Appendix 12E

Foul Water Technical Note

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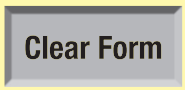
SITE CHARACTERISATION FORM
COMPLETING THE FORM

Note: This form requires the latest version of Adobe Acrobat Reader

and on PC's Windows 7 or later. Windows XP produces errors in calculations

Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.



Use the **Clear Form** button to clear all information fields.

Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty four hour format as follows: HH:MM

All date formats are DD-MM-YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

Section 3.2 In this section use an underline _____ across all six columns to indicate the depth at which changes in classification / characteristics occur.

Section 3.4 Lists supporting documentation required.

Section 4 Select the treatment systems suitable for this site and the discharge route.

Section 5 Indicate the system type that it is proposed to install.

Section 6 Provide details, as required, on the proposed treatment system.

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: IRISH DRILLING Surname:

Address: TRIAL HOLE NUMBER 1 (REAR OF SITE)

Site Location and Townland: DERRYGREENAGH

Number of Bedrooms: Maximum Number of Residents: 4

Comments on population equivalent

Proposed Water Supply:

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

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): PEAT

Subsoil, (Specify Type): PEAT

Bedrock Type: VISEAN LIMESTONE & CALCAREOUS SHALE

Aquifer Category: Regionally Important | Locally Important Poor PI

Vulnerability: Extreme ☐ High ☐ Moderate ☐ Low ☑

Groundwater Body: Status

Name of Public/Group Scheme Water Supply within 1 km:

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): SITE IS LOCATED ON PEAT LANDS

Past experience in the area: NONE

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 SITE IS AN EXISTING BROWNFIELD SITE INDUSTRIAL SITE.

THE PROPOSAL IS TO CARRY OUT AN ASSESSMENT TO DETERMINE THE SITE SUITABILITY TO TREAT AND DISPOSE OF WASTEWATER ON SITE THROUGH GROUNDWATER DISCHARGE.

THE TARGETS AT RISK ARE SURFACEWATERS.

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: SITE IS A BROWNFIELD INDUSTRIAL SITE

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:

SITE IS A BROWNFIELD INDUSTRIAL SITE WITH A NUMBER OF OFFICE AND STORAGE BUILDINGS.

Existing Land Use:

INDUSTRIAL PEAT EXTRACTION

Vegetation Indicators:

N/A

Groundwater Flow Direction:

Ground Condition:

N/A

Site Boundaries:

N/A

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

SITE FRONTS ONTO THE REGIONAL ROAD R400

Outcrops (Bedrock And/Or Subsoil):

NONE

Surface Water Ponding:

NONE

Lakes:

NONE

Beaches/Shellfish Areas:

NONE

Wetlands:

PEATLANDS TO THE REAR OF SITE

Karst Features:

NONE

Watercourses/Streams:*

PEATLANDS TO THE REAR OF SITE

***Note and record** water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

PEATLANDS TO THE REAR OF SITE

Springs:*

Wells:*

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).

THE SITE IS A BROWNFIELD SITE. THE FRONT OF THE SITE HAS BEEN INFILLED WITH IMPORTED SOIL TO THE FRONT OF THE ADMINISTRATION BUILDINGS AND YARD.

PROPOSE TO DIG TRIAL HOLES ON EDGE OF PEATLANDS TO THE REAR OF THE YARD ADJOINING THE PEATLANDS.

***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): 3.0

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

Depth from ground surface to water table (m) (if present): 1.3

Depth of water ingress: 1.3 Rock type (if present):

Date and time of excavation: 18-Jul-2023 11:30 Date and time of examination: 20-Jul-2023 09:23

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 0.3 m 0.4 m 0.5 m 0.6 m 0.7 m 0.8 m 0.9 m 1.0 m 1.1 m 1.2 m 1.3 m 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	300MM IMPORTED TOPSOIL --- 200MM OF ORGINAL PEAT --- 1000MM OF CLAY CLAY BOTTOM OF TRIAL HOLE AT 3.0	THREADS: 5NR RIBBONS:100mm DILATENT : YES	STRUCTURE LESS MASSIVE	COMPACT UNCOMPACT/SOFT UNCOMPACT/SOFT	BROWN DARK BROWN BROWN GREY BROWN	NONE

Likely Subsurface Percolation Value: 40

Likely Surface Percolation Value: 120

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:

THE TRIAL HOLE WAS EXCAVATED TO 3.0 METRES. THE TRIAL HOLE INDICATED APPROXIMATELY 300MM OF IMPORTED INFILL SOIL ON TOP OF THE EXISTING THIN PEAT LAYER OF 200MM WHICH OVERLAIDS A DEEP CLAY LAYER.

THE TRIAL HOLE HAD WATER INGRESS.

THE WATER TABLE STABLISED AT 1.3 METRES BELOW GROUND LEVEL.

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)	1,000	1,000	1,000
Depth from ground surface to base of hole (mm) (B)	1,400	1,400	1,400
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	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	11:50	10:50	10:50
2nd pre-soak start	Date	18-Jul-2023	18-Jul-2023	18-Jul-2023
	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			
Time filled to 400 mm			
Time water level at 300 mm			
Time (min.) to drop 100 mm (T_{100})	0.00	0.00	0.00
Average T_{100}			0.00

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			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: Subsurface Percolation Value = 0.00 (min/25 mm)

Comments:

THE SUBURFACE TEST HOLES WERE STILL FULL WITH WATER THE FOLLOWING DAY. THE WATER HAD DROPPED A MAXIMUM OF 20 MM ON THE FOLLOWING DAY.

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 Tim§e 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_2)			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)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	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	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	11:55	11:55	11:55
2nd pre-soak start	Date	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	16:20	16:20	16:20

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	19-Jul-23	19-Jul-23	19-Jul-2023
Time filled to 400 mm	09:52	09:53	09:54
Time water level at 300 mm	12:25	12:00	10:42
Time to drop 100 mm (T_{100})	153.00	127.00	48.00
Average T_{100}			109.33

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:

THE WATER IN THE 3 TEST HOLES DROPPED MARGINALLY OVER SEVERAL HOUR AFTER THE FIRST 100MM DROP.
THE TOPLAYER OF IMPORTED SOIL IS COMPACTED.

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

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	$K_{fs} = T_f / T_m$	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_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:

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:

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)**
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)**

Discharge Route [1]

5.0 SELECTED DWWTS

Propose to install:

and discharge to:

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

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

THERE WAS EVIDENCE OF A WATER TABLE AT 1.3 METRES BELOW GROUND LEVEL.

THE SURFACE TESTS INDICATED ARE VERY POOR DRAINING COMPACTED TOPLAYER.

THE SUBSOIL IS A CLAY, THE SUBSURFACE HOLES DID NOT DRAIN OVERNIGHT AND WERE STILL RETAINING WATER 48 HOURS LATER.

[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

Capacity PE

Sizing of Primary Compartment

m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*

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

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

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

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

On-going Maintenance

7.0 SITE ASSESSOR DETAILS

Company: BRENDAN SLEVIN & ASSOCIATES

Prefix: First Name: BRENDAN Surname: SLEVIN

Address: NO 7 MILLCOURT BRIDGE STREET GORT CO GALWAY

Qualifications/Experience: CHARTERED ENGINEER FAS CERTIFIED SITE ASSESSOR

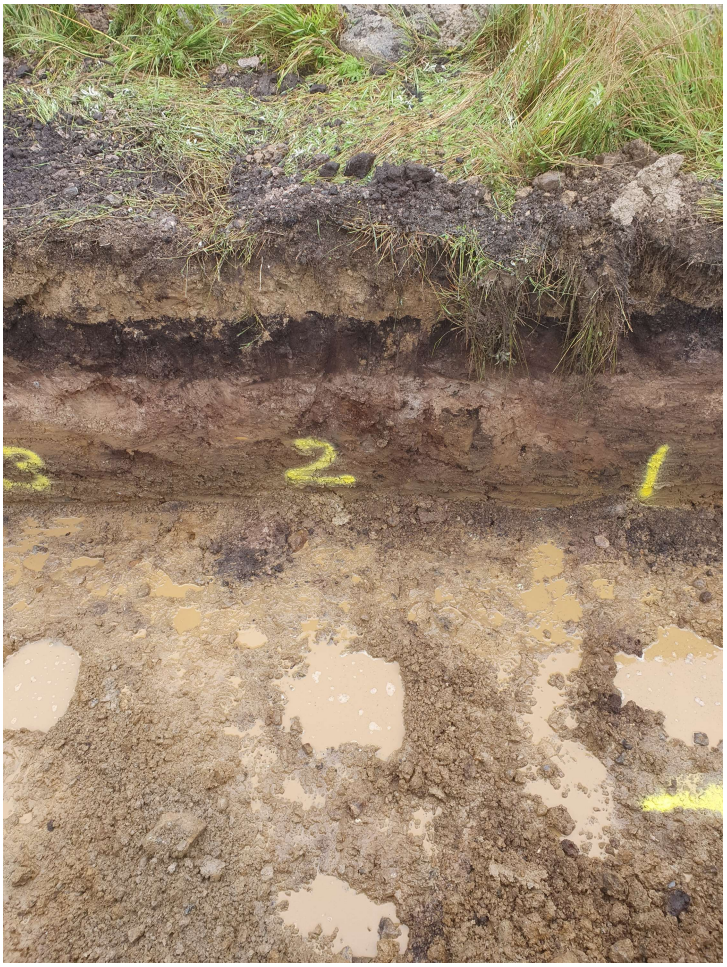
Date of Report: 08-Aug-2023

Phone: 091 630199 E-mail brendanslevin1@gmail.com

Indemnity Insurance Number: API0003681

Signature: 


1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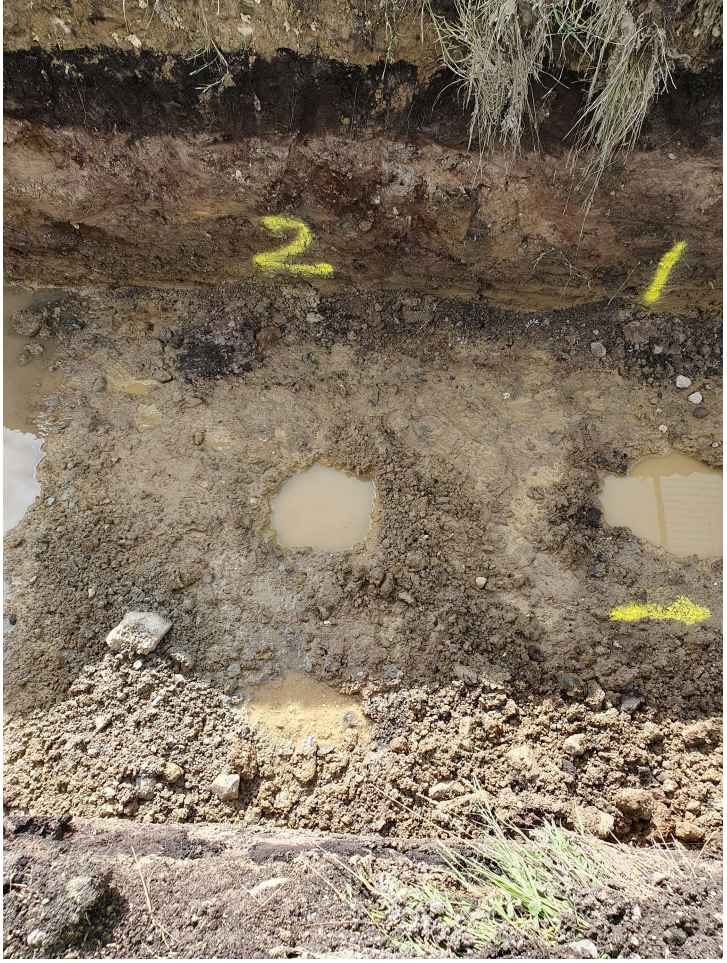
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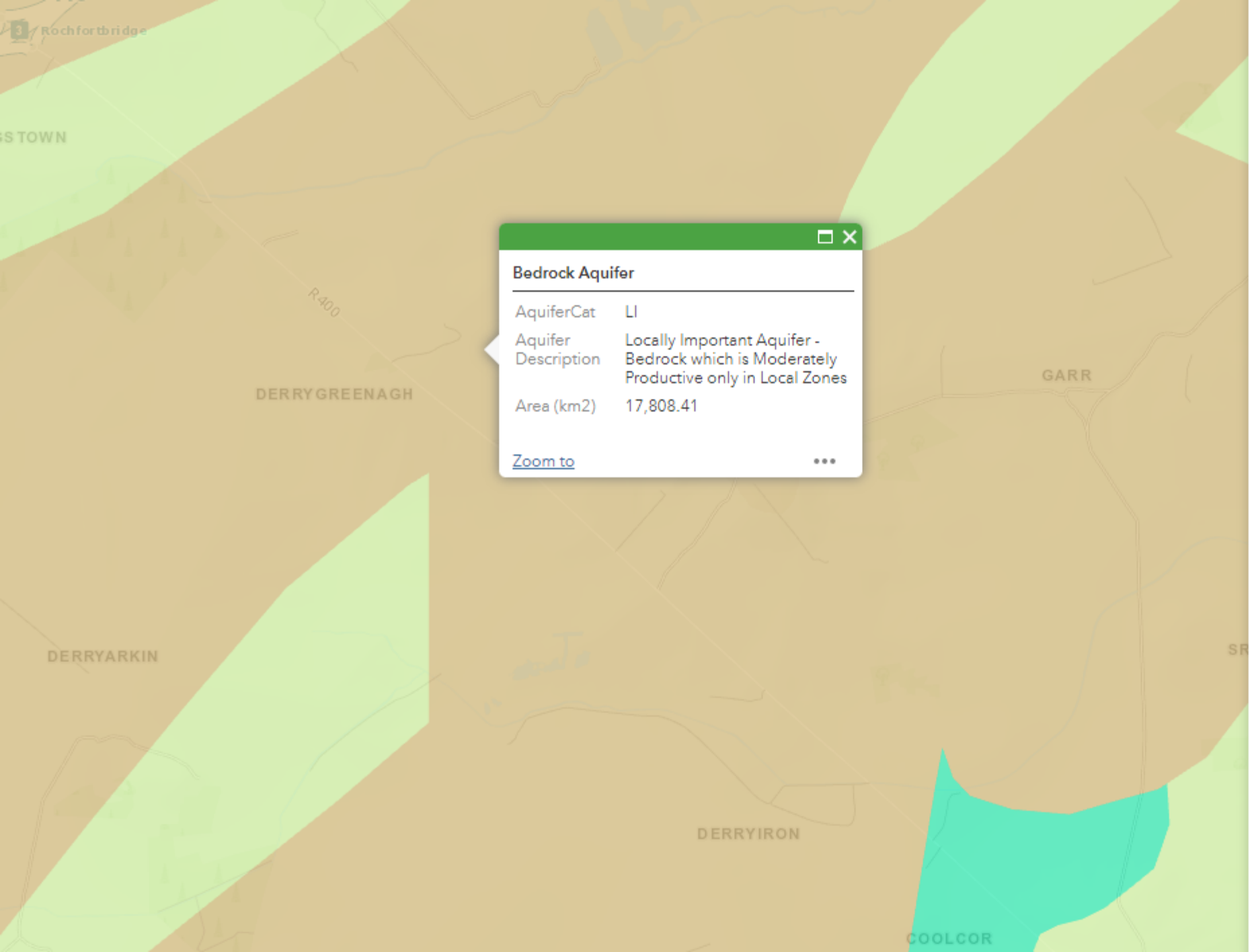
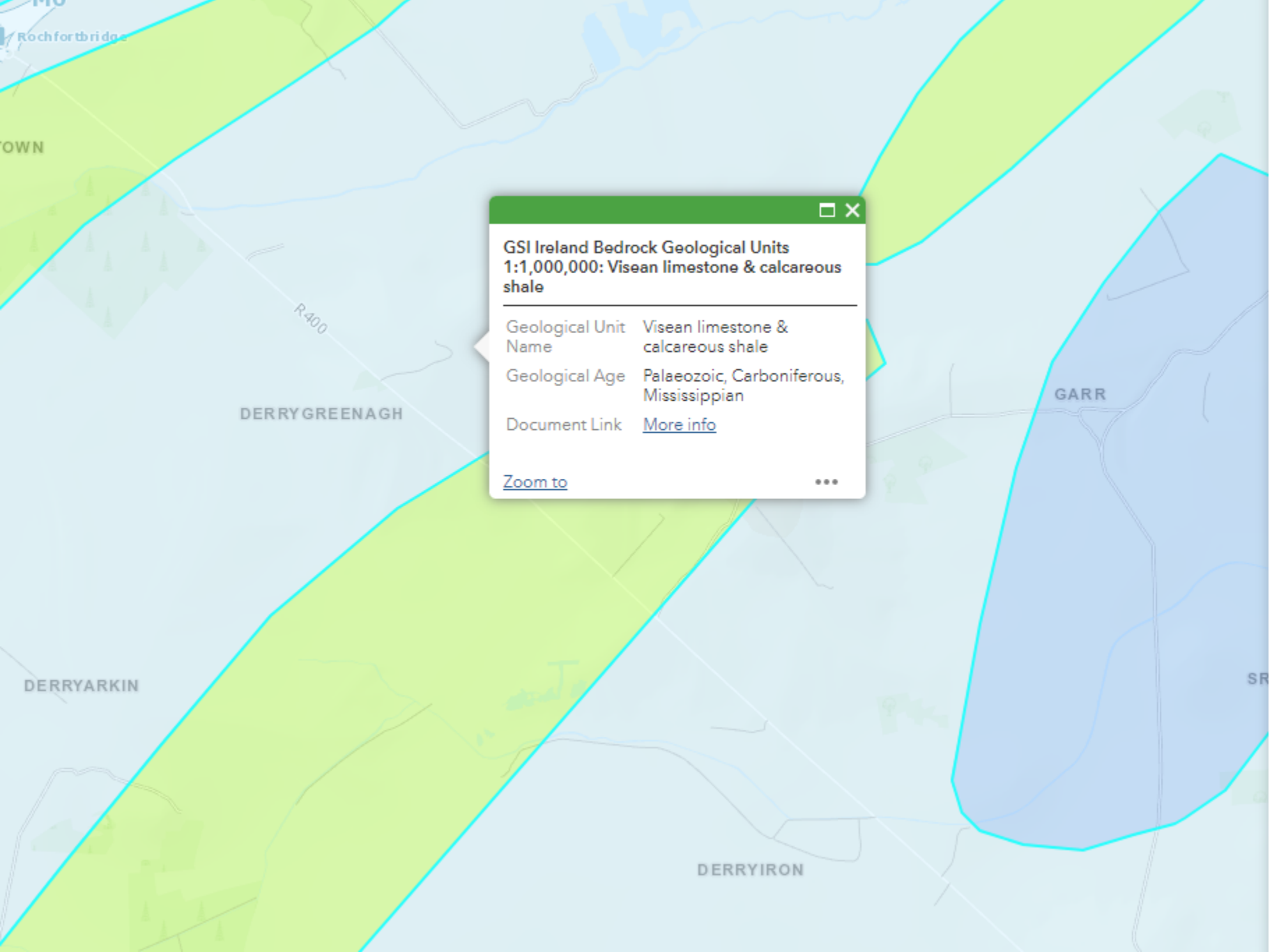
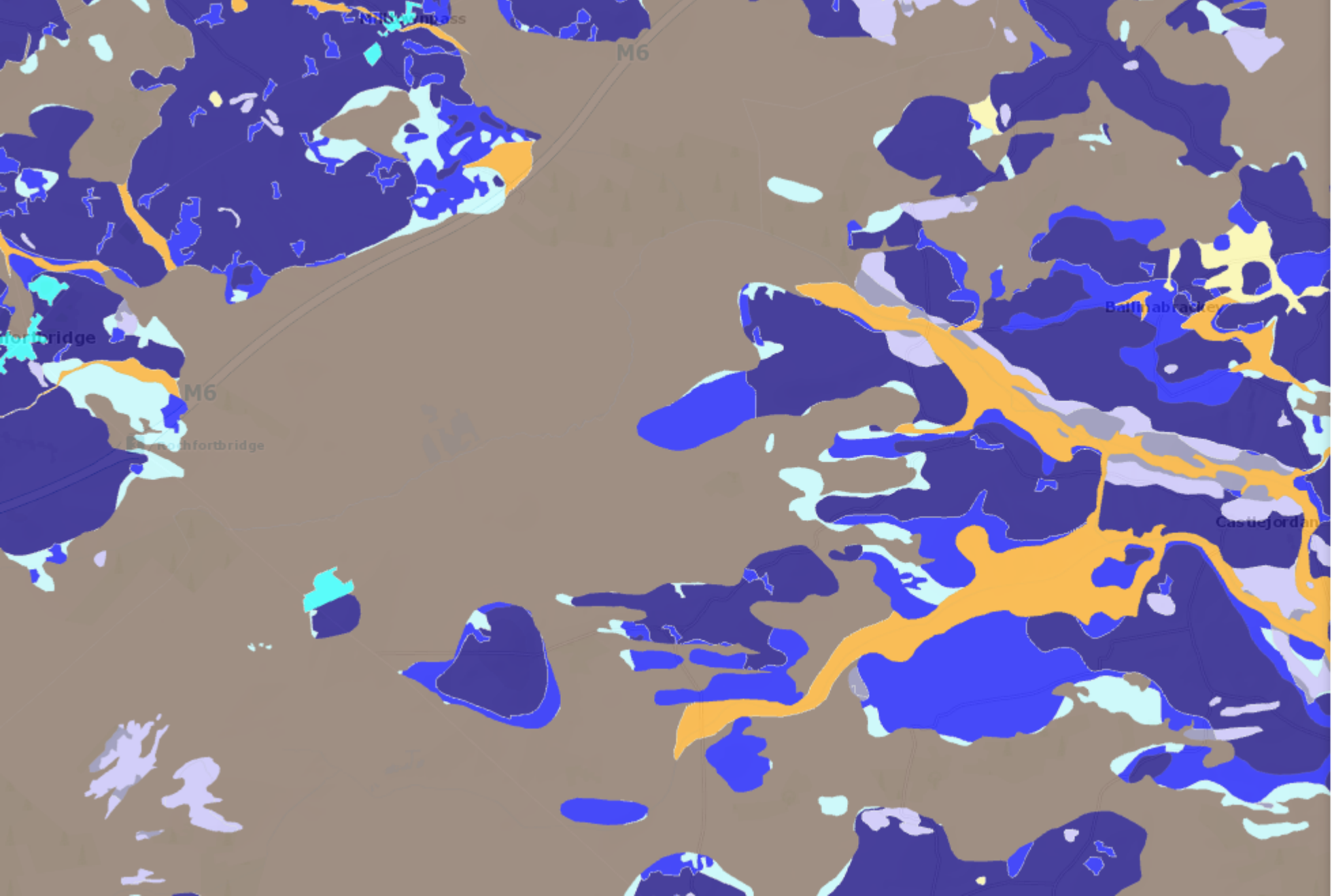


- [ ] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
- [ ] Bedrock 100k Sections
- [ ] Bedrock Geology 100k
- [ ] Groundwater Drinking Water Protection Areas
- [ ] Groundwater Catchment and WFD Management Units
- [x] Groundwater Resources (Aquifers)
- [ ] Groundwater Bedrock Geology
- [ ] Groundwater Recharge
- [ ] Groundwater Vulnerability
- [ ] Groundwater Subsoil Permeability
- [ ] Teagasc Soils
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 10m
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 25m
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 100m
- [ ] OSI Boundaries
- Bedrock100k_Seamless_2018 - BEDROCK.Lexicon_Polygons_2018
- Bedrock100k_Seamless_2018 - BEDROCK.Lexicon_Linework_2018



Layers

- [ ] Geological Heritage Audited Sites
- [ ] Geological Heritage Unaudited Sites
- [ ] Mineral Exploration Boreholes
- [ ] Verified Boreholes Logs
- [ ] Borehole Locations (Unverified)
- [ ] Mineral Localities
- [ ] Active Quarries
- [ ] Groundwater Karst Data
- [ ] Groundwater Wells and Springs
- [ ] Landslide Events
- [ ] EXT GSI Geotechnical Boreholes
- [ ] EXT GSI Geotechnical Sites
- [ ] Quaternary Sediments
- [x] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
- [ ] Bedrock 100k Sections



- [ ] EXT GSI Geotechnical Boreholes
- [ ] EXT GSI Geotechnical Sites
- [ ] Quaternary Sediments
- [ ] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
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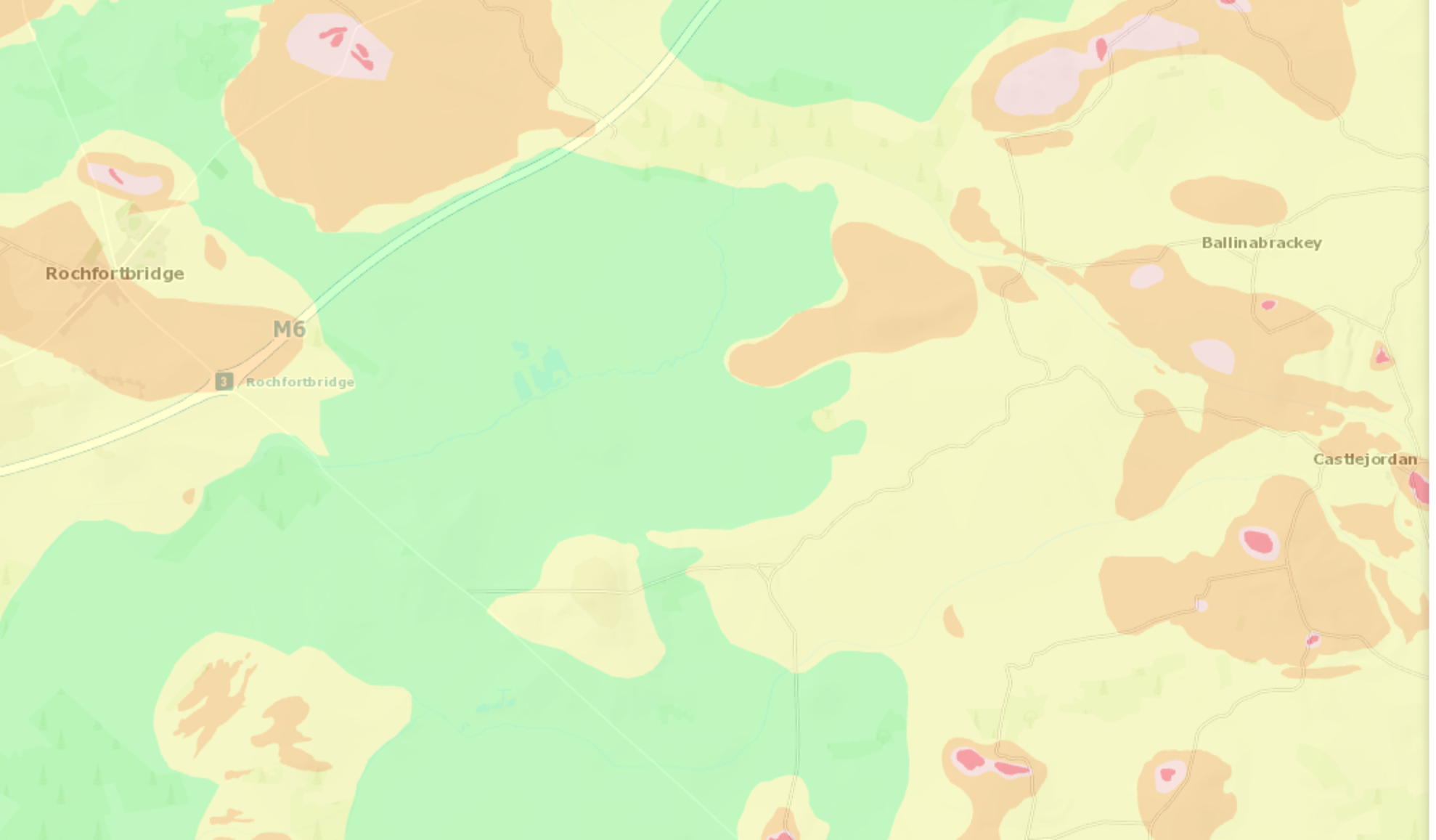
- [ ] Groundwater Drinking Water Protection Areas
- [ ] Groundwater Catchment and WFD Management Units
- [ ] Groundwater Resources (Aquifers)
- [ ] Groundwater Bedrock Geology
- [ ] Groundwater Recharge
  - IE GSI Groundwater Recharge 40K Ireland (ROI) ITM
- [ ] Groundwater Vulnerability
- [ ] Groundwater Subsoil Permeability
- [x] Teagasc Soils
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 10m



- Quaternary Sediments
- Bedrock Geology 1 Million
- Bedrock Geology 500k
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- Teagasc Soils
- INFOMAR Bathymetry (Water Depth to Seafloor) 10m

Rev.	DESCRIPTION	DATE
P01	First Draft	13/04/23

..\BnM Logo 2021 Transparent Background.png

Main St, Newbridge, Co. Kildare
Phone 045 439000
www.bnm.ie
Email: info@bnm.ie

Project
DERRYGREENAGH THERMAL POWER PLANT

Client

Drawing Title
PERCOLATION TESTS
BACK AREA

Date	Scale (A1)	Drawn by	Checked by	Approved by
08/08/2023	NTS	MM	BS	BS

Status
PLANNING ☐ FOR APPROVAL ☐
TENDER ☐ FOR CONSTRUCTION ☐
AS BUILT ☐

Dwg. No.

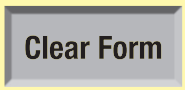
SITE CHARACTERISATION FORM
COMPLETING THE FORM

Note: This form requires the latest version of Adobe Acrobat Reader

and on PC's Windows 7 or later. Windows XP produces errors in calculations

Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.



Use the **Clear Form** button to clear all information fields.

Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty four hour format as follows: HH:MM

All date formats are DD-MM-YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

Section 3.2 In this section use an underline _____ across all six columns to indicate the depth at which changes in classification / characteristics occur.

Section 3.4 Lists supporting documentation required.

Section 4 Select the treatment systems suitable for this site and the discharge route.

Section 5 Indicate the system type that it is proposed to install.

Section 6 Provide details, as required, on the proposed treatment system.

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: IRISH DRILLING Surname:

Address: TRIAL HOLE NUMBER 1 (FRONT OF SITE)

Site Location and Townland: DERRYGREENAGH

Number of Bedrooms: Maximum Number of Residents: 4

Comments on population equivalent

Proposed Water Supply:

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

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): MADE GROUND

Subsoil, (Specify Type):

Bedrock Type: VISEAN LIMESTONE & CALCAREOUS SHALE

Aquifer Category: Regionally Important | Locally Important Poor PI

Vulnerability: Extreme ☐ High ☐ Moderate ☐ Low ☑

Groundwater Body: Status

Name of Public/Group Scheme Water Supply within 1 km:

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): SITE IS LOCATED ON PEAT LANDS

Past experience in the area: NONE

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 SITE IS AN EXISTING BROWNFIELD SITE INDUSTRIAL SITE.

THE PROPOSAL IS TO CARRY OUT AN ASSESSMENT TO DETERMINE THE SITE SUITABILITY TO TREAT AND DISPOSE OF WASTEWATER ON SITE THROUGH GROUNDWATER DISCHARGE.

THE TARGETS AT RISK ARE SURFACEWATERS.

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: SITE IS A BROWNFIELD INDUSTRIAL SITE

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:

SITE IS A BROWNFIELD INDUSTRIAL SITE WITH A NUMBER OF OFFICE AND STORAGE BUILDINGS.

Existing Land Use:

INDUSTRIAL PEAT EXTRACTION

Vegetation Indicators:

N/A

Groundwater Flow Direction:

Ground Condition:

N/A

Site Boundaries:

N/A

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

SITE FRONTS ONTO THE REGIONAL ROAD R400

Outcrops (Bedrock And/Or Subsoil):

NONE

Surface Water Ponding:

NONE

Lakes:

NONE

Beaches/Shellfish Areas:

NONE

Wetlands:

PEATLANDS TO THE REAR OF SITE

Karst Features:

NONE

Watercourses/Streams:*

PEATLANDS TO THE REAR OF SITE

***Note and record** water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

PEATLANDS TO THE REAR OF SITE

Springs:*

Wells:*

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).

THE SITE IS A BROWNFIELD SITE. THE FRONT OF THE SITE HAS BEEN INFILLED WITH IMPORTED SOIL TO THE FRONT OF THE ADMINISTRATION BUILDINGS AND YARD.

PROPOSE TO DIG TRIAL HOLES ON THE FRONT GREEN AREA AND TO THE REAR OF THE YARD ADJOINING THE PEATLANDS.

***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): 3.6

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

Depth from ground surface to water table (m) (if present):

Depth of water ingress:

Rock type (if present):

Date and time of excavation: 18-Jul-2023 10:00 Date and time of examination: 20-Jul-2023 10:00

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	200MM IMPORTED TOPSOIL 300MM IMPORTED CLAY SUBSOIL ---------- 200MM LAYER OF ORGINAL PEAT SOIL ---------- 1000MM OF CLAY			COMPACT	BROWN LIGHT BROWN DARK BROWN	NONE
0.2 m						
0.3 m						
0.4 m						
0.5 m						
0.6 m						
0.7 m						
0.8 m						
0.9 m		THREADS: 5NR RIBBONS:100mm DILATENT : YES	STRUCTURE LESS MASSIVE	UNCOMPACT/SOFT	GREY BROWN WITH MOTTLING	
1.0 m						
1.1 m						
1.2 m						
1.3 m						
1.4 m						
1.5 m						
1.6 m						
1.7 m	—————————— CLAYgravel	THREADS: 5NR RIBBONS:100mm DILATENT : YES		UNCOMPACT/SOFT	GREY BROWN	
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	BOTTOM OF TRIAL HOLE AT 3.6					
3.5 m						

Likely Subsurface Percolation Value: 30

Likely Surface Percolation Value: 90

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:

THE TRIAL HOLE WAS EXCAVATED TO 3.6 METRES. THE TRIAL HOLE INDICATED APPROXIMATELY 500MM OF IMPORTED INFILL SOIL ON TOP OF THE EXISTING THIN PEAT LAYER OF 200MM WHICH OVERLAIDS A 1 METRE DEEP CLAY LAYER WITH MOTTLING EVIDENT. UNDER THIS LAYER WAS A CLAYGRAVEL LAYER. PROPOSE TO CARRY OUT SUBSURFACE TESTS IN THIS LAYER.

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)	1,100	1,100	1,100
Depth from ground surface to base of hole (mm) (B)	1,500	1,500	1,500
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

Pre-soak start	Date	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	10:30	10:30	10:30
2nd pre-soak start	Date	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	16:00	16:00	16:00

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	19-07-2023	19-07-2023	19-07-2023
Time filled to 400 mm	10:17	10:19	10:22
Time water level at 300 mm	11:35		10:50
Time (min.) to drop 100 mm (T_{100})	78.00	821.00	28.00
Average T_{100}			309.00

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	11:35	13:43	128.00			0.00	10:50	11:30	40.00
2	13:44	15:58	134.00			0.00	11:32	12:47	75.00
3	15:59	18:12	133.00			0.00	12:50	14:12	82.00
Average Δt Value			131.67			0.00			65.67
	Average Δt/4 = [Hole No.1]		32.92 (t_1)	Average Δt/4 = [Hole No.2]		0.00 (t_2)	Average Δt/4 = [Hole No.3]		16.42 (t_3)

Result of Test: Subsurface Percolation Value = 16.44 (min/25 mm)

Comments:

THE PERCOLATION RATE WAS INCONSISTENT BETWEEN THE HOLES. TEST HOLE 2 HAD A VALUE GREATER 120 WITH VERY LITTLE MOVEMENT AND WAS STILL RETAINING WATER AFTER PRE SOAKING.THERE WAS NO EVIDENCE OF WATER INGRESS INTO THE HOLE AT 3.6 METRES DEEP.

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 Tim§e 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_2)			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)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	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	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	10:05	10:05	10:05
2nd pre-soak start	Date	18-Jul-2023	18-Jul-2023	18-Jul-2023
	Time	16:00	16:00	16:00

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	19-Jul-23	19-Jul-23	19-Jul-2023
Time filled to 400 mm	10:14	10:14	10:14
Time water level at 300 mm	11:50	11:41	13:05
Time to drop 100 mm (T_{100})	96.00	87.00	171.00
Average T_{100}			118.00

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:

THE WATER IN THE 3 TEST HOLES DROPPED MARGINALLY OVER SEVERAL HOUR AFTER THE FIRST 100MM DROP.
THE FIRST 100MM IS ACCOUNTED FOR DUE TO HTE IMPORTED TOPSOIL. BELOW THIS TOPLAYER IS A CLAY SUBSOIL.

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

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	$K_{fs} = T_f / T_m$	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_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:

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:

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)**
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)**

Discharge Route [1]

5.0 SELECTED DWWTS

Propose to install:

and discharge to:

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

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

THERE WAS NO EVIDENCE OF A WATER TABLE OR WATER INGRESS INTO THE TRIAL HOLE. THE PERCOLATION RATE IN THE CLAYGRAVEL LAYER 1100MM BELOW GROUND WAS IN THE EXPECTED RANGE EXPECT FOR 1 TEST HOLE WHICH WAS INCONSISTENT WITH THE OTHER 2.

THE SURFACE PERCOLATION IS POOR ON THE IMPORTED CALY SUBSOIL WHICH OVERLAYS THE PEAT LAYER.

[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

Capacity PE

Sizing of Primary Compartment

m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*

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

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

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

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

On-going Maintenance

7.0 SITE ASSESSOR DETAILS

Company: BRENDAN SLEVIN & ASSOCIATES

Prefix: First Name: BRENDAN Surname: SLEVIN

Address: NO 7 MILLCOURT BRIDGE STREET GORT CO GALWAY

Qualifications/Experience: CHARTERED ENGINEER FAS CERTIFIED SITE ASSESSOR

Date of Report: 08-Aug-2023

Phone: 091 630199 E-mail brendanslevin1@gmail.com

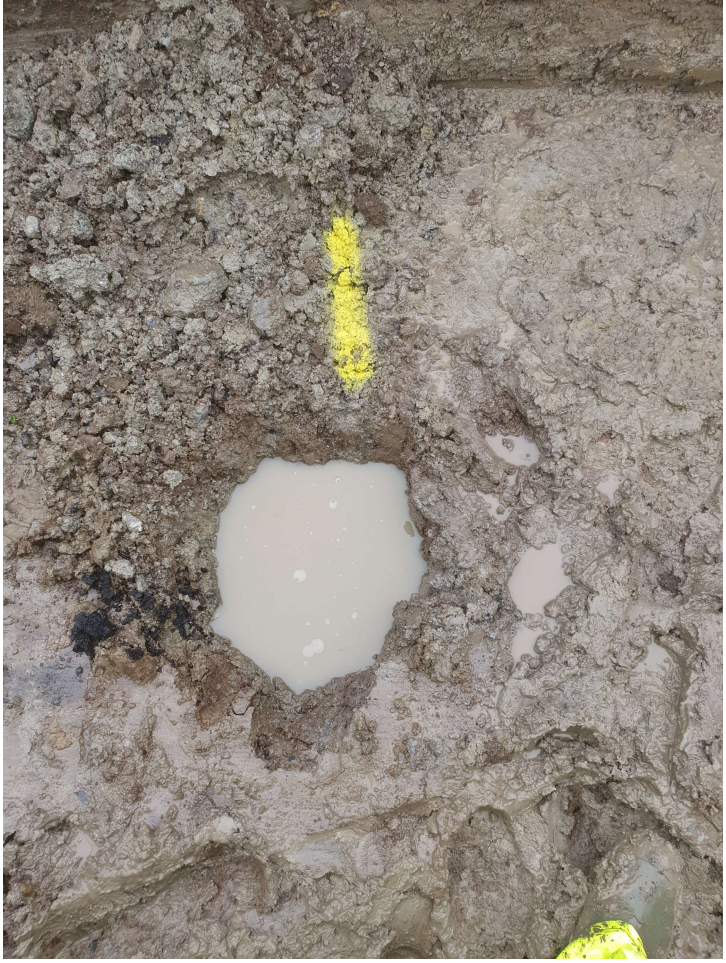
Indemnity Insurance Number: API0003681

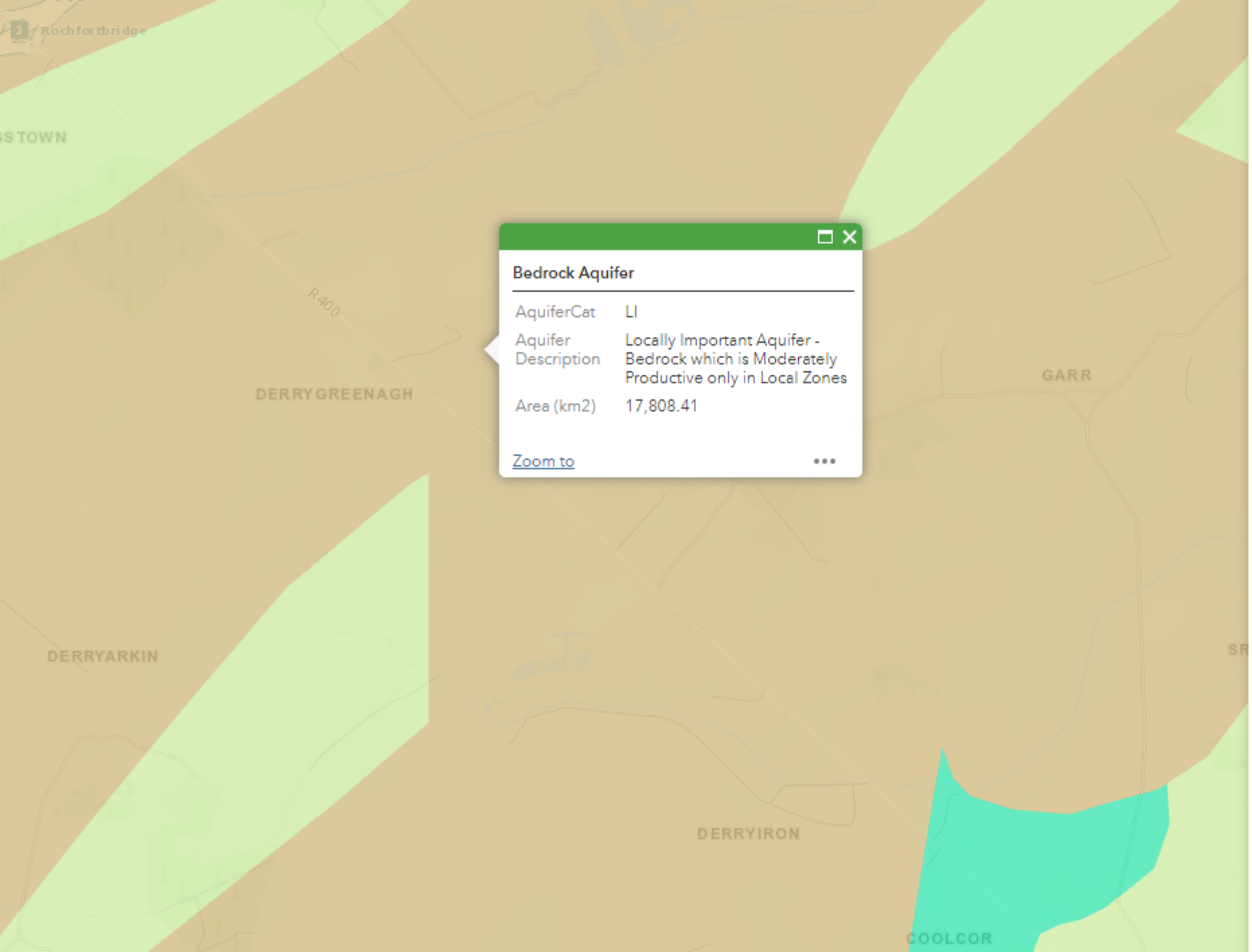
Signature: 


2

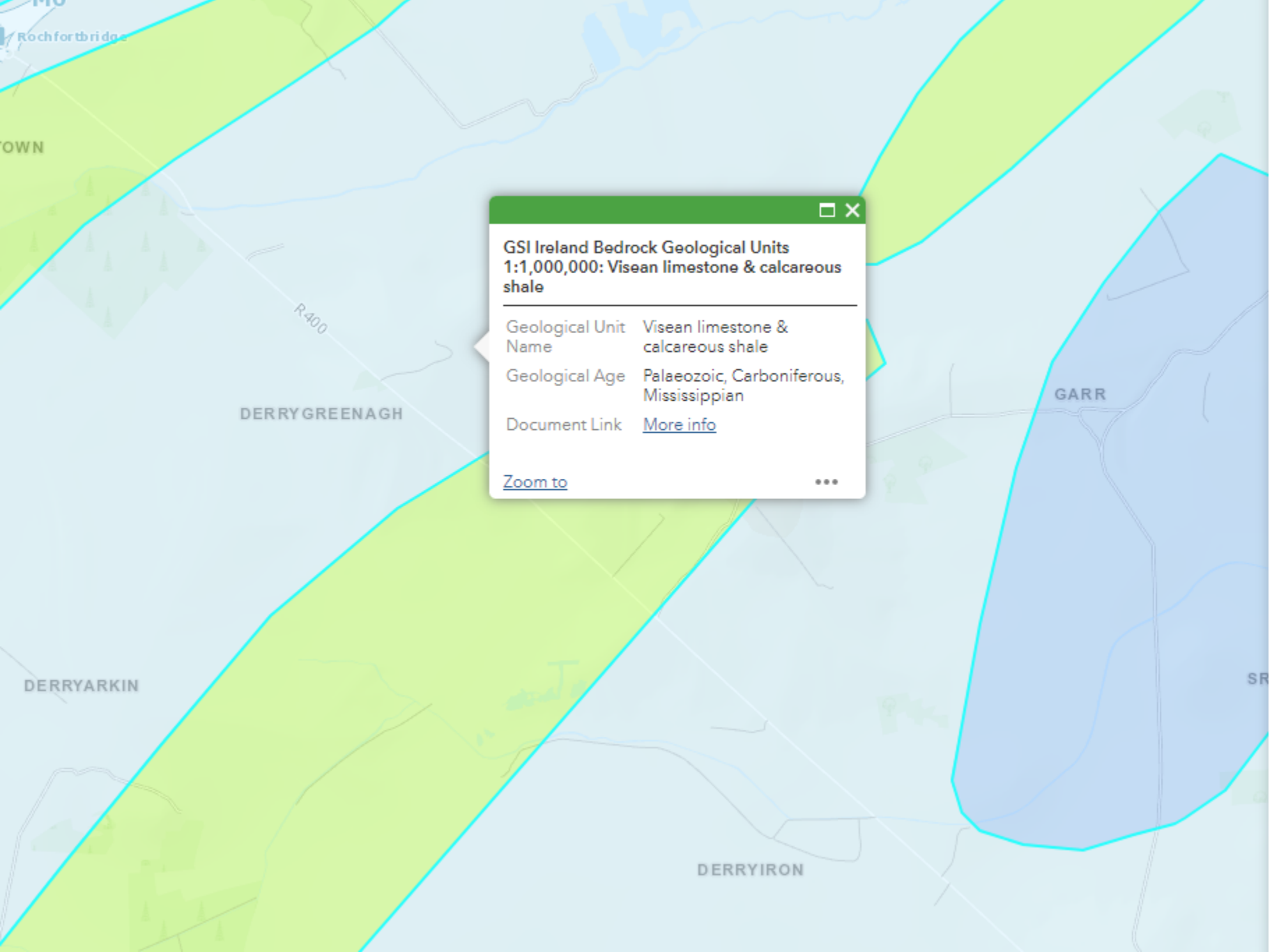

3


3



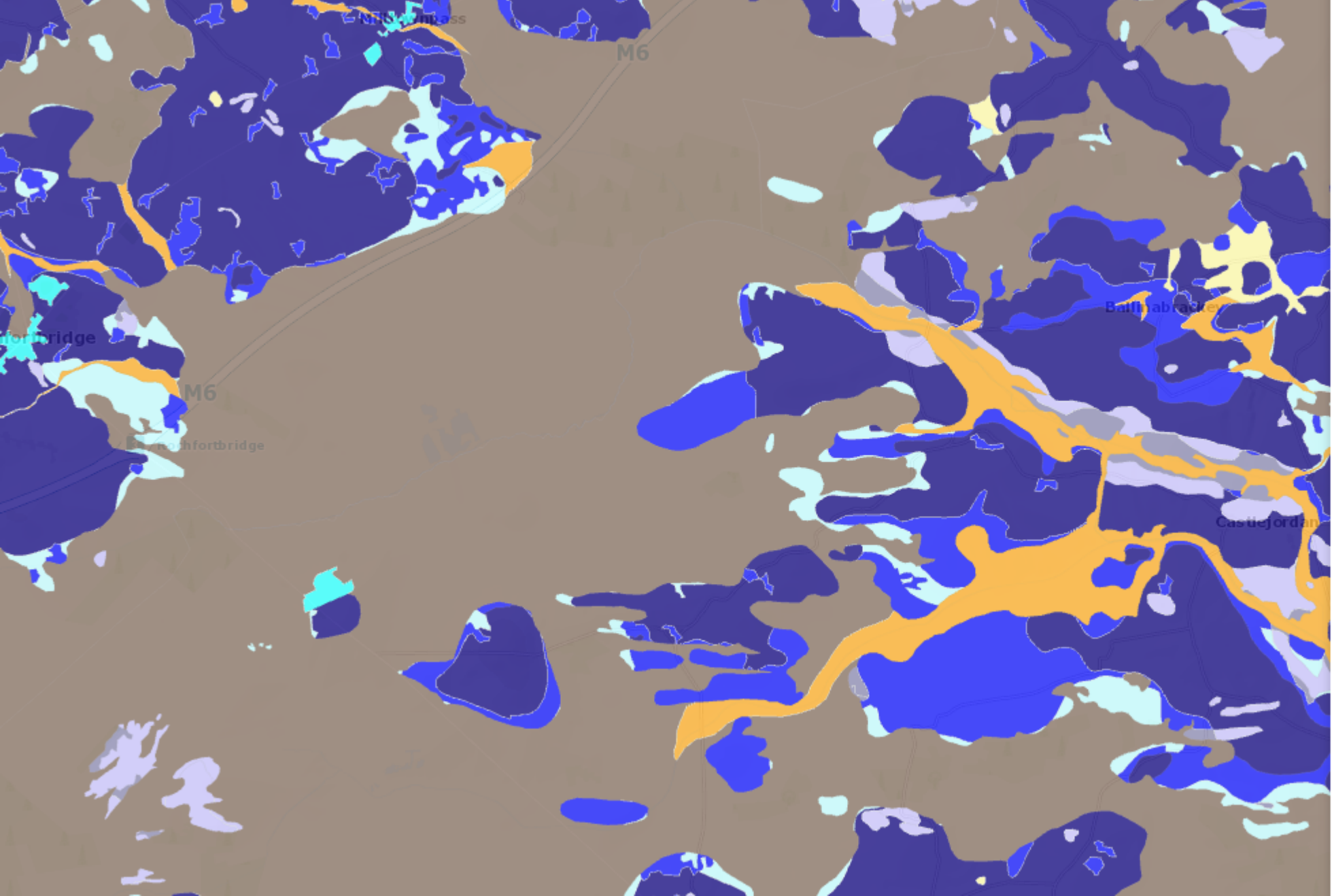


- [ ] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
- [ ] Bedrock 100k Sections
- [ ] Bedrock Geology 100k
- [ ] Groundwater Drinking Water Protection Areas
- [ ] Groundwater Catchment and WFD Management Units
- [x] Groundwater Resources (Aquifers)
- [ ] Groundwater Bedrock Geology
- [ ] Groundwater Recharge
- [ ] Groundwater Vulnerability
- [ ] Groundwater Subsoil Permeability
- [ ] Teagasc Soils
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 10m
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 25m
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 100m
- [ ] OSI Boundaries
- Bedrock100k_Seamless_2018 - BEDROCK.Lexicon_Polygons_2018
- Bedrock100k_Seamless_2018 - BEDROCK.Lexicon_Linework_2018

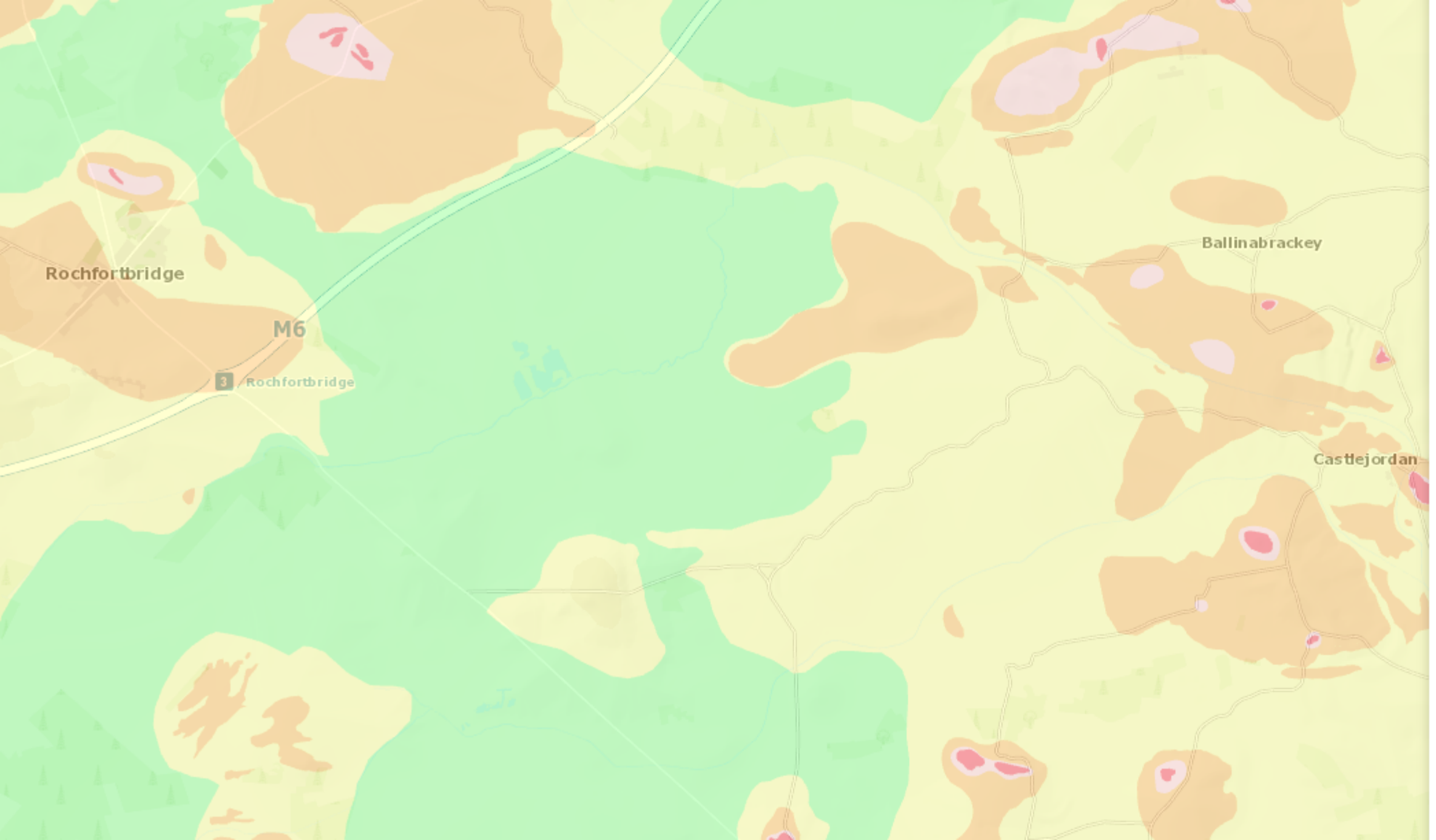


Layers

- [ ] Geological Heritage Audited Sites
- [ ] Geological Heritage Unaudited Sites
- [ ] Mineral Exploration Boreholes
- [ ] Verified Boreholes Logs
- [ ] Borehole Locations (Unverified)
- [ ] Mineral Localities
- [ ] Active Quarries
- [ ] Groundwater Karst Data
- [ ] Groundwater Wells and Springs
- [ ] Landslide Events
- [ ] EXT GSI Geotechnical Boreholes
- [ ] EXT GSI Geotechnical Sites
- [ ] Quaternary Sediments
- [x] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
- [ ] Bedrock 100k Sections



- [ ] EXT GSI Geotechnical Boreholes
- [ ] EXT GSI Geotechnical Sites
- [ ] Quaternary Sediments
- [ ] Bedrock Geology 1 Million
- [ ] Bedrock Geology 500k
- [ ] Bedrock 100k Sections
- [ ] Bedrock Geology 100k
- [ ] Groundwater Drinking Water Protection Areas
- [ ] Groundwater Catchment and WFD Management Units
- [ ] Groundwater Resources (Aquifers)
- [ ] Groundwater Bedrock Geology
- [ ] Groundwater Recharge
  - IE GSI Groundwater Recharge 40K Ireland (ROI) ITM
- [ ] Groundwater Vulnerability
- [ ] Groundwater Subsoil Permeability
- [x] Teagasc Soils
- [ ] INFOMAR Bathymetry (Water Depth to Seafloor) 10m



- Quaternary Sediments
- Bedrock Geology 1 Million
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- Groundwater Drinking Water Protection Areas
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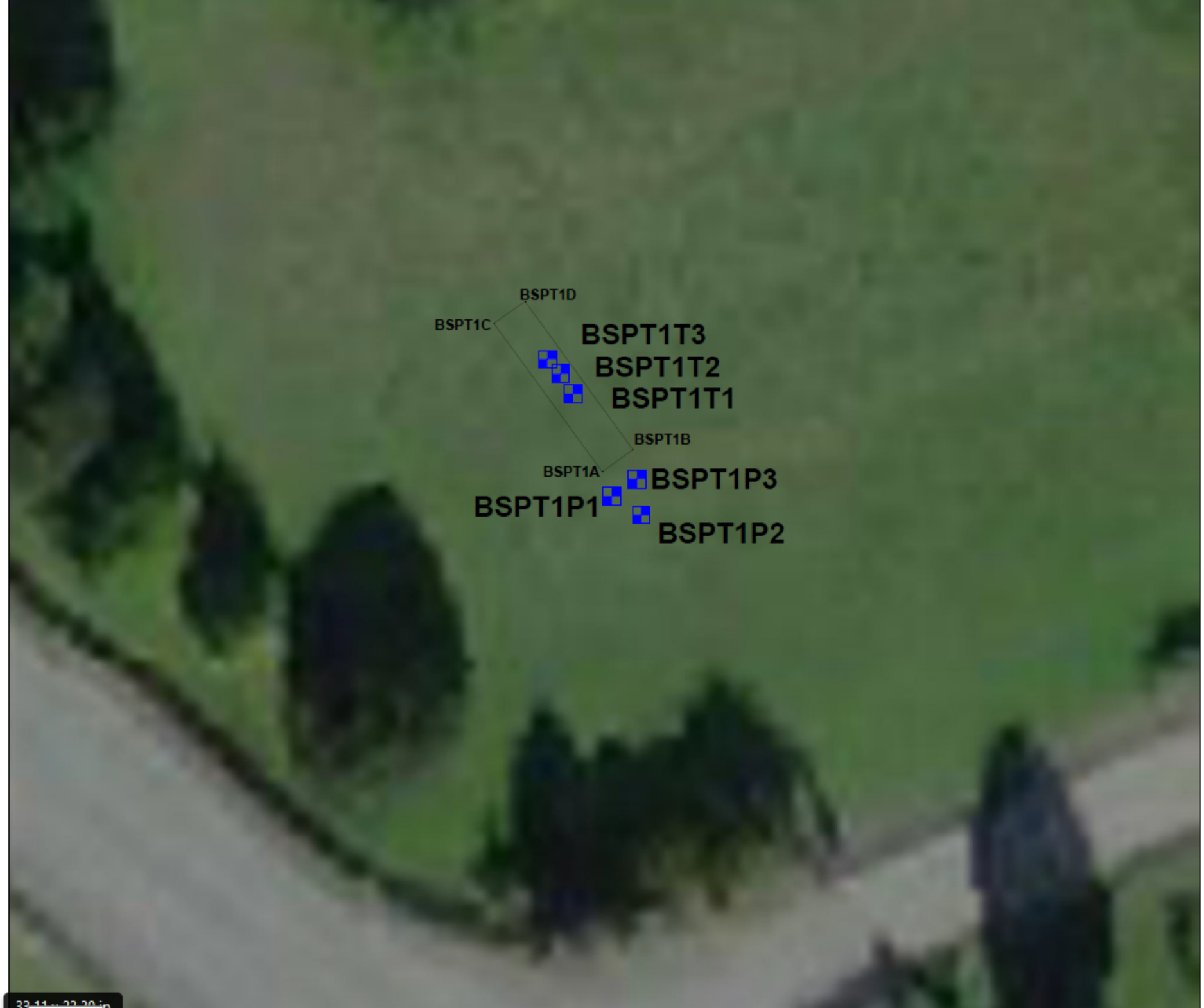

Rev.	DESCRIPTION	DATE
P01	First Draft	13/04/23

..\BnM Logo 2021 Transparent Background.png

Main St, Newbridge, Co. Kildare
Phone 045 439000
www.bnm.ie
Email: info@bnm.ie

Project
DERRYGREENAGH THERMAL POWER PLANT

Client

Drawing Title
PERCOLATION TESTS
FRONT LAWN

Date	Scale (A1)	Drawn by	Checked by	Approved by
08/08/2023	NTS	MM	BS	BS

Status
PLANNING ☐ FOR APPROVAL ☐
TENDER ☐ FOR CONSTRUCTION ☐
AS BUILT ☐

Dwg. No.