

## Water Framework Directive Groundwater Monitoring Programme

### Site Information

### Ardtullybeg



Ardtullybeg PWS comprises 2 adjacent boreholes situated in gravels, abstracting 1020m<sup>3</sup>/day. The GSI completed a source report in 2009.



Louth

August 2011

SITE INFORMATION					
Site Name:	Ardtullybeg		County:	Louth	
RBD:	NBIRBD		EU Reporting Code:	IE_NB_G_024_15_001	
Easting:	319577		GWB Name:	Dundalk Gravels	
Northing:	306266		GWB Code:	IE_NB_G_024	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2100PUB1004	
Hydrometric Area:	6		Water Level Monitoring Network:	Level	Flow
Townland:	GALTRIMSLAND			N	N
Ownership:	Louth County Council				
Water Quality Monitoring Network:	Surveillance	Operational (Point)		Operational (Diffuse)	
	N	N		Y	
Site Comments:	---				

SITE DIRECTIONS	
Location and Access Information:	Located in the townland of Ardtully Beg, on the southern Cooley Peninsula approximately 2.7 km west-northwest of Cooley Point and 5.5 km south of Carlingford.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	1020	Ground Elevation (m OD):	28
Borehole Log Available:	Y	Total Drilled Depth (m bgl):	20	Depth to Bedrock (m bgl):	20
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	250	Lower Casing Diameter (mm):	---
Final Borehole Depth (m):	---	Upper Casing Bottom Depth (m bgl) :	---	Lower Casing Bottom Depth (m bgl):	---
Screen Interval (m bgl):	14.82-19.32	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:	Dimensions for PW1 are given above. Dimensions for PW2 are similar except for screened interval (12.3-16.5mbg); specific capacity (471m³/d/m). The sample point is a tap on the fence next to PW1.		
Specific Capacity (m³/d/m):	118				
Static Water Level (m bgl):	5				
Scheme Name:	Ardtullybeg	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	GSI published a Groundwater Source Protection Zone Report in 2009.				
Scheme Summary:	Two boreholes are used for the Ardtully Beg Public Water Supply. Currently, the two boreholes are active and are pumped at a combined rate of 60 m³/hr for approximately 16-17 hours per day, resulting in a combined abstraction of 1,020 m³/d. The abstracted water is chlorinated before being combined with the water from the Carlingford boreholes and Grenore Spring.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Shallow well drained mineral (AminSW)					Subsoil Permeability:	High
	Subsoil:	Glaciofluvial sands and gravels (GLPSsS)						
	Bedrock:	Dinantian Mixed Sandstones, Shales and Limestones						
HYDROGEOLOGY	Aquifer Category:	Lg	Vulnerability at Monitoring site:	High	Flow Regime:	Intergranular		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	1.32	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	230		
	ZOC Delineation Comments:	The GSI delineated a ZOC based on abstraction, recharge and topography. See the source report for details.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0	0	28.31	71.69	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 30 mg/l NO3 and the maximum nitrate concentration was 42 mg/l NO3. The average ammonium concentration was 0.015 mg/l N and the maximum ammonium concentration was 0.052 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.013 mg/l P and the maximum MRP concentration was 0.05 mg/l P. The average chloride concentration was 28.1 mg/l Cl and the maximum chloride concentration was 45 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	272	186-360						
Hardness (mg/l CaCO3):	Average:	Range:						
	312	9-388						
Conductivity (uS/cm):	Average:	Range:						
	652	561-752						
Monitoring Record Period:	From:	To:						
	1993	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:		Nitrate			
Risk Category:	At risk, low confidence		GWB Status:		Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:		Low:	Negligible:		
	0.00	18.85	23.56		57.39	0.20		
OTHER INFORMATION								
It is considered that a proportion of the groundwater in the bedrock flows upward into the gravels. This view is supported by the hydrochemistry.								



Pump Housing

## 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

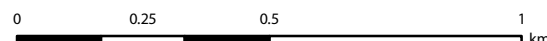
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

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

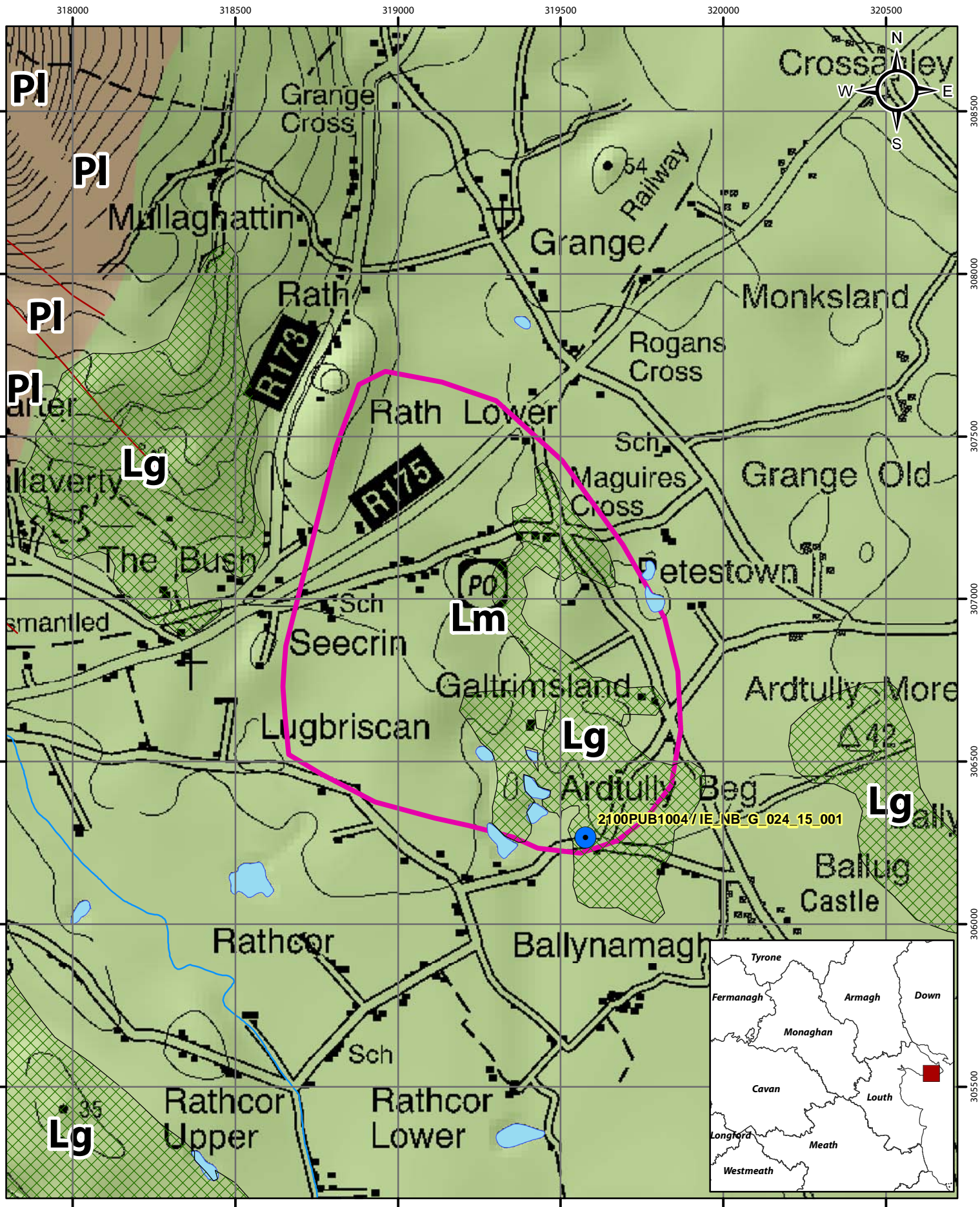
It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient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

Version 0:	Prepared by	GSI	Date:	
Version 1:	Prepared by	OCM (DC)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

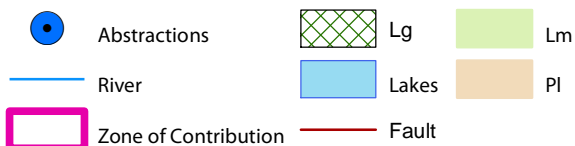




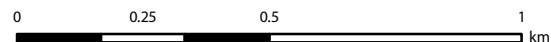




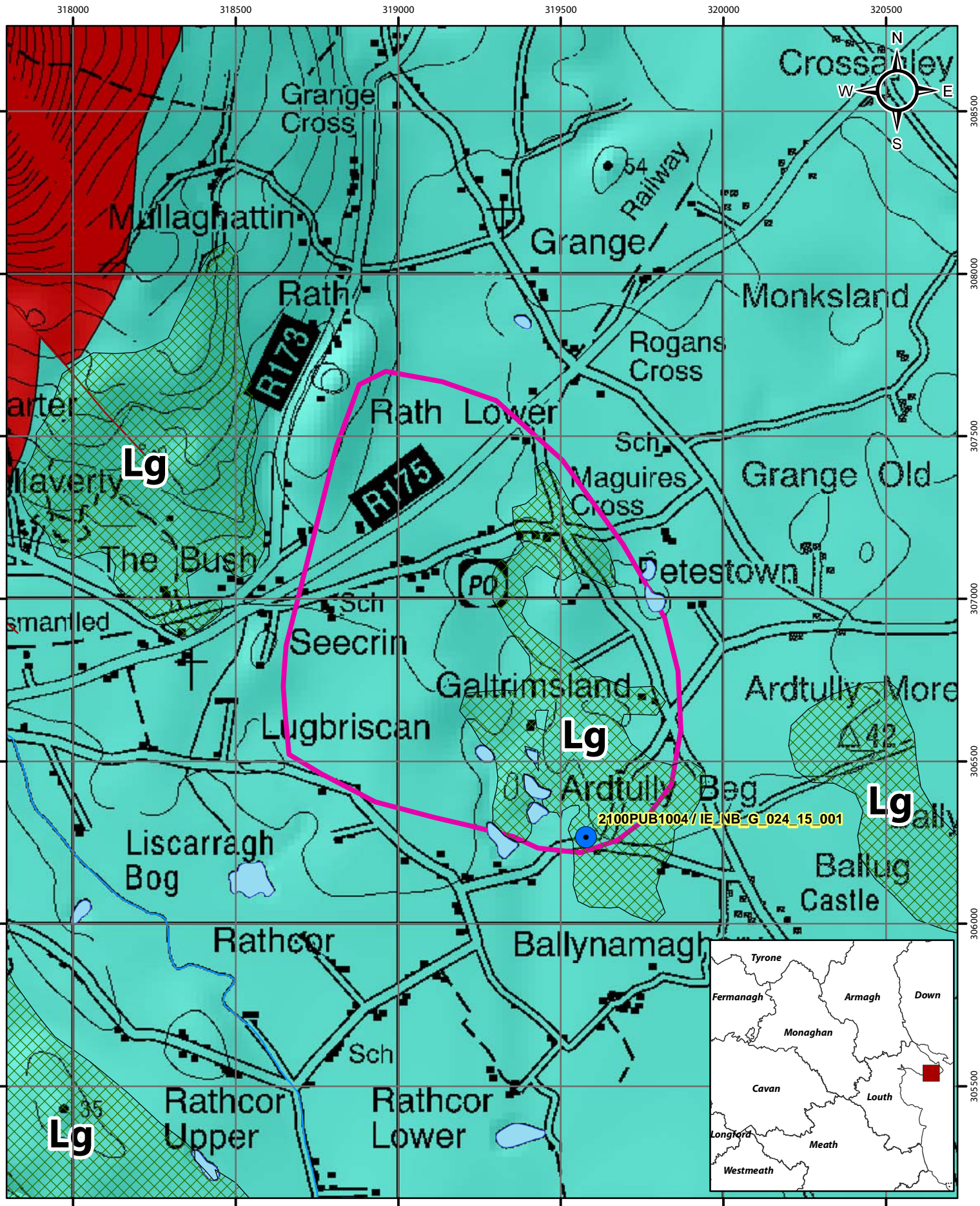
## Aquifer Category Map for Ardtullybeg



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## Bedrock Map for Ardtullybeg

-  Abstractions
-  Lakes
-  Dinantian Mixed Sandstones, Shales and Limestones
-  Lg
-  River
-  Granites & other Igneous Intrusive rocks
-  Fault
-  Zone of Contribution

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0 0.25 0.5 1 km







