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## Site Suitability Assessment

Site at

Shanballyduff, Cashel, Co. Tipperary E25H302

3/3/22

### Contents.

#### 1. Site Characterisation Form

- General Details
- On Site Assessment
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#### 3. 1/50000 scale map showing site location

#### 4. On site sketch showing trial hole and tests holes etc

#### 5. Photographs of Trial hole and tests

#### 6. Supporting GSI groundwater maps on Site Vulnerability, Aquifer, Recharge, Soils and Bedrock

#### 7. Design details on typical secondary and tertiary treatment system designs proposed

12 Person Treatment Unit to 30.87m Sandeel polishing  
filter.

*John Egan*

# APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

## 1.0 GENERAL DETAILS (From planning application)

Prefix: First Name:  Surname:

Address:  Site Location and Townland:

Number of Bedrooms:  Maximum Number of Residents:

Comments on population equivalent

In the CoP the minimum house size is two bedrooms, which equates to a design capacity of 4 PE. For every additional bedroom, irrespective of size, an additional 1 PE should be added. Therefore the PE is 8. The actual population to be catered for is 12 people.

Proposed Water Supply:

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

## 2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type):

Subsoil, (Specify Type):

Bedrock Type:

Aquifer Category: Regionally Important  Locally Important  Poor

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:

Presence of Significant Sites (Archaeological, Natural & Historical):

Past experience in the area:

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).

Groundwater and surfacewater are potential targets at risk. Response is R2(2)  
Acceptable subject to normal good practice and the following additional condition:  
1) There is a minimum thickness of 2 m unsaturated soil/subsoil beneath the invert of the percolation trench of a conventional septic tank system;  
OR  
1) A treatment system other than a conventional septic tank system as described in EPA (2000) is installed, with a minimum thickness of 0.6 m unsaturated soil/subsoil with P/T values 1 from 1 to 50 (in addition to the polishing filter which should be a minimum depth of 0.6 m), beneath the invert of the polishing filter (i.e. 1.2 m in total for a soil polishing filter).

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: Plain. Position of the proposed treatment unit is on a raised bank at the rear of existing dwelling house.

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

Slope Comment   Raised bank at back of house

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

Houses:

2no. houses within 250m

Existing Land Use:

Site of an existing house

Vegetation Indicators:

None noted

Groundwater Flow Direction: Assumed to be in a southerly direction

Ground Condition:

Good sound dry ground

Site Boundaries:

Existing hedgerows and front boundary wall

## 3.0 ON-SITE ASSESSMENT

### 3.1 Visual Assessment (contd.)

Roads:

The site fronts onto a local road

Outcrops (Bedrock And/Or Subsoil):

None noted nearby

Surface Water Ponding:

None noted nearby

Lakes:

None within 250m

Beaches/Shellfish Areas:

NA

Wetlands:

None nearby

Karst Features:

None noted

Watercourses/Streams:\*

None noted nearby

\*Note and record water level

## 3.0 ON-SITE ASSESSMENT

### 3.1 Visual Assessment (contd.)

Drainage Ditches:\*

None noted nearby

Springs:\*

None noted

Wells:\*

None noted

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 appears to be suitable for wastewater treatment system subject to suitable results from the trial hole and percolation tests.

Groundwater and surfacewater are potential targets at risk

\*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):

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:   Date and time of examination:

Depth of  
Surface and  
Subsurface

Soil/Subsoil

Percolation Tests	Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m <input type="text"/>	300 topsoil stoney gravelly SILT/CLAY	4,4,5 threads 90,100,100 ribbons dilatancy uncertain	crumb	firm	greyish brown	along roots systems of the nearby hedgerow
0.2 m <input type="text"/>						
0.3 m <input type="text"/>						
0.4 m <input type="text"/>						
0.5 m <input type="text"/>						
0.6 m <input type="text"/>	1800 subsoil. loamy SILT/CLAY Approx 5% of visible area of subsoil has some small fragmented stone	3,3,3 threads, ribbons 80,80,90 dilatancy uncertain	crumb	firm	grey to reddish brown	none noted
0.7 m <input type="text"/>						
0.8 m <input type="text"/>						
0.9 m <input type="text"/>						
1.0 m <input type="text"/>						
1.1 m <input type="text"/>						
1.2 m <input type="text"/>						
1.3 m <input type="text"/>						
1.4 m <input type="text"/>						
1.5 m <input type="text"/>						
1.6 m <input type="text"/>						
1.7 m <input type="text"/>						
1.8 m <input type="text"/>						
1.9 m <input type="text"/>						
2.0 m <input type="text"/>						
2.1 m <input type="text"/>						
2.2 m <input type="text"/>						
2.3 m <input type="text"/>						
2.4 m <input type="text"/>						
2.5 m <input type="text"/>						
2.6 m <input type="text"/>						
2.7 m <input type="text"/>						
2.8 m <input type="text"/>						
2.9 m <input type="text"/>						
3.0 m <input type="text"/>						
3.1 m <input type="text"/>						
3.2 m <input type="text"/>						
3.3 m <input type="text"/>						
3.4 m <input type="text"/>						
3.5 m <input type="text"/>						

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:

Trail hole indicates that the site may be suitable for a domestic wastewater treatment system. Groundwater and surface water are potential targets at risk and site testing is required to establish suitability.

### 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)	600	650	700
Depth from ground surface to base of hole (mm) (B)	1,000	1,050	1,100
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	15-Feb-2022	15-Feb-2022	15-Feb-2022
	Time	17:00	17:00	17:00
2nd pre-soak start	Date	17-Feb-2022	17-Feb-2022	17-Feb-2022
	Time	12:00	12:00	12:00

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	25-02-2022	25-02-2022	25-02-2022
Time filled to 400 mm	17:12	17:17	17:15
Time water level at 300 mm	17:39	17:24	17:20
Time (min.) to drop 100 mm ( $T_{100}$ )	27.00	7.00	5.00
Average $T_{100}$			13.00

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)	$\Delta t$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta t$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta t$ (min)
1	17:39	18:09	30.00	17:24	17:36	12.00	17:20	17:27	7.00
2	18:09	18:39	30.00	17:36	17:48	12.00	17:27	17:36	9.00
3	18:39	19:11	32.00	17:48	18:01	13.00	17:37	17:47	10.00
Average $\Delta t$ Value			30.67			12.33			8.67
	Average $\Delta t/4 =$ [Hole No.1] 7.67 ( $t_1$ )			Average $\Delta t/4 =$ [Hole No.2] 3.08 ( $t_2$ )			Average $\Delta t/4 =$ [Hole No.3] 2.17 ( $t_3$ )		

Result of Test: Subsurface Percolation Value = 4.31 (min/25 mm)

Comments:

Average T value of 4 indicates that the site is suitable to cater for domestic effluent.

**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: Subsurface Percolation Value =

0.00 (min/25 mm)

Comments:

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		



### 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)	$\Delta T$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta T$ (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	$\Delta T$ (min)
1	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00
2	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00
3	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00	<input type="text"/>	<input type="text"/>	0.00
Average $\Delta T$ Value			0.00			0.00			0.00
	Average $\Delta T/4 =$ [Hole No.1] <input type="text"/> 0.00 ( $T_1$ )			Average $\Delta T/4 =$ [Hole No.2] <input type="text"/> 0.00 ( $T_2$ )			Average $\Delta T/4 =$ [Hole No.3] <input type="text"/> 0.00 ( $T_3$ )		

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

Comments:

P testing not concluded as T testing gave satisfactory results

**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)

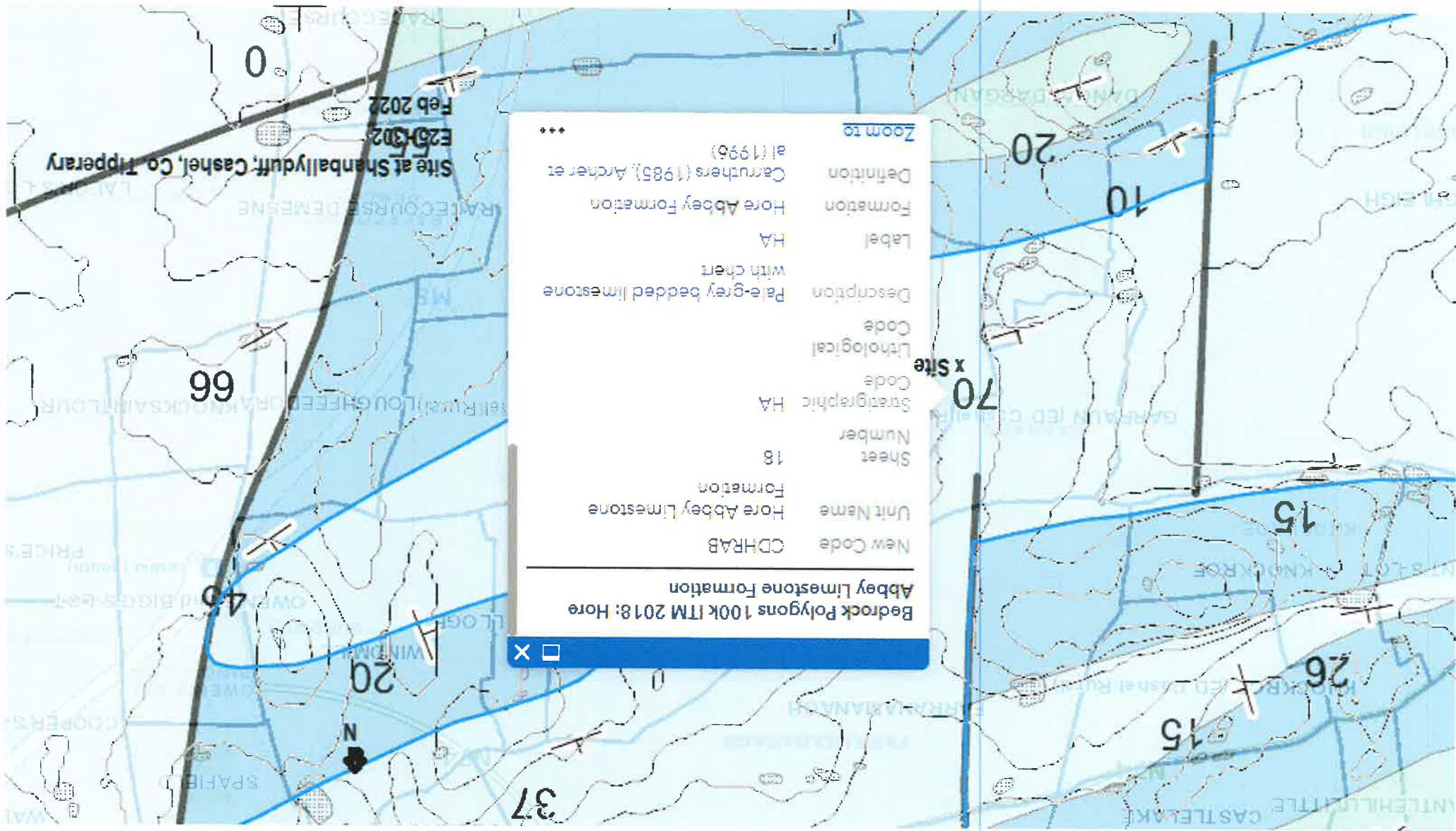
Percolation Test Hole No.	3					
Fall of water in hole (mm)	Time Factor $= T_f$	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) $= T_m$	$K_{fs}$ $= T_f / T_m$	T - Value $= 4.45 / K_{fs}$
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value	T- Value Hole 3 = ( $T_3$ )		0.00		

Comments:

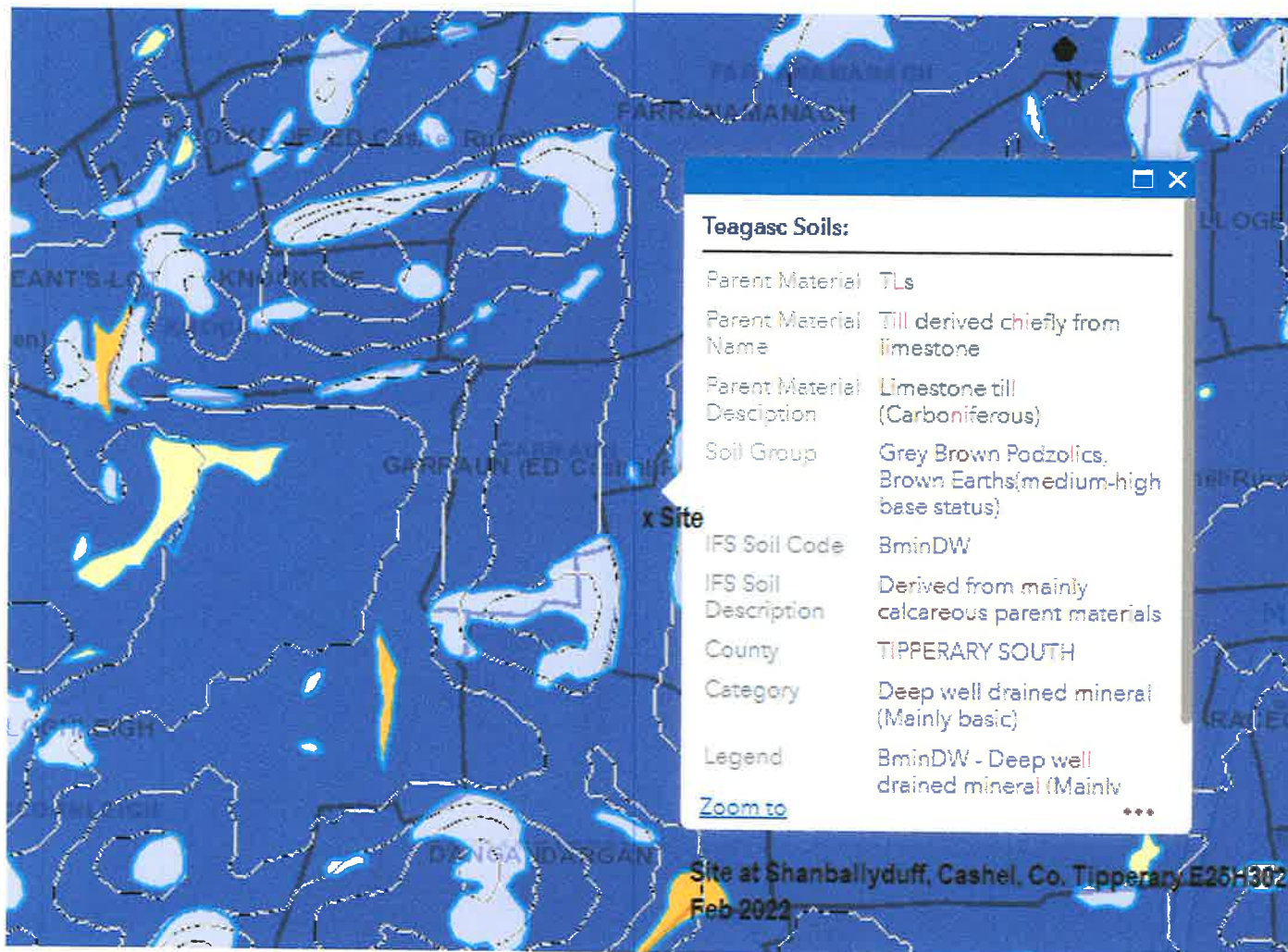
**3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.**

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<sup>1</sup> 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.

<sup>1</sup> 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.



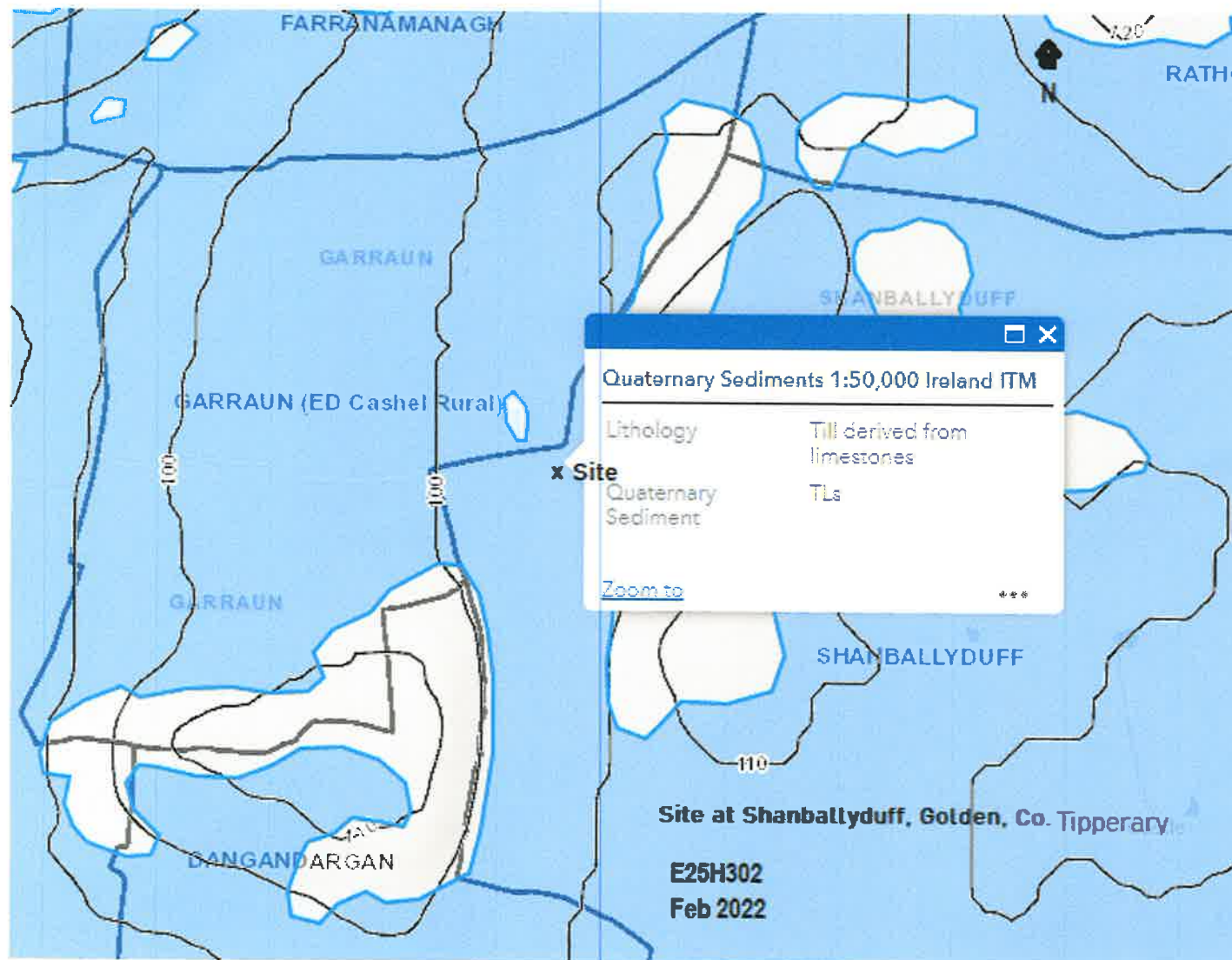




## Teagasc Soils

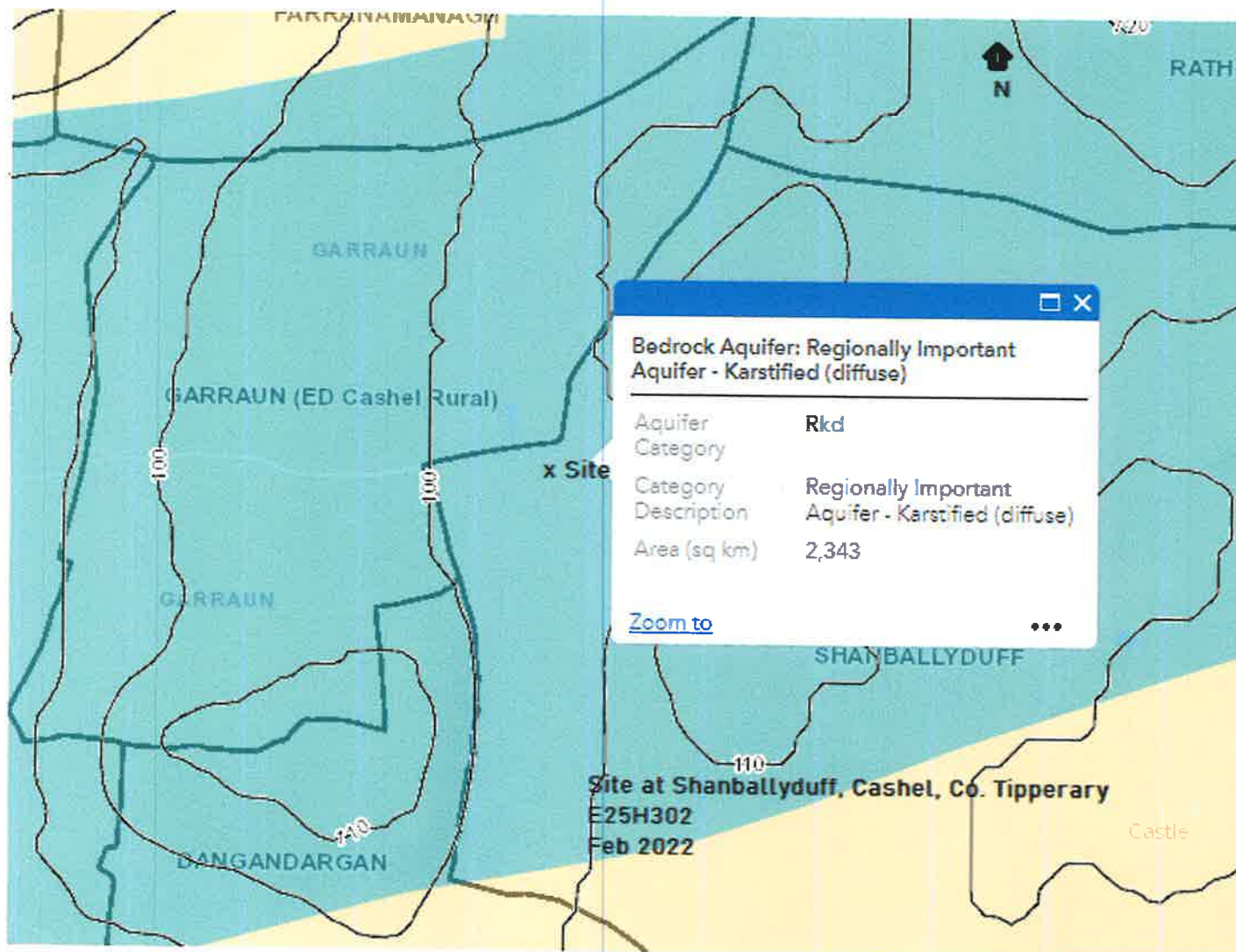
TEAGASC\_Soils\_50K\_IE26\_ITM

- AminDW - Deep well drained mineral (Mainly acidic)
- AminPD - Mineral poorly drained (Mainly acidic)
- AminPDPT - Peaty poorly drained mineral (Mainly acidic)
- AminSW - Shallow well drained mineral (Mainly acidic)
- AminSP - Shallow poorly drained mineral (Mainly acidic)
- AminSPPT - Shallow peaty poorly drained mineral (Mainly acidic)
- AminSRPT - Shallow, rocky, peaty/non-peaty mineral complexes (Mainly acidic)
- BminDW - Deep well drained mineral (Mainly basic)
- BminPD - Mineral poorly drained (Mainly basic)
- BminPDPT - Peaty poorly drained mineral (Mainly basic)
- BminSW - Shallow well drained mineral (Mainly basic)
- BminSP - Shallow poorly drained mineral (Mainly basic)
- BminSPPT - Shallow peaty poorly drained mineral (Mainly basic)
- BminSRPT - Shallow, rocky, peaty/non-peaty mineral complexes (Mainly basic)



- TGr, Till derived from granites
- TLCSSs, Till derived from lower Carboniferous sandstones and shales
- TLPCSsS, Till derived from Lower Palaeozoic and Carboniferous sandstones and shales
- TLPDSs, Till derived from Lower Palaeozoic and Devonian sandstones
- TLPS, Till derived from Lower Palaeozoic shales
- TLPSs, Till derived from Lower Palaeozoic sandstones
- TLPSsS, Till derived from Lower Palaeozoic sandstones and shales
- TLSCs, Till derived from Silicified Limestone and cherts
- TLs, Till derived from limestones
- TMp, Till derived from Metamorphic rocks
- TNCSSs, Till derived from Namurian and Carboniferous sandstones and shales
- TNSSs, Till derived from Namurian sandstones and shales
- TQz, Till derived from quartzites
- Tailings Pond
- TdIMr, Tidal Marsh
- Urban
- Water
- Ws, Windblown sands
- Wsd, Windblown sands and dunes





## Groundwater Resources (Aquifers)

### Gravel Aquifer

- Locally important gravel aquifer
- Regionally important gravel aquifer

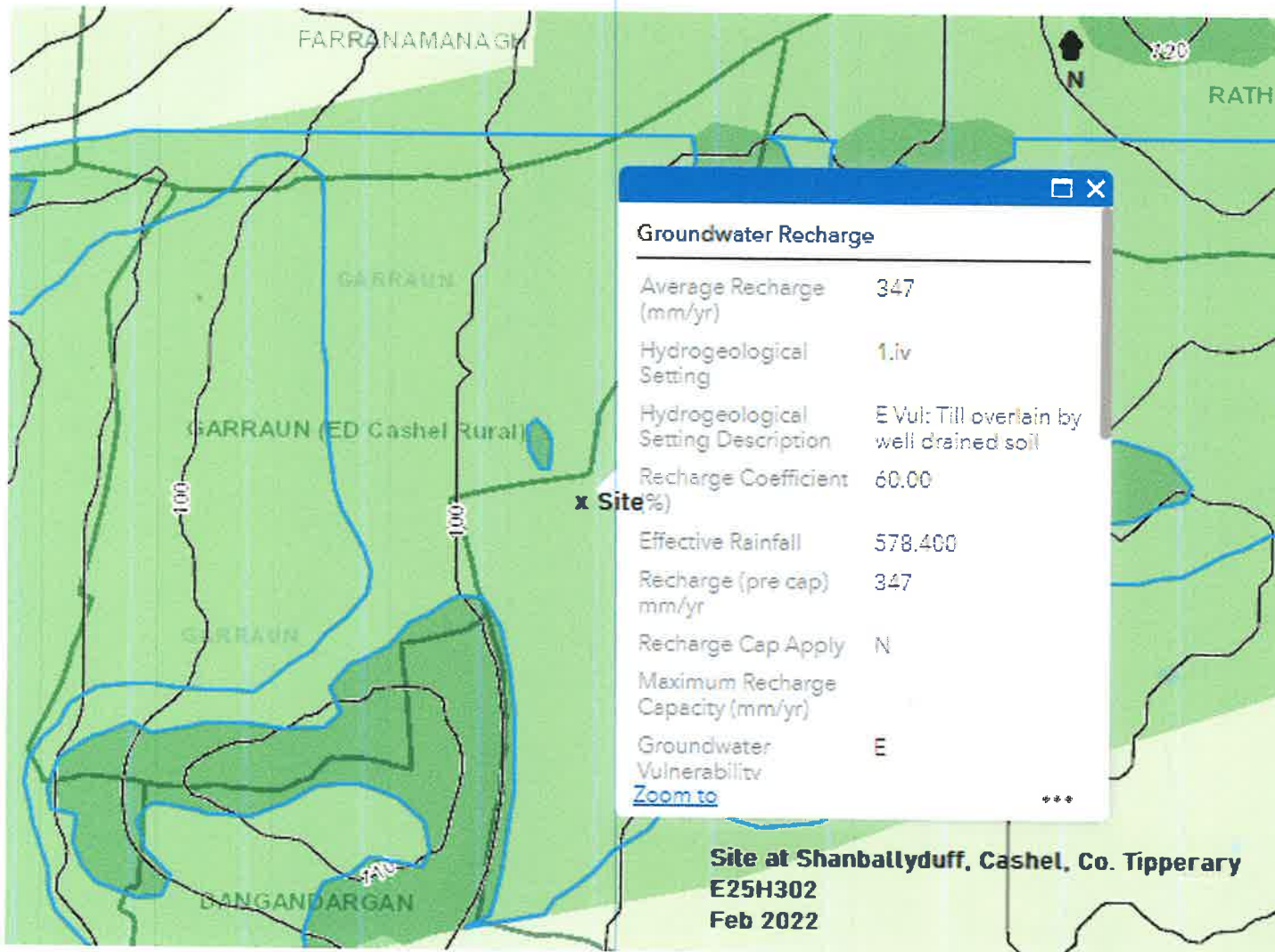
### Bedrock Aquifer

- 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

## Townlands

### Townlands



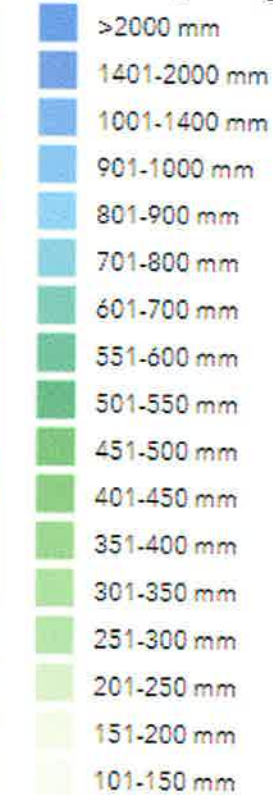


## Ground Elevation Contours

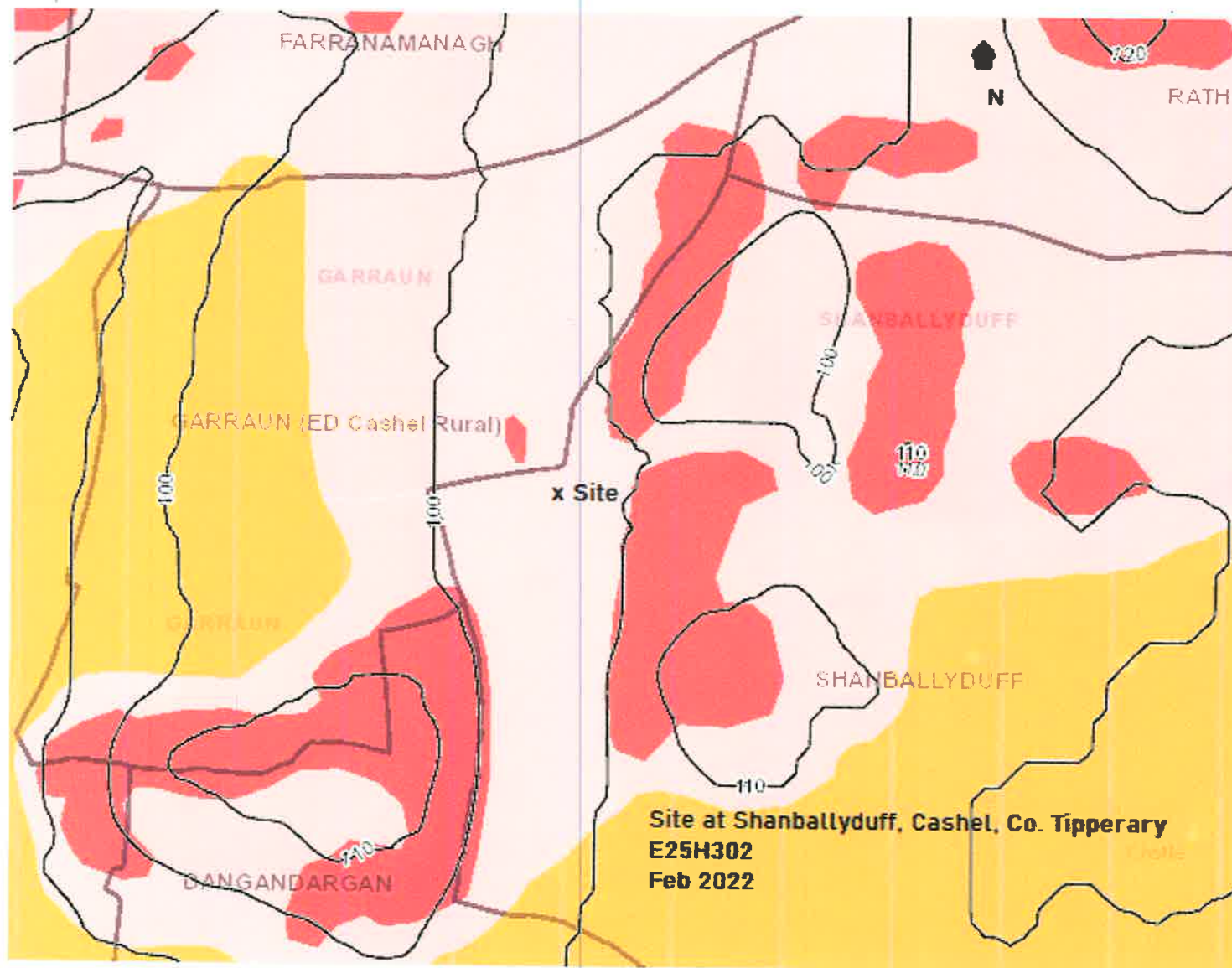
EPA Contours

## Groundwater Recharge

Groundwater\_Recharge\_40K\_IE26\_ITM







### Ground Elevation Contours

EPA Contours

### Groundwater Vulnerability

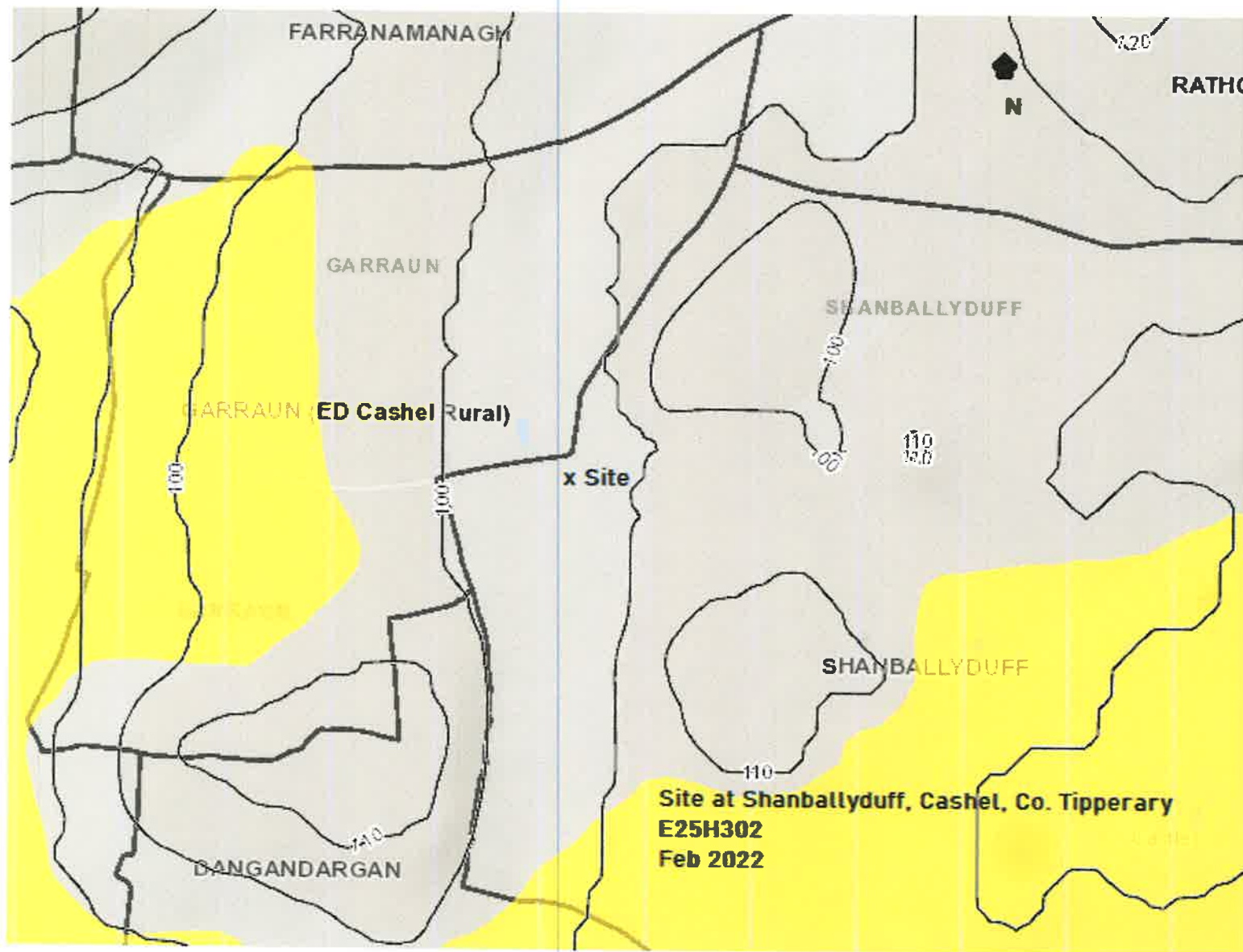
Groundwater\_Vulnerability\_40K\_IE26\_ITM

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low
- Water

### Townlands

Townlands





### Ground Elevation Contours

EPA Contours

### Subsoil Permeability

Subsoil\_Permeability\_40K\_IE26\_ITM

- High
- Moderate
- Low
- Water
- Not mapped

### Townlands

Townlands



## 6.0 TREATMENT SYSTEM DETAILS

### SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m <sup>3</sup> )	<input type="text"/>	Percolation Area	Mounded Percolation Area
		No. of Trenches	<input type="text"/>
		Length of Trenches (m)	<input type="text"/>
		Invert Level (m)	<input type="text"/>

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

#### Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

#### Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Media Type	Area (m <sup>2</sup> )*	Depth of Filter	Invert Level	Type
Sand/Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>	SBR
Soil	<input type="text"/>	<input type="text"/>	<input type="text"/>	Capacity PE <input type="text" value="12"/>
Constructed Wetland	<input type="text"/>	<input type="text"/>	<input type="text"/>	Sizing of Primary Compartment
Other	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> m <sup>3</sup>

#### Polishing Filter\*: (Section 10.1)

Surface Area (m <sup>2</sup> )*	<input type="text"/>	Option 3 - Gravity Discharge	<input type="text"/>
Option 1 - Direct Discharge		Trench length (m)	
Surface area (m <sup>2</sup> )	<input type="text"/>	Option 4 - Low Pressure	
Option 2 - Pumped Discharge		Pipe Distribution	<input type="text"/>
Surface area (m <sup>2</sup> )	<input type="text"/>	Trench length (m)	
		Option 5 - Drip Dispersal	<input type="text"/>
		Surface area (m <sup>2</sup> )	

### 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

Tertiary treatment used on this site as it overlies a Regionally important karstified aquifer and the vulnerability is extreme.

Tricel Sandcel technical document attached. System designed to EPA Code of Practice.  
Effluent quality achievable :1mg/litre BOD5

4m x 7.5m by 1m deep stratified sand polishing filter.  
See section 5 of this report for details on the make up of the filter and its position within the ground.  
3.75sq.m /person x 8P.E.  
=30sq.m area.

#### DISCHARGE ROUTE:

Groundwater	<input checked="" type="checkbox"/>	Hydraulic Loading Rate * (l/m <sup>2</sup> .d)	<input type="text" value="40.00"/>	Surface area (m <sup>2</sup> )	<input type="text" value="30.00"/>
Surface Water **	<input type="checkbox"/>	Discharge Rate (m <sup>3</sup> /hr)	<input type="text"/>		

\* 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

Supervision on installation as per EPA guidelines for both secondary treatment packaged unit and tertiary treatment sand polishing filter. Installations to comply with EP COP for one off houses and supervised and certified by a suitably qualified person.

#### On-going Maintenance

Installations should be maintained by the installing companies or their agents. Maintenance agreements should be put in place to ensure the ongoing performance of the system as a whole

## 7.0 SITE ASSESSOR DETAILS

Company:

Prefix:

First Name:

Surname:

Address:

Qualifications/Experience:

Date of Report:

Phone:

E-mail:

Indemnity Insurance Number:

Signature: 

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

## 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:

1/200

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)

0.90

Percolation test result: Surface:

Sub-surface:

4.00

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)

No

Yes

Yes

### Discharge Route<sup>1</sup>

To groundwater

## 5.0 SELECTED DWWTs

Propose to install:

Tertiary Treatment System and Infiltration /treatment area

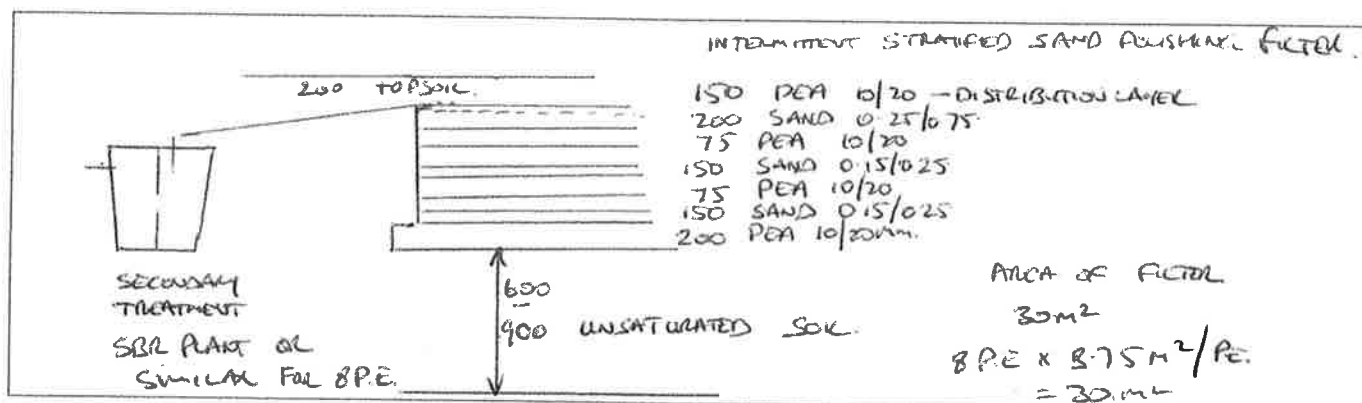
and discharge to:

Ground Water

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

-1.20

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



<sup>1</sup> 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.



## Professional Indemnity Insurance Schedule

Policy Number: API0003533

### Item 1 Policyholder

John Egan T/A Comerstone Engineering

#### Address

Dovea Templemore Co. Tipperary

#### Profession

Engineer

### Item 2 Policy Period

Inception Date: 14/11/2021

Expiry Date: 13/11/2022

Both days inclusive local standard time at address in Item 1

### Item 3 Limit of Liability

A. € 1,300,000 any one Claim except however, in respect of:

B. Asbestos, the Limit of Liability is

€ 1,000,000 or 50% of the amount specified in Item 3.A. whichever is the less, both in respect of any one Claim and in the aggregate for the Policy Period

C. Pollution, the Limit of Liability is

€ 1,000,000 or 50% of the amount specified in Item 3.A. whichever is the less, both in respect of any one Claim and in the aggregate for the Policy Period

D. III. Extensions B. Lost Documents, the Limit of Liability is

€ 500,000 or 50% of the amount specified in Item 3.A. whichever is the less, both in the aggregate for the Policy Period

E. III. Extensions C. Statutory Regulation, the Limit of Liability is

€ 150,000 in the aggregate for the Policy Period or the amount applicable to II. Cover A. Professional Indemnity, whichever is less

F. III. Extensions D. Legal Representation Costs, the Limit of Liability is

€ 350,000 in the aggregate for the Policy Period or 50% of the amount specified in Item 3.A. whichever is the less, both in the aggregate for the Policy Period

Cover under II. Cover C. Defence Costs does not form part of and will not erode the Limit of Liability in respect of 3.A – 3.F. above.

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E.& O.E.

### Item 9 This contract is underwritten by the following Insurers

This contract is underwritten by the following Insurers;  
Schedule as follows;

#### Section 1. Professional Indemnity

Primary Layer (Limit of Indemnity - The Limit of Liability as per Item 3A of this schedule or to a maximum of €2,500,000)

Arch Insurance (EU) dac 58.695652%

Lloyd's Insurance Company S.A. ASC 5325 28.260870%

Reinsured by Lloyd's syndicate ASC 1414

Lloyd's Insurance Company S.A. CNP 6380 13.043478%

Reinsured by Lloyd's syndicate CNP 4444

#### Section 2. Professional Indemnity

Excess Layer (Limits of indemnity in excess of €2,500,000 if purchased by the policyholder)

Not Operative

### Item 10 Endorsements

None

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### Item 4 Excess

A. € 1,000 each and every Claim except however, in respect of:

B. Asbestos Claims (for which the applicable Limit of Liability is the amount specified in Item 3.B. above), the Excess shall be € 5,000 each and every Claim or the amount specified in Item 4.A. above whichever is the greater

C. Pollution Claims (for which the applicable Limit of Liability is the amount specified in Item 3.C. above), the Excess shall be € 5,000 each and every Claim or the amount specified in Item 4.A. above whichever is the greater

D. Defamation, the Excess is € 10,000 each and every Claim or the amount specified in Item 4.A. above whichever is the less

Subject to an overall aggregate Excess of three times the applicable Excess specified in Item 4.A. in the aggregate for the Policy Period. Payment by the Insured of the applicable Excess specified in Item 4.A. above will erode the aggregate Excess; once the aggregate Excess is exhausted an Excess of nil shall apply thereafter.

The Excess does not apply to II. Cover C. Defence Costs or III. Extensions A. Court Attendance Costs, III. Extensions B. Lost Documents, III. Extensions C. Statutory Regulation or III. Extensions D. Legal Representation Costs.

### Item 5 Professional Services

Any professional architectural and engineering services (including surveys and/or valuations), design or specification, supervision of construction, feasibility study, technical information or calculation including whilst the Insured hold any individual appointment in respect of such services including design, assigned or ancillary certifier as defined by the Building Control Amendment Regulations 2014.

### Item 6 Retroactive Date

Unlimited

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E.& O.E.

### Item 7 Premium

administration fee and 5% Government levy where applicable.

### Item 8 Claims Notification THIS IS A "CLAIMS MADE" POLICY

Subject also to other policy terms and conditions, all cover under this policy is afforded solely in respect of:

A. Claims first made against an Insured during the Policy Period; and

B. circumstances that any Responsible Person first becomes aware of during the Policy Period that they reasonably expect will give rise to a Claim;

and are notified to the Insurer during the Policy Period or within three working days after the expiry of the Policy Period as required by this policy.

Notice of a Claim or circumstance shall be made to:

Leeson Claims Services (LCS Ireland)  
68 Merion Square South, Dublin 2

Tel: 01 4852980  
or by email arachasclaims@lcsi.ie

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E.& O.E.

## CERTIFICATE OF INSURANCE

Effected through:

Arachas Corporate Brokers Limited

Via Arachas, Capital Insurance Markets, Capital IM, Covercentre (the Coverholder).

9 Eastgate Avenue  
Eastgate Business Park  
Little Island  
Cork  
T45 YN92

Telephone: 01 213 5000  
Website: www.arachas.ie

This is to Certify that, in accordance with the authorisation granted under Contract No. B1715PFD022621 to the undersigned by certain underwriters at Lloyd's Insurance Company SA and other insurers (hereinafter referred to as the 'Insurers') whose names and the proportions underwritten by them are shown in the Schedule attached hereto, and in consideration of the premium specified herein, the said Insurers are hereby bound, each for his own part and not one for another, their Executors and Administrators, to indemnify the Insured in accordance with the terms and conditions of Insurance attached hereto.

Provided that the liability of the Insurers shall not exceed the Limit of Liability as set forth in the Schedule.

The Insured is requested to read this Certificate and if it is not correct, return it immediately to the Coverholder for appropriate alteration.

In Witness whereof, this Certificate has been signed by the Coverholder and on the date specified below.

Date: 09/11/2021

Conor Brennan  
Arachas Corporate Brokers Limited

Martin Adams  
Arachas Corporate Brokers Limited

### PLEASE NOTE - This notice contains important information. PLEASE READ CAREFULLY

The liability of an insurer under this contract is several and not joint with other insurers party to this contract. An insurer is liable only for the proportion of liability it has underwritten. An insurer is not jointly liable for the proportion of liability underwritten by any other insurer. Nor is an insurer otherwise responsible for any liability of any other insurer that may underwrite this contract.

The proportion of liability under this contract underwritten by an insurer (or, in the case of a Lloyd's syndicate, the total of the proportions underwritten by all the members of the syndicate taken together) is shown in this contract.

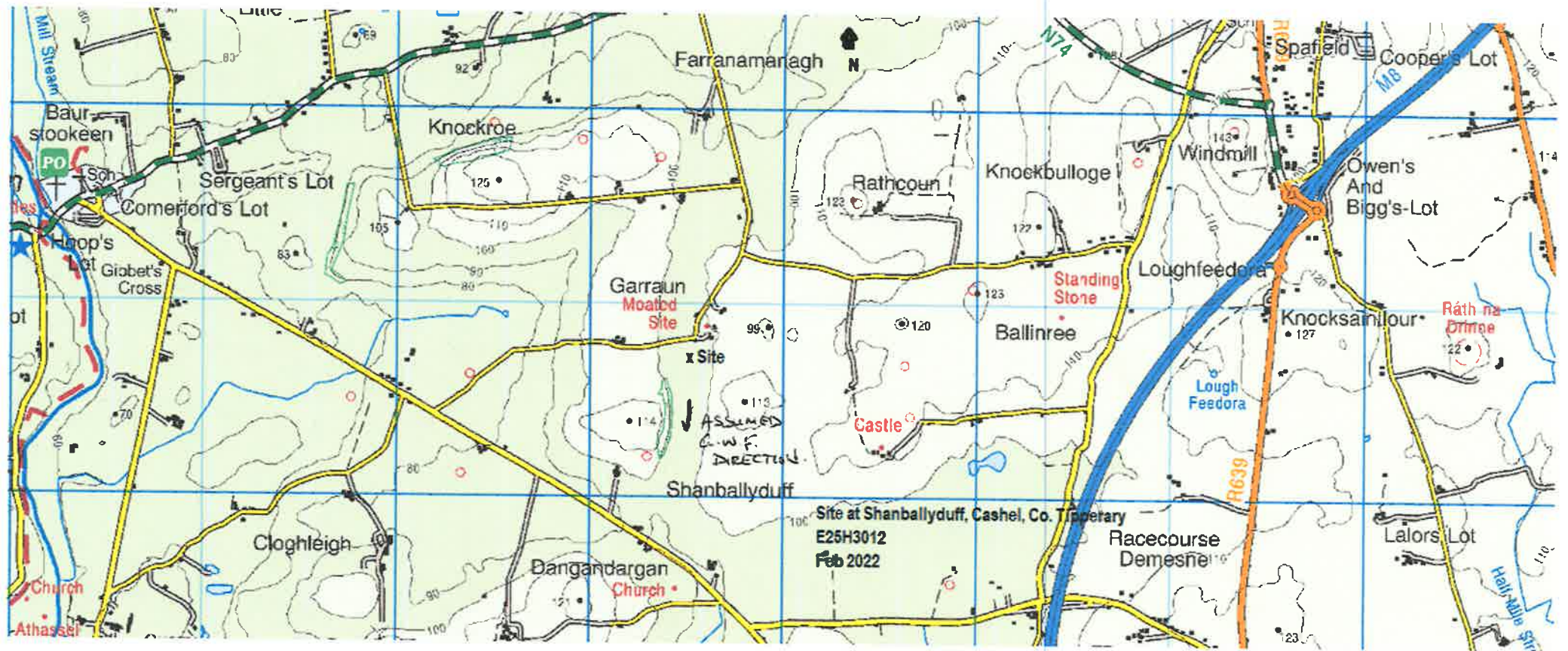
In the case of a Lloyd's syndicate, each member of the syndicate (rather than the syndicate itself) is an insurer. Each member has underwritten a proportion of the total shown for the syndicate (that total itself being the total of the proportions underwritten by all the members of the syndicate taken together). The liability of each member of the syndicate is several and not joint with other members. A member is liable only for that member's proportion. A member is not jointly liable for any other member's proportion. Nor is any member otherwise responsible for any liability of any other insurer that may underwrite this contract. The business address of each member is Lloyd's, Lloyd's Brussels, Bastion Tower, Floor 14, 5 Place du Champs de Mars, 5 Marveldplein, 1050 Brussels. The identity of each member of a Lloyd's syndicate and their respective proportion may be obtained by writing to Market Services, Lloyd's, at the above address.

Although reference is made at various points in this clause to "this contract" in the singular, where the circumstances so require this should be read as a reference to contracts in the plural

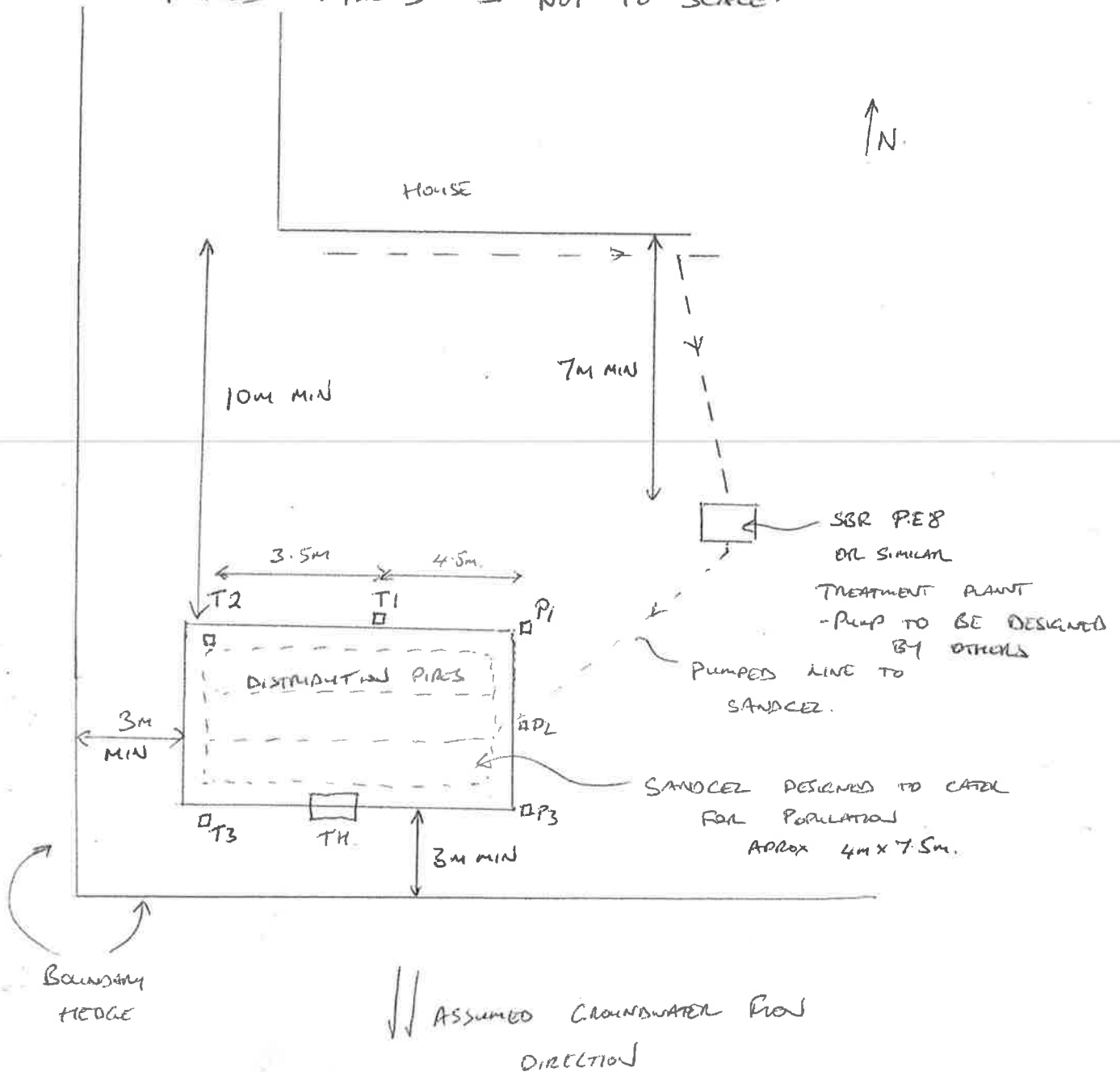
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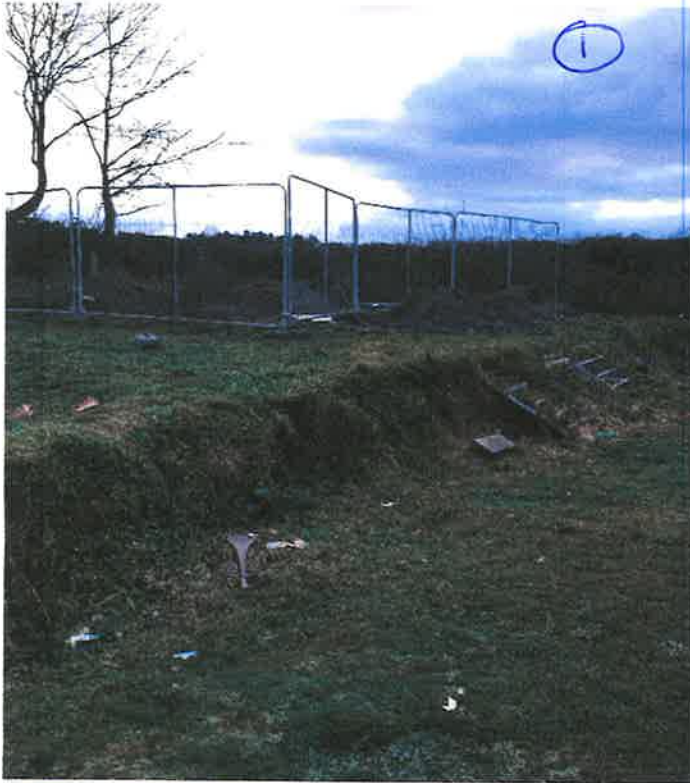
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E.& O.E.



SKETCH LAYOUT AT E25H302 SHOWING  
POSITIONS OF TRIAL HOLE, TEST HOLES AND  
PROPOSED SYSTEMS - NOT TO SCALE.







Photographs taken on site at  
Shankellydeth, Carhel, Co. Tipperary  
E25H302. on 25/2/22

① Existing Raised Bank at  
Rear of dwelling house.

② P Test hole

③ T. Test Hole.

④ Trial Hole.

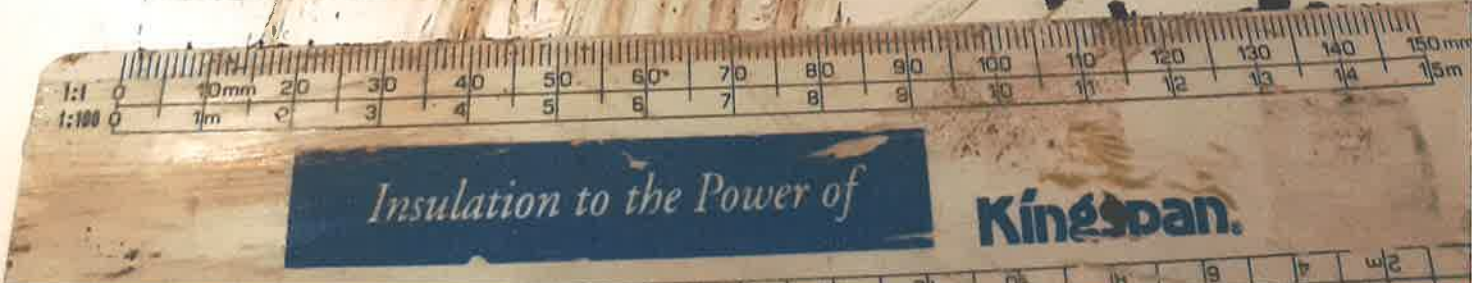


0" DORO GAGES

RIBBON AND  
THERMAL TESTS  
AT E25H302  
25/2/2022

SHAW BALLY DUFF

E25H302





# Tricel® Sandcel

Sand polishing filter

*Engineering a green future*





## How a Tricel Sandcel works

Sandcel sand polishing filters are designed to the EPA Code of Practice as tertiary treatment systems. These filters are the perfect solution for treatment and disposal of effluent from a secondary treatment unit. The filters comprise of stratified layers of certified sands according to the EPA Code of Practice.

They are enclosed in GRP impermeable panels which will not rot or decay, ensuring the structure of the filter will hold for many years. The filters can be installed above or below ground with all pipe work accessible from a service pod.

### Treatment efficiency:

Sandcel filters provide excellent polishing of treated effluent. Samples testing of some sites where a Sandcel and Tricel Novo WWTP were in operation have shown final effluent quality of >1 mg/ltr BOD<sub>5</sub>.



## Why buy a Tricel Sandcel?

### Solid impermeable structure

Filter enclosure will not rot or decay like timber surrounds.

### Small footprint

Only 16m<sup>2</sup> area for a 6 person application eliminating the need of large percolation area.

### Aesthetic finish

Filter can be covered with topsoil and planted with a lawn to blend into garden.

### Long life components

Certified sands and gravel used as the filter bed which will not break down over time.

### Flexible design:

Under and overground applications possible.

### Future

Pipework accessible from service pod to future proof your system.

### Engineered design:

Specifically designed pipework network to ensure equal distribution over the entire bed.

### High performance

Excellent treatment of effluent.

### Legacy sites

Ideal compact solution designed to the EPA CoP fulfilling most Local Authority requirements.

### Quick installation

Reduced on site labour costs.

### Certification

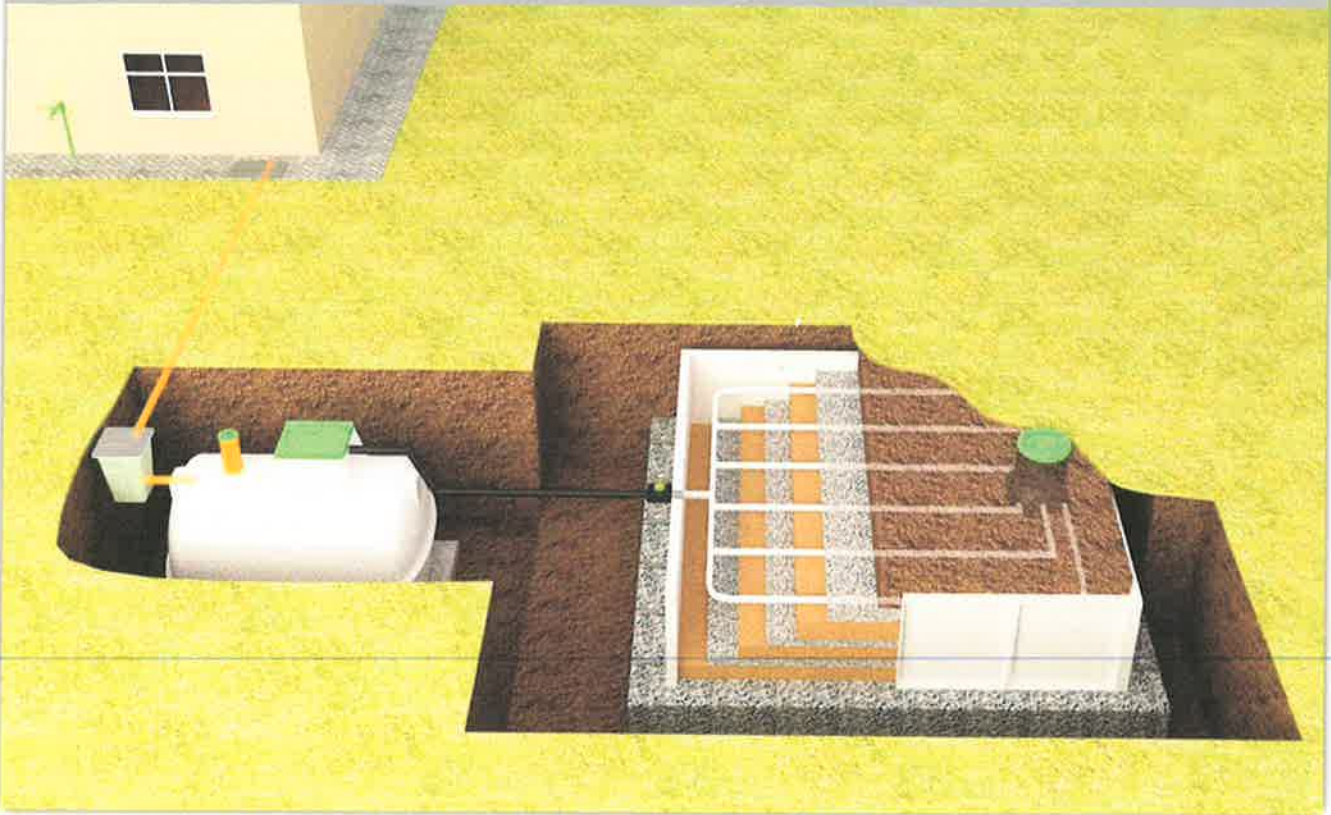
Certified components used.

### Peace of mind:

Tricel have earned an unrivalled reputation in the environmental field in over 20 countries worldwide.



Drawing of Sandcel



Sandcel during installation



Sandcel installed

## Tricel Sandcel

-Up to 10 persons-

	Sandcel 900	Sandcel 1200	Sandcel 1500
Capacity	900 litres per day	1200 litres per day	1500 litres per day
Length	4000mm	4000mm	4000mm
With	3850mm	5000mm	6350mm
Depth	1000mm	1000mm	1000mm
Footprint	15.4m <sup>2</sup> (165.77 sq/ft)	20.0m <sup>2</sup> (215.28 sq/ft)	25.4m <sup>2</sup> (269.10 sq/ft)

>10 persons available on request.

Tricel is a global provider of high performance solutions for the Water, Environmental, Construction and Materials industries. Our company ethos "Generations of Innovation" is built around three interlinking themes; Innovation, Quality and Heritage, which have been developed over the last 40 years. We deliver innovative quality solutions that our customers can trust. With manufacturing locations in 5 countries we possess a broad and distinct range of capabilities enabling us to supply a comprehensive range of products to over 50 countries worldwide.

## Tricel global presence



Your Tricel partner

Designed in  
accordance  
with  
EPA CoP



## Environmental solutions



**Novo**  
Domestic wastewater  
treatment plants



**Vento**  
Septic tanks



**Sandcel**  
Sand polishing filter



**Pump stations**



**Rainwater harvesting  
systems**



Tricel (Killarney), Ballyspillane Industrial Estate, Killarney, Co. Kerry, Ireland.  
Tel: +353 (0) 64 6632421 | Email: sales@ie.tricel.eu | www.ie.tricel.eu

In accordance with Tricel's normal policy of product development these specifications are subject to change without notice