

Water Framework Directive Groundwater Monitoring Programme

Site Information **Ballinakill 2 PWS**



Ballinakill (BH A) is part of the Fermoy WS. It is a 26.7m deep borehole situated in Dinantian Lower Impure Limestones and is used as a public water supply. The abstraction rate is 200m³/day. It is located next to Borehole B which supplies Durrow - separate Site Folder (Durrow).



Laois

August 2011

SITE INFORMATION					
Site Name:	Ballinakill 2 PWS		County:	Laois	
RBD:	SERBD		EU Reporting Code:	---	
Easting:	242852		GWB Name:	Durrow	
Northing:	179121		GWB Code:	IE_SE_G_059	
Site Use:	Drinking Water Supply		Drinking Water Code:	1600PUB1101	
Hydrometric Area:	15		Water Level Monitoring Network:	Level	Flow
Townland:	Fermoyle			N	N
Ownership:	Laois County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		N
Site Comments:	---				
SITE DIRECTIONS					
Location and Access Information:	From Dublin, take the Old N8 to Durrow, taking a left at Atleys Xrds for Ballinakill about 2.3km before reaching Durrow. Site is 300m on the RHS. Wells and pumphouse in fenced compound adjacent to road. From Durrow, drive toward Dublin on the n8 for 2.3km, take a right at Atleys xrds.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	Borehole	Abstraction Rate (m³/d):	200	Ground Elevation (m OD):	80
Borehole Log Available:	---	Total Drilled Depth (m bgl):	26.7	Depth to Bedrock (m bgl):	8.2
Top of Casing (m agl):	-1.26	Upper Casing Diameter (mm):	420	Lower Casing Diameter (mm):	260
Final Borehole Depth (m):	---	Upper Casing Bottom Depth (m bgl) :	---	Lower Casing Bottom Depth (m bgl):	---
Screen Interval (m bgl):	---	Screen Type (PVC,Steel,other):	PVC 190mm	Screen Slot Size (mm):	---
Grout Type (cement,bentonite):	---	Grouted above (m bgl):	---	Grout Volume Injected (m³):	---
Gravel Pack Interval (m bgl):	---	Gravel Pack Volume (m³):	---	Open Hole Interval (m bgl):	---
Potential Yield (m³/day):	920	Comments on Monitoring Site:	30 year old borehole. Drilled depth reported to be 27m. Site visit plumbed to 18m - unsure of total depth. The wells are not capped but both chambers are covered and padlocked. Smell of landspreading nearby. Pump at 50ft. Pumping water level 4.4btoc, November 2010. The sampling tap in the pumphouse - it is not clear if it is linked to one or both boreholes on site.		
Specific Capacity (m³/d/m):	994				
Static Water Level (m bgl):	3.8				
Scheme Name:	Ballinakill 2	Number of Abstraction Points in the Scheme:	1	Source Report Available	Y
Source Report Info:	Report by GSI on Durrow and Fermoyle (2000), covers this borehole.				
Scheme Summary:	Ballinakill 2 is served by a borehole (this site folder) in Fermoyle - called Well A which is adjacent to Well B - which feeds into Durrow.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep poorly drained mineral (BminPD)					Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictos) (TLs)						
	Bedrock:	Dinantian Pure Bedded Limestones						
HYDROGEOLOGY	Aquifer Category:	Rkd	Vulnerability at Monitoring site:	High	Flow Regime:	Karstified		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	0.65	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	430		
	ZOC Delineation Comments:	Durrow PWS (Fermoyle Well-B) is an abstraction in an Rkd aquifer. The ZOC delineated is for Fermoyle Well-B (Durrow WS) and Fermoyle Well-A (Ballinakill 2). The ZOC for the two Fermoyle boreholes is based on recharge, abstraction and topography and the abstraction used for the ZOC is based on GSI source report figure, 150% of 440m³/day abstraction from year 2000, to give figure of 660m³/day. The ZOC area of 0.64 km² with an estimated recharge of 430 mm/yr provided 280% of the abstraction figure. The current average combined abstraction for the two wells is 570m³/day.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	42.09	22.64	34.3	0.98	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	---		Additional Water Chemistry Information:	The groundwater samples indicate a 'very hard' (399-409 mg/l CaCO3) calcium-bicarbonate hydrochemical signature. High nitrates and elevated chlorides are also indicative of significant organic contamination occurring within the groundwater system. The average				
Alkalinity (mg/l HCO3):	Average:	Range:						
	323	210-420						
Hardness (mg/l CaCO3):	Average:	Range:						
	427	290-768						
Conductivity (uS/cm):	Average:	Range:						
	770	678-832						
Monitoring Record Period:	From:	To:						
	---	---						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Phosphates		Typical Contaminants:	---				
Risk Category:	At risk, high confidence		GWB Status:	Good				
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	6.30	93.20	0.70	0.00	0.00			
OTHER INFORMATION								



Pump House



Well Head



Sampling Point

Data Summary Sheet - July 2011

Disclaimer: The data in this document are based on the best available information and understanding at time of writing. Neither the Environmental Protection Agency, nor the individual bodies supplying data for this document and accompanying maps will be responsible for any loss or damage from the use or interpretation of these data.

Rock Unit Geology Map: GSI, 2009

Aquifer Type Map: GSI, 2009

Groundwater Vulnerability Map: GSI, 2009

Soils & Subsoils Type: Teagasc, 2007

Recharge Map: GSI, 2009

Impact Potential Map: EPA, 2009

Risk Assessment Map: EPA WFD Risk Assessment, 2006

Groundwater Body Status: EPA WFD Status Assessment, 2008

Water Quality Data: EPA WFD Monitoring, 2008

Groundwater Threshold Values

Groundwater threshold values for selected parameters:

Nitrate - General Chemical Test/ Drinking Water Test (37.5 mg/l NO₃)

Ammonium - Drinking Water Test (0.175 mg/l N) / Surface Water Test (0.065 mg/l N)

Molybdate Reactive Phosphorus (MRP) - Surface Water Test (0.035 mg/l P)

Chloride -Saline/Intrusive Test (24 mg/l) / Drinking Water Test (175 mg/l Cl)

Electrical Conductivity -Saline/Intrusive Test (800 µS/cm) / Drinking Water Test (1,875 µS/cm)

Further information on groundwater threshold values is contained in the Groundwater Regulations (S.I. No.9 of 2010).

General Downgradient Distances

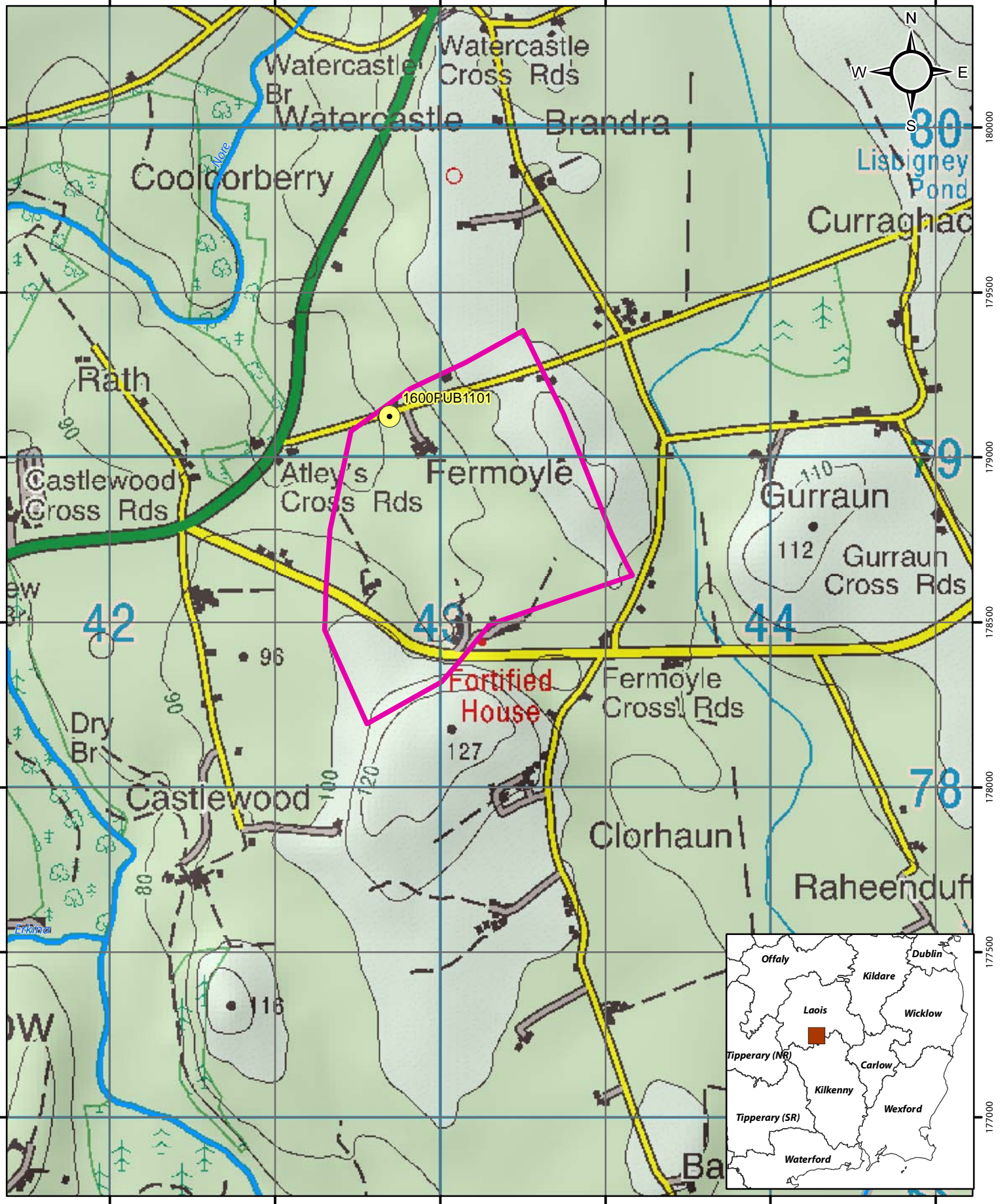
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

Rk, Rkd, Lk	225 m
Lm	150 m
Ll, Pl	60 m

It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient side.

Version 0:	Prepared by	GSI	Date:	01/11/2000
Version 1:	Prepared by	Tobin (OMA)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

242000 242500 243000 243500 244000 244500



Location Map for Ballinakill 2 PWS

- Abstractions
- ▭ Zone of Contribution
- River

242000

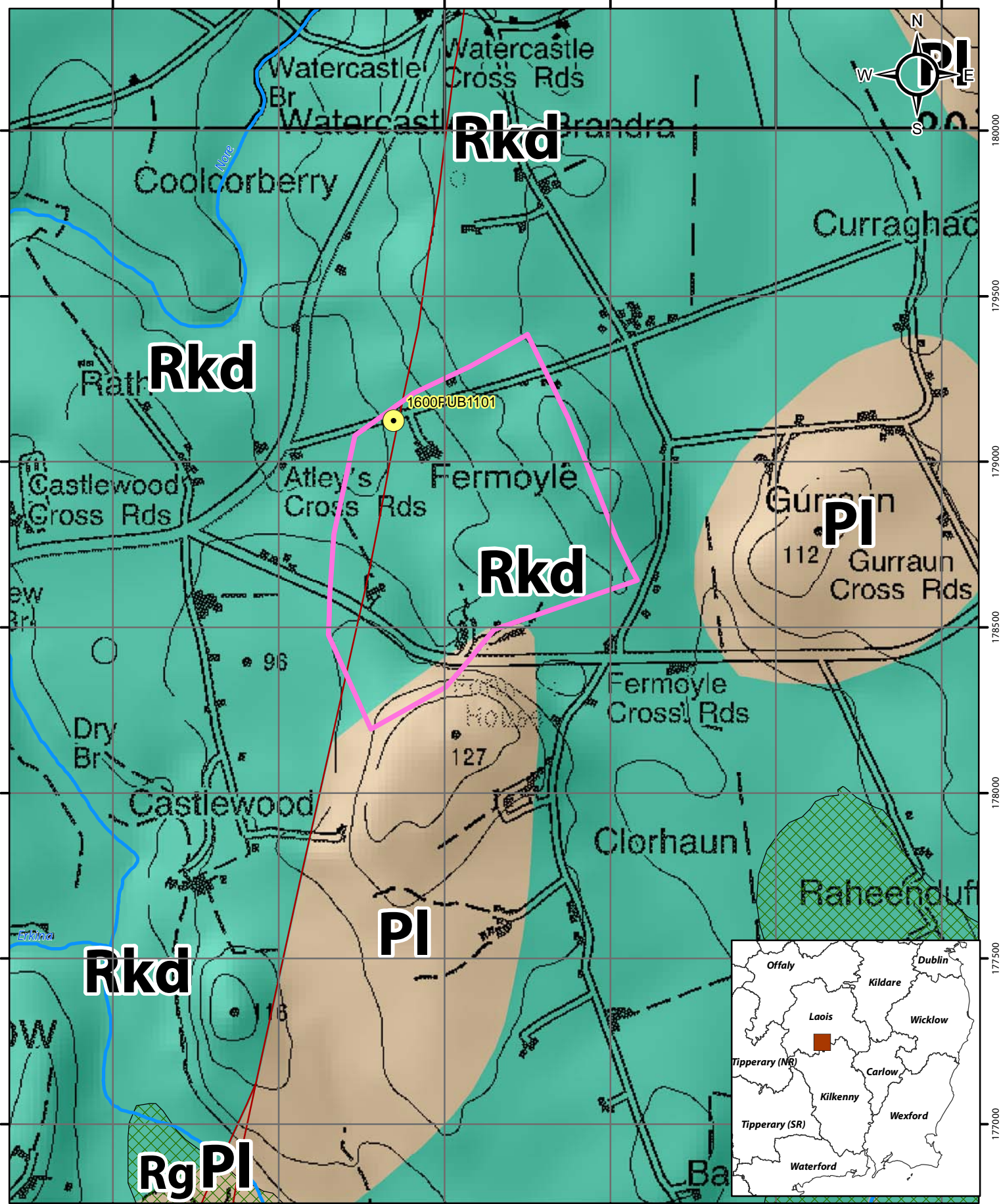
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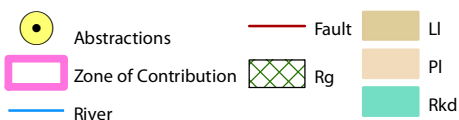
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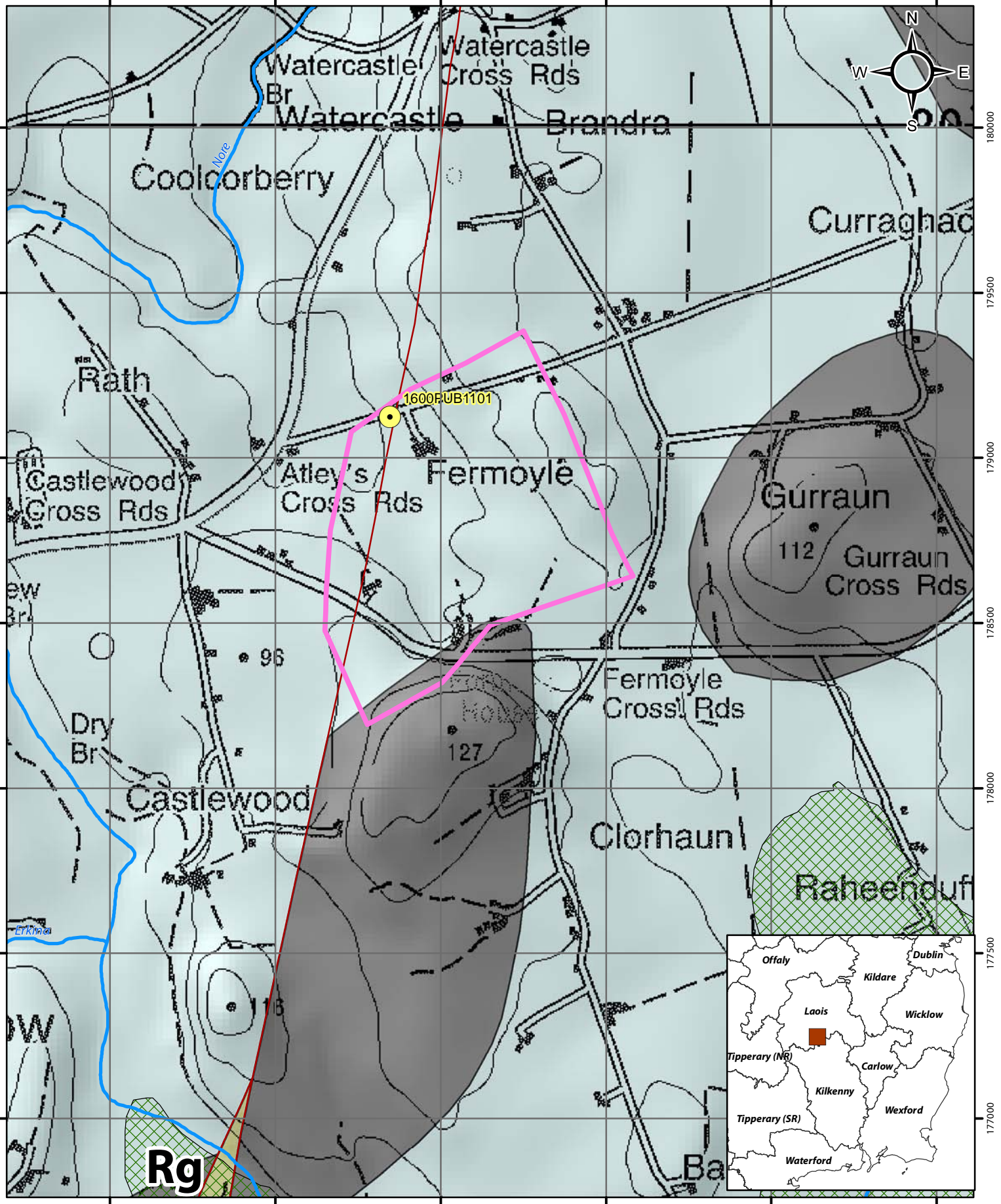
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Aquifer Category Map for Ballinakill 2 PWS



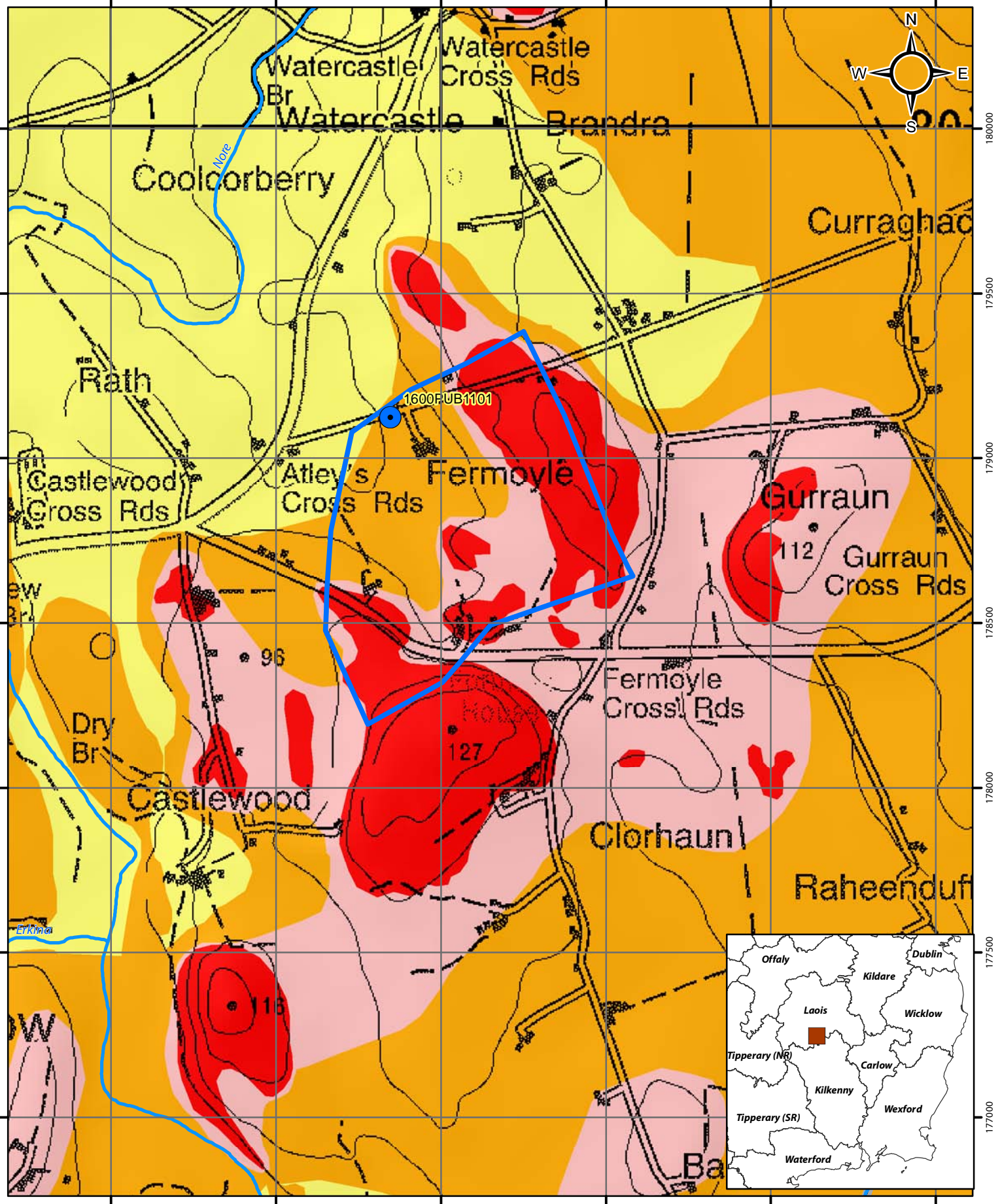
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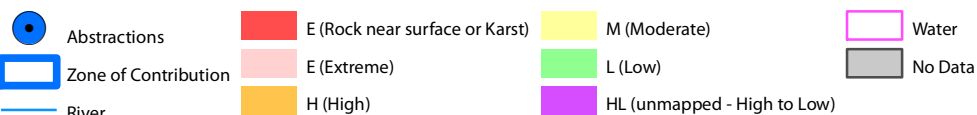
Bedrock Map for Ballinakill 2 PWS

- Abstractions
- Zone of Contribution
- River
- Fault
- Dinantian Pure Bedded Limestones
- Dinantian Upper Impure Limestones
- Namurian Sandstones
- Namurian Shales
- Rg

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Groundwater Vulnerability Map for Ballinakill 2 PWS



242000

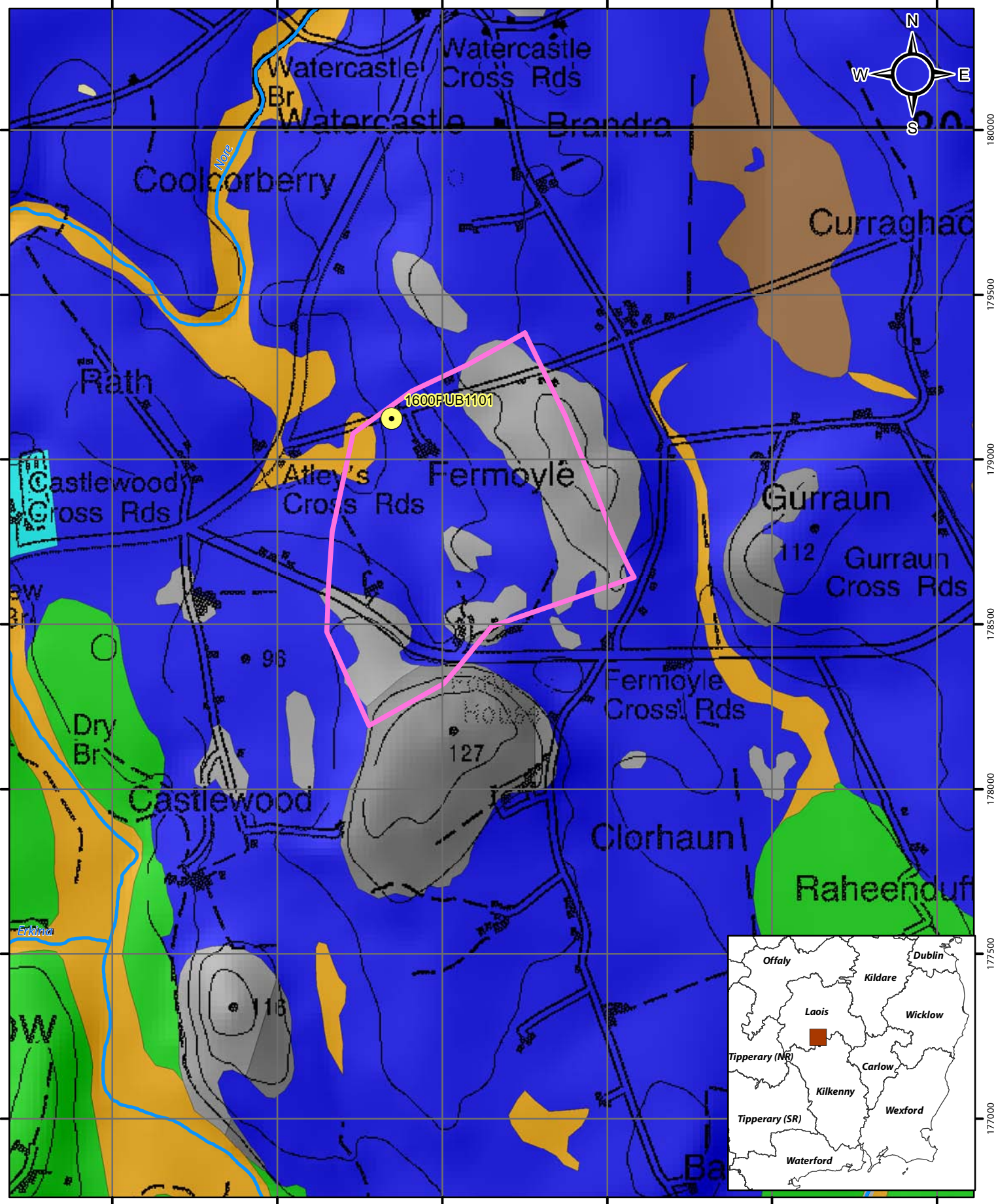
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Subsoils Map for Ballinakill 2 PWS



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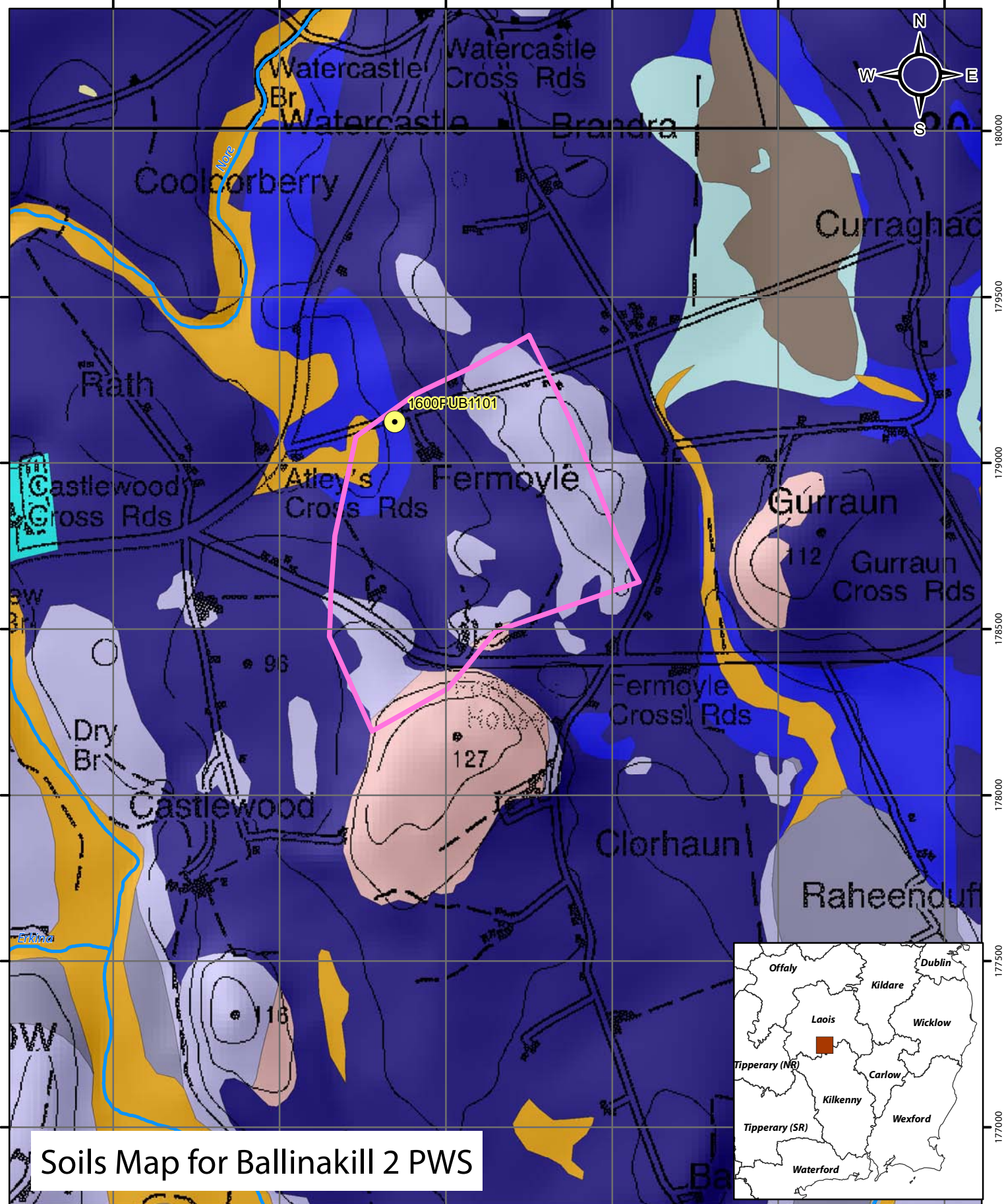
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Soils Map for Ballinakill 2 PWS

- | | | | |
|----------------------|-------------------------------------|--------------------------------------|----------------------|
| Abstractions | Acid Shallow Well Drained Mineral | Basic Poorly Drained Peaty Mineral | Cutover/Cutaway Peat |
| Zone of Contribution | Acid Shallow Poorly Drained Mineral | Basic Shallow Well Drained Mineral | Mineral Alluvium |
| River | Acid Shallow/Rocky/Peaty Mineral | Basic Shallow Poorly Drained Mineral | Lacustrine |
| | Basic Deep Well Drained Mineral | Basic Shallow/Rocky/Peaty Mineral | Made |
| | Basic Deep Poorly Drained Mineral | Fen Peat | |