by ICP-MS

All

NDPs: 0
Tests: 6

X

TPH CWG (W)

All

NDPs: 0
Tests: 6

X

VOC MS (W)

All

NDPs: 0
Tests: 6

X

X

RECEIVED: 05/12/2025



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Results Legend		Customer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	MW3	MW4	MW5	MW6	SW1	SW2
# ISO17025 accredited.			0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024
M mCERTS accredited.								
aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.								
tot.unfiltTotal / unfiltered sample.								
* Subcontracted - refer to subcontractor report for accreditation status.								
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F) Trigger breach confirmed								
1-4**@ Sample deviation (see appendix)								
Component	LOD/Units	Method						
Escherichia Coli (W)*		SUB	See Attached	See Attached	See Attached	See Attached		
Coliforms, Total*		SUB	See Attached	See Attached	See Attached	See Attached		
Suspended solids, Total	<2 mg/l	TM022					263	8.35
BOD, unfiltered	<1 mg/l	TM045					2.04	<1
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2		
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3	<0.3	<0.3	<0.3		
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01	<0.01		
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107					105	30.4
Aluminium (diss.filt)	<10 µg/l	TM152	<10	<10	<10	<10	<10	11
Aluminium (tot.unfilt)	<10 µg/l	TM152	36200	241	9590	46.9	281	24.3
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.524	0.577	<0.5	<0.5	0.523	0.766
Barium (diss.filt)	<0.2 µg/l	TM152	16.1	11	3.12	4.41	11.4	10.8
Boron (diss.filt)	<10 µg/l	TM152	10.5	15.2	<10	10.2	18.6	14.2
Cadmium (diss.filt)	<0.08 µg/l	TM152	0.167	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1	<1	<1	<1
Copper (diss.filt)	<0.3 µg/l	TM152	1.99	1.25	1.82	1.37	1.51	1.01
Manganese (tot.unfilt)	<1 µg/l	TM152	1340	50.9	416	<1	736	56.6
Lead (diss.filt)	<0.2 µg/l	TM152	0.543	0.521	0.334	<0.2	<0.2	0.389
Nickel (diss.filt)	<0.4 µg/l	TM152	4.38	0.801	0.565	<0.4	1.58	1.1
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	<10	11.3	<10	31.2	22.1
Selenium (diss.filt)	<1 µg/l	TM152	2.71	<1	<1	<1	<1	<1
Vanadium (diss.filt)	<1 µg/l	TM152	5.62	<1	<1	<1	<1	<1
Sodium (Dis.Filt)	<0.076 mg/l	TM152	8.96	32.3	5.03	6.69	10.3	10.5
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.91	0.726	0.227	0.835	3.52	3.3
Calcium (Dis.Filt)	<0.2 mg/l	TM152	121	98.6	55.5	82.9	92.3	91.5
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	<0.019	<0.019	<0.019	0.313	0.185
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152	13.2	14.2	3.42	2.23	3.07	3.05
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as NO2	<0.05 mg/l	TM184	<0.25	<0.05	<0.05	<0.05		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05	<0.05	<0.05	<0.05	0.057
Sulphate	<2 mg/l	TM184	4	4.6	21.2	7.3		



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

VOC MS (W)

Results Legend			Customer Sample Ref.		MW3	MW4	MW5	MW6	SW1	SW2
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed 1-4*§@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024	
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM208	104	103	104	104	103	103		
Toluene-d8**	%	TM208	97.8	96.4	97.4	97.2	97.5	97.5		
4-Bromofluorobenzene**	%	TM208	93.8	94.2	93.3	93	92.9	93.5		
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Dichloromethane	<3 µg/l	TM208	<3	<3	<3	<3	<3	<3		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1		



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

VOC MS (W)

Results Legend			Customer Sample Ref.		MW3	MW4	MW5	MW6	SW1	SW2
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Ground Water (GW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024	0.00 - 0.00 Surface Water (SW) 08/10/2024
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
* Subcontracted - refer to subcontractor report for accreditation status.					10/10/2024 241010-56 30496536	10/10/2024 241010-56 30496552	10/10/2024 241010-56 30496567	10/10/2024 241010-56 30496583	10/10/2024 241010-56 30496517	10/10/2024 241010-56 30496527
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery										
(F) Trigger breach confirmed										
1-4* Sample deviation (see appendix)										
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#

08:47:18 17/10/2024



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Table of Results - Appendix

Method No	Description
SUB	Subcontracted Test
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Determination of Sulphide in soil and water samples using the Kone Analyser
TM104	Determination of Fluoride using the Kone Analyser
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM152	Analysis of Aqueous Samples by ICP-MS
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM245	Determination of GRO by Headspace in waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

RECEIVED: 05/12/2025



CERTIFICATE OF ANALYSIS

Validated

SDG: 241010-56
Client Ref.: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	30496536	30496552	30496567	30496583	30496517	30496527
	MW3	MW4	MW5	MW6	SW1	SW2
	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water	Surface Water
Ammoniacal Nitrogen	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024		
Anions by Kone (w)	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024
BOD True Total					15-Oct-2024	15-Oct-2024
COD Unfiltered					15-Oct-2024	15-Oct-2024
Coliforms (W)*	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024		
Cyanide Comp/Free/Total/Thiocyanate	15-Oct-2024	16-Oct-2024	17-Oct-2024	16-Oct-2024		
Dissolved Metals by ICP-MS	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024
EPH and CWG by FID	17-Oct-2024	17-Oct-2024	17-Oct-2024	16-Oct-2024	17-Oct-2024	16-Oct-2024
Fluoride	12-Oct-2024	12-Oct-2024	11-Oct-2024	11-Oct-2024		
GRO by GC-FID (W)	15-Oct-2024	14-Oct-2024	14-Oct-2024	14-Oct-2024	14-Oct-2024	14-Oct-2024
Mercury Dissolved	11-Oct-2024	11-Oct-2024	11-Oct-2024	10-Oct-2024	16-Oct-2024	10-Oct-2024
Nitrite by Kone (w)	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024		
PAH Spec MS - Aqueous (W)	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024		
pH Value	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024	17-Oct-2024
Phenols by HPLC (W)	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024		
Phosphate by Kone (w)	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024	11-Oct-2024
Sulphide	14-Oct-2024	14-Oct-2024	14-Oct-2024	14-Oct-2024		
Suspended Solids					15-Oct-2024	15-Oct-2024
Total Metals by ICP-MS	16-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024
TPH CWG (W)	17-Oct-2024	17-Oct-2024	17-Oct-2024	16-Oct-2024	17-Oct-2024	16-Oct-2024
VOC MS (W)	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024	15-Oct-2024

RECEIVED: 05/12/2025



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
Telephone: +353 (0) 52 617 8100



Report No: ALSH-546091024

Document No: EF0011

RECEIVED: 05/11/2025

CERTIFICATE OF ANALYSIS

Client	ALS Hawarden Units 7-8 Hawarden Business Park Manor Lane Hawarden CH5 3US	Date Submitted	09/10/2024
		Date Reported	10/10/2024
		Order Number	N/A
For the Attention of:	ALS Hawarden		
Sample Reception	4 sample(s) received in good condition.		
Comments	N/A		

Report Authorised by:

Mairead Gilmore
Microbiology Manager

Conditions:

1. Results in this report relate only to the items tested as received
2. Reports may not be reproduced except in full without the approval of ALS Life Sciences Ltd
3. All queries regarding this report should be addressed to the Technical Manager at the above address
4. A * next to a method reference signifies that ALS Life Sciences Ltd is NOT INAB accredited for this method
5. Results reported as CFU/cm² are calculated based on information supplied by customer regarding area swabbed
6. SUBCON* indicates analysis subcontracted to approved subcontractors who do not hold accreditation for this test
7. SUBCON^ indicates analysis subcontracted to approved subcontractors who hold accreditation for this test
8. Where sampling is undertaken by ALS personnel, sampling activities are outside the scope of INAB accreditation
9. Dil next to a method reference indicates that a dilution of the water sample was undertaken during testing
10. Statement of conformity made against the result does not take into account the uncertainty of measurement associated with the method



ALS Life Sciences Ltd trading as ALS
Carrigeen Business Park, Clonmel, Co. Tipperary
Telephone: +353 (0) 52 617 8100



RECEIVED: 05/12/2025

Report No: ALSH-546091024

Document No: EF0011

CERTIFICATE OF ANALYSIS

Date Submitted 09/10/2024
Date Reported 10/10/2024
Order Number N/A

Sample Type Water
Client ID MW3 (08/10/2024 @ 15.51
Date Tested 09/10/2024
ALS ID 6378763

Test	Result	Unit	Method
Coliforms	3	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	10	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW4 (08/10/2024 @ 10.57
Date Tested 09/10/2024
ALS ID 6378764

Test	Result	Unit	Method
Coliforms	49	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	46	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW5 (08/10/2024 @ 10.08
Date Tested 09/10/2024
ALS ID 6378765

Test	Result	Unit	Method
Coliforms	17	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	3	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Sample Type Water
Client ID MW6 (08/10/2024 @ 12.20
Date Tested 09/10/2024
ALS ID 6378766

Test	Result	Unit	Method
Coliforms	11	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)
Escherichia coli	0	MPN/100ml	SP 196 Based on ISO 9308-2 (2012)

Report Authorised by:

Mairead Gilmore

Mairead Gilmore
Microbiology Manager



CERTIFICATE OF ANALYSIS

SDG: 241010-56
Client Ref: 501.000180.65091

Report Number: 743901
Location: Cam Quarry

Superseded Report: 743360

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Deeside
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email: hawardencustomerservices@alsglobal.com

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SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Michelle Sherry

RECEIVED: 05/12/2025

CERTIFICATE OF ANALYSIS

Date of report Generation: 05 August 2025
Customer: SLR Consulting Ireland
Sample Delivery Group (SDG): 250721-35
Your Reference: 501.065512.00001
Location: Cam Quarry, Co.Roscommon
Report No: 773233
Order Number: 1819

This report has been revised and directly supersedes 772477 in its entirety.

We received 3 samples on Monday July 21, 2025 and 3 of these samples were scheduled for analysis which was completed on Tuesday August 05, 2025. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Justin Keeton
Business Unit Leader - Land





CERTIFICATE OF ANALYSIS

Validated

SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
31858937	SW1		0.00 - 0.00	17/07/2025
31858950	SW2		0.00 - 0.00	17/07/2025
31858964	SW3 (River Suck)		0.00 - 0.00	17/07/2025

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		31 858937										31 858950										31 858964										
	Customer Sample Reference		SW1										SW2										SW3 (River Suck)										
	AGS Reference																																
	Depth (m)		0.00 - 0.00										0.00 - 0.00										0.00 - 0.00										
	Container		DO KIT + DO 250 ml glass (ALE208)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
	Sample Type		SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Ammonium Low	All	NDPs: 0 Tests: 3																															
Anions by Kone (w)	All	NDPs: 0 Tests: 3																															
BOD True Total	All	NDPs: 0 Tests: 3																															
COD Unfiltered	All	NDPs: 0 Tests: 3																															
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3																															
Dissolved Oxygen by Titration	All	NDPs: 0 Tests: 3																															
EPH and CWG by FID	All	NDPs: 0 Tests: 3																															
Fluoride	All	NDPs: 0 Tests: 3																															
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3																															
Low Level Cyanide (W)	All	NDPs: 0 Tests: 3																															
Mercury Dissolved	All	NDPs: 0 Tests: 3																															
Nitrite by Kone (w)	All	NDPs: 0 Tests: 3																															
pH Value	All	NDPs: 0 Tests: 3																															
Phosphate by Kone (w)	All	NDPs: 0 Tests: 3																															
Sulphide	All	NDPs: 0 Tests: 3																															

RECEIVED: 05/12/2025

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend X Test N No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
	31858964	SW3 (River Suck)		0.00 - 0.00	DO KIT + DO 250 ml glass (ALE208)	SW
	31858950	SW2		0.00 - 0.00	0.5l glass bottle (ALE227)	SW
					ZnAc (ALE246)	SW
					Vial (ALE297)	SW
					NaOH (ALE245)	SW
					HNO3 Filtered (ALE204)	SW
				H2SO4 (ALE244)	SW	
				DO KIT + DO 250 ml glass (ALE208)	SW	
				0.5l glass bottle (ALE227)	SW	
				ZnAc (ALE246)	SW	
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				NaOH (ALE245)	SW	
				HNO3 Filtered (ALE204)	SW	
				H2SO4 (ALE244)	SW	
				DO KIT + DO 250 ml glass (ALE208)	SW	
				0.5l glass bottle (ALE227)	SW	
				ZnAc (ALE246)	SW	
				Vial (ALE297)	SW	
				NaOH (ALE245)	SW	
				HNO3 Filtered (ALE204)	SW	
				H2SO4 (ALE244)	SW	
				DO KIT + DO 250 ml glass (ALE208)	SW	
				0.5l glass bottle (ALE227)	SW	
				ZnAc (ALE246)	SW	

RECEIVED: 05/12/2025

31858964	SW3 (River Suck)		0.00 - 0.00	ZnAc (ALE246)	SW														
				Vial (ALE297)	SW														
				NaOH (ALE245)	SW														
				HNO3 Filtered (ALE204)	SW														
				H2SO4 (ALE244)	SW														



CERTIFICATE OF ANALYSIS

Validated

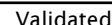
SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Results Legend			Customer Sample Ref. Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	SW1	SW2	SW3 (River Suck)	RECEIVED: 05/12/2025		
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfiltTotal / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6.2 FTAB (see appendix) 1-4**@Sample deviation (see appendix)		0.00 - 0.00 Surface Water (SW) 17/07/2025		0.00 - 0.00 Surface Water (SW) 17/07/2025	0.00 - 0.00 Surface Water (SW) 17/07/2025				
Component	LOD/Units	Method							
Suspended solids, Total	<2 mg/l	TM022		220	<2	4.7			
BOD, unfiltered	<1 mg/l	TM045		3.97	<1	<1			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.037	0.027	0.033			
Ammoniacal Nitrogen Low as NH3	<0.01 mg/l	TM099		0.0449	0.0328	0.0401			
Ammoniacal Nitrogen Low as NH4	<0.01 mg/l	TM099		0.0476	0.0347	0.0424			
Sulphide	<0.01 mg/l	TM101		0.0125	<0.01	<0.01			
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107	258	55.3	30.5				
Aluminium (diss.filt)	<10 µg/l	TM152	33.4	<10	<10				
Antimony (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.941	0.879	1.04				
Barium (diss.filt)	<0.2 µg/l	TM152	10.9	8.59	27				
Boron (diss.filt)	<10 µg/l	TM152	10.8	14.4	18.1				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08				
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
Copper (diss.filt)	<0.3 µg/l	TM152	0.548	0.761	1.02				
Lead (diss.filt)	<0.2 µg/l	TM152	0.423	<0.2	0.237				
Manganese (diss.filt)	<3 µg/l	TM152	267	99.2	21.7				
Nickel (diss.filt)	<0.4 µg/l	TM152	8.67	7.33	1.21				
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	<10	<10				
Selenium (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
Vanadium (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
Zinc (diss.filt)	<1 µg/l	TM152	6.41	5	4.87				
Sodium (Dis.Filt)	<0.076 mg/l	TM152	7.39	7.24	9.49				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	1.9	1.89	5.41				
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.83	1.83	1.8				
Calcium (Dis.Filt)	<0.2 mg/l	TM152	62.3	62.3	93.7				
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.901	0.686	0.0852				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01				
Nitrite as NO2	<0.05 mg/l	TM184	<0.05	<0.05	<0.05				
Sulphate	<2 mg/l	TM184	<2	<2	<2				
Chloride	<2 mg/l	TM184	14.3	14.6	18.7				
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	<0.02	<0.02				

RECEIVED: 05/12/2025



Superseded Report: 772477

Location: Cam Quarry, Co. Roscommon



CERTIFICATE OF ANALYSIS

Validated

SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co.Roscommon

Superseded Report: 772477

Table of Results - Appendix

Method No	Description
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Determination of Sulphide in soil and water samples using the Kone Analyser
TM104	Determination of Fluoride using the Kone Analyser
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM152	Analysis of Aqueous Samples by ICP-MS
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM187	Dissolved Oxygen in Natural and Waste Waters HMSO 1979 ISBN 011 751442
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	Determination of GRO by Headspace in waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM279	Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

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CERTIFICATE OF ANALYSIS

Validated

SDG: 250721-35
Client Ref.: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.

Depth

Type

31858937	31858950	31858964
SW1	SW2	SW3 (River Suck)
0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Surface Water	Surface Water	Surface Water
Ammonium Low	23-Jul-2025	23-Jul-2025
Anions by Kone (w)	23-Jul-2025	23-Jul-2025
BOD True Total	05-Aug-2025	05-Aug-2025
COD Unfiltered	31-Jul-2025	31-Jul-2025
Dissolved Metals by ICP-MS	24-Jul-2025	24-Jul-2025
Dissolved Oxygen by Titration	22-Jul-2025	22-Jul-2025
EPH and CWG by FID	25-Jul-2025	24-Jul-2025
Fluoride	23-Jul-2025	23-Jul-2025
GRO by GC-FID (W)	28-Jul-2025	28-Jul-2025
Low Level Cyanide (W)	25-Jul-2025	25-Jul-2025
Mercury Dissolved	25-Jul-2025	24-Jul-2025
Nitrite by Kone (w)	23-Jul-2025	23-Jul-2025
pH Value	25-Jul-2025	25-Jul-2025
Phosphate by Kone (w)	23-Jul-2025	23-Jul-2025
Sulphide	23-Jul-2025	23-Jul-2025
Suspended Solids	25-Jul-2025	25-Jul-2025
TPH CWG (W)	28-Jul-2025	28-Jul-2025
VOC MS (W)	27-Jul-2025	27-Jul-2025

RECEIVED: 05/12/2025



CERTIFICATE OF ANALYSIS

SDG: 250721-35
Client Ref: 501.065512.00001

Report Number: 773233
Location: Cam Quarry, Co. Roscommon

Superseded Report: 772477

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur - e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis.

The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

If during the search of the two 'pinch' samples by PLM only 1 or 2 fibres or fibre bundles are seen and identified as asbestos, the term 'trace asbestos identified' is reported.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Potentially respirable fibres are identified by using a Phase Contrast Microscope.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

21. 6:2 FTAB

Recovery of 6:2 FTAB in the quality control samples has been observed to be <50% of the target value. Please note the 6:2 FTAB result is supplied as indicative only.



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email: hawardencustomerservices@alsglobal.com

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SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Michelle Sherry

RECEIVED: 05/12/2025

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 September 2025
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	250919-102
Your Reference:	501.065512.00001
Location:	Cam Quarry
Report No:	778409
Order Number:	1888

We received 3 samples on Friday September 19, 2025 and 3 of these samples were scheduled for analysis which was completed on Thursday September 25, 2025. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Justin Keeton
Business Unit Leader - Land





CERTIFICATE OF ANALYSIS

Validated

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
32166072	Quarry Sump		0.00 - 0.00	16/09/2025
32166042	SW1		0.00 - 0.00	16/09/2025
32166058	SW2		0.00 - 0.00	16/09/2025

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

[illegible]

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[illegible]

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water
- Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

[illegible]

RECEIVED: 05/12/2025

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Results Legend			Customer Sample Ref.	Quarry Sump	SW1	SW2			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference							
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
* Subcontracted - refer to subcontractor report for accreditation status.									
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
*** 6.2 FTAB (see appendix)									
1-4** Sample deviation (see appendix)									
Component	LOD/Units	Method							
Suspended solids, Total	<2 mg/l	TM022	7.75	3.65	2.45				
			#	#	#				
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1				
			#	#	#				
Oxygen, dissolved	<0.3 mg/l	TM046			10.7				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.065	0.044	0.052				
			#	#	#				
Ammoniacal Nitrogen Low as NH3	<0.01 mg/l	TM099	0.0789	0.0534	0.0631				
			#	#	#				
Ammoniacal Nitrogen Low as NH4	<0.01 mg/l	TM099	0.0836	0.0566	0.0669				
			#	#	#				
Sulphide	<0.01 mg/l	TM101	<0.01	<0.01	<0.01				
Fluoride	<0.5 mg/l	TM104	0.85	<0.5	<0.5				
COD, unfiltered	<7 mg/l	TM107	<7	56.5	60.8				
			#	#	#				
Aluminium (diss.filt)	<10 µg/l	TM152	<10	13.6	<10				
			#	#	#				
Antimony (diss.filt)	<1 µg/l	TM152	1.18	<1	<1				
			#	#	#				
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	0.733	0.651				
			#	#	#				
Barium (diss.filt)	<0.2 µg/l	TM152	7.75	9.7	8.7				
			#	#	#				
Boron (diss.filt)	<10 µg/l	TM152	24.2	<10	<10				
			#	#	#				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08				
			#	#	#				
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
			#	#	#				
Copper (diss.filt)	<0.3 µg/l	TM152	0.375	0.364	0.467				
			#	#	#				
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2	<0.2				
			#	#	#				
Manganese (diss.filt)	<3 µg/l	TM152	<3	57.5	25.4				
			#	#	#				
Nickel (diss.filt)	<0.4 µg/l	TM152	8.58	4.7	4.06				
			#	#	#				
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	<10	<10				
			#	#	#				
Selenium (diss.filt)	<1 µg/l	TM152	2.54	<1	<1				
			#	#	#				
Vanadium (diss.filt)	<1 µg/l	TM152	<1	<1	<1				
			#	#	#				
Zinc (diss.filt)	<1 µg/l	TM152	2.81	3.47	2.46				
			#	#	#				
Sodium (Dis.Filt)	<0.076 mg/l	TM152	10.8	8.52	8.78				
			#	#	#				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	10.7	1.83	1.87				
			#	#	#				
Potassium (Dis.Filt)	<0.2 mg/l	TM152	0.823	1.58	1.64				
			#	#	#				
Calcium (Dis.Filt)	<0.2 mg/l	TM152	80.8	68.8	70.3				
			#	#	#				
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	0.367	0.29				
			#	#	#				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01				
Nitrite as NO2	<0.05 mg/l	TM184	0.142	<0.25	<0.05				
			#	#	#				
Sulphate	<2 mg/l	TM184	102	<2	<2				
			#	#	#				
Chloride	<2 mg/l	TM184	22.8	19	18.7				
			#	#	#				



CERTIFICATE OF ANALYSIS

Validated

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Results Legend			Customer Sample Ref.		Quarry Sump		SW1		SW2							
#	ISO17025 accredited.		Depth (m)		0.00 - 0.00		0.00 - 0.00		0.00 - 0.00							
M	mCERTS accredited.		Sample Type		Surface Water (SW)		Surface Water (SW)		Surface Water (SW)							
aq	Aqueous / settled sample.		Date Sampled		16/09/2025		16/09/2025		16/09/2025							
diss.filt	Dissolved / filtered sample.		Sample Time													
tot.unfilt	Total / unfiltered sample.		Date Received		19/09/2025		19/09/2025		19/09/2025							
*	Subcontracted - refer to subcontractor report for accreditation status.		SDG Ref		250919-102		250919-102		250919-102							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Lab Sample No.(s)		32166072		32166042		32166058							
***	6:2 FTAB (see appendix)		AGS Reference													
1-4**\$	Sample deviation (see appendix)															
Component	LOD/Units	Method														
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	#	<0.02	#	<0.02	#								
Nitrate as NO3	<0.3 mg/l	TM184	39.8	#	1.05	#	1.18	#								
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	9.02	#	0.237	#	0.265	#								
Oxygen, dissolved	<0.3 mg/l	TM187	9.2		5.84											
pH	<1 pH Units	TM256	8.11	#	7.72	#	7.84	#								
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.501	#	0.342	#	0.345	#								
Alkalinity, Total as CaCO3	<3 mg/l	TM256	112	#	166	#	165	#								
Cyanide, Total (low level)	<5 µg/l	TM279	<5	#	<5	#	<5	#								
Cyanide, Free (low level)	<2.5 µg/l	TM279	<2.5	#	<2.5	#	<2.5	#								



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Validated

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Table of Results - Appendix

Method No	Description
TM046	Measurement of Dissolved Oxygen by Oxygen Meter
TM104	Determination of Fluoride using the Kone Analyser
TM152	Analysis of Aqueous Samples by ICP-MS
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM187	Dissolved Oxygen in Natural and Waste Waters HMSO 1979 ISBN 011 751442
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	Determination of GRO by Headspace in waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM279	Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Determination of Sulphide in soil and water samples using the Kone Analyser
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 250919-102
Client Ref.: 501.065512.00001

Report Number: 778409
Location: Cam Quarry

Superseded Report:

Test Completion Dates

Lab Sample No(s)	32166072	32166042	32166058
Customer Sample Ref.	Quarry Sump	SW1	SW2
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water

Ammonium Low	23-Sep-2025	22-Sep-2025	22-Sep-2025
Anions by Kone (w)	22-Sep-2025	22-Sep-2025	22-Sep-2025
BOD True Total	24-Sep-2025	24-Sep-2025	24-Sep-2025
COD Unfiltered	22-Sep-2025	22-Sep-2025	22-Sep-2025
Dissolved Metals by ICP-MS	23-Sep-2025	23-Sep-2025	23-Sep-2025
Dissolved Oxygen by Probe			24-Sep-2025
Dissolved Oxygen by Titration	21-Sep-2025	21-Sep-2025	
EPH and CWG by FID	24-Sep-2025	24-Sep-2025	24-Sep-2025
Fluoride	23-Sep-2025	23-Sep-2025	23-Sep-2025
GRO by GC-FID (W)	23-Sep-2025	23-Sep-2025	23-Sep-2025
Low Level Cyanide (W)	23-Sep-2025	24-Sep-2025	24-Sep-2025
Mercury Dissolved	23-Sep-2025	23-Sep-2025	23-Sep-2025
Nitrite by Kone (w)	21-Sep-2025	21-Sep-2025	19-Sep-2025
pH Value	23-Sep-2025	23-Sep-2025	23-Sep-2025
Phosphate by Kone (w)	22-Sep-2025	22-Sep-2025	22-Sep-2025
Sulphide	24-Sep-2025	24-Sep-2025	24-Sep-2025
Suspended Solids	25-Sep-2025	25-Sep-2025	25-Sep-2025
TPH CWG (W)	24-Sep-2025	24-Sep-2025	24-Sep-2025
VOC MS (W)	22-Sep-2025	22-Sep-2025	22-Sep-2025

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Client Ref: 501.065512.00001

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Location: Cam Quarry

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur - e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

If during the search of the two 'pinch' samples by PLM only 1 or 2 fibres or fibre bundles are seen and identified as asbestos, the term 'trace asbestos identified' is reported.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Potentially respirable fibres are identified by using a Phase Contrast Microscope.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

21. 6:2 FTAB

Recovery of 6:2 FTAB in the quality control samples has been observed to be <50% of the target value. Please note the 6:2 FTAB result is supplied as indicative only.

Appendix 7-G Biological Q Survey Data

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Water (Hydrology & Hydrogeology) 7

Table 7-21: Freshwater Macroinvertebrate Taxa and Abundance (March 2025)

Taxon/Order	Family	Genus / Species	EPA Pollution Sensitivity Group	No. of organisms	Total abundance of EPA Groups	% of EPA Group abundance	Abundance category
Plecoptera (Stonefly)	<i>Perlidae</i>	sp.indet	A	2	2	1.72	Few / Present
Trichoptera (Caddisfly)	Cased Caddisfly <i>Limnephilidae</i>	sp.indet	B	9	9	7.76	Fair
	Caseless Caddisfly <i>Hydropsychidae</i>	sp.indet	C	4	96	82.76	Dominant / Excessive
Ephemeroptera (Mayfly)	<i>Baetidae</i>	<i>Baetis rhodani</i>	C	21			
Coleoptera (Beetle)	<i>Elmidae</i>		C	8			
Amphipoda (Shrimp)	<i>Gammaridae</i>	<i>Gammarus duebeni</i>	C	63			
Isopoda (Hoglice)	<i>Asellidae</i>	<i>Asellus aquaticus</i>	D	6	13	8.62	Fair
		sp.indet		4			
Annelida (Worms)	<i>Oligochaeta</i>	sp.indet	E or N/A	1	1	0.86	Scarce / present
Diptera (Fly Larvae)	<i>Chironomidae</i>	sp.indet	C if non-chironomus spp, E if Chironomus spp	1	1	0.86	Scarce / present
Total no. of taxa				10			
Total no. of organisms				116			
Q Score				Q3-4 Moderate			

Table 7-22: Freshwater Macroinvertebrate Taxa and Abundance (July 2025)

Order	Family	EPA Pollution Sensitivity Group	SW1		SW2	
			No.	%	No.	%
Ephemeroptera (Mayfly)	Baetidae (<i>Baetis muticus</i>)	B	-	4.67	1	1.41
Trichoptera (Cased Caddis)	Limnephilidae (<i>sp.indet</i>)	B	7			
Trichoptera (Cased Caddis)	<i>Sericostoma personatum</i>	B	-		1	
Trichoptera (Caseless caddis)	Hydropsychidae (<i>sp. Indet</i>)	C	2	38.00	-	93.66
Gastropoda (Snails & Limpets)	Gastropoda (<i>sp.indet</i>)	C	1		-	
Ephemeroptera (Mayfly)	Ephemerellidae (<i>Ephemerella excrucians</i>)	C	-		1	
Amphipoda (Shrimps)	<i>Gammarus duebeni</i>	C	52		132	
Trombidiformes (Water Mite)	Hydracarina (<i>sp.indet</i>)	C			-	
Coleoptera (Beetle)	Elmidae (<i>sp.indet</i>)	C			-	
Isopoda (Hoglice)	Asellidae (<i>Asellus aquaticus</i>)	D		3.33	2	1.41
Diptera (Fly Larvae)	Blood worms (<i>sp.indet</i>)	E	73	48.67	-	0
	Unable to identify is non-Chironomus or Chironomus	N/A	8	N/A	5	N/A
Total Number of Organisms excluding <i>Potamopyrgus antipodarum</i>			150		142	
Total Number of Taxa			8		6	
Q Score			Q2-3 Poor		Q3 Poor	

Table 7-23: Description of Sampling Locations (July 2025)

Monitoring Site	Description						
<u>SW1</u> Plate 2: Sampling Location SW1 	Survey site SW1 is situated on the section of the Ballyglass River proposed as the discharge point from Cam Quarry. The river runs perpendicular to the R363 road and proceeds to flow under it. As seen in Plate 4, there is a piped outflow entering the sample location and the source of this water is unknown. The watercourse has a mean channel width of c. 1.5m at normal water level with banks up to 3m in height and at angle of c. 90° on the northern bank and c. 45° on the southern bank. The substrata consisted of a mixture of consolidated cobbles and gravel and unconsolidated fine silt and sand (up to 20cm deep). This sediment may be as a result of the outflow pipe carrying excess sediment. This sediment produced a sewage like odour when disturbed. The presence of sewage fungus was also detected. An accumulation of metal wire, decaying leaves and logs created a slight dam in the river, seen in Plate 3. The water conditions at the time of the survey on the 17th July 2025 were: <table><tr><td>Mean Depth</td><td>Flow Rate</td><td>Turbidity</td></tr><tr><td>20cm</td><td>Moderate</td><td>Moderate</td></tr></table> The channel is slightly sheltered by overhanging hawthorn (<i>Crataegus monogyna</i>) and beech trees (<i>Fagus sylvatica</i>). Common ivy, bramble and cotoneaster spp. was observed climbing up these trees and along the banks. The channel itself was devoid of any aquatic vegetation. Several fern species were noted growing along the banks including Hart's tongue (<i>Asplenium scolopendrium</i>) and Hard Shield (<i>Polystichum aculeatum</i>).	Mean Depth	Flow Rate	Turbidity	20cm	Moderate	Moderate
Mean Depth	Flow Rate	Turbidity					
20cm	Moderate	Moderate					

Plate 3 SW1 sampling location habitat



Plate 4 Pipe outflow at SW1 sampling location



Monitoring Site	Description						
SW2 Plate 5: Sampling Location SW2 	Site SW2 is situated on the Ballyglass River downstream of the SW1 sampling location. The river passes under the R363 road into agricultural lands before being culverted again under the R357 into another agricultural field where the SW2 sampling location is located. Livestock were located in the field beside the sampling location on the day of sampling but there was evidence of cows drinking from and walking through this river previously. The southern banks of the river were visibly damaged as a result of livestock entering in and out of the river, see Plate 7. The stream at the survey site had a mean channel width of 1m at normal water level. The banks on the northern banks were up to a height of 1m at an angle of 90° while the southern bank was flat. The channel bed consisted of layers of consolidated cobbles and gravels. The water conditions at the time of the survey on the 17th of July 2025 were: <table><tr><td>Mean Depth</td><td>Flow Rate</td><td>Turbidity</td></tr><tr><td>5 cm</td><td>Moderate</td><td>Low-Moderate</td></tr></table> The southern bank was devoid of any vegetation due to damage caused by livestock but the northern bank displayed brambles, thistles and common gorse (<i>Ulex europaeus</i>). The channel itself was sparsely populated with Fool's Water-cress (<i>Helosciadium nodiflorum</i>) but was mostly devoid of aquatic vegetation.	Mean Depth	Flow Rate	Turbidity	5 cm	Moderate	Low-Moderate
Mean Depth	Flow Rate	Turbidity					
5 cm	Moderate	Low-Moderate					

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Monitoring Site	Description
Plate 6: SW2 sampling location 	

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Monitoring Site	Description
Plate 7 Banks of SW2 damaged by livestock trampling 	

Appendix 7-H Surface Water Quality Results Screened

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Table 7-24: Surface Water Quality Results Screened

Parameter	EQS Inland Surface Waters (MACs)	Units	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2	SW3	SW1	SW2	Sump
			05/08/2023		01/01/2024		08/10/2024		17/07/2025			16/09/2025		
Inorganics														
Suspended solids		mg/l	189	8.6	<2	<2	263	8.35	220	<2	4.7	3.65	2.45	7.75
BOD	High status ≤ 1.3 (mean) or ≤ 2.2 (95%ile) Good status ≤ 1.5 (mean) or ≤ 2.6 (95%ile)"	mg/l	2.36	<1	<1	<1	2.04	<1	-	-	-	<1	<1	<1
COD		mg/l	108	50.2	18	11.7	105	30.4				56.5	60.8	<7
pH	Soft water (<100mg/l CaCO ₃): 4.5-9.0. Hard water (>100mg/l CaCO ₃): 6.0-9.0	pH Units	7.75	8.23	7.92	7.94	8.01	8.12	7.47	7.84	8.1	7.72	7.84	8.11
Phosphate (Ortho as PO ₄)		mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Alkalinity, as CaCO ₃	Soft water (<100mg/l CaCO ₃): 4.5-9.0. Hard water (>100mg/l CaCO ₃): 6.0-9.0	mg/l	244	209	242	248	242	234	157	153	248	166	165	112

Water (Hydrology & Hydrogeology) 7

Parameter	EQS Inland Surface Waters (MACs)	Units	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2	SW3	SW1	SW2	Sump
Total Oxidised Nitrogen as N		mg/l	-	-	0.46	0.553	0.59	0.768	0.156	0.139	0.283	0.237	0.265	9.02
Filtered (Dissolved) Metals														
Aluminium		µg/l	<10	<10	<10	<10	281	24.3	33.4	<10	<10	13.6	<10	<10
Arsenic	25	µg/l	0.791	0.841	<0.5	<0.5	0.523	0.766	0.941	0.879	1.04	0.733	0.651	<0.5
Barium		µg/l	10.2	9.56	7.8	7.77	11.4	10.8	10.9	8.59	27	9.7	8.7	7.75
Boron		µg/l	<10	<10	<10	13.4	18.6	14.2	10.8	14.4	18.1	<10	<10	24.2
Cadmium	0.45 - 1.5	µg/l	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Calcium		µg/l	87.9	88.6	94	93.4	92.3	91.5	62.3	62.3	93.7	68.8	70.3	80.8
Chromium	32	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	5	µg/l	0.403	0.416	0.312	<0.3	1.51	1.01	0.548	0.761	1.02	0.364	0.467	0.375
Iron		µg/l	0.507	0.457	0.0606	0.0549	0.313	0.185	0.901	0.686	0.0852	0.367	0.29	<0.019
Lead	7.2	µg/l	<0.2	<0.2	<0.2	<0.2	<0.2	0.389	0.423	<0.2	0.237	<0.2	<0.2	<0.2
Mercury	0.07	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	20	µg/l	1.54	1.27	0.617	0.744	1.58	1.1	8.67	7.33	1.21	4.7	4.06	8.58
Phosphorus	High status ≤ 10 (mean). Good status ≤ 25(mean)	µg/l	12.2	10.1	<10	<10	31.2	22.1	<10	<10	<10	<10	<10	<10
Potassium		µg/l	1.37	1.38	2.08	2.03	3.52	3.3	1.83	1.83	1.8	1.58	1.64	0.823
Selenium		µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.54

Water (Hydrology & Hydrogeology) 7

Parameter	EQS Inland Surface Waters (MACs)	Units	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2	SW3	SW1	SW2	Sump
Sodium		µg/l	8.09	8.31	6.57	6.57	10.3	10.5	7.39	7.24	9.49	8.52	8.79	10.8
Vanadium		µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc		µg/l	2.72	2.74	-	-	-	-	6.41	5	4.87	3.47	2.46	2.81
Unfiltered (Total) Metals														
Aluminium		µg/l	151	24.8	<10	10.1	281	24.3	33.4	<10	<10	13.6	<10	<10
Magnesium		mg/l	2.52	2.54	3.24	3.21	3.07	3.05	1.9	1.89	5.41	1.83	1.87	10.7
Manganese (		µg/l	218	192	14.5	13.5	736	56.6	267	99.2	21.7	57.5	25.4	<3
Hydrocarbons														
Mineral oil >C10 C40 (aq)		µg/l	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Exceedances in bold														

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Appendix 7-I Water Framework Directive Assessment



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Water Framework Directive Assessment Cam, Co. Roscommon

Continuance of Use of Existing Cam Quarry

Roadstone Ltd.

Fortunestown, Belgard, Dublin 24, D24 PKK2

Prepared by:

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SLR Project No.: 501.065512.00001

18 November 2025

Revision: Final

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0	6 November 2025	MS	SMcD/PG	PG
	Click to enter a date.			
	Click to enter a date.			
	Click to enter a date.			

Basis of Report

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Appendix D	WFD Stage 1 Screening for surface water bodies and WFD details



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RECEIVED: 05/12/2025



1.0 Introduction

SLR Environmental Consulting (Ireland) Ltd. (SLR) has been appointed by Roadstone Limited to prepare a Water Framework Directive (WFD) Assessment report for Cam Quarry, Co. Roscommon and is submitted in support of a Planning Application and accompanying Environmental Impact Assessment Report (EIAR) for the proposed continued use of the existing permitted quarry, and ancillary facilities.

In the absence of specific Irish guidance on undertaking WFD Assessments, this assessment and report has been undertaken with regard to the following guidelines:

- Nationally Significant Infrastructure Projects - Advice Note Eighteen: The Water Framework Directive, Planning Inspectorate for England and Wales (Rev.1, June 2017).

This WFD assessment report sets out the potential implications of the existing Quarry development for the objectives of the WFD, identifies relevant water bodies which may be impacted, and identifies whether the requirements of the WFD are being met and the development will not result in a deterioration in status.

1.1 Site location and details

The application Site is located within the townlands of Curry / Cloonacaltry, Co. Roscommon and approximately 4 km to the west of Brideswell, and c. 12 km west of Athlone. The landholding comprises c. 68 hectares (c.168 acres) of lands, see **Figure WFD-1**.

The proposed development site is located within the Upper Shannon (ID 26D) Catchment.

1.2 Development overview

The proposed development at Cam Quarry will consist of:

- Permission for continued use of the existing quarry development currently permitted by P. Ref. 04/1479 and ABP PL20.215417 for a further period of 25 years, within an application area of c. 66.3 hectares, with an extraction area of c. 17.1 hectares and permanent overburden storage area of c. 3.9 hectares;
- Permission for continued use of the permitted facilities consisting of: ESB substation (26m²), portacabin office facilities including canteen and washroom facilities (91m²), bunded fuel storage, vehicle circulation/access including wheelwash and weighbridge, settlement tanks/hydrocarbon interceptors for treatment of water, construction of overburden and screening mounds, all other associated site works and ancillary activities;
- Permission for continued extraction of limestone using conventional blasting techniques and processing of rock using crushing and screening plant;
- Upgrade of the existing WWTS and percolation area to new Secondary WWTS and constructed soil polishing filter area;
- Provision of the permitted concrete block making facility and concrete batching plant, truck washdown facility with wash water recycled via a closed settlement tank system, the storage of aggregates; and workshop including storage room, canteen and washroom facilities (485m²); and
- Restoration of the overall application site to a natural habitat including a permanent waterbody.



In terms of the water environment and the WFD, the key aspects of the proposed development which relate to potential impacts on water are:

- there is currently no discharge of water from the Site to any watercourses. The planning reference no. P. Ref. 04/1479 (ABP PL20.215417) provides for the discharge of waters (GW / SW) from the quarry void via a pipe along the R363 regional road to the Ballyglass river c. 1.1km northwest of the Site. As the quarry is deepened and operations require the discharge of the treated waters off-site to maintain a dry working area, the water management system associated with the discharge will be put in place.
- there will be no surface water abstraction from any watercourses;
- a truck washdown facility with wash water recycled via a closed settlement tank system;
- the existing fuel storage is within a bunded tank, and the hard stand refuelling area has a hydrocarbon interceptor; and
- A new packaged Secondary WwTS and constructed soil polishing filter area will be installed at the site to replace the existing WwTS.

1.3 Water Framework Directive Assessment report

This WFD Assessment report has been prepared for the Proposed Development and includes the following stages:

- **Stage 1** - WFD Screening (Section 4.0 of this report);
- **Stage 2** - WFD Scoping (Section 5.0 of this report); and
- **Stage 3** - WFD Impact Assessment (Section 6.0 of this report).

This report will demonstrate how the requirements of WFD have been complied with and provides information on how the objectives of the River Basin Management Plan (RBMP) have been met.

1.4 Supporting documents

A number of documents have been prepared for the Proposed Development in support of the planning application. This WFD Assessment report has been prepared with regard to the following documents and should be read in conjunction with them, the documents include:

- The Environmental Impact Assessment Report (EIAR) for the planning application, specifically Chapter 5 Biodiversity and Chapter 7 Hydrology and Hydrogeology, prepared by SLR (November, 2025). The EIAR includes details of the Geophysical ground investigation as well as the borehole ground investigation and groundwater level monitoring; and
- The Appropriate Assessment Screening and Natura Impact Assessment Report, prepared by SLR (November, 2025).

1.5 Statement of authority

This WFD Assessment report was prepared by SLR Environmental Consulting (Ireland) Ltd. The project team consists of:

- Michelle Sherry - BSc. (Environmental Bioscience);
- Dominica Baird - Technical Director (Hydrogeology) BSc. (Earth Science), MSc (Hydrogeology), CGeol, EurGeol, MIAH; and



- Peter Glanville - Technical Director (Hydrology) BA (Geography), PhD (Geomorphology), PGeo, EurGeol.

Michelle is Graduate Hydrogeologist with the Hydrology and Hydrogeology team based in SLR Consulting Dublin. Since joining SLR, some of her roles and responsibilities have included undertaking groundwater and surface quality monitoring, collecting and analysing logger data from a variety of sites, compiling site monitoring data and preparing reports on said data to be sent to clients. She also has contributed to the preparation of Environmental Impact Assessment Reports and of Water Framework Directive reports. A First Class Honours degree in Environmental Bioscience (BSc) has provided a solid foundational knowledge in hydrology and the Water Framework Directive plus the ability to collect, handle and analysis various sets of data and write scientific reports.

Dominica is a Chartered Hydrogeologist with twenty-two years' consultancy experience. Dominica has practised hydrogeology, groundwater risk and contaminated land assessment in London, Edinburgh and Dublin and leads groundwater monitoring, water resources and due diligence projects. Key competencies include hydrogeological assessments and aquifer characterisation, developing conceptual site models, quantitative and qualitative groundwater risk assessments and groundwater investigations. Dominica has presented findings of hydrogeological assessments at oral hearings and prepared briefs of evidence. She has project managed numerous water assessments for EIARs, which have predicted potential impacts on the water environment.

Peter is a technical and project Director in the Water (Hydrology and Hydrogeology) team in SLR's Dublin office. He has over 20 years' experience in environmental consulting including hydrology, geomorphology and geology and is a Professional Geologist (PGeo. EurGeol.) with the Institute of Geologists of Ireland. Peter's specialist experience is in the field of water assessments, hydrological monitoring (hydrology and hydrogeology) and hydromorphology. He has overseen the design and practical implementation of a number of field scientific monitoring programmes, supported the management, analysis and interpretation of the scientific data collected, and written and reviewed the resultant technical reports. Peter has worked on a wide range of projects in the minerals and mining, power, commercial and infrastructure sectors. He leads as project manager on multi-disciplinary projects and also acts as project director for multi-disciplinary teams.

1.6 Zone of influence

The zone of influence, or study area, for the purpose of this WFD Assessment is taken to be a 15 km radius from the Site boundary, see **Figure WFD-1**. This zone of influence is consistent with the standard zone of influence radius used in the Appropriate Assessment and Natura Impact Assessment. The zone of influence can extend beyond 15 km radius from the Site in certain circumstances where there is a direct hydrological link to a designated site and if it is considered that the Proposed Development has the potential to impact on a waterbody.

The Site WFD catchment hierarchy is shown in **Table 1** below. The Catchments, Sub-Catchments and River Sub Basins within the study area are listed in **Appendix A**. The application Site itself is located in the Suck South Groundwater Body (GWB), see **Table 2** and GWBs located within the wider study area are listed in **Appendix A**.

Table 1 Site WFD Catchment Areas

WFD Catchment Hierarchy	WFD Catchment Name
Catchment	Upper Shannon - Catchment ID. No. 26D
Sub-catchment	Suck_SC_090 Sub-catchment ID. 26D_5
River Sub-Basin	Sub-basin ID. BALLYGLASS_010



Table 2 Site WFD Groundwater Body

WFD Groundwater Body	WFD Groundwater Body Name
Suck South GWB	IE_SH_G_225

2.0 Water Framework Directive

The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) (the 'Water Framework Directive') was adopted and came into force in 2000 and sought to align provisions for water resource protection in response to emerging scientific data on widespread degradation of quality. It establishes a legislative framework for the protection of surface waters (including rivers, lakes, transitional waters (Article 2 of 2000/60/EC defines 'Transitional waters' which for the purposes of this Advice Note are referred to as estuarine waters) and coastal waters) and groundwater throughout the EU.

The EU Water Framework Directive¹ (WFD) became EU law in December 2000 and provides for a single European approach to assessing water quality (Ecological status) and allows for the comparison of results across Europe.

The WFD requires all Member States to protect and improve water quality in all waters so that we achieve good ecological status by 2015 or, at the latest, by 2027. It was given legal effect in Ireland by the European Communities (Water Policy) Regulations². The Directive requires that management plans be prepared on a river basin basis and specifies a structured method for developing these plans.

Surface waters are classified into five quality classes (Ecological status) under the WFD; High, Good, Moderate, Poor and Bad Ecological status. Groundwater is classified into just two quality classes, Good and Poor Ecological status. High Ecological status is when the water is unpolluted, while at the opposite end of the classification Bad Ecological status is when the water is highly polluted.

The Ecological Status is assessed based on a combination of biological, chemical and hydromorphological quality parameters. The overall status sought for all waterbodies under the objectives of the WFD by 2027, at the latest, is based on the combined analysis of these three variables is Good or High ecological status and Good chemical status for surface waters and Good chemical and quantitative status for groundwaters.

The overall aims and objectives of the WFD are to:

- enhance the status and prevent further deterioration of surface water bodies, groundwater bodies and their ecosystems;
- ensure progressive reduction of groundwater pollution;
- reduce pollution of water, especially by Priority Substances and Certain Other Pollutants (Annex II, Environmental Quality Standards (EQS) Directive (2008/105/EC) as amended);
- contribute to mitigating the effects of floods and droughts;

¹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

² European Communities (Water Policy) regulations 2003 (SI No. 722 of 2003).



- all water bodies must reach at least 'Good' overall status by 2027, at the latest. For surface waters, good overall status is a combination of good ecological status (or potential) and good chemical status;
- the status of each water body, including all the quality elements which make up the overall status, must not deteriorate relative to the baseline reported in the relevant RBMP; and
- to promote sustainable water use.

The WFD identifies where actions are required to achieve Good Ecological status or maintain waterbodies which are already Good or High Ecological status. Waterbodies can be restored to Good and High Ecological status by using targeted actions and measures to reduce the impact of human activities on them.

For heavily modified or artificial water bodies, which are incapable of achieving Good Ecological status without impairing an existing specified water use, the environmental objective is to achieve Good Ecological potential.

The WFD requires that management plans are prepared on a river basin basis and specifies a structured method for developing these plans.

The WFD surface waters classification is shown in **Appendix B** and the ecological status classification is shown in **Appendix C**.

2.1 River Basin Management Plans

The WFD requires the consideration of a single system of water resource management through characterisation, protection and enhancement of water resources considered within the context of a river basin district (RBD) with the production of a River Basin Management Plan (RBMP) by the Environmental Protection Agency (EPA).

The RBMPs describe the current state of the water environment for each RBD, the pressures effecting the water environment, the objectives for protecting and improving it, and the programme of measures needed to achieve the statutory environmental objectives of the WFD. RBMPs are subject to a six year planning cycle and are to be routinely reviewed and updated to ensure compliance with the overall WFD objectives.

The RBMPs provide a single system of water management based on the natural delineation of river catchments and is the method by which the aims of the WFD are implemented.

For each river basin district in Ireland a RBMP plan needs to be established and updated every six years, to provide the context for the co-ordination requirements of the WFD, key aims of which are to:

- provide for protection to all waters, surface waters and groundwater;
- achieving Good Ecological status for all waters by 2027;
- establish water management measures based on river basin catchment areas;
- establish a combined approach of emission limit values and quality standards for waters;
- involving citizens more closely in the WFD and RBMP; and
- streamlining and aligning national legislation.

The RBMP provides a detailed account of how the objectives set for each river basin in terms of ecological status, quantitative status, chemical status and protected area objectives are to be reached within the timescale of the plan. The plans include the results of the catchment analysis including the river basin's characteristics, a review of the impact of human activity on



the status of waters in the basin, estimation of the effect of existing legislation and the remaining gap to meeting these objectives; and establish a set of measures designed to meet the objectives.

2.1.1 River Basin Management Plan for Ireland 2022-2027

The current RMBP report for Ireland is at the draft stage³. The draft report states that while substantial progress has been made in the management of water services and how we work together to protect, restore and improve water quality with the improvement in some areas and aspects of water quality, many waterbodies are still subject to mounting environmental pressures and overall water quality is in decline primarily due to nutrient pollution.

The RMBP states that due to the overall decline in water quality, stronger measures are now required which will improve overall water quality. The sustainable management of water resources is important to address and adapt to the impacts of climate change, with many of the required measures having co-benefits for climate mitigation and biodiversity. Protecting and restoring water quality in Ireland will most of all need measures to address:

- the loss of agricultural nutrients to water;
- continue to improve waste water treatment; and
- to re-establish natural free-flowing conditions in more rivers.

The plan states that Ireland's water resources and services face challenges on a number of fronts including a continued need for investment in infrastructure and increasing demand for water services due to urbanisation, population and economic growth. These challenges are set against a backdrop of widespread, rapid and intensifying climate change.

2.2 WFD Surface Water Bodies and catchments

The local surface water bodies and catchments within the potential zone of influence for rivers and the river catchments are identified in **Figure WFD-2**.

2.3 WFD Groundwater bodies

The WFD groundwater bodies within the potential zone of influence are identified in **Figure WFD-3**.

2.4 Source Protection Areas

Public water supply source protection areas in the vicinity of the site are shown in **Figure WFD-4**.

2.5 Designated Areas

The designated areas within the potential zone of influence are identified in **Figure WFD-5**.

³ Draft River Basin Management Plan for Ireland 2022-2027, Government of Ireland



3.0 WFD Assessment Methodology

The WFD impacts have been considered in a three-stage assessment process the stages in the assessment process are set out as follows:

- Stage 1 WFD screening.** To determine if there are any activities associated with the Proposed Development that don't require further consideration, for example activities which have been ongoing since before the current RBMP plan cycle and which have thus formed part of the baseline;
- Stage 2 WFD scoping.** To identify risks of the Proposed Development's activities to receptors based on the relevant designations and hydrological link using a source-pathway-receptor approach; and
- Stage 3 WFD impact assessment.** An assessment of water bodies and their quality elements that are considered likely to be impacted by the Proposed Development, identification of any areas of noncompliance; consideration of mitigation measures and contributions to the WFD objectives to achieve Good Status

Any mitigation measures relied upon to demonstrate compliance at any of the above stages needs to be appropriately defined in order to ensure securement through any Planning Permission conditions for the Proposed Development.

Preplanning consultations were undertaken with statutory consultees including Roscommon Co. Council during the EIA process undertaken for the Proposed Development. In response to the consultation, an Aquatic Survey of the Ballyglass River was undertaken.

4.0 Stage 1 - WFD assessment screening

The WFD catchments, surface waterbodies and groundwater bodies in the 15 km zone of influence of the Site are shown in **Figure WFD-2** and **Figure WFD-3**. The drinking water supplies are shown in **Figure WFD-4** and ecological designation within the 15 km zone of influence of the Site are shown in **Figure WFD-5**.

4.1 Screening exercise

4.1.1 Surface Water

Screening for WFD surface water bodies has been carried out, identifying all WFD surface water bodies within a 15 km of the Site or the potential zone of influence, see **Appendix D**. A 15 km area for the zone of influence is used here as this is in line with the study area used for the Appropriate Assessment and Natura Impact Statement undertaken for the Proposed Development and submitted in support of the planning application.

The identified surface water bodies within the potential zone of influence and their details are set out in **Appendix D**.

4.1.2 Groundwater

Screening for WFD groundwater bodies has been carried out, identifying all WFD groundwater bodies within a 15 km of the Site or the zone of influence, see **Appendix E**. A 15 km radius for the zone of influence is used here as this is consistent with the study area used for the Appropriate Assessment and Natura Impact Statement undertaken for the Proposed Development and submitted in support of the planning application.

The identified groundwater bodies within the potential zone of influence and their details are set out in **Appendix E**.



4.1.3 Drinking water Schemes

Screening for drinking water supplies schemes and source protection areas has been undertaken to identify sites within a 15 km of the Site or the potential zone of influence, see **Appendix G**. A 15 km radius for the zone of influence is used here as this is consistent with the study area used for the Appropriate Assessment and Natura Impact Statement undertaken for the Proposed Development and submitted in support of the planning application.

The identified designated areas within the potential zone of influence and their details are set out in **Appendix G**.

4.1.4 Designations

Screening for designated areas has been undertaken to identify sites within a 15 km of the Site or the potential zone of influence, see **Appendix F**. A 15 km radius for the zone of influence is used here as this is consistent with the study area used for the Appropriate Assessment and Natura Impact Statement undertaken for the Proposed Development and submitted in support of the planning application.

The identified designated areas within the potential zone of influence and their details are set out in **Appendix F**.

4.2 Screening outcomes

Based on the identified potential zone of influence for the Proposed Development and hydrological links, the following WFD waterbodies in **Table 3** are screened in for the purpose of this assessment.

The remainder of the waterbodies identified in **Appendix D** and **Appendix E**, and the designations in **Appendix F** are therefore screened out from further consideration as part of this WFD Assessment as there is no hydrological link to the Proposed Development Site.

Table 3. WFD screening outcome

No.	WFD Feature	Reason for Screening in
1	Ballyglass River and Cross River	Potential hydrological link to river given the Site is in the Ballyglass river sub basin catchment, located c.1.1km northwest of Site. It is also the discharge location if Roadstone Ltd. deepens the quarry floor below the groundwater table. Cross River has potential hydrological link to Site as there is a high degree of interaction between surface water and groundwater due to numerous karst features in this area.
2	River Suck	Potential hydrological link to river given the river is downstream of the Ballyglass river.
3	Killeglan Public Water Supply (PWS) or Killeglan River Sub Basin	Potential hydrological link as groundwater flows naturally from the Ballyglass River Sub Basin to that of the Killeglan Public Water Supply.
4	Corkip Lough SAC and Feacle Lough pNHA (Turloughs)	Groundwater dependent features which are hydrological link to the site as both turloughs are groundwater controlled.
5	Suck South groundwater body (GWB)	Site is located within the Suck South groundwater body



5.0 Stage 2 - WFD Assessment Scoping

This section of the assessment identifies the risks from the Proposed Development's activities to receptors based on the relevant water bodies and their water quality elements and includes the following:

- identify the potential risks from the proposed development on WFD waterbody receptors, PWS and designated areas within the zone of influence, based on hydrological linkages; and
- identification of those water bodies where a more detailed WFD impact assessment is required.

5.1 Identified potential risks from the proposed development

In terms of identified potential impacts on WFD receptors, the key aspects of the proposed development which relate to water are set out here:

- There will be no abstraction of surface water from any adjoining water courses;
- The development will continue to be worked dry above the water table until it is required to deepen the quarry;
- There will be no discharge of waters to any adjoining water courses until the quarry deepening takes place;
- Wastewater currently treated using an existing septic tank and;
- All hydrocarbons at the Site are banded to 110% of the maximum tank capacity and a hard standing refuelling area with hydrocarbon interceptor will be provided.

5.2 Identification of potential receptors

Receptors within the potential zone of influence of the quarry development have been identified here in this Stage 2 Scoping. The potential receptors are set out in **Table 4** below.

Table 4: Identified potential receptors within the development potential zone of influence

Receptor Type	Figure	List of Identified Receptors
WFD surface water bodies	Figure WFD-2	Appendix D
WFD groundwater bodies	Figure WFD-3	Appendix E
Public water supply areas	Figure WFD-4	Appendix G
Designated areas	Figure WFD-5	Appendix F

5.3 Source Pathway Receptor Model

Potential impacts from the quarry development on identified receptors can be identified using the Source-Pathway-Receptor (SPR) model.

Risk can be defined as "the chance of a defined hazard occurring and achieving its potential". Reference to documentation (CLR 11)⁴ by the Environment Agency in the UK indicates that there must be a pollutant linkage between the source of pollution and the receptor, in order for harm to human beings or the environment to occur. The pollutant linkage comprises:

⁴ Environment Agency (UK). Model Procedures for the Management of Land Contamination (CLR 11)



- A **Source** of potential pollution (contaminant);
- A **Pathway** for the pollutant to move from source to receptor. This can include the transport of contamination via groundwater, and
- A **Receptor** (target), which is affected by the pollutant. According to the EPA, key receptors include groundwater, surface water and protected ecological sites.

This scoping assessment is based on the 'source-pathway-receptor' pollution linkage concept. For a potential risk to arise each stage of the pollution linkage must be present.

5.4 Potential Pollution Sources

Potential pollution sources from the Proposed Development are the decrease in groundwater quality from potential increase in suspended solids and accidental fuel leakage / spillage during construction and operational stages. Migration of a pollution source in the shallow groundwater could then migrate laterally to surface water or could migrate vertically to the underlying bedrock aquifer.

During soil removal, direct rainfall and the dust suppression of stockpiles could increase the fine sediment on the quarry floor which could infiltrate into the underlying groundwater body.

Accidental fuel leakage/spillage at the Site is a potential impact and could also infiltrate into the underlying groundwater body.

The construction stage is taken to be Site preparation for extraction, and the establishment of the Site infrastructure.

The operational stage will consist of limestone extraction being carried out over an overall extraction area. The quarry is currently worked dry above the underlying groundwater table.

5.5 Pathways

Pathways are the means by which a receptor is likely to come into contact with a source.

As noted above, suspended solids could migrate laterally in the shallow groundwater to the nearby surface water bodies, including the Ballyglass River and Cross River. Suspended solids could then migrate from the stream to further surface water bodies downstream i.e. River Suck.

Suspended solids in shallow groundwater could also migrate vertically to the underlying bedrock aquifer and groundwater body.

If an accidental spillage occurred, hydrocarbons could also migrate laterally to nearby surface water bodies and further downstream surface water bodies and could migrate vertically to the underlying bedrock aquifer.

5.6 WFD receptors for assessment

Based on the screening exercise undertaken in Section 4.0 above and scoping exercise undertaken here the following surface water, groundwater, public water supplies, groundwater dependant environments and designated areas are included in this assessment.

5.6.1 Surface Water

The WFD surface water receptors identified and scoped in for this assessment are:

- The Site is located within the BALLYGLASS_010 WFD River Sub Basins. The Ballyglass River is located c. 1.1 km northwest of the Site from the entrance of the



quarry and flows downstream in a southwesterly direction towards River Suck. This confluence occurs c. 6.2 km southwest of Site.

- The Cross River may be hydrologically linked to the Site via shallow groundwater flow discharging to local rivers and streams.

5.6.2 Groundwater

The WFD groundwater receptor identified and scoped in for this assessment is:

- The bedrock aquifer is within the Suck South GWB which has a good status (2016 - 2021).

The Suck South GWB is classified as being a regionally important karstified bedrock aquifer.

5.6.3 Public Water Supplies

The public water supply identified as a receptor and scoped in for this assessment is

- The Killeglan Public Water Supply (PWS) which is supplied by the Tobermore Spring.

The Killeglan PWS supplies over 5300 homes and has a reported abstraction rate of c. 9,090 m³/d.

5.6.4 Groundwater Dependant Environments

The groundwater dependant environment receptors identified and scoped in for this assessment are:

- Corkip Lough SAC (Site Code 002339); and
- Feacle Lough pNHA (Site Code 001634).

While these turloughs are not designated as Groundwater Dependent Terrestrial Environments (GWDTE) under the WFD, they are environments that are dependent on groundwater levels. Hence, they have been scoped in as a receptor for this assessment.

5.6.5 Ecological Designation

The identified ecological designated sites which are hydrologically linked to the Site are:

- The River Suck Callows SPA (Site Code 004097) and Suck River Callows NHA (Site Code 000222) is downstream of the Ballyglass stream and is located c. 4.6km southwest of the Site.
- Corkip Lough SAC (Site Code 002339) and Feacle Lough pNHA (Site Code 001634) which are both turloughs fed by groundwater in the area.

5.7 Findings from the scoping

Based on the Proposed Development outlined above and investigations undertaken at the Site the following statements can be made in terms of the scoping of local surface water and groundwater in the vicinity of the Site:

- i. there is no direct hydrological pathway between the Proposed Development and the adjacent surface water courses as there will be no abstraction of surface water or current discharge to surface water courses. **There is no direct hydrological linkage.** However, in future, if Roadstone Ltd. decides to deepen the quarry floor below the water table, then water will be discharged to the Ballyglass River and there will be a direct hydrological linkage;



- ii. there are several turloughs in the area which are fed by groundwater. However, O'Neill Groundwater Engineering (OGE) undertook a pump test in 2004 as part of the EIS for Cam Quarry, see Appendix H for copy of hydrogeological report written up by OGE. In this pump test, they tested the permeability of the karstified areas of the bedrock below the Site. The results suggest that the permeability of the karst features below the Site is relatively low. Hence, although the turloughs (in particular Corkip Lough) may be located above zones of deeper karstification, the contribution of groundwater from the deeper karst is likely to be very limited. Therefore, while **there is a direct hydrogeological linkage** with the turloughs, it is considered unlikely that continued use of the quarry development will have a significant impact the turloughs in the surrounding areas.
- iii. The Ballyglass river flows in a southwesterly direction towards the River Suck which is also an SAC and NHA (River Suck Callows). When Roadstone Ltd discharge to Ballyglass river in the future then there will be a direct link to these protected areas . Several turloughs in the area are also classified as designated sites but as previously mentioned, while **there is a direct hydrogeological link** to the Site due to the turloughs being controlled by groundwater, there is no predicted adverse significant impact on the turloughs as a result of the proposed continued use of the permitted quarry; and
- iv. There is a **direct hydrogeological link** pathway via the groundwater underlying the Site and the Killeglan Spring as demonstrated by OGE in their report. The report found that the groundwater below the site discharges to both the Killeglan Spring catchment and the Cross River (Corkip Lough). Hence, as the quarry deepens, the groundwater levels need to be lowered which has the potential to affect the Killeglan PWS. Calculations by OGE determined that discharges of groundwater that will ingress into the quarry are negligible, at less than 1% and that because the permeability of the bedrock aquifer is relatively low and that relatively steep gradients will develop on the cone of drawdown around the Site.

Based on the Proposed Development activities and investigations undertaken at the Site, there is no direct pathway to surface water courses and to the underlying bedrock aquifer. However, when the need arises for Roadstone Ltd to lower the water table, it may have an impact on the Killeglan PWS. It is considered the likely impact on the Killeglan PWS from discharges of groundwater that will ingress into the quarry will be negligible. In addition, when the discharge of water to the Ballyglass River commences then there may also be an impact on the surface water quality and flow volumes.

Therefore, with mitigation measures the Cross River, the bedrock aquifer and the Suck South GWB can be scoped out here as there are no hydrogeological pathways present.

6.0 Stage 3 - WFD impact assessment

This impact assessment includes a detailed assessment of the Proposed Site activities and water bodies identified at the WFD screening and scoping Stages 1 and 2 above.

6.1 Baseline Environmental Conditions

The baseline hydrological and hydrogeological conditions at the Site have been identified from the geophysical surveys and ground investigations undertaken at the Site and are presented in Chapters 6 and 7 of the EIAR.

The baseline aquatic ecology (Q Survey) in the surrounding watercourses is outlined in the Aquatic Survey which is included in Chapter 7 of the EIAR.



6.1.1 WFD identified pressures on waterbodies

The baseline conditions in the identified surface water bodies and groundwater bodies are set out in **Appendix D** and **Appendix E**, including the identification of pressures on the waterbodies and the WFD Third-Cycle risk rating for the water bodies not achieving Good Status by 2027.

A number of pressures have been identified downstream of the Ballyglass River for the River Suck from the WFD Second-Cycle, these are set out in **Appendix D** and are included here:

- SUCK_140 and SUCK_150 identified issues are Hydrological and Morphological from Hydromorphology pressures (such as changes in the flow, channels, sediment or riparian zone of a river) and Peat drainage/extraction.

6.1.2 Baseline Aquatic Survey

The aquatic baseline survey included an invertebrate survey, the findings of which are presented here.

Biological water quality & pressures

A biological water quality assessment was undertaken at surface water sampling locations SW1 and SW2. Two rounds of Q survey monitoring were conducted on the Ballyglass River. In April 2025, a kick sample could not be taken at SW1 for health and safety reasons. Sampling site SW2 received a Moderate status (Q3-4). In July 2025, a kick sample could safely be undertaken at both sampling sites. The results revealed that SW1 achieved a Q value score of Q2-3 (Poor status) and SW2 received a Q value score of Q3 (Poor status) which is a decrease in status from the April 2025 Q survey.

According to CORINE Land Cover mapping (2018), the surrounding land use of the Ballyglass River comprises of agricultural pastures. SW1 is inaccessible to livestock, however, there is a storm drain present at the sample location which feeds into the river after heavy rainfall. Previous surface water chemical quality sampling rounds reveal that after heavy rainfall, the colour and silt levels of the Ballyglass River is impacted. SW2 is located in a pasture field and cows have direct access to the river and it is considered they use the river as a drinking water source.

Therefore, its considered the main pressure on the Ballyglass River currently is agriculture and surface run-off.

6.2 Designated areas

The identified designated areas which have a hydrological link to the Site are as follows:

- River Suck Callows SPA (Site Code 004097) and NHA (Site Code 000222) is located downstream of the Ballyglass River c. 4.6km west of Site;
- Feacle Turlough pNHA (Site Code 001634) is located c. 550m southeast of Site; and
- Ballynamona Bog and Corkip Lough SAC (Site Code 002339) is located c. 2km southeast of Site

The BALLYGLASS_010, CROSS (ROSCOMMON)_010 and SUCK_130 are not drinking water protected rivers under the WFD but they are designated as SPA's.

Killeglan Public Water Supply (PWS) is a receptor that is hydrologically linked to the Site and provides drinking water to over 5,300 homes in the vicinity of the Site.

All Groundwater bodies in Ireland have been designated as Drinking Water Protected Areas under the WFD. This designation is based on the possibility of meeting the criteria for water abstraction for human consumption, as defined in Article 7 of the WFD. These Drinking Water



Protected Areas encompass the complete extent of each WFD groundwater body. The Suck South GWB is classified as a regionally important karstic bedrock aquifer and therefore, is considered as capable of supplying regionally important water supplies.

6.3 WFD impact assessment methodology

The methodology used here to assess the nature, scale and magnitude of impact in terms of WFD potential receptors is the same as that used in the EIAR Chapter 7 for Hydrology and Hydrogeology. The methodology applied here is a qualitative risk assessment methodology in which the nature of the potential impacts is described in terms of the character, magnitude, duration, probability and consequence of the impact are considered.

First the significance and sensitivity of the receptor is classified and then the description of the potential impact is then screened against the significance and sensitivity of the receiving environment to establish the overall significance of the potential impact. The classification of the impact significance is determined using the matrix from the EPA Guidelines (2022).

The following sections identify the sensitivity of the WFD environmental receptors and potential impacts of the Proposed Development during the Construction Stage (Site preparation), the Operation Stage (extraction and processing) and Post Operational Stage (Site restoration).

6.4 Sensitivity of WFD receptors

The sensitivity and significance of the identified WFD environmental receptors are outlined in **Table 5** below.

Table 5: Sensitivity and Significance of WFD Environmental Receptors

No.	WFD Environment Receptor	Significance	Sensitivity	Existing Environment Significance / Sensitivity Rating (H/M/L/N)
1	Local Rivers and Streams	Surface watercourses: Ballyglass river and Cross River are located within c. 2km of Site. Ballyglass River is the chosen quarry discharge location when Roadstone Ltd decide to deepen their quarry floor.	Ballyglass river has a Good WFD status and is under review. Cross River is of Moderate WFD status and at risk. High degree of interaction between surface water and groundwater due to numerous karst features (e.g. turloughs, swallow holes, springs etc). surface and groundwater quality are closely linked.	Medium – Attribute has a medium quality or value on a local and regional scale due to regionally important karstic aquifer.
2	Killeglan PWS located directly south of the Site	Killeglan PWS supplies water to over 5300 homes in the area.	The PWS is hydrogeologically linked to the Site as the groundwater under the Site discharges to the PWS. As the quarry dewateres the Site, there may be an impact on the Killeglan PWS. However, it is considered the likely impact on the Killeglan	High – Attribute is considered to be of High quality or value on a regional or national scale as it is a regionally important aquifer that supplies > 5300 homes with drinking water.



No.	WFD Environment Receptor	Significance	Sensitivity	Existing Environment Significance / Sensitivity Rating (H/M/L/N)
			PWS from discharges of groundwater that will ingress into the quarry are negligible, less than 1%.	
3	Feacle Turlough pNHA, located c.550m southeast of Site and Corkip Lough SAC, located c. 2km southeast of Site	pNHA is a designated area of protection due to its habitat and wildlife. SAC is a European designated Natura 2000 site. The turloughs are fed by groundwater. In wintertime, when groundwater levels rise, the turloughs fill with water.	The groundwater levels under the turloughs may be affected if groundwater levels under the Site are affected.	High - Attribute has a high quality or value on an international (SAC status) and regional scale (pNHA status)

6.5 Mitigation measures

In terms of the identified WFD receptors and the potential impacts from the Proposed Development, the existing embedded mitigation measures at the development will continue in place during the proposed continued use of the quarry. The existing mitigation measures are as follows:

- There will be no abstraction of surface water from any adjoining water courses;
- There will be no discharge of surface or process waters to any adjoining water courses until the quarry extends below the groundwater table;
- The development will continue to be worked dry above the groundwater table until such time as extraction operations breach the groundwater table;
- Roadstone will obtain a Section 4 Discharge Licence from Roscommon Co. Council when the quarry extends below the water table and dewatering is required. Roadstone will comply with all conditions in the Discharge Licence;
- The development will not go below the underlying bedrock aquifer (the Suck South GWB);
- A new packaged Secondary WwTS and constructed soil polishing filter area will be installed at the site to upgrade the existing WwTS; and
- All hydrocarbons at the Site will continue to be bunded to 110% of the maximum tank capacity and the hard standing refuelling area has a hydrocarbon interceptor provided.

These mitigation measures for the Proposed Development will be secured via any future planning permission and associated conditions relating to an approval.



6.6 Potential impacts on WFD receptors

The potential impacts on the identified WFD receptors are set out in **Table 6** below with the embedded mitigation measures in place.

Based on the Proposed Development and with the identified mitigation measures in place it is considered that the potential impacts on the identified WFD receptors will be Not Significant.

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Table 6. WFD Impact Assessment – significance of effects with embedded mitigation measures

No.	WFD Receptor	WFD Receptor Significance / Sensitivity Rating	WFD Status	WFD Risk Status	Potential Impacts	Description of Effects	Significance of Effects
1	Ballyglass River Surface watercourse located c. 1.1km northwest of Site Cross River surface watercourse located c. 2km northeast of the Site	Medium - Attribute is considered to be of high quality or value under the WFD as it currently meets Good Status requirements and is upstream from an SPA/pNHA designation. It is also the chosen quarry discharge location when Roadstone Ltd decide to deepen their quarry floor.	Good Status BALLYGLASS_010 river is Good status (WFD 2016-2021). Moderate status CROSS (ROSCOMMON)_010 river is of Moderate WFD status	Ballyglass Rive is still Under review for its risk status. Cross River is At risk due to morphological issues and excess nutrients as a result of agriculture and hydromorphological pressures.	Potential to effect surface water quality in the Ballyglass River, through quarry discharge to the watercourse. High degree of groundwater and surface water interactions in the vicinity of the Site	Negligible. Indirect effect from a pollution incident at the Site. The extent of any effect from a pollution incident at the Site will be over a small area only, if pollution entered the watercourse, it would extend downstream. The duration of any pollution event would be brief lasting less than a day. The probability of a pollution event occurring is considered unlikely given existing and future embedded mitigation measures. The quality of the effect is considered to be neutral on the waters of the Ballyglass River.	Not Significant



No.	WFD Receptor	WFD Receptor Significance / Sensitivity Rating	WFD Status	WFD Risk Status	Potential Impacts	Description of Effects	Significance of Effects
2	Killeglan PWS located directly south of Site	High – Attribute is considered to be of High quality or value on a regional or national scale as it is a regionally important aquifer that supplies > 5300 homes with drinking water.	N/A	N/A	PWS is hydrogeologically linked to Site as groundwater underneath the Site discharges to the PWS. However, it is considered the likely impact on the Killeglan PWS from discharges of groundwater that will ingress into the quarry are negligible, less than 1%.	Low Indirect effect from a pollution incident that has the potential to affect groundwater quality through lateral migration in underlying aquifer. Lowering of water table could impact water levels in Killeglan PWS The extent of any effect from a pollution incident at the Site will be small as the estimated discharges of groundwater that will ingress into the quarry are negligible, less than 1%. The duration of any pollution event at the Site would be brief lasting less than a day. The probability of a pollution event occurring is considered unlikely given embedded mitigation measures. The quality of the effect therefore is considered to be neutral on the Killeglan PWS.	Not Significant



No.	WFD Receptor	WFD Receptor Significance / Sensitivity Rating	WFD Status	WFD Risk Status	Potential Impacts	Description of Effects	Significance of Effects
3	Feacle Turlough pNHA is located c.550m southeast of Site	High - Attribute is considered to be of high quality or value as it has pNHA designation and the turlough and fen is fed by groundwater.	N/A	N/A	Potential to effect groundwater levels or groundwater quality by migration is limited by low permeability in deeper karstic structures. While groundwater flows in a southeasterly direction from Site towards Feacle Lough, it is via deeper karstic channels and cavities while Feacle Lough is fed by groundwater in the shallower epikarst.	Negligible. Indirect effect from a pollution incident at the Site. The extent of any effect from a pollution incident at the Site will be over a small area only, if pollution entered the groundwater, it would not extend to Feacle Lough due to the turlough only being fed by shallow epikarst groundwater. The duration of any pollution event at the Site would be brief lasting less than a day. The probability of a pollution event occurring is considered unlikely given embedded mitigation measures. The quality of the effect is considered to be neutral on the waters of the Feacle Lough.	Not Significant



6.7 Risk of deterioration in status

The potential risk to the identified WFD receptors as a result of the Proposed Development is considered to be Not Significant as set out in **Table 6** above.

This section of the assessment identifies any risk of deterioration of WFD status as a result of the Proposed Development with all embedded mitigation measures in place, see **Table 7** below. Based on the project design and mitigation measures, the WFD screening, WFD scoping and WFD assessment, it is predicted that there will be no risk of deterioration in the status of the identified WFD receptors.

Table 7: Risk of deterioration in status of identified WFD receptors as a result of Proposed Development

WFD Receptor Details				Embedded mitigation measures	Risk of deterioration in Status
No.	WFD Receptor	WFD Status	Identified Existing Pressures		
1	Ballyglass River and Cross River	Ballyglass: Good Status	Ballyglass River: Still under review	Yes	No
2	Killeglan PWS	N/A	N/A	Yes	No
3	Feacle Turlough	N/A	N/A	Yes	No

It is considered here, that based on the nature of the Proposed Development and the designed embedded mitigation measures in place then the Proposed Development will not result in a deterioration in the status of the identified WFD receptors.

7.0 WFD compliance findings

Based on the findings from the WFD screening, scoping and assessment undertaken here, it is considered that the Proposed Development, with the mitigation measures in place, will not result in a deterioration of the existing status of the identified WFD receptors.

It is not considered that the Proposed Development will be a contributing risk factor in any of the identified WFD receptors failing to achieve their status objectives in future.



FIGURES

Figure WFD-1: Site Location and Zone of Influence

Figure WFD-2: River Sub Basins and Surface Water Bodies

Figure WFD-3: Groundwater Bodies

Figure WFD-4: Public Water Supply Zones

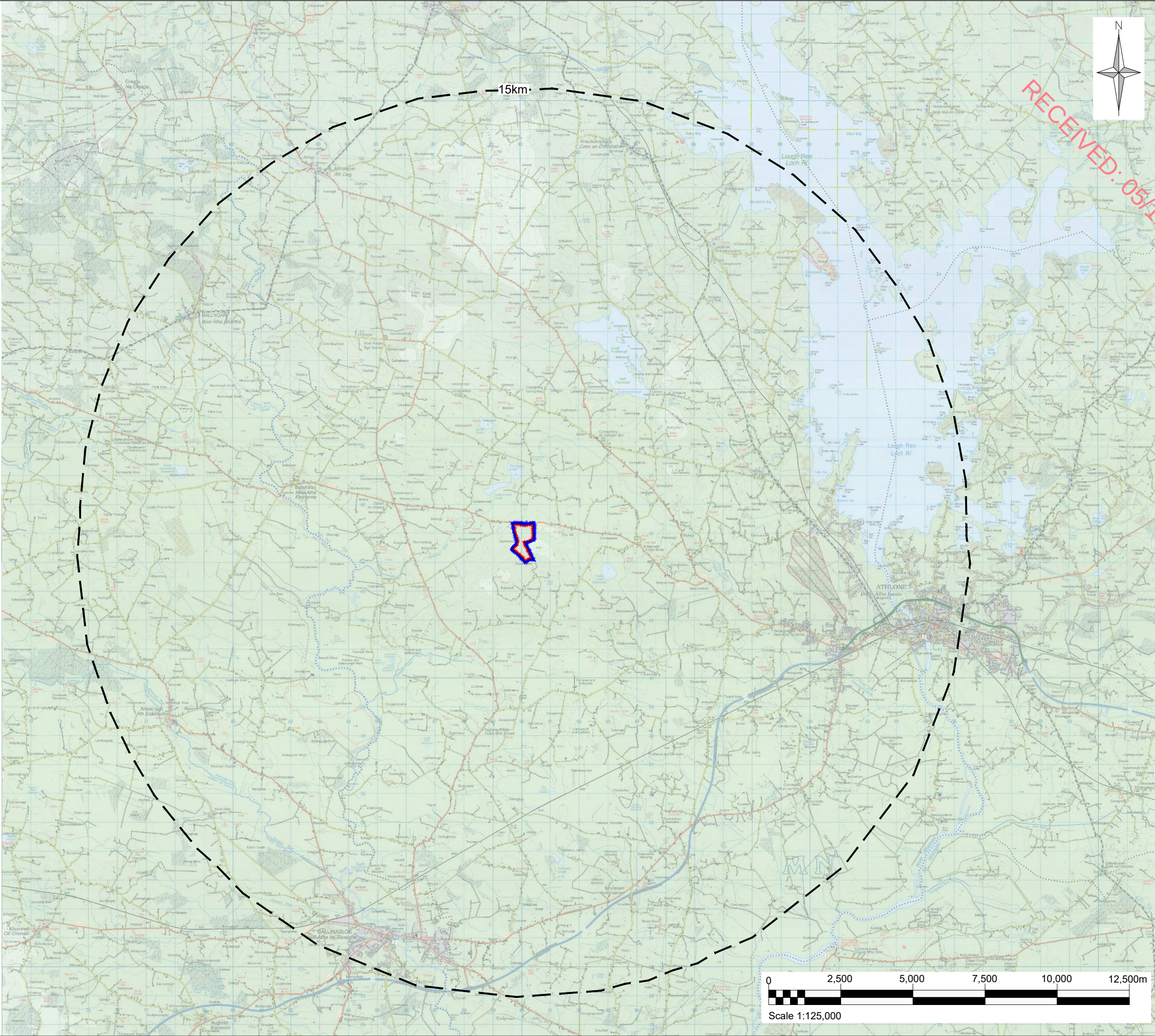
Figure WFD-5: Ecological Designations and Zone of Influence

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Notes:

1. Based on 50,000 scale Discovery Series Tailte Eireann maps 40 & 47

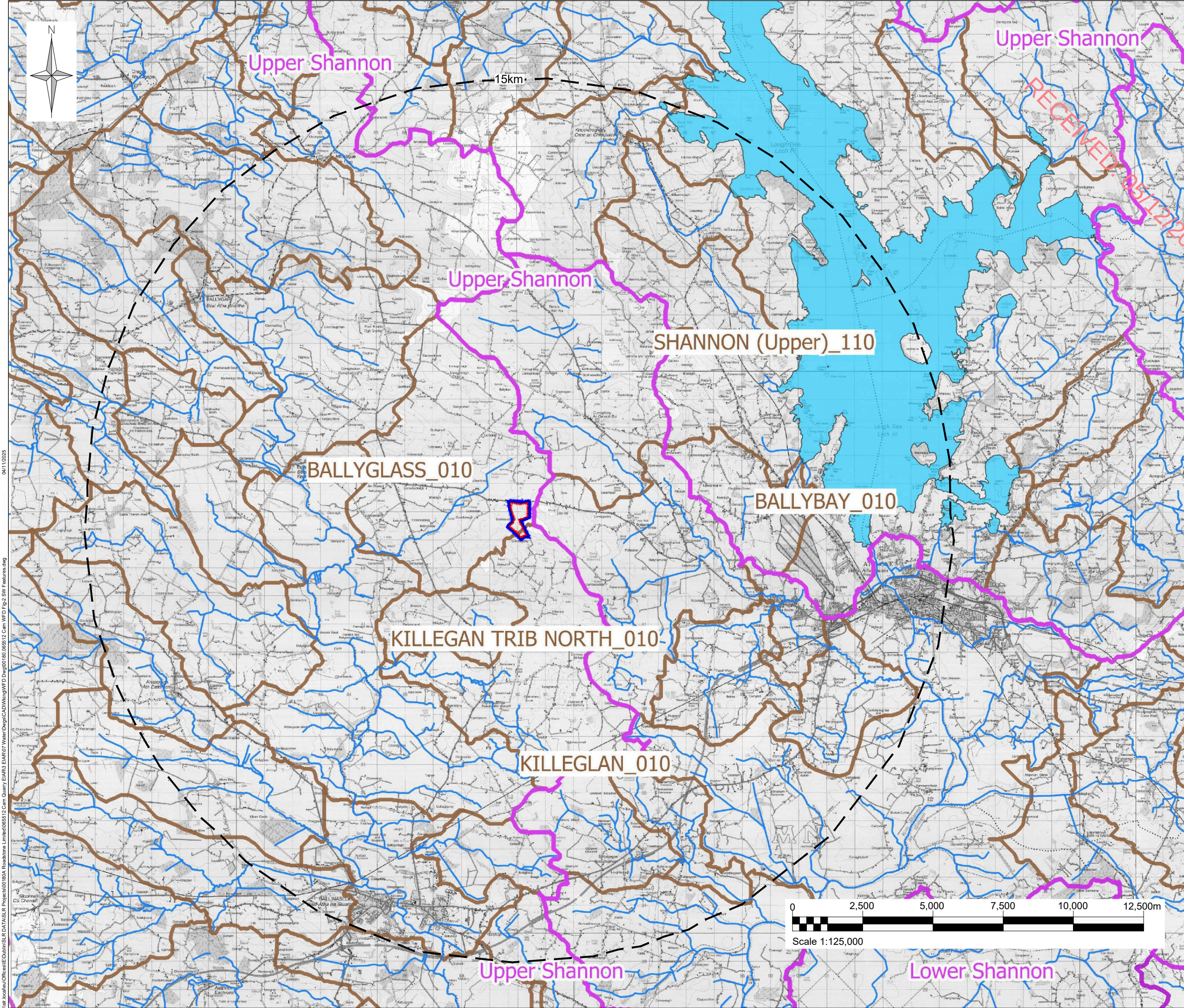
Legend:

Landholding (c. 66.3 hectares)

Planning Application Area (c. 66.3 hectares)

15km Off-Set from Site Boundary

Rev	Amendments	Date	By	Chk	Auth
SLR www.slrconsulting.com					
Client Roadstone Limited					
Project Continued Use of Existing Cam Quarry at Curry & Cloonacaltry townlands, Co. Roscommon					
Figure Title Site Location and Zone of Influence					
Water Framework Directive (WFD) Assessment					
Scale 1:125,000 @ A3		SLR Project No. 501.065512.00001			
Designed mcob	Drawn mcob	Checked pg	Authorised pg		
Date 03/25	Date 03/25	Date 10/25	Date 10/25		
Figure Number Figure WFD-1					Rev. 0



Notes:

1. Based on 50,000 scale Discovery Series Tailte Eireann maps 40 & 47

Legend:

Landholding (c. 66.3 hectares)

Planning Application Area (c. 66.3 hectares)

15km Off-Set from Site Boundary

WFD River Catchment

Lower Shannon

Upper Shannon

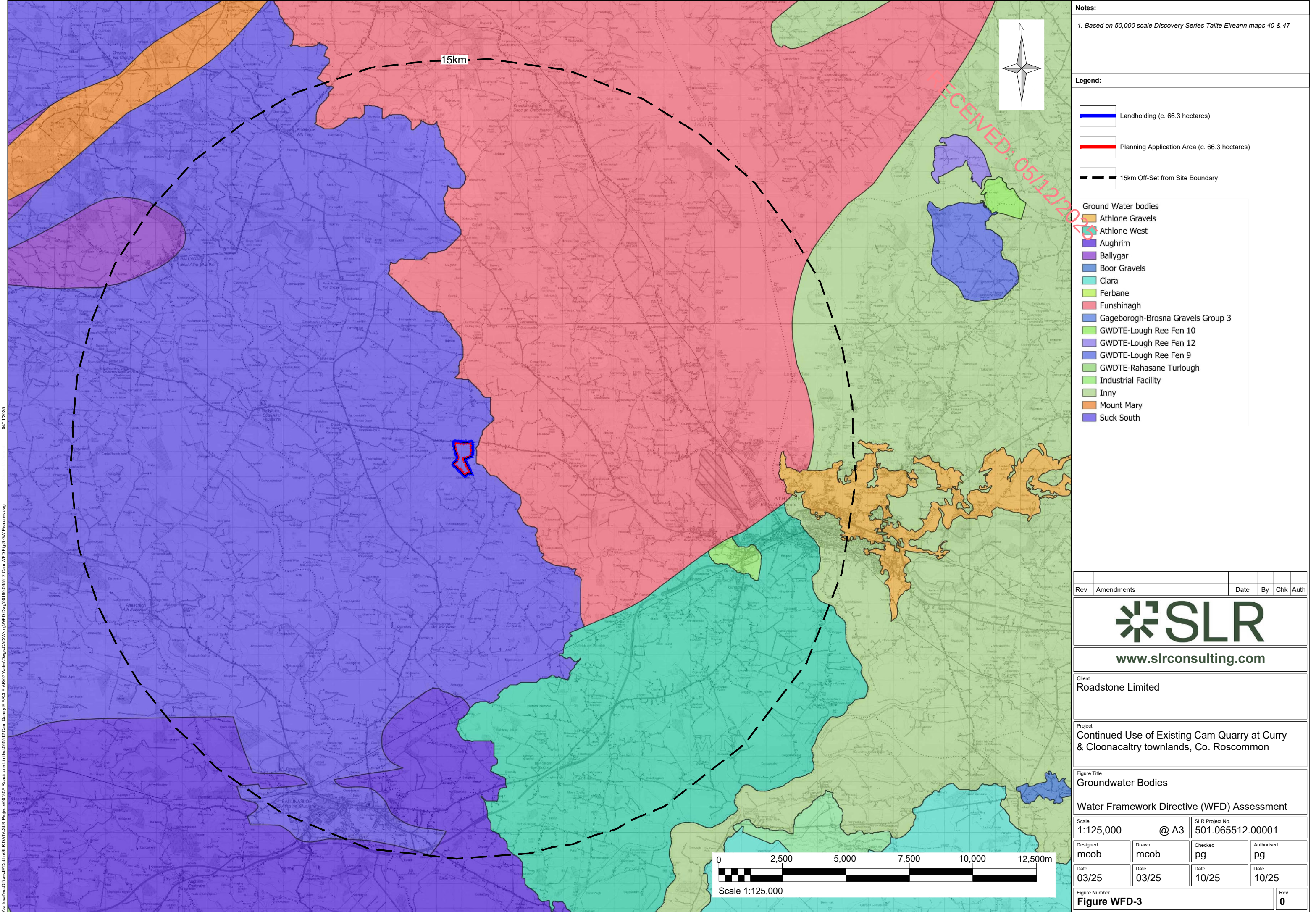
WFD Lake Waterbodies

Surface Watercourse

WFD Sub-Catchment

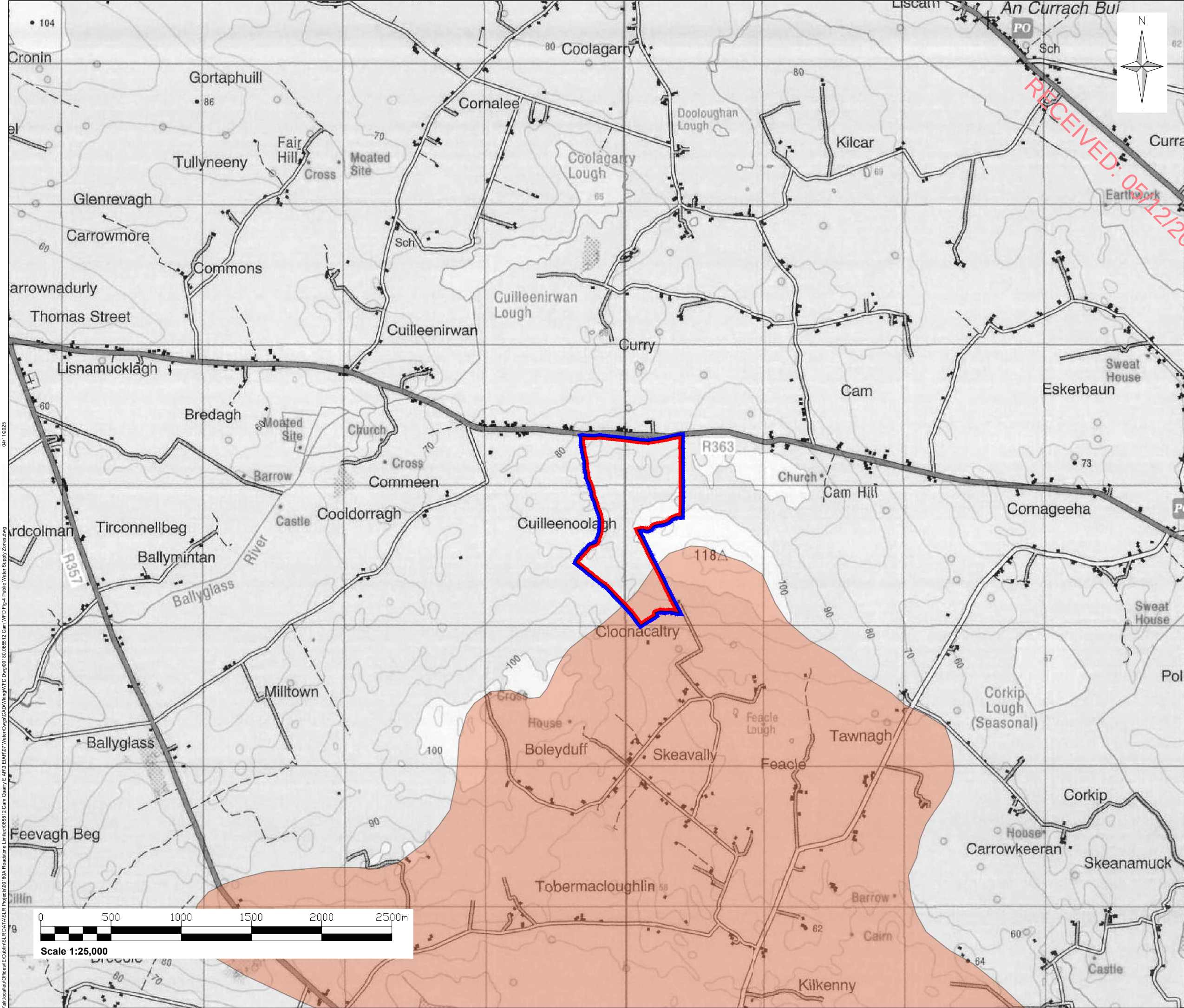
Rev	Amendments	Date	By	Chk	Auth
 www.slrconsulting.com					
Client Roadstone Limited					
Project Continued Use of Existing Cam Quarry at Curry & Cloonacaltry townlands, Co. Roscommon					
Figure Title River Basins & Surface Water Features					
Water Framework Directive (WFD) Assessment					
Scale 1:125,000 @ A3		SLR Project No. 501.065512.00001			
Designed mcob	Drawn mcob	Checked pg	Authorised pg		
Date 03/25	Date 03/25	Date 10/25	Date 10/25		
Figure Number Figure WFD-2					Rev. 0

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Notes:
1. Based on 6 inch scale Tailte Eireann Discovery raster mapping RN047, RN048, RN050, RN051

Legend:

Landholding (c. 66.3 hectares)

Planning Application Area (c. 66.3 hectares)

Public Water Supply Source Protection Area
Killeglan PWS Tobermore Spring

Rev	Amendments	Date	By	Chk	Auth
SLR www.slrconsulting.com					
Client Roadstone Limited					
Project Continued Use of Existing Cam Quarry at Curry & Cloonacaltry townlands, Co. Roscommon					
Figure Title Source Protection Areas					
Water Framework Directive (WFD) Assessment					
Scale 1:25,000 @ A3		SLR Project No. 501.065512.00001			
Designed mcob	Drawn mcob	Checked pg	Authorised pg		
Date 03/25	Date 03/25	Date 10/25	Date 10/25		
Figure Number Figure WFD-4					Rev. 0

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\\slr\local\offices\IEDublin\SLR Data\SLR Projects\00180A\Roadstone Limited\065512 Cam Quarry EIA\R3 EIA\R3 CAD\WFD Dwg\00180.065512 Cam WFD Fig-4 Public Water Supply Zones.dwg