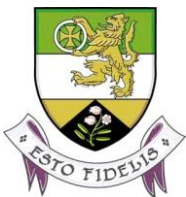

Water Framework Directive
Groundwater Monitoring Programme

Site Information
Clonaslee Borehole - Plant

Clonaslee (Plant) borehole is one of two boreholes, the other being the Clonaslee (Forest) BH. The abstraction from Clonaslee Plant borehole is 130 m³/day, while the abstraction from Clonaslee Forest borehole is 200m³/day; the ZOC has been delineated for the abstraction from the two boreholes.

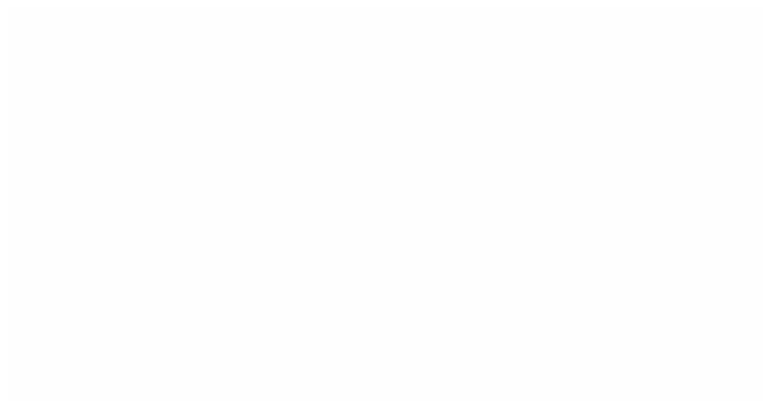


Offaly

August 2011

SITE INFORMATION					
Site Name:	Clonaslee Borehole - Plant		County:	Offaly	
RBD:	Shannon IRBD		EU Reporting Code:	IE_SH_G_066_19_003	
Easting:	231790		GWB Name:	Clonaslee West	
Northing:	210890		GWB Code:	IE_SH_G_066	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2500PUB1020	
Hydrometric Area:	25		Water Level Monitoring Network:	Level	Flow
Townland:	CLONASLEE			N	N
Ownership:	Offaly County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	Clonaslee (Plant) borehole is situated in a Regionally Important Fissured Aquifer (Rf) / Devonian Kiltorcan-type Sandstone. The Clonaslee (Plant) BH is included in the GW surveillance monitoring network.				
SITE DIRECTIONS					
Location and Access Information:	From Dublin, take M7 for Cork and turn off for Mountmellick just before Portlaoise. Drive through Mountmellick for Clonaslee village along the R422. Drive along the main street and take a left up a narrow road, next to a shop (Peavoy) and drive until arrive at Water Treatment Works.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	130	Ground Elevation (m OD):	110
Borehole Log Available:	---	Total Drilled Depth (m bgl):	45	Depth to Bedrock (m bgl):	7.6
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	150	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):	393	Comments on Monitoring Site:	The sample is taken from the BH & is a groundwater only sample. The groundwater supplied from the Clonsalee boreholes is mixed with surface water prior to distribution. Water inflows at 12, 55, 51.		
Specific Capacity (m³/d/m):	14				
Static Water Level (m bgl):	---				
Scheme Name:	Clonaslee	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	Done by WYG				
Scheme Summary:	Clonaslee Borehole - Plant is part of a larger water supply , including Clonaslee Forest which also has a site folder.				

HYDROGEOLOGY							
GEOLOGY	Soil:	Made/Built land (Made)				Subsoil Permeability:	Moderate
	Subsoil:	n.a. (Made)					
	Bedrock:	Devonian Kiltorcan-type Sandstones					
HYDROGEOLOGY	Aquifer Category:	Rf	Vulnerability at Monitoring site:	Moderate	Flow Regime:	Productive fissured bedrock	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	6.7	ZOC Delineated By:	Tobin	Recharge Estimate (mm/yr):	260	
	ZOC Delineation Comments:	Original ZOC delineated for entire well field. The ZOC for Clonaslee (Forest and Plant) is based on the original WYG ZOC, though smaller based on lower abstraction rates and topography. The ZOC is larger than the cumulative abstraction of Forest and Plant (150%).					
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	17.19	21.56	38.15	23.13	0	0	0
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 12 mg/l NO3 and the maximum nitrate concentration was 18 mg/l NO3. The average ammonium concentration was 0.026 mg/l N and the maximum ammonium concentration was 0.118 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.01 mg/l P and the maximum MRP concentration was 0.067 mg/l P. The average chloride concentration was 13.8 mg/l Cl and the maximum chloride concentration was 17 mg/l Cl.			
Alkalinity (mg/l HCO3):	Average:	Range:					
	248	190-340					
Hardness (mg/l CaCO3):	Average:	Range:					
	259	182-292					
Conductivity (uS/cm):	Average:	Range:					
	506	396-577					
Monitoring Record Period:	From:	To:					
	2007	2010					
RISK ASSESSMENT							
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:	Nitrates			
Risk Category:	At risk, low confidence		GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:		
	0.00	10.60	26.60	16.50	46.60		
OTHER INFORMATION							



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 μ S/cm) / Drinking Water Test (1,875 μ S/cm)

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

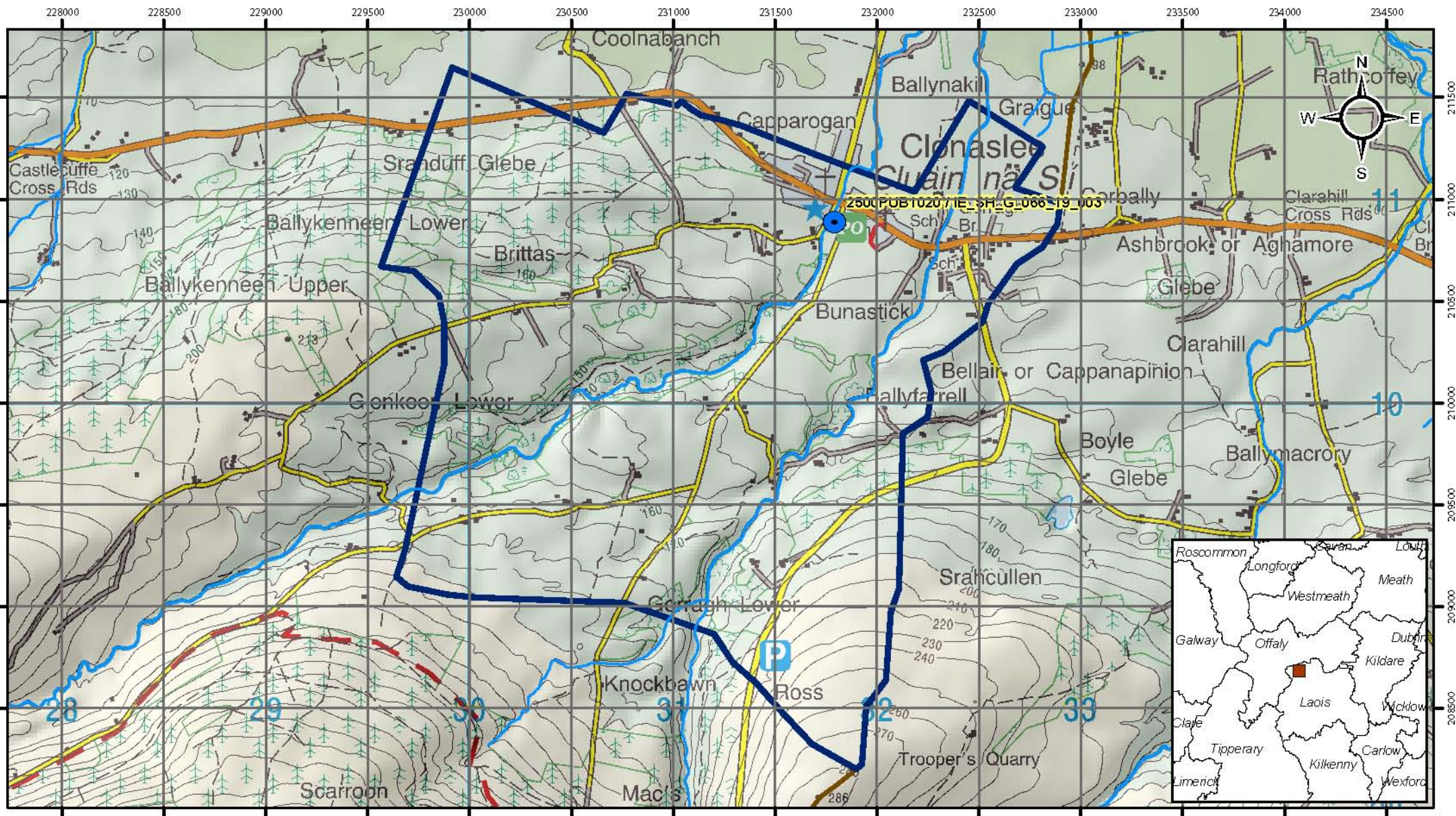
General Downgradient Distances

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		Date:	
Version 1:	Prepared by	Tobin	Date:	Mar 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

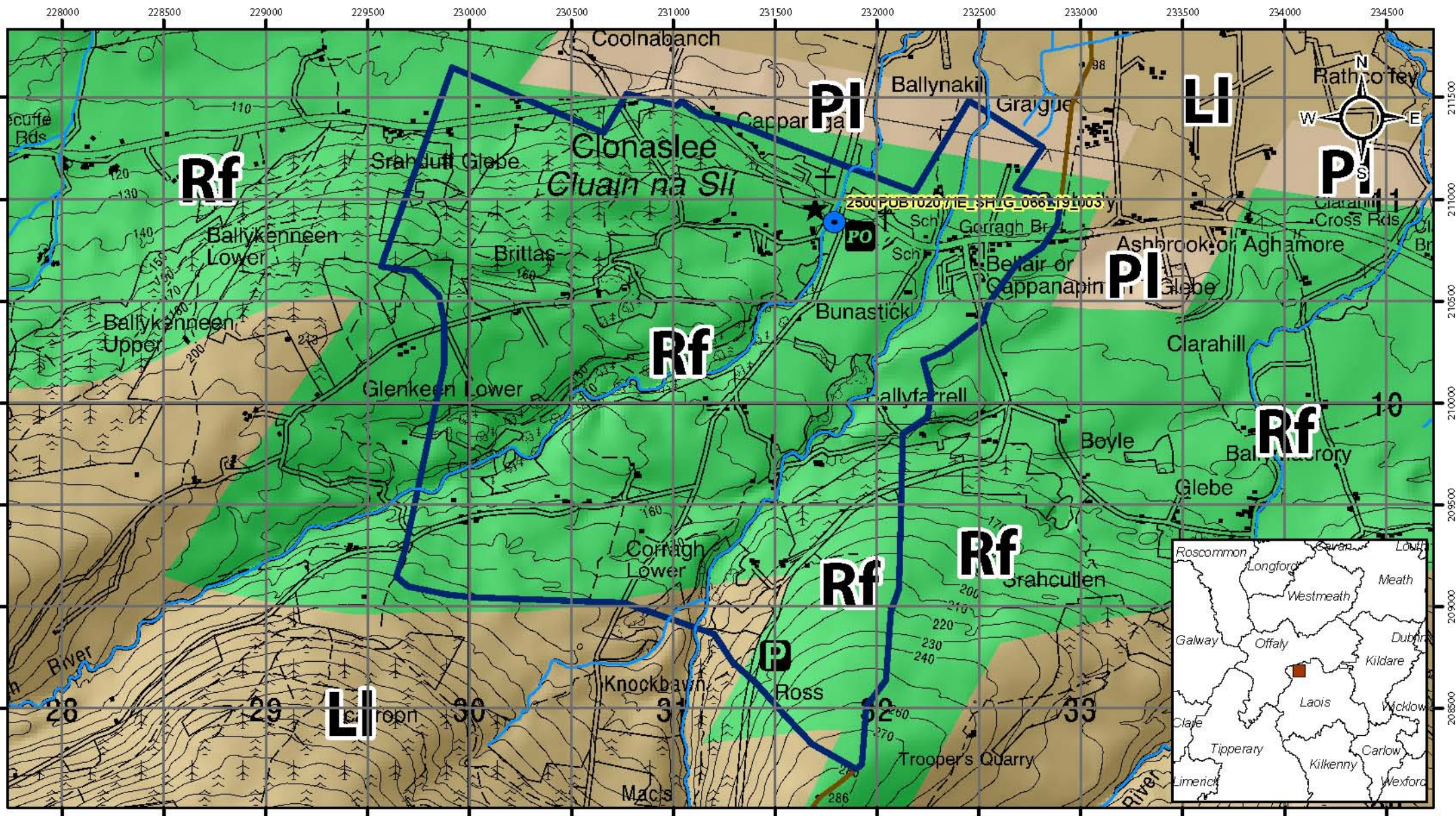


Location Map for Clonaslee Borehole - Plant

- Abstractions
- RiverBasinDistrict
- River
- Zone of Contribution

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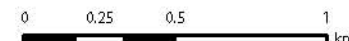
0 0.25 0.5 1 km

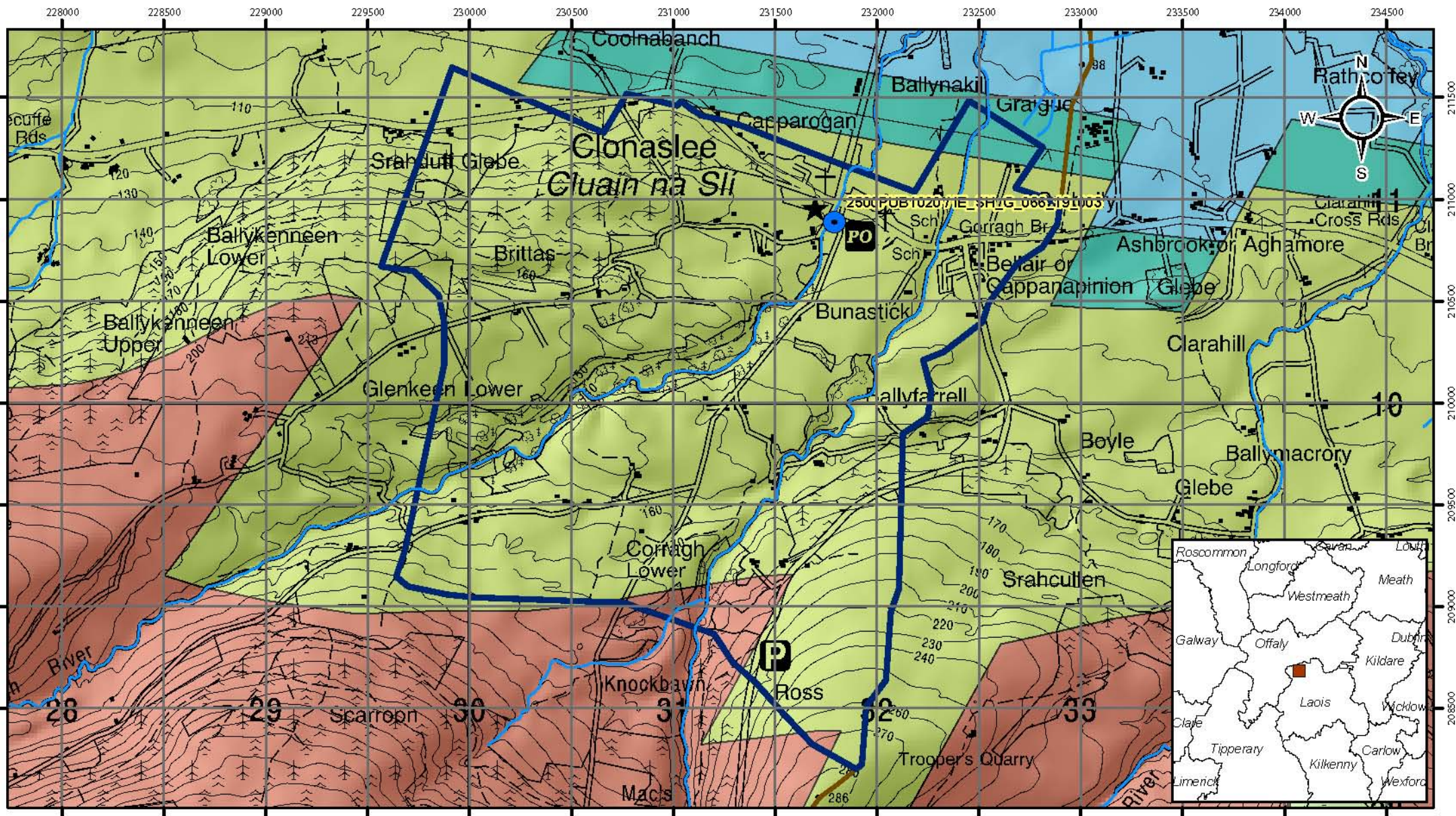


Aquifer Category for Clonaslee Borehole - Plant



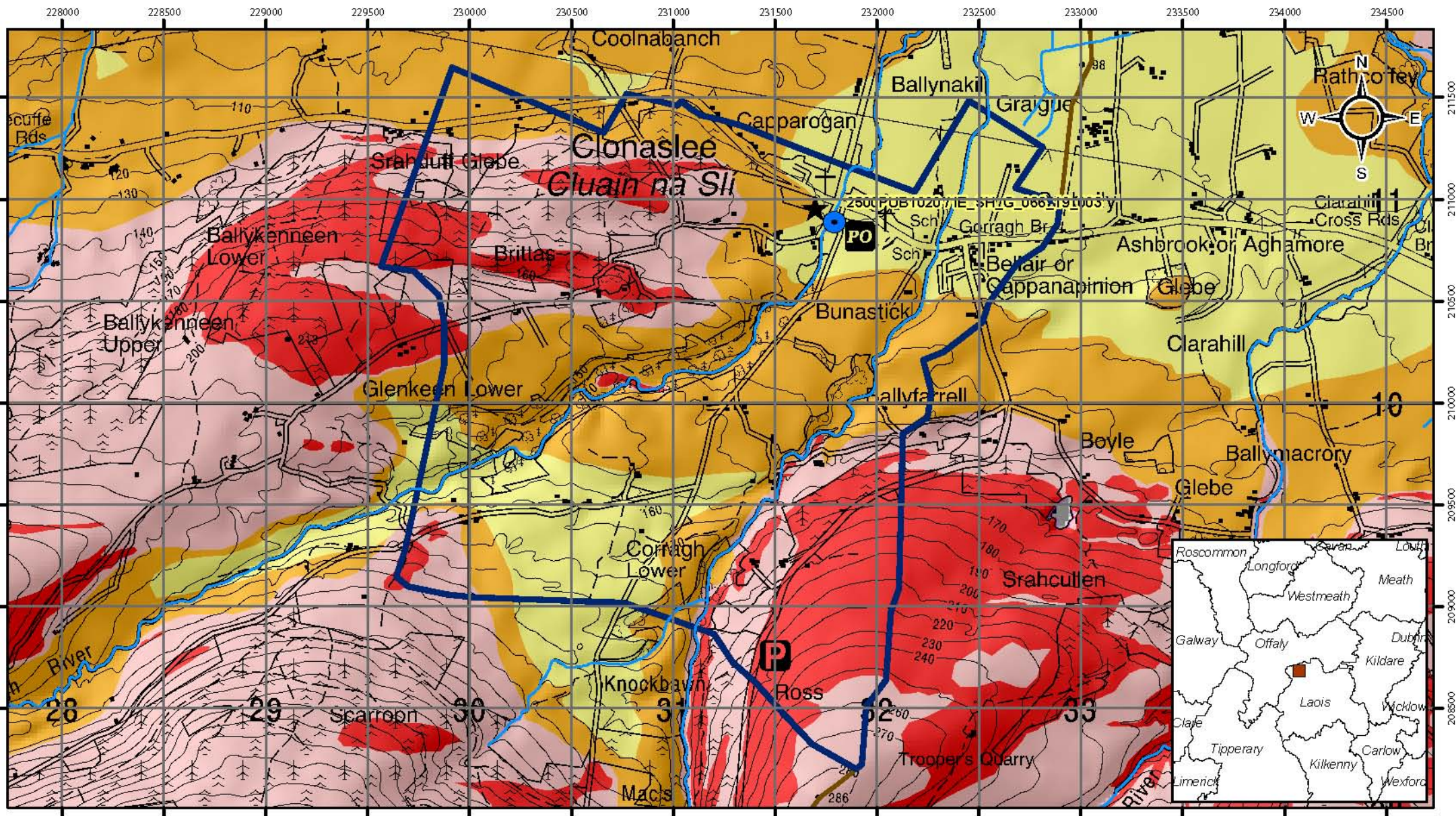
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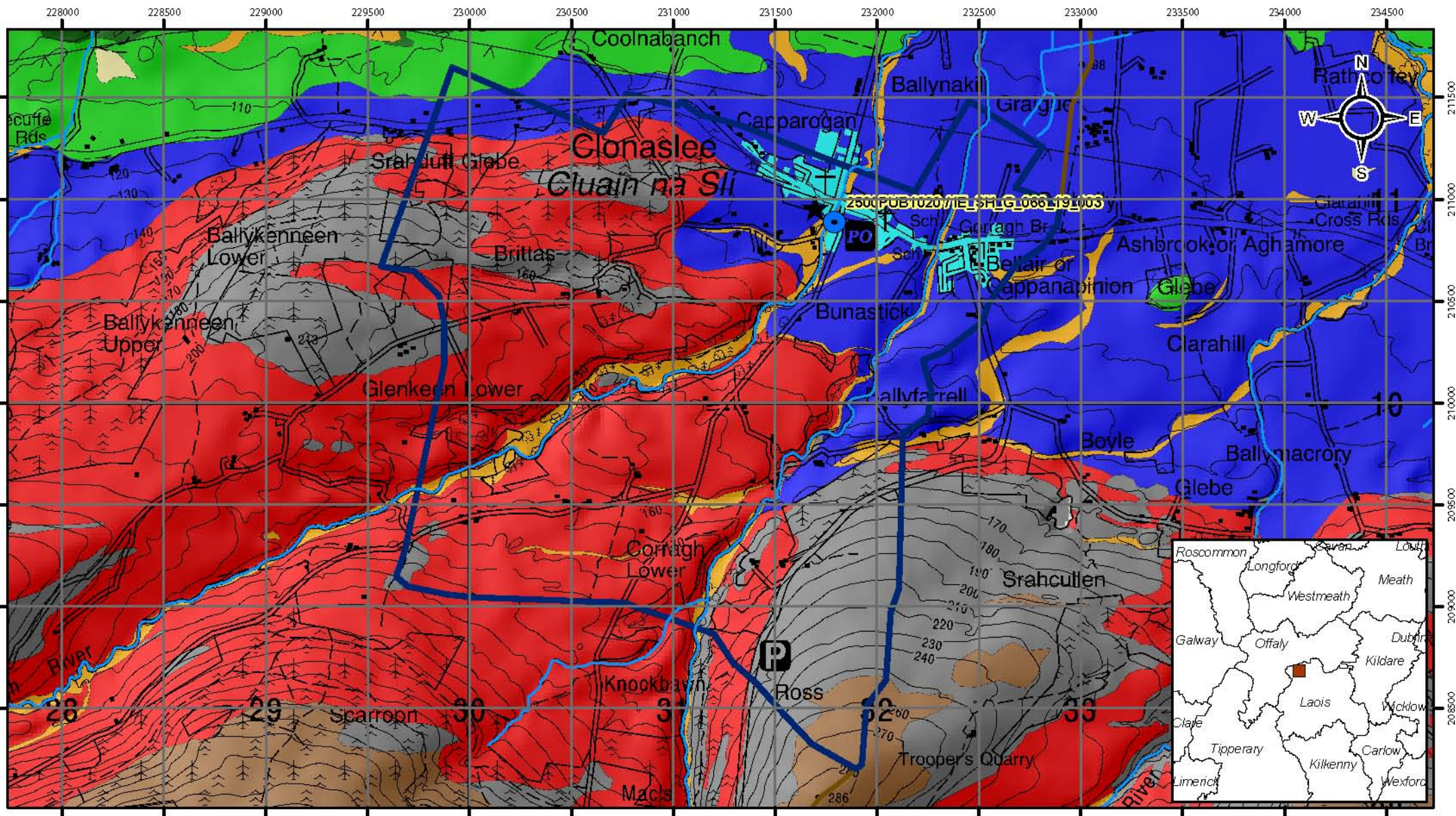
Bedrock Map for Clonaslee Borehole - Plant

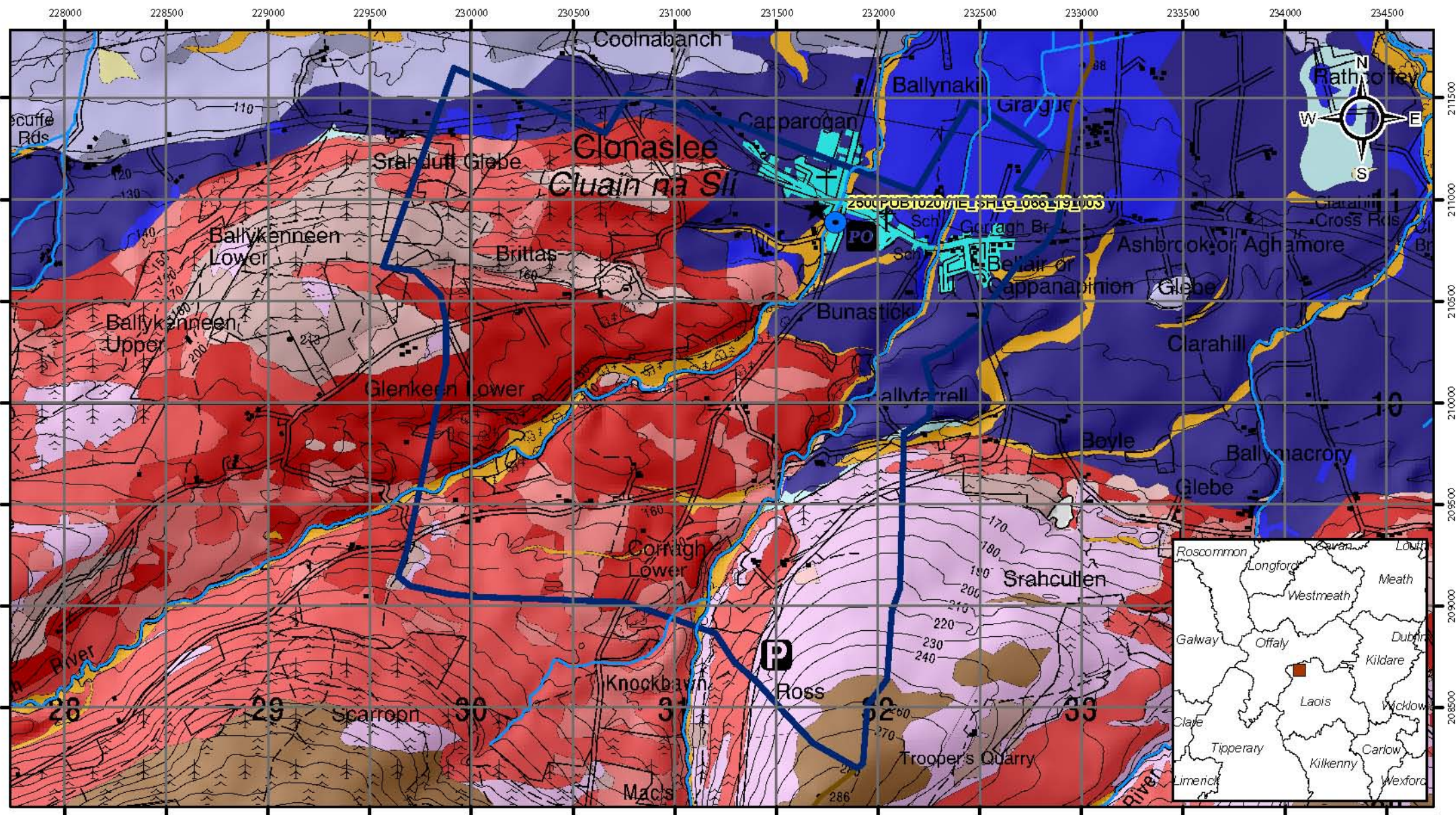
- | | | |
|----------------------|------------------------------------|---|
| Abstractions | RiverBasinDistrict | Dinantian (early) Sandstones, Shales and Limestones |
| River | Devonian Kiltorcan-type Sandstones | Dinantian Lower Impure Limestones |
| Zone of Contribution | Devonian Old Red Sandstones | Silurian Metasediments and Volcanics |



Groundwater Vulnerability for Clonaslee Borehole - Plant

- Abstractions
- River
- Zone of Contribution
- RiverBasinDistrict
- E (Extreme)
- H (High)
- M (Moderate)
- Water
- E (Rock near surface or Karst)





Soils Map for Clonaslee Borehole - Plant

