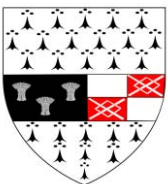


Water Framework Directive Groundwater Monitoring Programme

Site Information **Graiguenamanagh**



Graiguenamanagh consists of four springs used as a public water supply. The combined abstraction rate with the river intake is 650m³/day.



Kilkenny

August 2011

SITE INFORMATION					
Site Name:	Graiguenamanagh		County:	Kilkenny	
RBD:	SERBD		EU Reporting Code:	IE_SE_G_103_10_010	
Easting:	270600		GWB Name:	New Ross_S	
Northing:	141301		GWB Code:	IE_SE_G_103	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	1500PUB1008	
Hydrometric Area:	14		Water Level Monitoring Network:	Level	Flow
Townland:	BALLYOGAN			N	Y
Ownership:	Kilkenny County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	Graiguenamanagh is spring situated in Granites & other Igneous Intrusive rocks and is used as a public water supply. The abstraction rate is 600m³/day. The spring is included in the operational chemical network.				

SITE DIRECTIONS	
Location and Access Information:	Located off a minor road 2.2km south of Graiguenamagh. The source comprises four springs, forming a line 230 m long in Ballyogan townland. The springs all lie close to the 170 m contour on the flanks of Brandon Hill, some 1.4 km north east of its peak.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	650	Ground Elevation (m OD):	170
Borehole Log Available:	---	Total Drilled Depth (m bgl):	n/a	Depth to Bedrock (m bgl):	---
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	---	Lower Casing Diameter (mm):	---
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):	---	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):	---	Comments on Monitoring Site:	---		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Graiguenamanagh	Number of Abstraction Points in the Scheme:	5	Source Report Available	Y
Source Report Info:	Source report prepared by GSI in 2002.				
Scheme Summary:	According to a site location map sent to the GSI on 18th April 2002, the source comprises four springs, forming a line 230 m long in Ballyogan town land. The springs all lie close to the 170 m contour on the flanks of Brandon Hill, some 1.4 km north east of its peak. The spring water is mixed with a surface water intake from the River Duikse. The combined abstraction of the springs and the river is 650 m³/d.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (AminDW)					Subsoil Permeability:	n/a
	Subsoil:	Tills (diamictons) (TGr)						
	Bedrock:	Granites & other Igneous Intrusive rocks						
HYDROGEOLOGY	Aquifer Category:	PI	Vulnerability at Monitoring site:	Extreme			Flow Regime:	Poorly productive
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	1.17	ZOC Delineated By:	GSI			Recharge Estimate (mm/yr):	101
	ZOC Delineation Comments:	The GSI delineated a ZOC based on the topographic catchment that is considered to contribute to the source. The discharge of the spring is unknown. See the source report for details.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	97.25	2.75	0	0	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 9 mg/l NO3 and the maximum nitrate concentration was 18 mg/l NO3. The average ammonium concentration was 0.043 mg/l N and the maximum ammonium concentration was 0.17 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.008 mg/l P and the maximum MRP concentration was 0.033 mg/l P. The average chloride concentration was 17.2 mg/l Cl and the maximum chloride concentration was 107 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	37	12-80						
Hardness (mg/l CaCO3):	Average:	Range:						
	30	11-70						
Conductivity (uS/cm):	Average:	Range:						
	109	67-175						
Monitoring Record Period:	From:	To:						
	2007	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	---			Typical Contaminants:	---			
Risk Category:	Not at risk, low confidence			GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	0.00	1.14	0.00	0.00	98.86			
OTHER INFORMATION								



Pump House



Overflow



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 N03)

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).

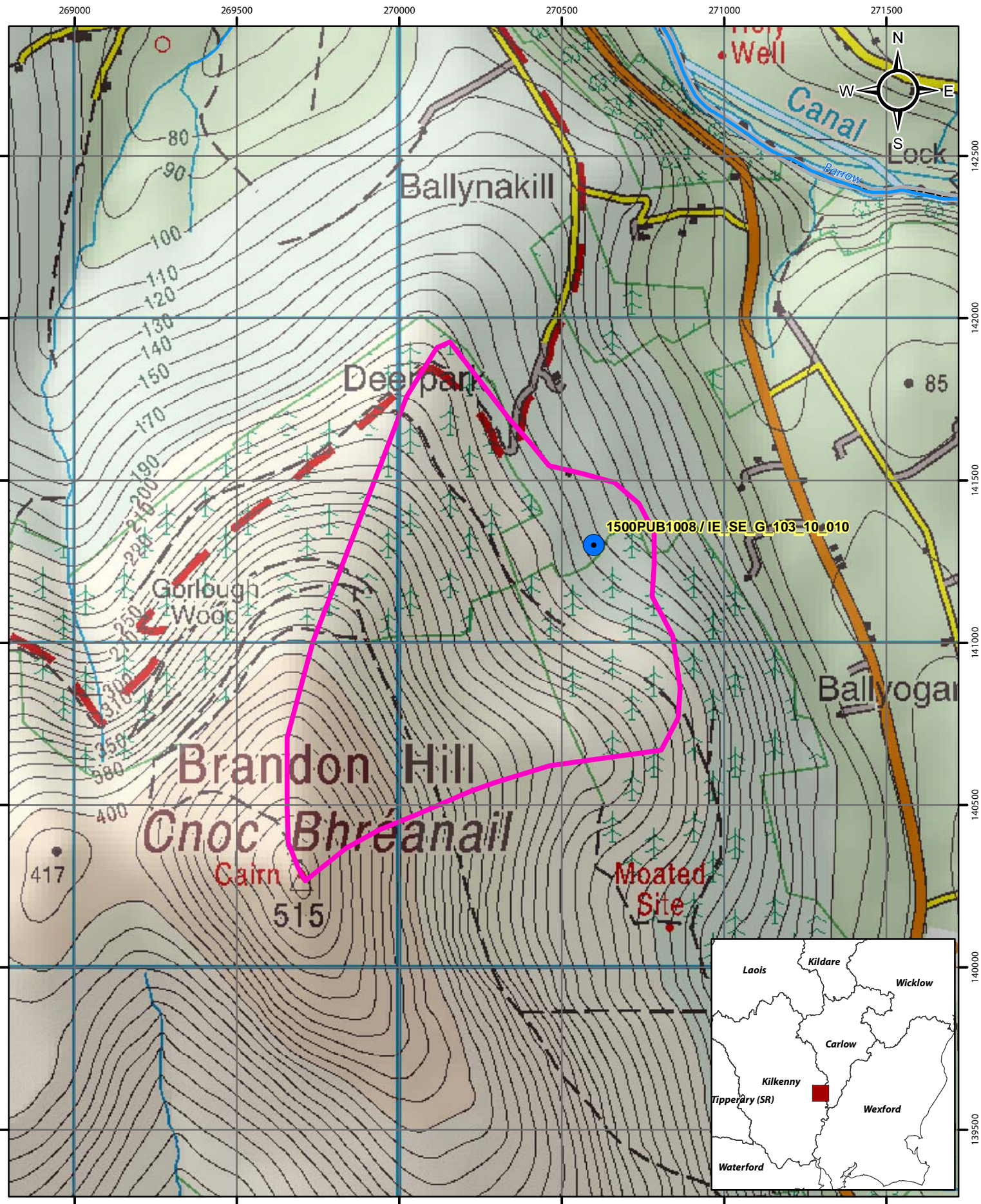
General Downgradient Distances

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
LI, PI	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:	
Version 1:	Prepared by	OCM (DC)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

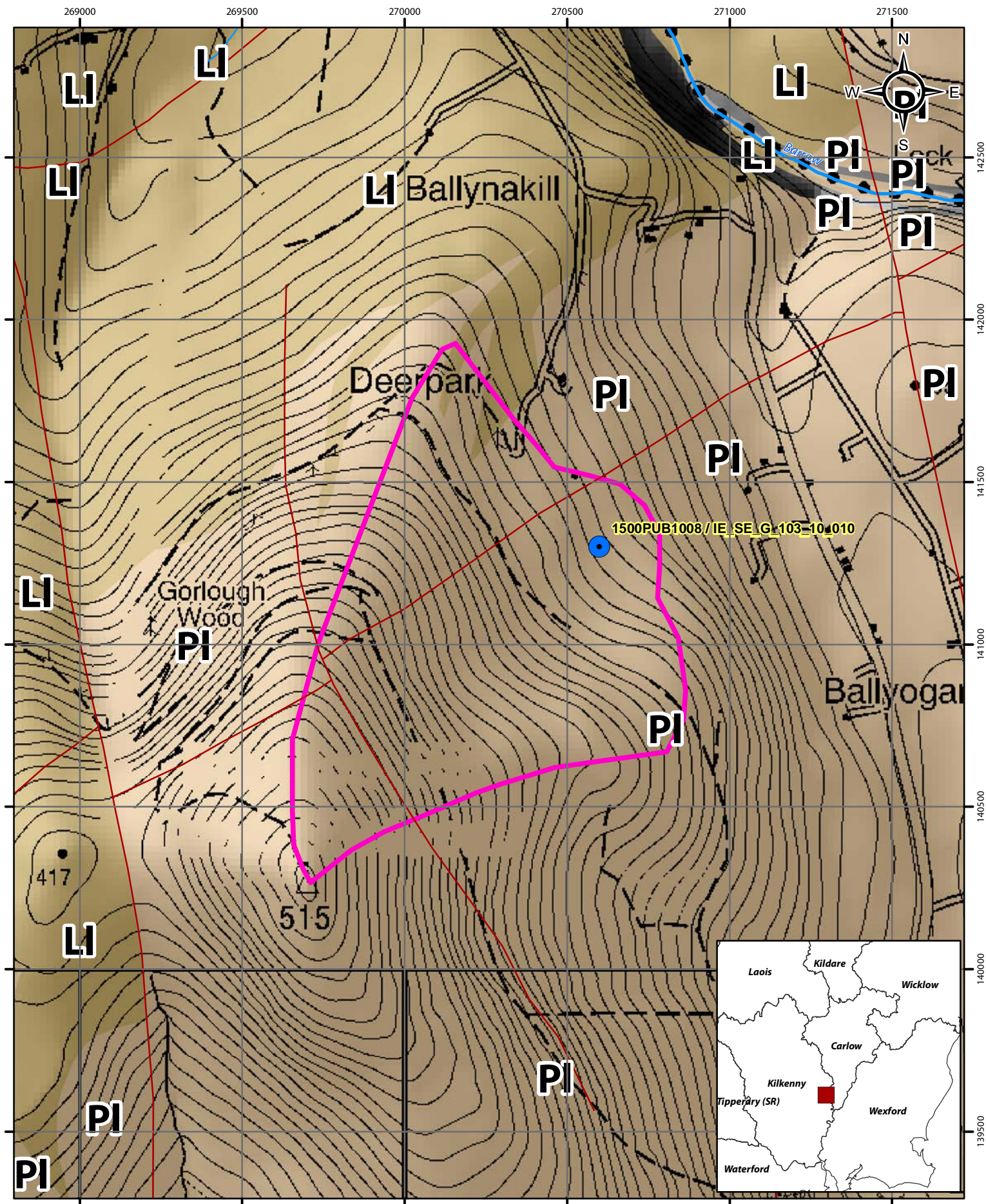


Location Map for Graiguenamanagh







-  Abstractions
-  River
-  Zone of Contribution

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0 0.25 0.5 1 km

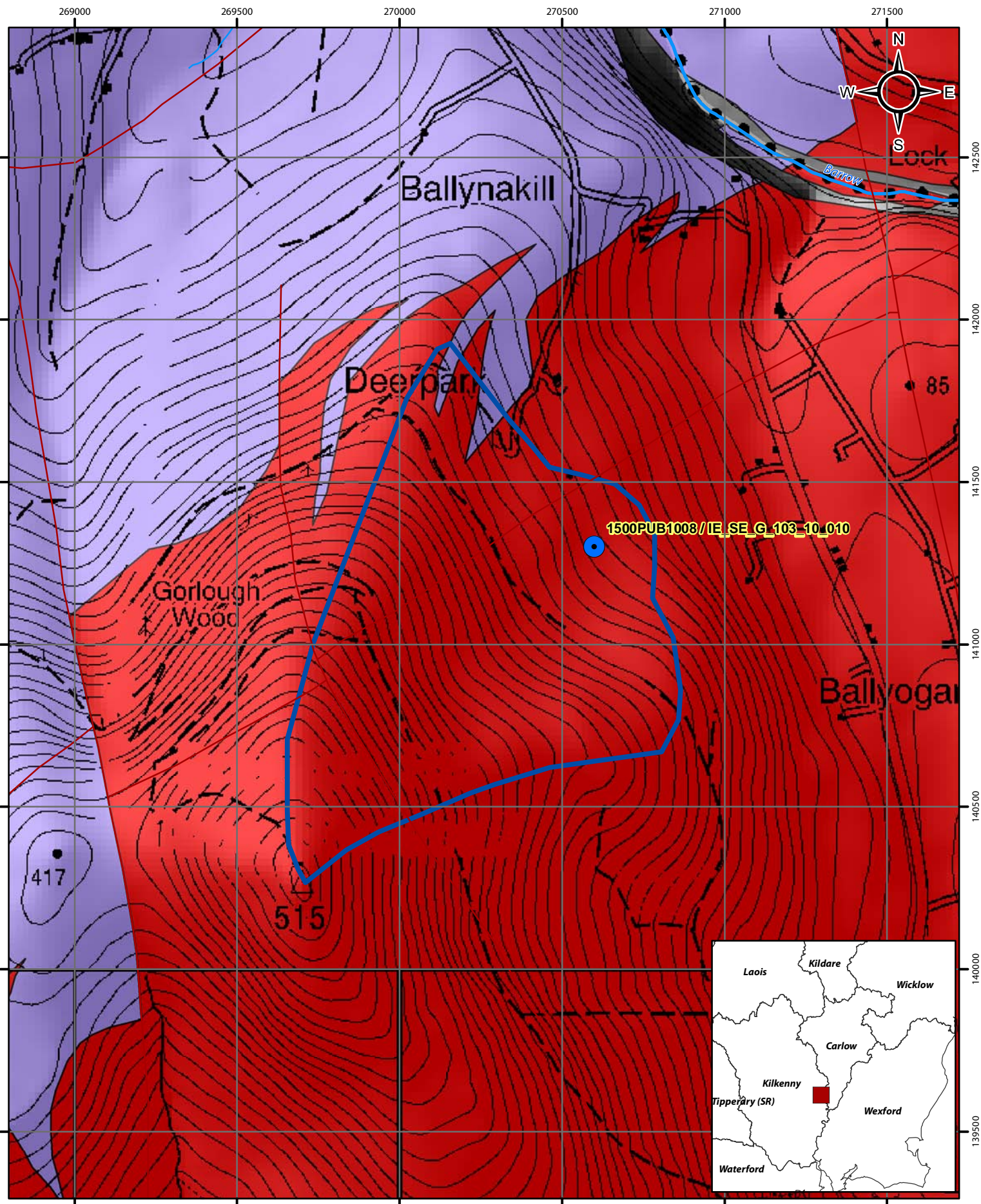


Aquifer Category Map for Graiguenamanagh

-  Abstractions
-  River
-  Zone of Contribution
-  LI
-  PI
-  Fault

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0 0.25 0.5 1 km

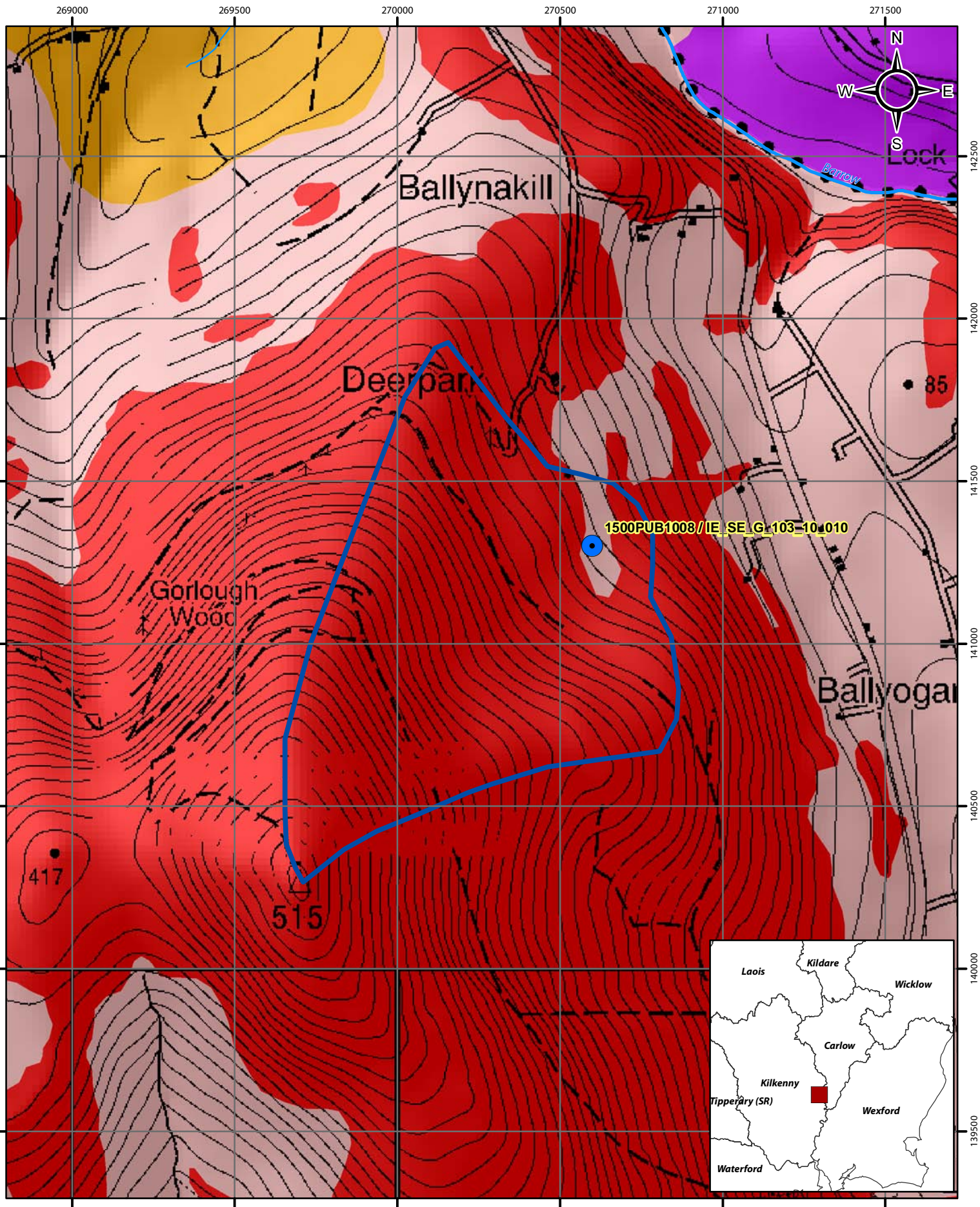


Bedrock Map for Graiguenamanagh

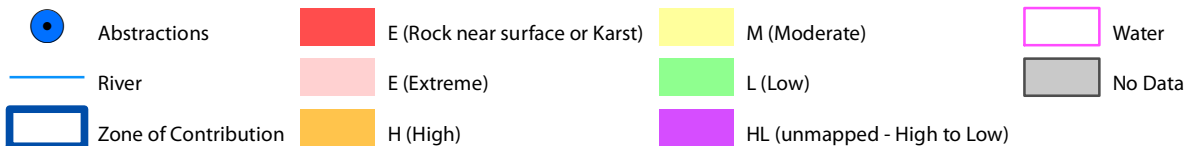
- Abstractions
- Granites & other Igneous Intrusive rocks
- Ordovician Metasediments
- River
- Fault
- Zone of Contribution

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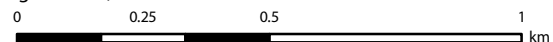
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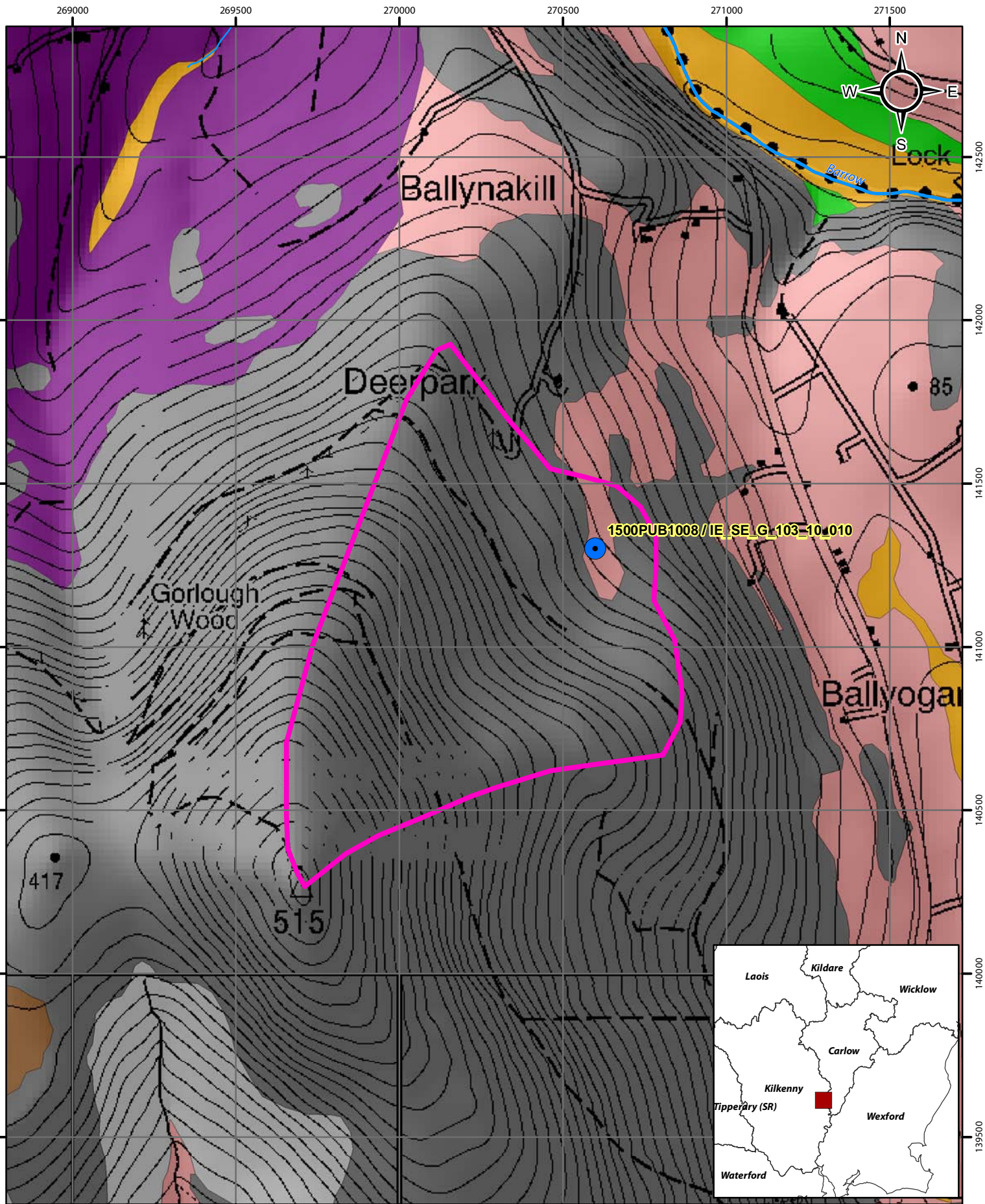


Groundwater Vulnerability Map for Graiguenamanagh

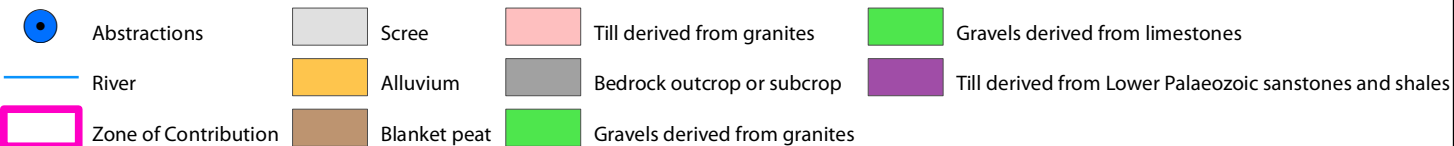


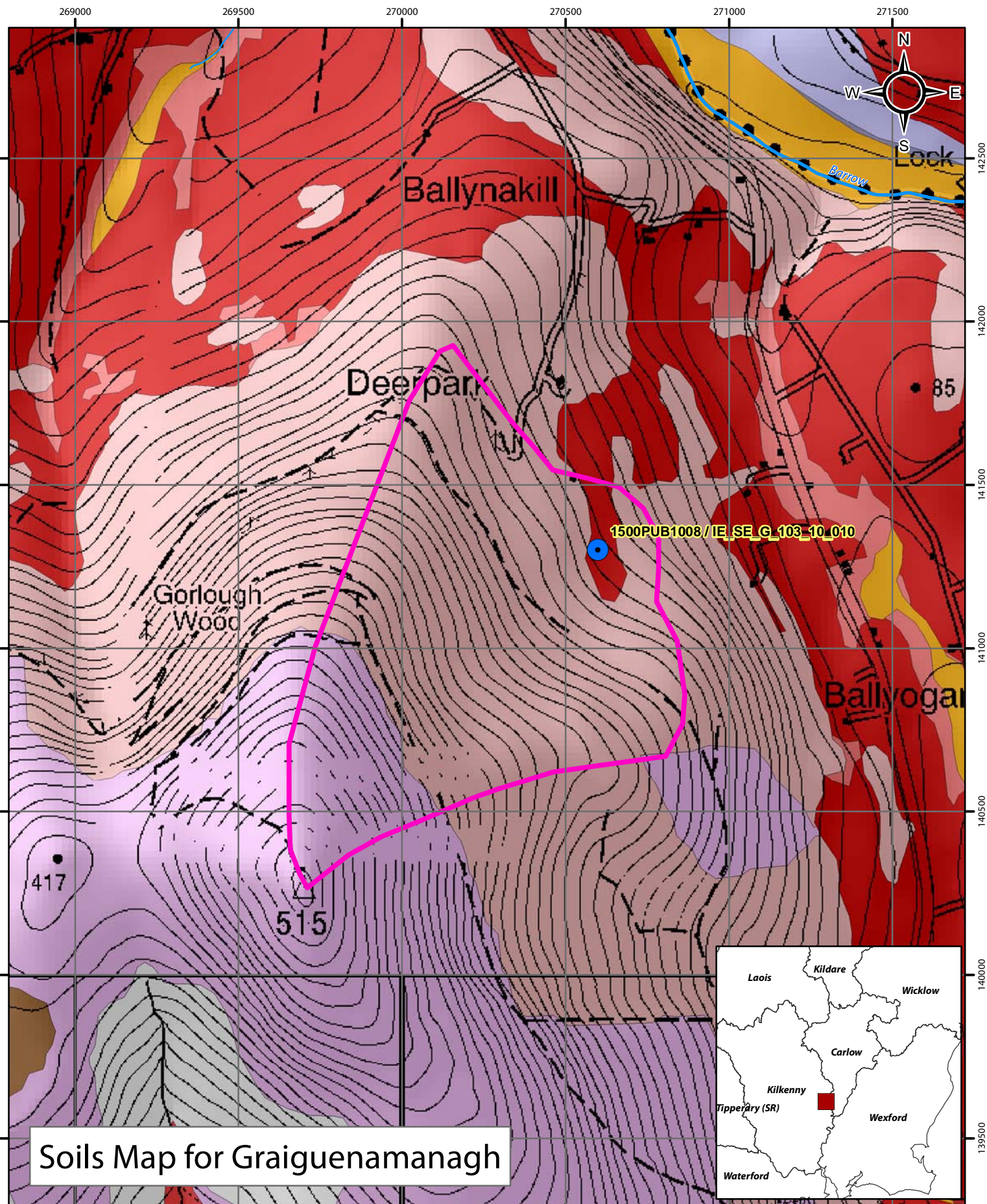
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Subsoils Map for Graiguenamanagh





Soils Map for Graiguenamanagh

