



**Comhairle Chontae Laoise
Laois County Council**

**SITE ASSESSMENT IN ACCORDANCE WITH E.P.A CODE OF PRACTICE WASTEWATER
TREATMENT AND DISPOSAL SYSTEMS SERVING SINGLE HOUSES (p.e. ≤10)**

Laois County Council Housing Dept
c/o Darragh Carey,
AOCA Engineering Consultants
Lismard House,
Timahoe Rd.,
Portlaoise,
Co. Laois

19th September 2019

SITE SUITABILITY ASSESSMENT REF. NO. 19/117

A Chara,

I refer to your application for Site Suitability Assessment with Laois County Council and enclose a copy of the results herewith.

These results illustrate that your site has been deemed suitable for development.

Is mise, le meas,

**PAT DELANEY
ADMINISTRATIVE OFFICER
PLANNING**

This matter is being dealt with by Antoinette Brennan who can be contacted at 057 86 64014

SITE CHARACTERISATION FORM

COMPLETING THE FORM

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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.

Clear Form

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 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 B: SITE CHARACTERISATION FORM

File Reference: 19- 117

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: Laois County Council Surname:

Address:

c/o Darragh Carey, AOCA Engineering Consultants
Lismard House, Timahoe Road, Portlaoise

Site Location and Townland:

Coolroe, Ballybrittas

Telephone No: 057 8663244

Fax No:

E-Mail: darragh@aoca.ie

Maximum no. of Residents: 3

No. of Double Bedrooms: 2

No. of Single Bedrooms: 1

Proposed Water Supply: Mains ☐

Private Well/Borehole ☒

Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): AminSP

Aquifer Category: Regionally Important ☐ Rk Locally Important ☐ Poor ☐

Vulnerability: Extreme ☐ High ☒ Moderate ☐ Low ☐ High to Low ☐ Unknown ☐

Bedrock Type: Visean limestone and calcareous shale

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

Groundwater Protection Scheme (Y/N): No

Source Protection Area: SI ☐ SO ☐

Groundwater Protection Response: R2'

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

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).

Site potentially suitability for development.
Potential targets @ risk : - Ground Water

Site restrictions : -

1. Proposed Dwelling
2. Neighbouring dwelling
3. Site Boundaries

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: Toe of slope

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

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

Houses: 3 within 250m of site

Existing Land Use: Agriculture - Bean crop

Vegetation Indicators: Hedgerow / Trees

Groundwater Flow Direction: North to South

Ground Condition: Good / Firm

Site Boundaries: Northern and Eastern hedgerow - other two open

Roads: Cul de sac off local road

Outcrops (Bedrock And/Or Subsoil): N

Surface Water Ponding: N Lakes: N

Beaches/Shellfish: N Areas/Wetlands: N

Karst Features: N

Watercourse/Stream*: N

Drainage Ditches*: N

Springs / Wells*: 3 within 250m of site

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).

Site potentially suitability for development.
Potential targets @ risk : - Ground Water

Site restrictions : -

1. Proposed Dwelling
2. Neighbouring dwelling
3. Site Boundaries

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 P/T Test*	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	<input type="text" value="p"/> 250mm Topsoil Clay	T = 5, 5, 4 R = 120, 110, 120	Soft	Soft	Dark brown	Bean roots
0.2 m	<input type="text" value="p"/>					
0.3 m	<input type="text" value="p"/>					
0.4 m	<input type="text" value="p"/> 250mm Subsoil Clay	T = 110, 120, 110	Soft	Soft	Light brown	None evident
0.5 m	<input type="text"/>					
0.6 m	<input type="text" value="t"/>					
0.7 m	<input type="text" value="t"/> 400mm Subsoil Clay	T = 5, 5, 6 R = 130, 130, 120	Dense	Dense	Brown / Grey	None evident
0.8 m	<input type="text" value="t"/>					
0.9 m	<input type="text" value="t"/> Gravel					
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"/> 1300mm Subsoil Gravel	R = 5, 6, 6 R = 130, 130, 120	Compact	Compact	Grey / Brown	None evident
1.5 m	<input type="text"/> Cobbles					
1.6 m	<input type="text"/> Silt					
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"/>					

Likely T value:

Note: *Depth of percolation test holes should be indicated on log above. (Enter P or T 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:

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3.3(a) Percolation ("T") Test for Deep Subsoils and/or Water Table

Step 1: Test Hole Preparation

Percolation Test Hole

	1	2	3
Depth from ground surface to top of hole (mm) (A)	500	500	500
Depth from ground surface to base of hole (mm) (B)	900	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

Date and Time pre-soaking started	04/09/2019 10:30	04/09/2019 10:30	04/09/2019 10:30
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Each hole should be pre-soaked twice before the test is carried out. Each hole should be empty before refilling.

Step 3: Measuring T_{100}

Percolation Test Hole No.

	1	2	3
Date of test	05/09/2019	05/09/2019	05/09/2019
Time filled to 400 mm	09:10	09:10	09:10
Time water level at 300 mm	12:45	12:30	12:30
Time to drop 100 mm (T_{100})	215.00	200.00	200.00
Average T_{100}			205.00

If $T_{100} > 300$ minutes then T-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	12:45	17:00	255.00	12:30	16:15	225.00	12:30	16:15	225.00
2	17:00	22:30	330.00	16:15	21:00	285.00	16:15	20:30	255.00
3	22:30	04:00	330.00	21:00	01:45	285.00	20:30	00:45	255.00
Average Δt Value			305.00			265.00			245.00
	Average $\Delta t/4 =$ [Hole No.1] 76.25 (t_1)			Average $\Delta t/4 =$ [Hole No.2] 66.25 (t_2)			Average $\Delta t/4 =$ [Hole No.3] 61.25 (t_3)		

Result of Test: $T = 67.92$ (min/25 mm)

Comments:

$T = 68 >$ site suitable for development

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

Percolation Test Hole No.	1				2				3			
Fall of water in hole (mm)	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	T - Value $= 4.45 / K_{fs}$	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	T - Value $= 4.45 / K_{fs}$	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	T - Value $= 4.45 / K_{fs}$
300 - 250	8.1				8.1				8.1			
250 - 200	9.7				9.7				9.7			
200 - 150	11.9				11.9				11.9			
150 - 100	14.1				14.1				14.1			
Average T- Value	T- Value Hole 1= (t_1) 0.00				T- Value Hole 1= (t_2) 0.00				T- Value Hole 1= (t_3) 0.00			

Result of Test: $T = 0.00$ (min/25 mm)

Comments:

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3.3(b) Percolation ("P") Test for Shallow Soil / Subsoils and/or Water Table

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	400.00	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

Date and Time pre-soaking started	04/09/2019 10:30	04/09/2019 10:30	04/09/2019 10:30
-----------------------------------	------------------	------------------	------------------

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

Step 3: Measuring P_{100}

Percolation Test Hole No.	1	2	3
Date of test	05/09/2019	05/09/2019	05/09/2019
Time filled to 400 mm	09:10	09:10	09:10
Time water level at 300 mm	10:30	10:10	10:15
Time to drop 100 mm (P_{100})	80.00	60.00	65.00
Average P_{100}	68.33		

If $P_{100} > 300$ minutes then P-value > 90 – site unsuitable for discharge to ground

If $P_{100} \leq 210$ minutes then go to Step 4;

If $P_{100} > 210$ minutes then go to Step 5;

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

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)
1	10:30	12:30	120.00	10:10	11:15	65.00	10:15	11:15	60.00
2	12:30	14:45	135.00	11:15	12:45	90.00	11:15	12:30	75.00
3	14:45	17:30	165.00	12:45	14:45	120.00	12:30	14:00	90.00
Average Δp Value			140.00			91.67			75.00
	Average $\Delta p/4 =$ [Hole No.1] 35.00 (p_1)			Average $\Delta p/4 =$ [Hole No.2] 22.92 (p_2)			Average $\Delta p/4 =$ [Hole No.3] 18.75 (p_3)		

Result of Test: $P = 25.56$ (min/25 mm)

Comments:

$P = 26$ and $T = 68 >$ site suitable for development

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

Percolation Test Hole No.	1				2				3			
Fall of water in hole (mm)	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	P - Value $= 4.45 / K_{fs}$	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	P - Value $= 4.45 / K_{fs}$	Time Factor $= T_f$	Time of fall (mins) $= T_m$	$K_{fs} = T_f / T_m$	P - Value $= 4.45 / K_{fs}$
300 - 250	8.1				8.1				8.1			
250 - 200	9.7				9.7				9.7			
200 - 150	11.9				11.9				11.9			
150 - 100	14.1				14.1				14.1			
Average P- Value	P- Value Hole 1= (p_1) 0.00				P- Value Hole 1= (p_2) 0.00				P- Value Hole 1= (p_3) 0.00			

Result of Test: $P = 0.00$ (min/25 mm)

Comments:

SB19/9/19

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, bedrock.
3. North point should always be included.
4. (a) 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. Cross sectional drawing of the site and the proposed layout¹ should be submitted.
6. Photographs of the trial hole, test holes and site (date and time referenced).

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.

Not Suitable for Development ☐

Suitable for ¹

1. Septic tank system (septic tank and percolation area) ☐

2. Secondary Treatment System

a. septic tank and filter system constructed on-site and polishing filter; or ☐

b. packaged wastewater treatment system and polishing filter ☐

Discharge Route

Discharge to Ground Water ☐

5.0 RECOMMENDATION

Propose to install:

and discharge to:

Trench Invert level (m):

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

A treatment system should meet the requirements of I.S. EN 12566-3:2005 Small Wastewater treatment Systems for up to 50 PT- Part 3: Packaged and/or Site Assembled Domestic Wastewater Treatment Plants. The effluent from the packaged system should be treated on a polishing filter where the final discharge is to groundwater and constructed on top of the in-situ soil as follows:

Option 1 - Pumped discharge

The treated wastewater from the secondary treatment unit is pumped to a manifold and percolation pipes using typically 32mm diameter laterals with 4-6mm diameter orifices (0.6m apart) at 0.6m spacing between laterals facing downwards over a 250-mm layer of gravel. The detail design should conform to best practice as outlined in design manuals. The loading rates should conform to those listed in Table 10.1 page 44 of the Code of Practice manual for Wastewater Treatment and Disposal Systems Serving Single Houses. Surface area of Polishing Filter given on the following page was calculated using T values of 51 - 75 for 5 DPE.

Option 2 - Gravity discharge

In the case of loading a percolation area with a P-value of 3 - 75 through percolation trenches, a greater area of polishing filter than for option 1 is required. The length of percolation trench in a polishing filter for secondary-treated wastewater from a five person household for the different percolation values is shown in Table 10.1 page 44 of the Code of Practice manual for Wastewater Treatment and Disposal Systems Serving Single Houses. Treated wastewater from the secondary filter should flow by gravity to a distribution box, which distributes the flow evenly into the several trenches which should be 500mm wide at 2-m spacing (2.5 m centre to centre and designed according to the criteria given in Table 7.3 of the Code of Practice manual for Wastewater Treatment and Disposal Systems Serving Single Houses, with the exception that the maximum length of each trench should not exceed 10m. The number of trenches and length of trenches given on the following page was calculated using T values of 51 - 75 for 5 DPE.

¹ note: more than one option may be suitable for a site and this should be recorded

² 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 2.6.2.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank System

Tank Capacity (m ³) <input style="width: 80px;" type="text"/>	Percolation Area	Mounded Percolation Area
	No. of Trenches <input style="width: 80px;" type="text"/>	No. of Trenches <input style="width: 80px;" type="text"/>
	Length of Trenches (m) <input style="width: 80px;" type="text"/>	Length of Trenches (m) <input style="width: 80px;" type="text"/>
	Invert Level (m) <input style="width: 80px;" type="text"/>	Invert Level (m) <input style="width: 80px;" type="text"/>

SYSTEM TYPE: Secondary Treatment System

Filter Systems

Media Type	Area (m ²)*	Depth of Filter	Invert Level
Sand/Soil	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Soil	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Constructed Wetland	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Other	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>

Package Treatment Systems

Type <input style="width: 200px;" type="text"/>
Capacity PE <input style="width: 100px;" type="text"/>
Sizing of Primary Compartment <input style="width: 100px;" type="text"/> m ³

SYSTEM TYPE: Tertiary Treatment System

Polishing Filter: Surface Area (m ²)* <input style="width: 80px;" type="text" value="250.00"/> or Gravity Fed: No. of Trenches <input style="width: 80px;" type="text"/> Length of Trenches (m) <input style="width: 80px;" type="text"/> Invert Level (m) <input style="width: 80px;" type="text"/>	Package Treatment System: Capacity (pe) <input style="width: 80px;" type="text"/> Constructed Wetland: Surface Area (m ²)* <input style="width: 80px;" type="text"/>
--	---

DISCHARGE ROUTE:

Groundwater	<input checked="" type="checkbox"/>	Hydraulic Loading Rate * (l/m ² .d)	<input style="width: 100px;" type="text"/>
Surface Water **	<input type="checkbox"/>	Discharge Rate (m ³ /hr)	<input style="width: 100px;" type="text"/>

TREATMENT STANDARDS:

Treatment System Performance Standard (mg/l)	BOD	SS	NH ₄ - N	Total N	Total P
<input style="width: 350px;" type="text"/>	<input style="width: 60px;" type="text"/>	<input style="width: 60px;" type="text"/>	<input style="width: 60px;" type="text"/>	<input style="width: 60px;" type="text"/>	<input style="width: 60px;" type="text"/>

QUALITY ASSURANCE:

Installation & Commissioning

On-going Maintenance

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

** Water Pollution Act discharge licence required

7.0 SITE ASSESSOR DETAILS

Company: Laois County Council

Prefix:

Ms.

First Name:

Antoinette

Surname:

Brennan

Address:

Aras an Chontae,
Portlaoise,
Co. Laois

Qualifications/Experience:

Executive Technician

Date of Report:

18/09/2019

Phone:

057 86 64000

Fax:

057 86 22491

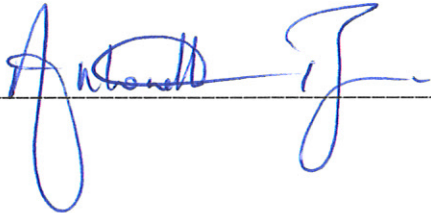
e-mail

anbrennan@laoiscoco.ie

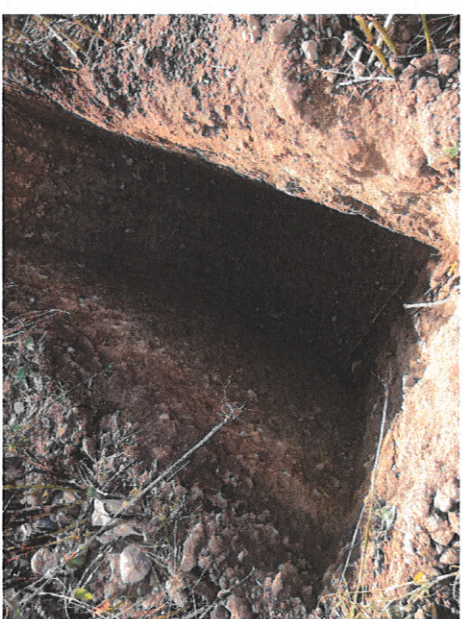
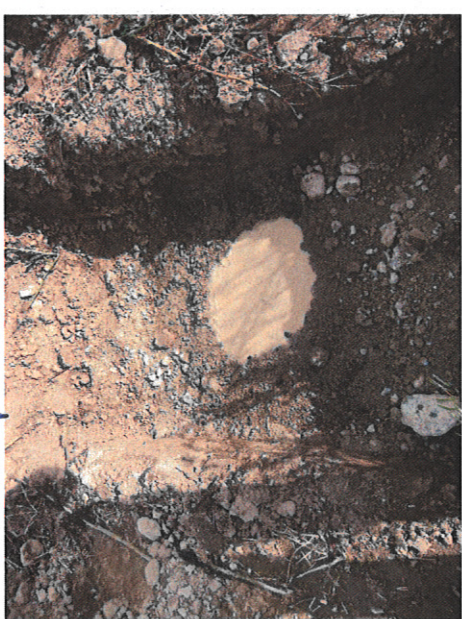
Indemnity Insurance Number:

E/010192/072

Signature:

A handwritten signature in blue ink, appearing to read 'Antoinette Brennan', is written over a horizontal dashed line.

SSA 19/11/17 FOR LAOS COUNTY COUNCIL @ COOLROE BALLYBRITTAS. 5/9/19.



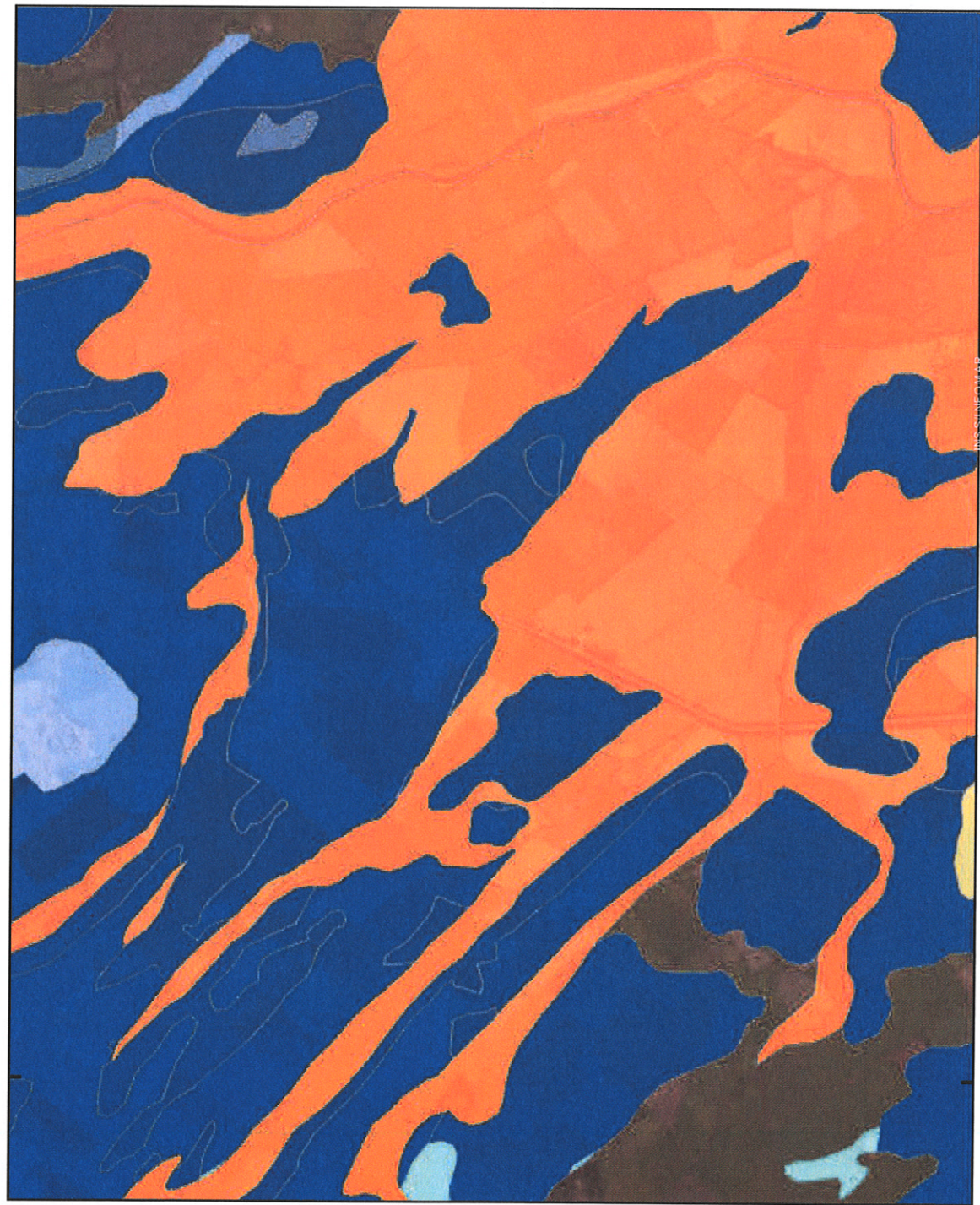
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A TRUE COPY 5/9/19



Red Flag Hill
very green

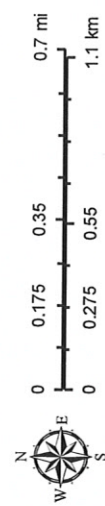
Soils Map for SSA 19 - 117 Laois Co Co Coolroe.

660000



660000

Scale: 1:25,000
Geological Survey Ireland



Map Centre Coordinates (ITM) 661 855 703 902
18/09/2019 15:32:28



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Legend

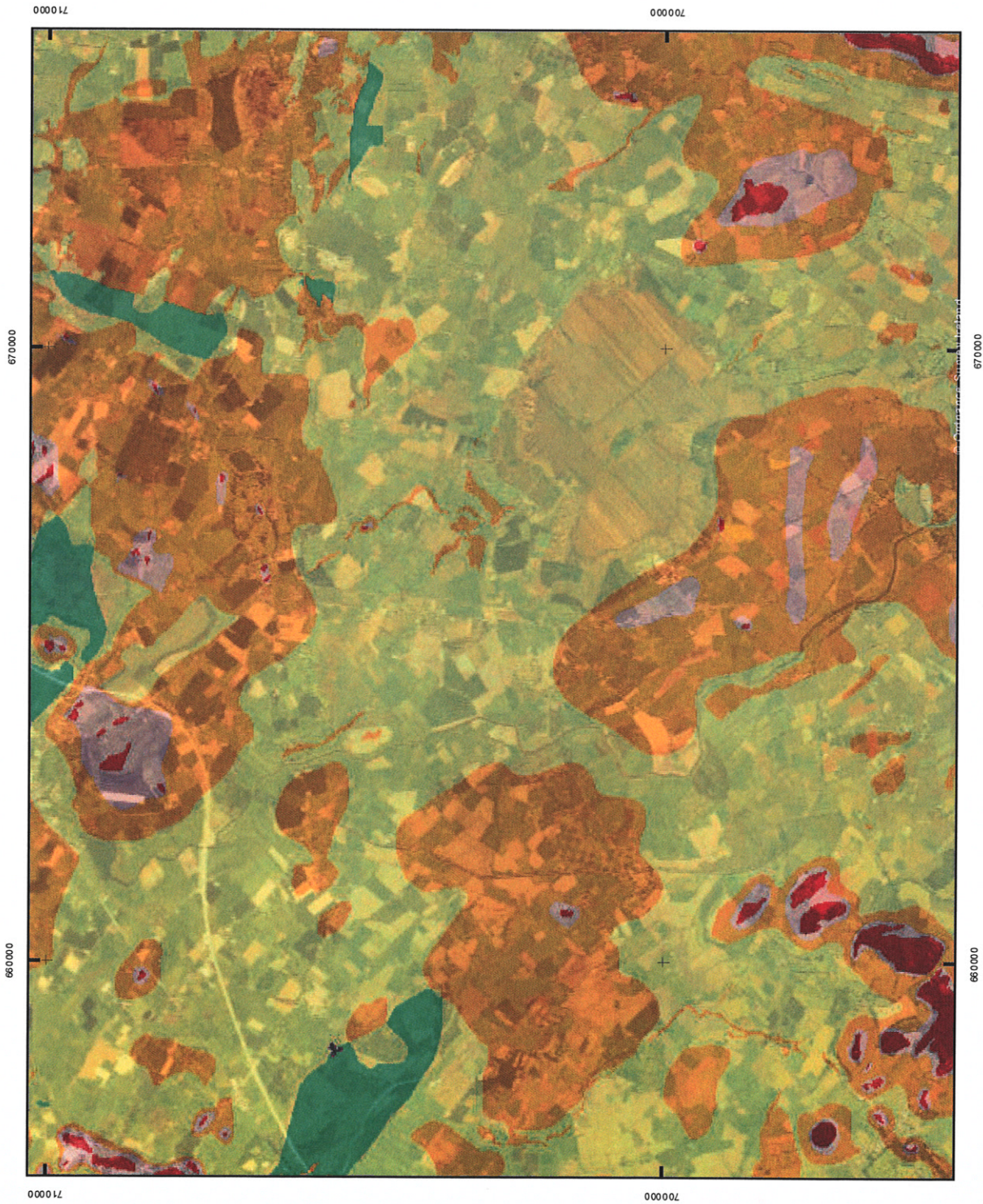
- Teagasc Soils**
- AminDW - Deep well drained mineral (Mainly acidic)
 - AminPD - Mineral poorly drained (Mainly acidic)
 - AminPDPT - Peaty poorly drained mineral (Mainly acidic)
 - AminSW - Shallow well drained mineral (Mainly acidic)
 - AminSP - Shallow poorly drained mineral (Mainly acidic)
 - AminSPPT - Shallow peaty poorly drained mineral (Mainly acidic)
 - AminSRPT - Shallow, rocky, peaty/non-peaty... 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... complexes (Mainly basic)
- Other Soils**
- BminSRPT - Shallow, rocky, peaty/non-peaty... complexes (Mainly basic)
 - BktPt - Blanket peat
 - FenPt - Fen peat
 - RsPt - Raised Peat
 - Cut - Cutover/cutaway
 - peat
 - AlluvMIN - Alluvial (mineral)
 - AlluvMRL - Alluvial (marl)
 - Lac - Lacustrine type soils
 - Scree - Scree
 - AeoUND - Aeolian undifferentiated
 - MarSands - Marine sand and gravel
 - MarSed - Marine/estuarine sediments
 - Made - Made ground
 - Water - Water
 - Unclass

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Vulnerability Map for SSA 19 - 117 Laois Co Co Coolroe

Legend National Groundwater Vulnerability Ireland

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



Scale: 1:100,000

Geological Survey Ireland

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Map Centre Coordinates (ITM) 665,835 702,788
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S 31/9/19

Bedrock Map - SSA 19/117 - Laois Co. Co. Coolroe

66 0000



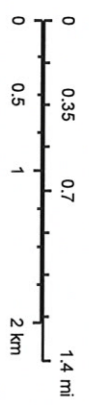
66 0000

Scale: 1:50,000

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Legend

- GSI Ireland Bedrock
- Faults 1:1,000,000

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SD 19/117

Aquifer Map - SSA 19/117 - Laois Co. Co. Coolroe

660000



660000

Scale: 1:50,000

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Legend

Gravel Aquifer

Locally important

gravel aquifer

Regionally important

Bedrock Aquifer

Faults

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

LI - 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

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