

## Water Framework Directive Groundwater Monitoring Programme

### Site Information

## Ballinagard Spring (Roscommon Central)



Ballinagard Spring is part of the Roscommon Central Regional WSS. The abstraction from the spring is approximately 2250m<sup>3</sup>/day. The GSI have published a source protection report for the spring and the adjacent borehole that forms part of the scheme.



Roscommon

**August 2011**

SITE INFORMATION					
Site Name:	Ballinagard Spring (Roscommon Central)		County:	Roscommon	
RBD:	Shannon IRBD		EU Reporting Code:	IE_SH_G_198_20_003	
Easting:	187435		GWB Name:	Roscommon Urban	
Northing:	261877		GWB Code:	IE_SH_G_198	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2600PUB1002	
Hydrometric Area:	26		Water Level Monitoring Network:	Level	Flow
Townland:	BALLINAGARD			N	Y
Ownership:	Roscommon County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	---				

SITE DIRECTIONS					
Location and Access Information:	The Ballinagard Spring and well field are located approximately 2 km south of Roscommon Town. Take Galway road (N63) out of Roscommon. Drive about 1.5km and take a left down Ballinagard road. Drive 600m and take a right down a narrow track to pumphouse.				
Additional Comments:	---				

WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	2250	Ground Elevation (m OD):	---
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:	There is significant discharge (overflow) from spring in addition to the abstraction. Quantity not well defined, but two measurements reported at 4,500 and 9,000 m³/d.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Roscommon Central Region	Number of Abstraction Points in the Scheme:	1	Source Report Available	Y
Source Report Info:	Source report prepared by GSI (2003).				
Scheme Summary:	The spring rises in a large deepened sump that is banked by limestone chippings. It overflows to the River Hind (approximately 75 m south of the spring) via a weir. The River Hind flows eastwards, discharging into Lough Ree. Ten boreholes were drilled in close proximity to the spring. Five of these borehole locations have been identified as appropriate for the production boreholes.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Cutaway/cutover peat (Cut)					Subsoil Permeability:	n/a
	Subsoil:	Peat (Cut)						
	Bedrock:	Dinantian Pure Bedded Limestones						
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	X-Extreme	Flow Regime:	Karstified		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	32.81	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	315		
	ZOC Delineation Comments:	ZOC delineated by the GSI for spring and production boreholes. Both Inner and Outer Source Protection Areas were defined. See GSI, Ballinagard Groundwater Source Protection Zones, April 2003. Available from the groundwater section at GSI.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	9.87	24.9	50.97	14.27	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 11 mg/l NO3 and the maximum nitrate concentration was 24 mg/l NO3. The average ammonium concentration was 0.021 mg/l N and the maximum ammonium concentration was 0.066 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.026 mg/l P and the maximum MRP concentration was 0.059 mg/l P. The average chloride concentration was 18.1 mg/l Cl and the maximum chloride concentration was 23 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	351	145-420						
Hardness (mg/l CaCO3):	Average:	Range:						
	372	197-420						
Conductivity (uS/cm):	Average:	Range:						
	717	562-993						
Monitoring Record Period:	From:	To:						
	1996	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Point Source- Contaminated Land		Typical Contaminants:		---			
Risk Category:	At risk, high confidence		GWB Status:		Poor			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:		Low:	Negligible:		
	0.00	31.39	39.29		12.78	16.54		
OTHER INFORMATION								
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Spring



Site

## 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 NO<sub>3</sub>)

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

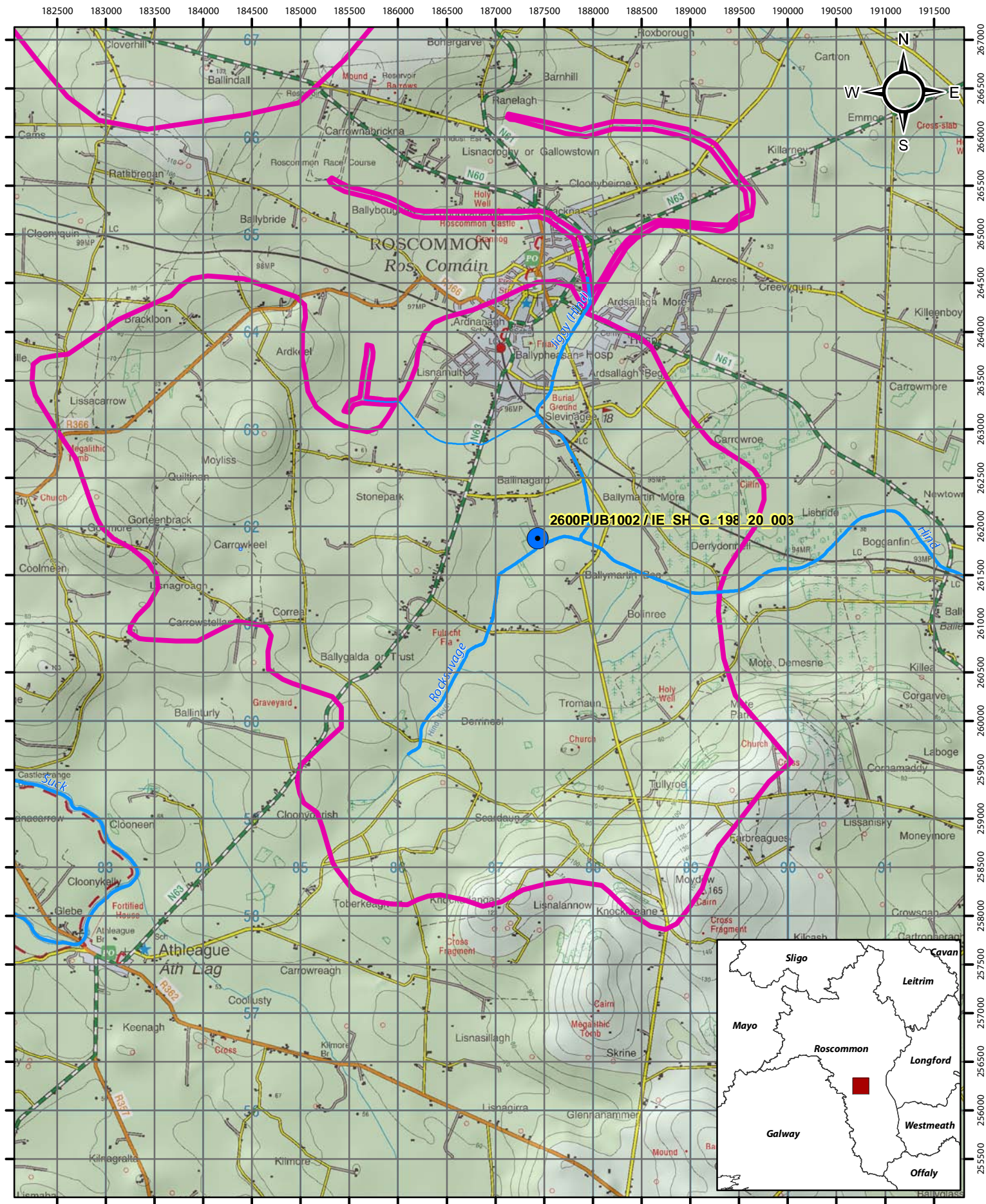
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

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:	01/04/2003
Version 1:	Prepared by	Tobin (JD)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	





## Location Map for Ballinaguard Spring (Roscommon Central)

-  Abstractions
-  River
-  Zone of Contribution

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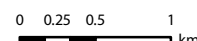
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km



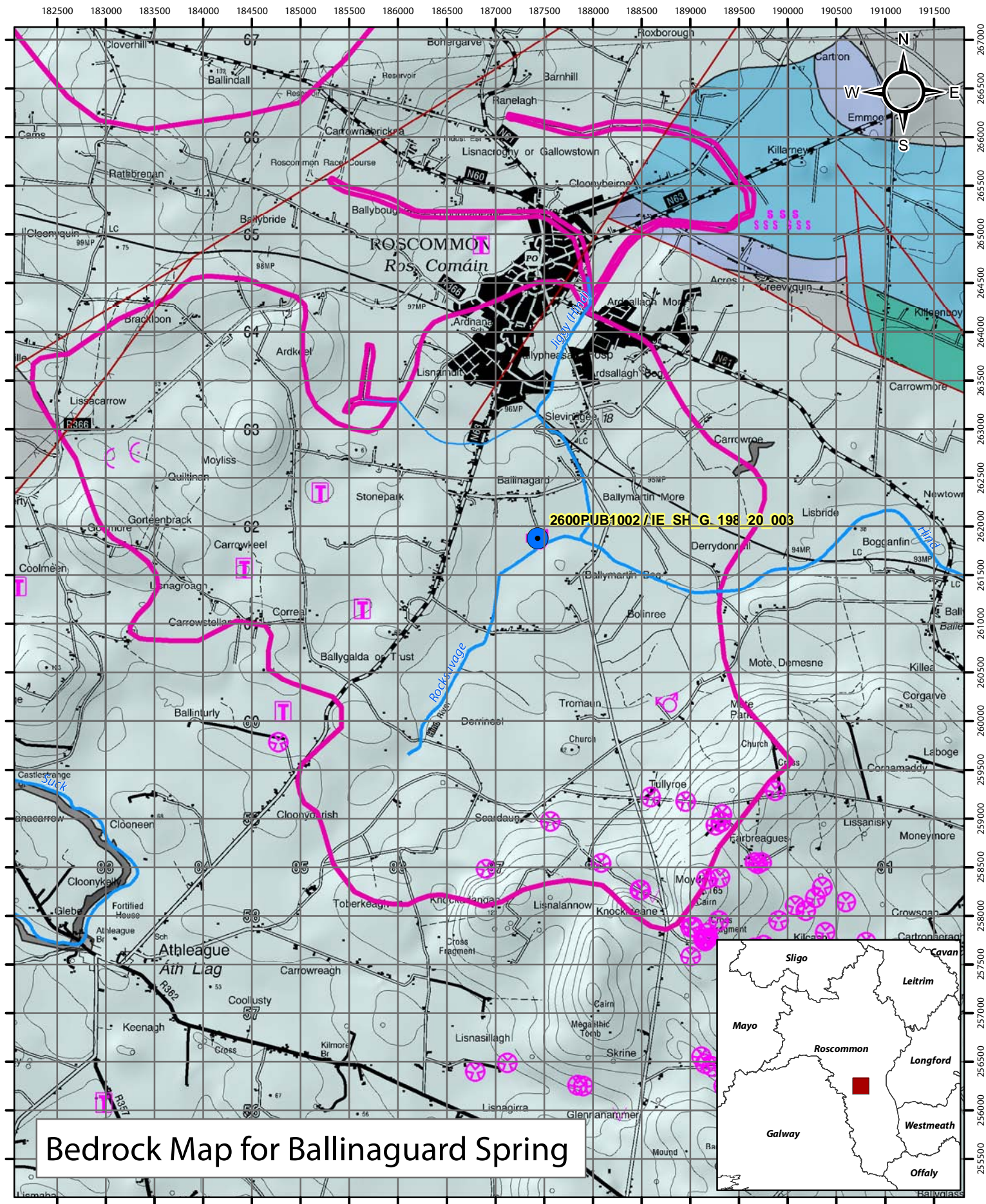
## Aquifer Category Map for Ballinaguard Spring (Roscommon Central)



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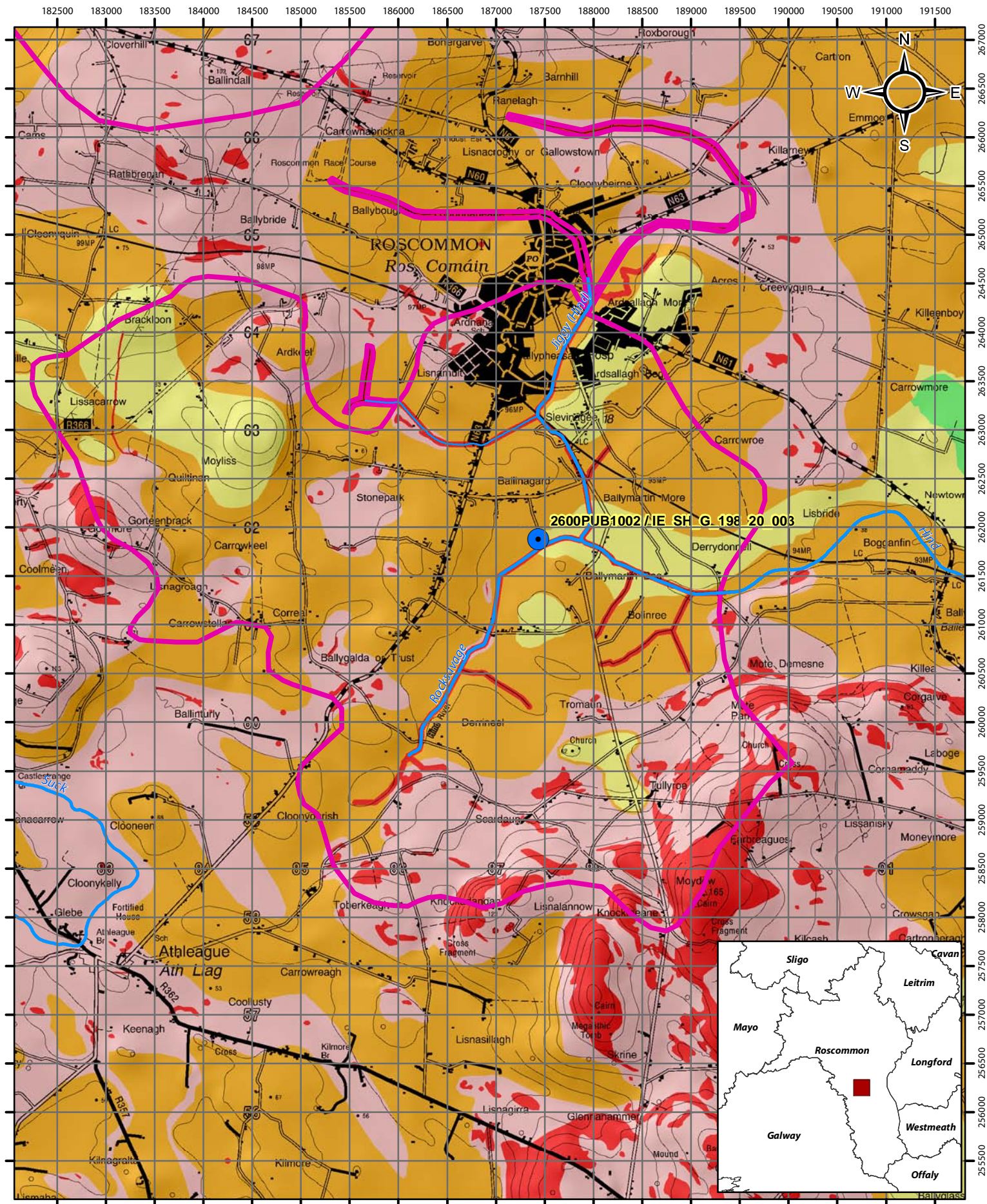






- |                      |   |                               |                                    |
|----------------------|---|-------------------------------|------------------------------------|
| Abstractions         | Fault   | Superficial Solution Features | Dinantian Lower Impure Limestones  |
| River                | Dry Valley  | Swallow Hole                  | Dinantian Pure Bedded Limestones   |
| Zone of Contribution | Enclosed Depression                                 | Turlough                      | Dinantian Pure Unbedded Limestones |
| Spring               | Dinantian (early) Sandstones, Shales and Limestones |                               | Dinantian Upper Impure Limestones  |





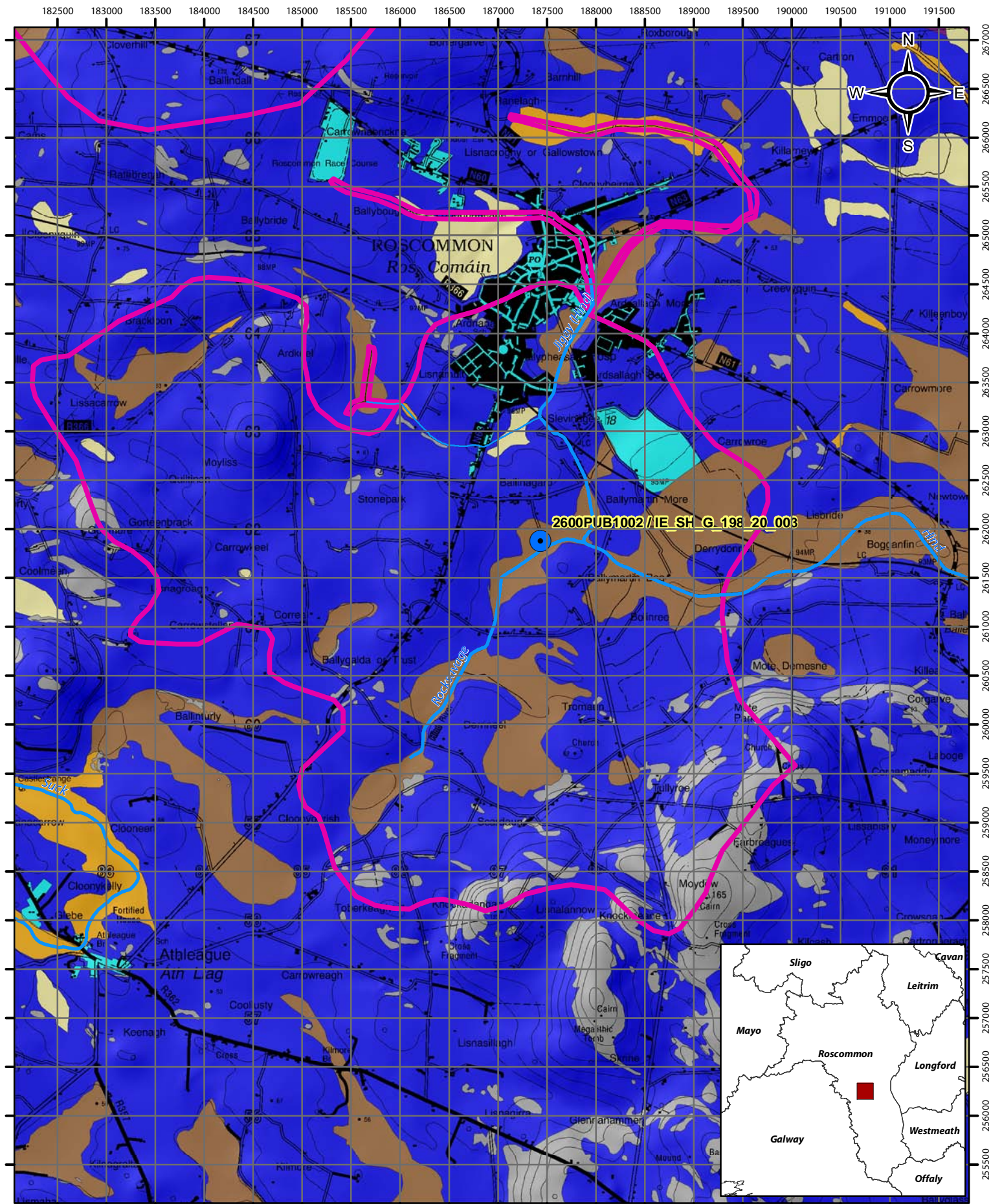
## Groundwater Vulnerability Map for Ballinaguard Spring

- Abstractions
- E (Rock near surface or Karst)
- M (Moderate)
- Water
- River
- E (Extreme)
- L (Low)
- No Data
- Zone of Contribution
- H (High)
- HL (unmapped - High to Low)

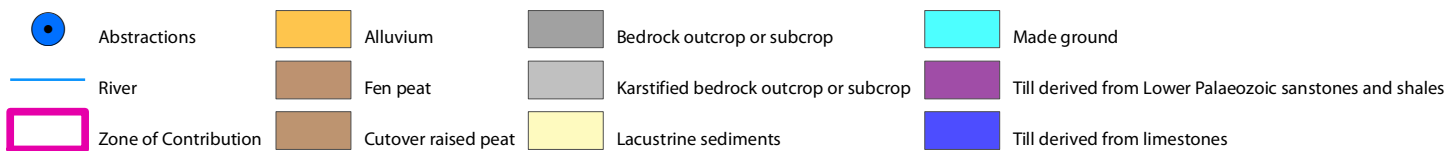
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km





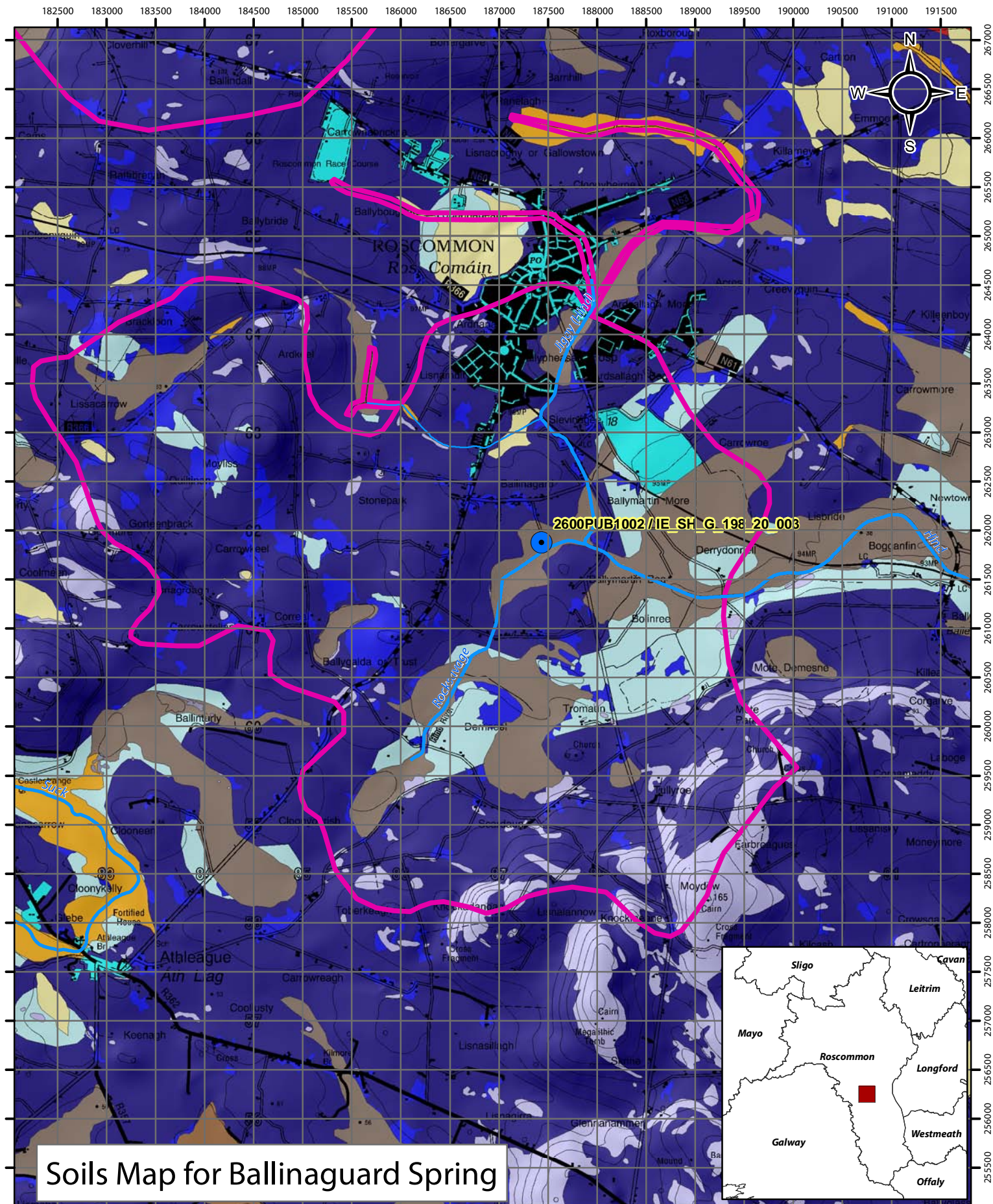
## Subsoils Map for Ballinaguard Spring (Roscommon Central)



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0 0.25 0.5 1  
km





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