APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: Mr First Name: Pearse Surname: McKiernan

Address: Redgap, Rathcoole, Co. Dublin

Site Location and Townland: Redgap, Rathcoole, Co. Dublin

Number of Bedrooms: 3 Maximum Number of Residents: 5

Comments on population equivalent

In order to take a conservative approach it has been decided to take six as the population equivalent.

Proposed Water Supply:

Mains ☐ Private Well/Borehole ☑ Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): Deep well drained mineral (mainly acidic). Acid Brown Earths, Brown Podzolics

Subsoil, (Specify Type): Till derived from Lowert Palaeozoic sandstones and shales

Bedrock Type: Slate Quarries Formation - Slate & Greywacke

Aquifer Category: Regionally Important | Locally Important | Poor Pu

Vulnerability: Extreme ☑ High ☐ Moderate ☐ Low ☐

Groundwater Body: Status

Name of Public/Group Scheme Water Supply within 1 km: None

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R2[1]

Presence of Significant Sites (Archaeological, Natural & Historical): None identified

Past experience in the area: Suitable for development with secondary treatment system and polishing filter

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

The Acquifer Category is Pu (Poor Aquifer - Bedrock which is Generally Unproductive)

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: Generally Shallow Sloping Ground

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☑ Relatively Flat (<1:20) ☐

Slope Comment

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

Dwelling-house on adjoining site to south west. Parent's house 200 m to north east. Other houses south east of public road.

Existing Land Use:

Agriculture

Vegetation Indicators:

Grass

Groundwater Flow Direction: North west

Ground Condition:

Good

Site Boundaries:

Fence with hedge along public road boundary. Fence with hedge on south west boundary with adjoining site

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

Public road adjoining site on south eastern boundary

Outcrops (Bedrock And/Or Subsoil):

No rock outcrop

Surface Water Ponding:

None

Lakes:

None

Beaches/Shellfish Areas:

None

Wetlands:

None

Karst Features:

None

Watercourses/Streams:*

None

*Note and record water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

None

Springs:*

No indication of any spring.

Wells:*

The adjoining dwelling-house is served by a deep bored well.

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

There is a dwelling-house on the site south west of the proposed site which is served by a deep bored well.
There are other houses in the area which are also served by bored wells.

*Note and record water level

3.2 Trial Hole (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m): 2.10

Depth from ground surface to bedrock (m) (if present): 0.8 to shaley

Depth from ground surface to water table (m) (if present): None

Depth of water ingress: ---------

Rock type (if present): Shaley rock at circa 0.8 m depth

Date and time of excavation: 08-Jun-2022

Date and time of examination: 08-Jun-2022 10:30

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m						
0.2 m	Topsoil			Low	Light Brown	
0.3 m	----------			----------	----------	----------
0.4 m						
0.5 m						
0.6 m	Silty Clay mixed with Shaley stones			Low	Dark Brown	None apparent
0.7 m						
0.8 m	----------			----------	----------	----------
0.9 m						
1.0 m						
1.1 m						
1.2 m						
1.3 m	Shaley Rock			Soft	Grey	None apparent
1.4 m						
1.5 m						
1.6 m						
1.7 m						
1.8 m						
1.9 m						
2.0 m						
2.1 m						
2.2 m	----------			----------	----------	----------
2.3 m						
2.4 m						
2.5 m						
2.6 m						
2.7 m						
2.8 m						
2.9 m						
3.0 m						
3.1 m						
3.2 m						
3.3 m						
3.4 m						
3.5 m						

Likely Subsurface Percolation Value:

Likely Surface Percolation Value:

Note: *Depth of percolation test holes should be indicated on log above. (*Enter Surface or Subsurface at depths as appropriate).

** See Appendix E for BS 5930 classification.

*** 3 samples to be tested for each horizon and results should be entered above for each horizon.

**** All signs of mottling should be recorded.

3.2 Trial Hole (contd.) Evaluation:

Shaley rock was encountered in the trial hole at circa 0.8 m depth. All rock to 2.1 m below ground level was excavated with mechanical digger.

The water table was not encountered.

No indication of mottling.

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	350	500	500
Depth from ground surface to base of hole (mm) (B)	750	900	900
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	08-Jun-2022	08-Jun-2022	08-Jun-2022
	Time	10:30	10:30	10:30
2nd pre-soak start	Date	08-Jun-2022	08-Jun-2022	08-Jun-2022
	Time	16:15	16:15	16:15

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	09-06-2022	09-06-2022	09-06-2022
Time filled to 400 mm	09:20	09:22	09:27
Time water level at 300 mm	11:28	09:33	09:37
Time (min.) to drop 100 mm (T_{100})	128.00	11.00	10.00
Average T_{100}			49.67

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	11:31	13:49	138.00	09:44	09:56	12.00	09:46	09:57	11.00
2	13:55	16:16	141.00	10:02	10:14	12.00	10:04	10:16	12.00
3	16:23	18:46	143.00	10:20	10:31	11.00	10:22	10:24	2.00
Average Δt Value			140.67			11.67			8.33
	Average Δt/4 = [Hole No.1]		35.17 (t_1)	Average Δt/4 = [Hole No.2]		2.92 (t_2)	Average Δt/4 = [Hole No.3]		2.08 (t_3)

Result of Test: Subsurface Percolation Value = 13.39 (min/25 mm)

Comments:

Test results satisfactory for packaged wastewater treatment system and polishing filter.
Note the percolation rate significantly higher for Test Hole No. 2 and Test Hole No. 3.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_3)			0.00

Result of Test: Subsurface Percolation Value =

0.00 (min/25 mm)

Comments:

3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)			
Depth from ground surface to base of hole (mm)			
Depth of hole (mm)	0	0	0
Dimensions of hole [length x breadth (mm)]	x	x	x

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date			
	Time			
2nd pre-soak start	Date			
	Time			

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test			
Time filled to 400 mm			
Time water level at 300 mm			
Time to drop 100 mm (T_{100})	0.00	0.00	0.00
Average T_{100}			0.00

If T_{100} > 480 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1			0.00			0.00			0.00
2			0.00			0.00			0.00
3			0.00			0.00			0.00
Average ΔT Value			0.00			0.00			0.00
	Average ΔT/4 = [Hole No.1]		0.00 (T_1)	Average ΔT/4 = [Hole No.2]		0.00 (T_2)	Average ΔT/4 = [Hole No.3]		0.00 (T_3)

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Comments:

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.
3. North point should always be included.
4. (a) Scaled sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Site specific cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site including landmarks (date and time referenced).
7. Pumped design must be designed by a suitably qualified person.

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of proposed infiltration / treatment area: Shallow

Are all minimum separation distances met? ✓

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system)

Percolation test result: Surface: Sub-surface: 13.39

Not Suitable for Development ☐ **Suitable for Development** ✓

Identify all suitable options

1. Septic tank system (septic tank and percolation area) **(Chapter 7)** ☐
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)** Yes
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)** Yes

Discharge Route [1]

Discharge to Ground Water

5.0 SELECTED DWWTS

Propose to install: Tertiary Treatment System and Infiltration /treatment area

and discharge to: Ground Water

Invert level of the trench/bed gravel or drip tubing (m)

Site Specific Conditions (e.g. special works, site improvement works testing etc.

Shaley rock was encountered in the trial hole and in the percolation test holes. Hence, it will be necessary to excavate the shaley rock and to construct a sand polishing filter where shown on the attached Site Plan.

It is proposed to install a CTP Biogreen BAF mechanical aeration treatment plant 6 PE and sand polishing filter - refer attached Report prepared by Carlow Precast Tanks.

The treated water from the Biogreen plant will be pumped onto the stratified sand polishing filter. The sand layers shall have a minimum total thickness of 900 mm and they shall be constructed over a depth of 900 mm sub-soil placed over the bedrock.

The sand polishing filter shall have a plan area of 20 m2 and it shall be constructed in accordance with the EPA 2009 Code of Practice.

For details of the sand polishing filter refer to Drawing No. D-2104-02.

[1] A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m^3)		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: CTP Biogreen BAF Plant - 6PE

Capacity PE: 6

Sizing of Primary Compartment: m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*: 20.00

Option 1 - Direct Discharge Surface area (m^2):

Option 2 - Pumped Discharge Surface area (m^2): 20.00

Option 3 - Gravity Discharge Trench length (m):

Option 4 - Low Pressure Pipe Distribution Trench length (m):

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 * ($l/m^2.d$)	60.00	Surface area (m^2)	22.50
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

The Biogreen BAF system shall be installed and commissioned by CarlowTanks Limited. The construction of the sand polishing filter shall be carried out by the applicant and supervising Engineer and will be certified on completion to comply with the EPA 2021 Code of Practice.

On-going Maintenance

An annual maintenance contract shall be put in place prior to the commissioning of the system.

7.0 SITE ASSESSOR DETAILS

Company: Patrick Joyce Associates

Prefix: Mr First Name: Patrick Surname: Joyce

Address: 2 Prospect Grove,
Stocking Lane,
Rathfarnham,
Dublin 16

Qualifications/Experience: BE, CEng, MIEI, MBA

Date of Report: 23-Aug-2022

Phone: 087-2476375 E-mail patrickjoyceassociates@gmail.com

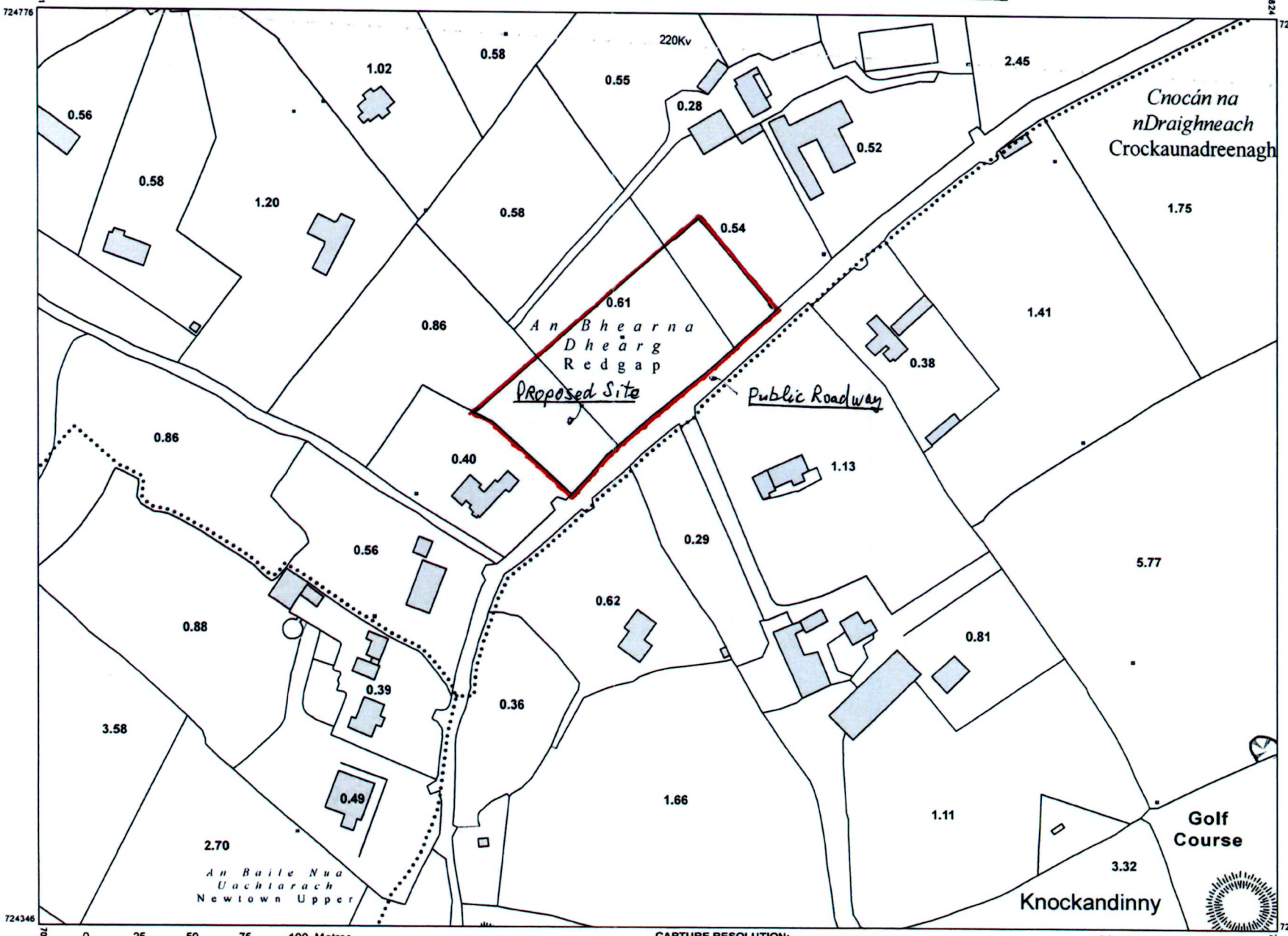
Indemnity Insurance Number: APl0004258

Signature: Patrick Joyce

NOTE: To secure your work prior to forwarding to third parties please select **Print**, select Printer **"print to PDF"** and name and save document.

OSi PLACE Map

APPLICANT: MR. PEARSE MCKIERNAN



0 25 50 75 100 Metres

0 50 100 150 200 250 Feet

OUTPUT SCALE: 1:2,500

CAPTURE RESOLUTION:
The map objects are only accurate to the resolution at which they were captured.
Output scale is not indicative of data capture scale.
Further information is available at:
http://www.osi.ie; search 'Capture Resolution'

N

Ordnance Survey Ireland
National Mapping Agency

CENTRE COORDINATES:
ITM 701533,724561

PUBLISHED:	ORDER NO.:
19/12/2018	50039502_1

MAP SERIES:	MAP SHEETS:
1:2,500	3451-A
1:2,500	3451-C

COMPILED AND PUBLISHED BY:
Ordnance Survey Ireland,
Phoenix Park,
Dublin 8,
Ireland.

Unauthorised reproduction infringes Ordnance Survey Ireland and Government of Ireland copyright.

All rights reserved.
No part of this publication may be copied, reproduced or transmitted in any form or by any means without the prior written permission of the copyright owners.

The representation on this map of a road, track or footpath is not evidence of the existence of a right of way.

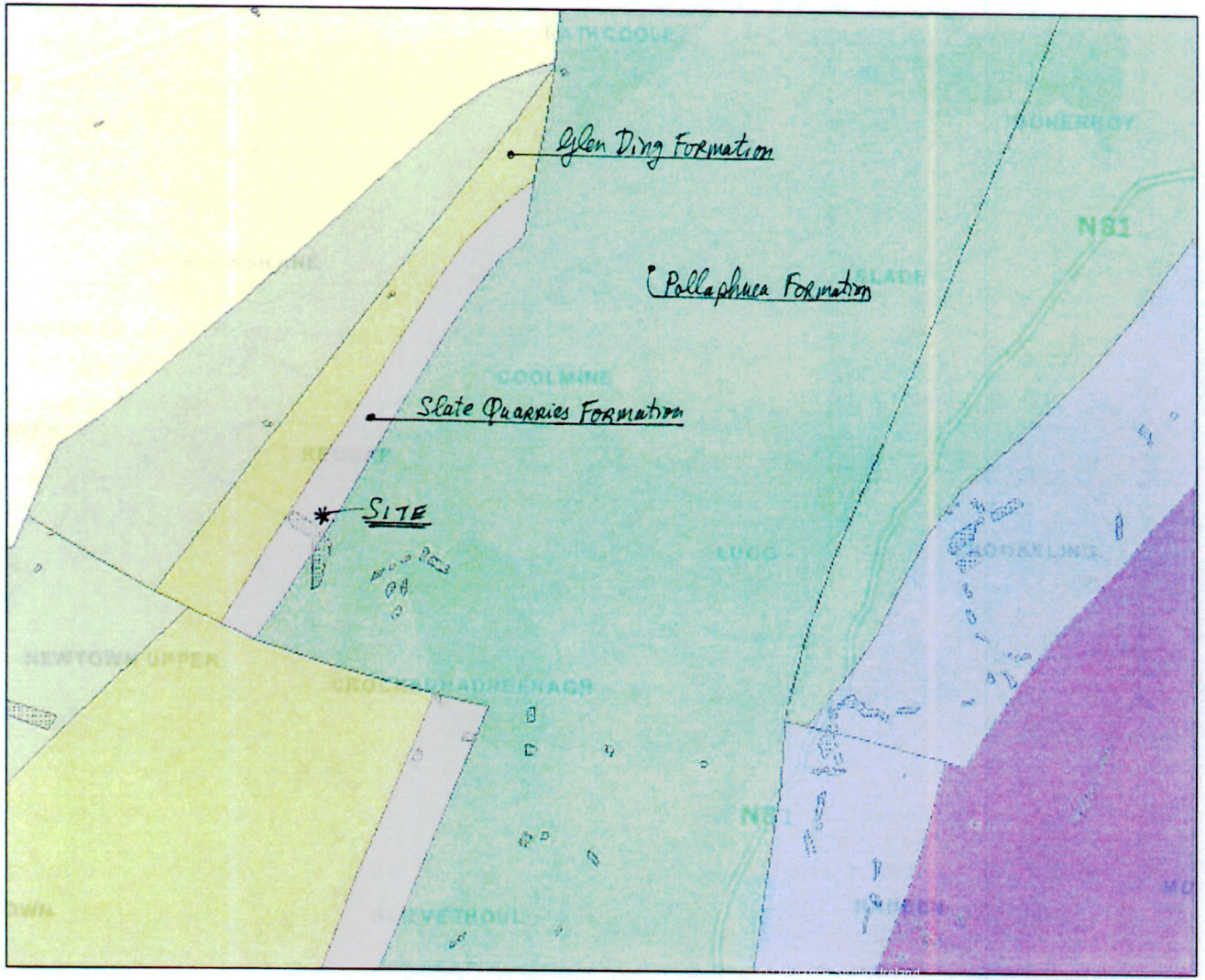
Ordnance Survey maps never show legal property boundaries, nor do they show ownership of physical features.

© Suirbhéireacht Ordanáis Éireann, 2018
© Ordnance Survey Ireland, 2018
www.osi.ie/copyright

LEGEND:
http://www.osi.ie;
search 'Large Scale Legend'

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Bedrock Map



Legend

Bedrock Outcrops
100 ITM 2018

Scale: 1:25,000

Geological Survey Ireland

PSI Licence

N W E S

0 0.175 0.35 0.7 mi
0 0.275 0.55 1.1 km

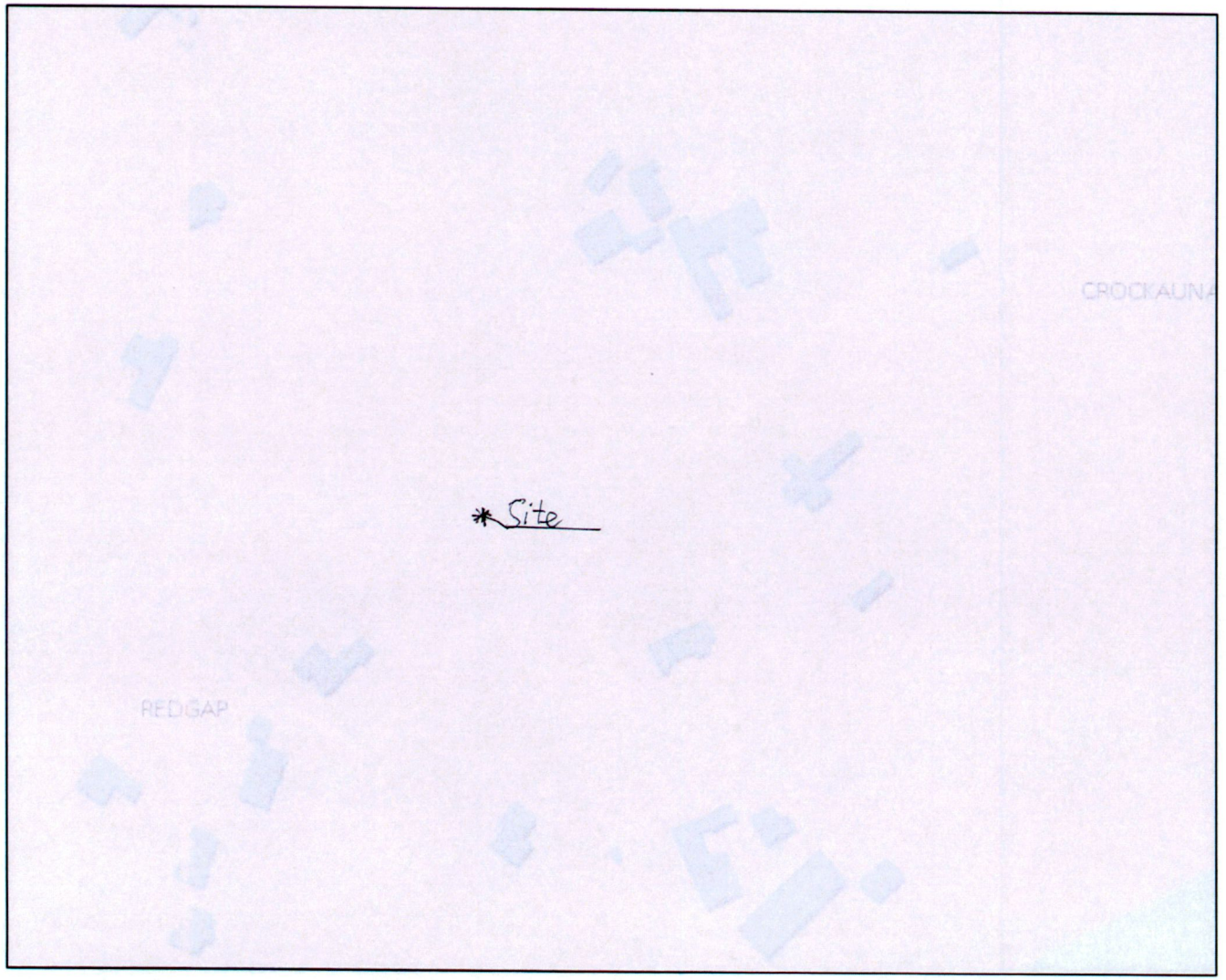
Map Centre Coordinates (ITM) 702,567 724,703
12/19/2018, 3:13:11 AM

This map and its data may not be used or reproduced for commercial purposes without the prior written permission of Copyright holders.
This map is a user generated static output from an Internet mapping site and is for general reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Ordnance Survey Ireland Licence No. EN 0047216
© Ordnance Survey Ireland/Government of Ireland
© Geological Survey Ireland/Government of Ireland

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Subsoils



Legend

IE_GSI_Quaternary_Sediments_50K_I...

SYMBOLOGY

- Rck, Bedrock outcrop or subcrop
- TLPSsS, Till derived from Lower Palaeozoic sandstones and shales

Scale: 1:2,500

Geological Survey Ireland

N W E S

0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

Map Centre Coordinates (ITM) 701,563 724,620

9/14/2022, 9:28:02 PM

This map and its data may not be used or reproduced for commercial purposes without the prior written permission of Copyright holders.
This map is a user generated static output from an Internet mapping site and is for general reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Ordnance Survey Ireland Licence No. EN 0047221
© Ordnance Survey Ireland/Government of Ireland
© Geological Survey Ireland/Government of Ireland

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Groundwater Vulnerability Map

Legend

Groundwater Vulnerability

- X - Rock at or near surface or Karst
- E - Extreme
- H - High
- M - Moderate
- L - Low
- W - Water

Scale: 1:25,000

Geological Survey Ireland

PSI Licence

N W E S

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 702,033 724,370

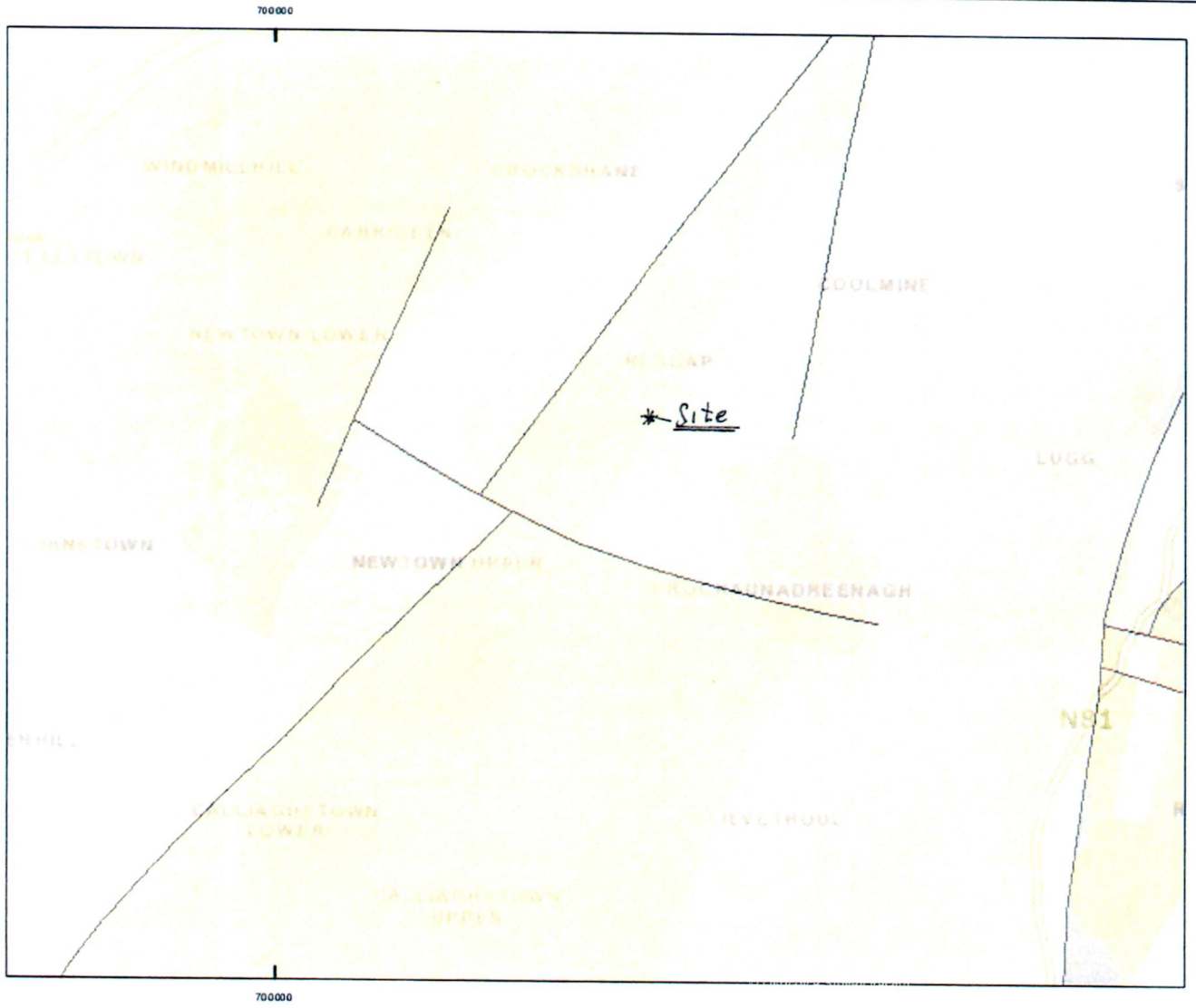
12/17/2018, 1:19:13 AM

This map and its data may not be used or reproduced for commercial purposes without the prior written permission of Copyright holders.
This map is a user generated static output from an Internet mapping site and is for general reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Ordnance Survey Ireland Licence No. EN 0047216
© Ordnance Survey Ireland/Government of Ireland
© Geological Survey Ireland/Government of Ireland

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

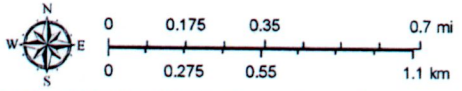
Aquifer Classification Map



Scale: 1:25,000

Geological Survey Ireland

PSI Licence



Map Centre Coordinates (ITM) 701,273 724,257

12/17/2018, 1:44:57 AM

This map and its data may not be used or reproduced for commercial purposes without the prior written permission of Copyright holders.
This map is a user generated static output from an Internet mapping site and is for general reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Ordnance Survey Ireland Licence No. EN 0047216
© Ordnance Survey Ireland/Government of Ireland
© Geological Survey Ireland/Government of Ireland

Legend

- Bedrock Aquifer
- Faults

Gravel Aquifer

- Locally Important Gravel Aquifer
- Regionally Important Gravel Aquifer

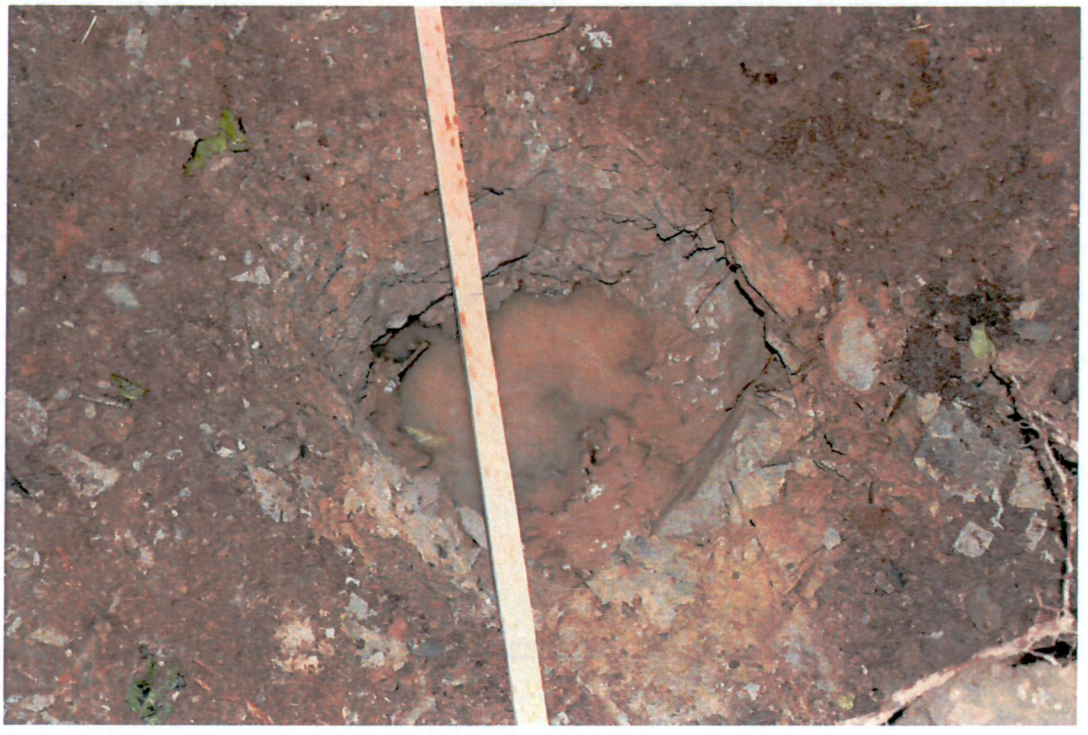
Bedrock Aquifer

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- RK - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake

PHOTOGRAPH NO. 1 - TRIAL HOLE (300 mm Topsoil Removed)

PHOTOGRAPH NO. 2 - TEST HOLE NO. 1

PHOTOGRAPH NO. 3 - TEST HOLE NO. 2



PHOTOGRAPH NO. 4 - TEST HOLE NO. 3

CCT Carlow Concrete Tanks

Soil Polishing Filter Recommendation
Based on Site Report from 23.08.2022

Mr Pearse McKiernan
Redgap
Rathcoole,
Co Dublin

Recommendation By:	N Nolan
Date:	14.09.2022

Revision	Date	Comment

PPR Environmental Ltd t/a Carlow Concrete Tank's
Kilnock, Ballon, Co. Carlow Tel: + 353 (0)59 9159100 Fax: + 353 (0)59 9159831 UK Mobile: + 44 (0) 7540 564 276
E: sales@carlowtanks.com W: www.carlowtanks.com

Data from Site Survey:

- Ground Water Level	-	Not encountered in trial
- Bedrock	-	Not encountered in trial
- P value	-	Not Recorded
-T value	-	13.39
- Population Equivalent	-	6
- Groundwater Protection Response	-	R2[1]

Recommendation:

CTP Biogreen BAF mechanical aeration treatment plant 6 PE and stratified sand polishing filter pod units.

Treatment Unit:

CPT Biogreen mechanical aeration treatment plant works as a fluidised Bed Reactor Pollutants from the wastewater are absorbed by the activated sludge and converted into biomass. The micro-organisms are activated by the oxygen intake

Please note:

1) Any surface water must not reach the system (Surface water will cause high water level alarm in the plant and wash away activated sludge from aeration chamber – in this case unit would have to be commissioned once more on clients cost).
2) Garbage grinder in the kitchen increases the BOD load by 30% and may cause food wastes rotting in the tank which may cause bad smell from the tank.
3) We would recommend installation of domestic grease traps at the kitchen outlet pipe. According to EPA 2000 Manual - Grease should not be allowed to enter the reactor. While the grease is still warm it flows freely but once it cools it solidifies and eventually blocks the pipes.

The Biogreen treatment system is designed to achieve the quality of the effluents - 20mg/l BOD and 30mg/l Suspended Solids.

Sand Polishing Filter

Design and layout of sand polishing filter to be fully in accordance with EPA 2009 code of Practice requirements.

Table 6.1.: From the EPA guidelines for minimum separation distances in metres

Type of System	Watercourse Stream	urface wc	Lake	Any Dwelling	Site Boundary	Road	be breaks
Packaged system 'colation area; poli filters	10	30	50	10	3	4	4

Table B.3.: From the EPA guidelines for minimum separation distances in metres

T/P val	pth of soil (m a bedrock)	Minimum distance (m) from receptor to percolation area or polishing filter			
		blic w supp	Down-gradient domestic well or fl direction is not known	mestic well alongsid gradient)	gradient domesti
21-40	1m	60	45	25	15

Discharge as per option 3 section 10.1.1 of EPA 2009 Code of Practice

Treated wastewater from Biogreen plant is pumped into the strafied sand polishing filter pods. Sand polishing filters comprise single layer and stratified sand filters; they should be a minimum of 900mm in thickness. In a typical layout, three layers of sand, comprising an upper layer of coarse sand and intermediate and lower layers of fine sand, are separated from each other by a thin layer of washed pea-sized gravel or broken stone. The hydraulic loading should not exceed 60 l/m^2/day. The sand polishing filter can be soil covered and sown with grass.

The sand polishing filter should be constructed in accordance with the EPA 2009 code of practice. The client should construct a sand polishing filter of 20m^2.

Number of PE		Loading rate	Required area of sand filter	
6		Up to 60 l/m^2	20m^2	

Sand polishing filters are employed to reduce microorganisms, phosphorus, and nitrate nitrogen.

Groundwater Protection Response (R2[1])
Acceptable subject to normal good practice. (system selection, construction, operation and maintenance in accordance with this CoP)

Prüfinstitut für Abwassertechnik GmbH

TREATMENT PERFORMANCE RESULTS

PPR Carlow Concrete Tanks
Drumberry, Bunclody, Co. Wexford, Ireland

EN 12566-3
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1601-1003

Biogreen BAF
Fluidised bed reactor

Nominal organic daily load	0.22 kg/d		
Nominal hydraulic daily load	0.72 m³/d		
Material	Concrete		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	89.0 %	66 mg/l
	BOD_5	93.5 %	19 mg/l
	NH_4-N	92.6 %	8 mg/l
	SS	77.9 %	25 mg/l
Number of desludging	Not more than once		
Electrical consumption	2.1 kWh/d		

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

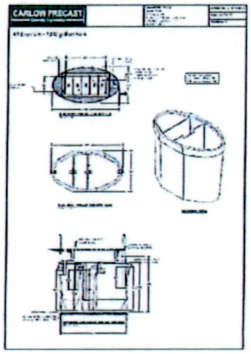
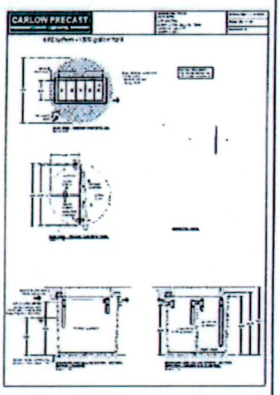
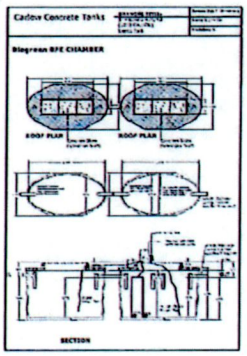
Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Elmar Lancé July 2016

Biogreen BAF range and its referring test reports:

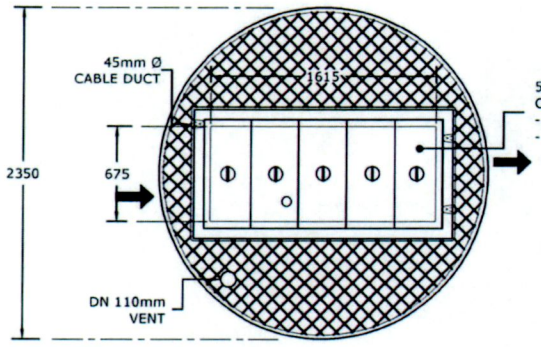
Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial Type Test (ITT) 4		Pass PIA2012-WD-1203-1017	Pass PIA2012-109B04	Pass PIA-2009-ST-AT0710-1012 For wet ground conditions also, installation depth 1.25 m from inlet invert	Pass PIA2016-DH-1601-1003.01
6		Pass PIA2013-WD-1203-1017	Pass Range conformity according to S.R. 66:2015	For wet ground conditions also, installation depth 1.25 m from inlet invert	Pass PIA2016-DH-1601-1003.01
8		Pass PIA2012-WD-1203-1017	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, installation depth 1.25 m from inlet invert	Pass PIA2016-DH-1601-1003.01

CARLOW CONCRETE TANKS

DRAWING TITLE:
BIOGREEN
6PE-SYSTEM
6.8m³ (1500 GALLON) TANK
GENERAL LAYOUT
SHEET 1 OF 1

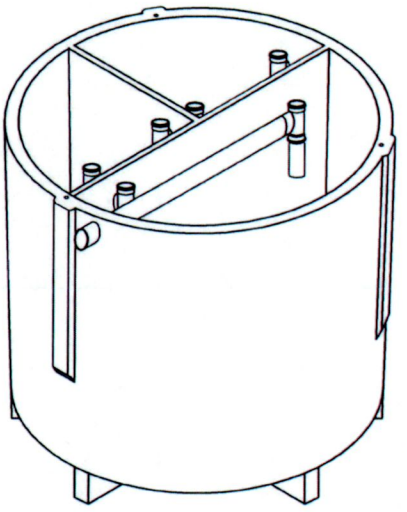
Drawn By: T.J. Rooney
Date: 25/10/16
Revision: A(18-04-17)

6 PE system - 1500 gallon tank

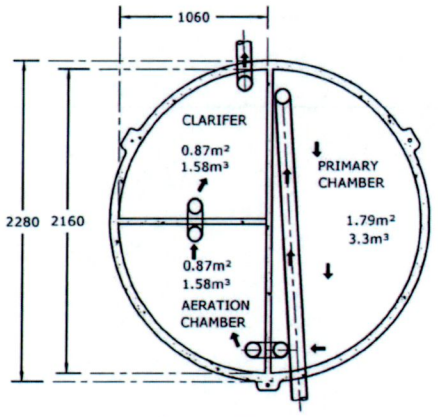


PLAN VIEW - PRECAST CONCRETE LID:
SCALE 1:35

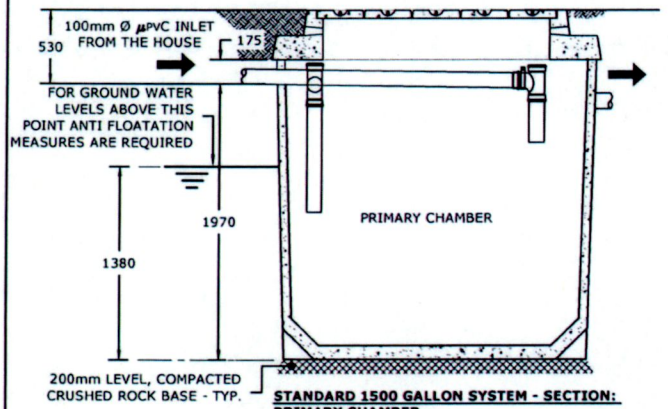
Standard tank weight
4.30 tonnes without lid,
6.30 tonnes including lid.



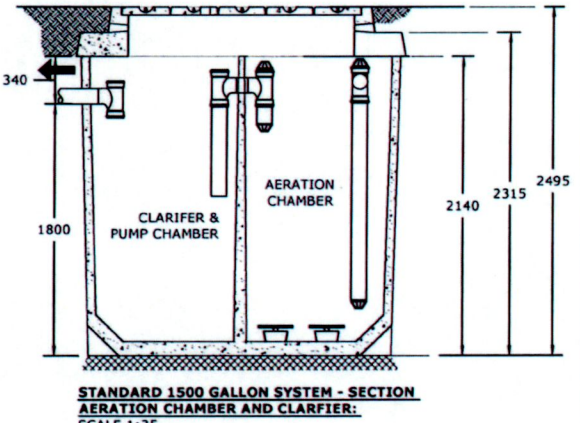
ISOMETRIC VIEW:



PLAN VIEW - PRECAST CONCRETE TANK:
SCALE 1:35



STANDARD 1500 GALLON SYSTEM - SECTION:
PRIMARY CHAMBER
SCALE 1:35



STANDARD 1500 GALLON SYSTEM - SECTION
AERATION CHAMBER AND CLARFIER:
SCALE 1:35