

Water Framework Directive Groundwater Monitoring Programme

Site Information

Carlingford



Carlingford has two boreholes and is used as a public water supply. The abstraction rate is 1200m³/day. The GSI has completed a source report.



Louth

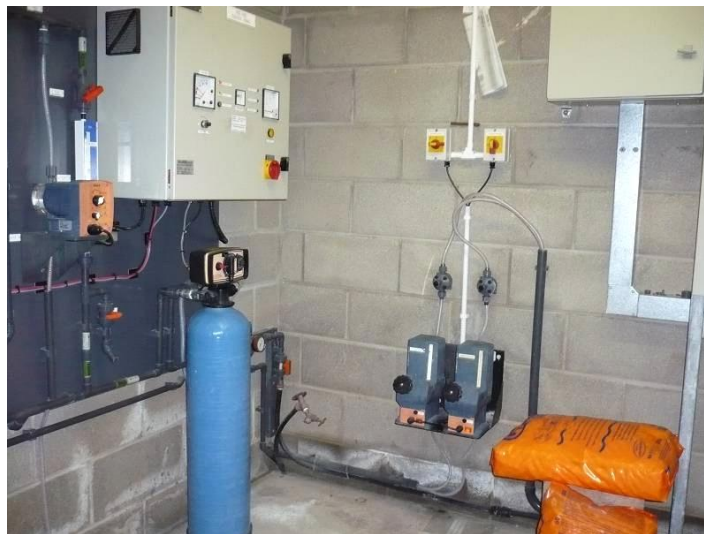
August 2011

SITE INFORMATION					
Site Name:	Carlingford		County:	Louth	
RBD:	NBIRBD		EU Reporting Code:	IE_NB_G_015_15_003	
Easting:	319264		GWB Name:	Dundalk	
Northing:	310896		GWB Code:	IE_NB_G_015	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2100PUB1004	
Hydrometric Area:	6		Water Level Monitoring Network:	Level	Flow
Townland:	LIBERTIES OF CARLINGFORD			N	N
Ownership:	Louth County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	Carlingford is a borehole situated in Dinantian Mixed Sandstones, Shales and Limestones and is used as a public water supply. The borehole is included in the operational chemical network.				
SITE DIRECTIONS					
Location and Access Information:	Located on a narrow, third class road just off the Regional R173 road, approximately 0.9 km south-southeast of the centre of the town of Carlingford. It is the first left off the R173 heading south of the village.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	1200	Ground Elevation (m OD):	10
Borehole Log Available:	---	Total Drilled Depth (m bgl):	-	Depth to Bedrock (m bgl):	---
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):	---	Comments on Monitoring Site:	---		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Cooley	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	Source report prepared by GSI in 2010.				
Scheme Summary:	The scheme was commissioned in 1998, as part of the augmentation scheme for the Ardtullybeg Source after a trail well was drilled but did not begin until 2000. By then a second borehole had been drilled, immediately adjacent to the first . Currently, the two boreholes are active and pump 24 hours a day. The water is treated before being combined with the Ardtullybeg boreholes and Greenore spring before distribution.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (AminDW)					Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictons) (TLPSSs)						
	Bedrock:	Dinantian Mixed Sandstones, Shales and Limestones						
HYDROGEOLOGY	Aquifer Category:	Lm	Vulnerability at Monitoring site:	Extreme			Flow Regime:	Productive fissured bedrock
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	1.36	ZOC Delineated By:	GSI			Recharge Estimate (mm/yr):	306
	ZOC Delineation Comments:	The GSI delineated a ZOC based on abstraction, recharge and topography. The GSI concluded that although mapped as tills the boreholes are underlain by gravels. See the source report for details.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	8.83	25.84	62.3	2.9	0	0	0.12	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 13 mg/l NO3 and the maximum nitrate concentration was 17 mg/l NO3. The average ammonium concentration was 0.026 mg/l N and the maximum ammonium concentration was 0.1 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.01 mg/l P and the maximum MRP concentration was 0.043 mg/l P. The average chloride concentration was 14.9 mg/l Cl and the maximum chloride concentration was 17 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	234	207-280						
Hardness (mg/l CaCO3):	Average:	Range:						
	227	9-280						
Conductivity (uS/cm):	Average:	Range:						
	490	414-530						
Monitoring Record Period:	From:	To:						
	2007	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	1.34	21.98		45.04	31.63		
OTHER INFORMATION								



Site Location



Inside the Pumping House



Sampling Tap

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).

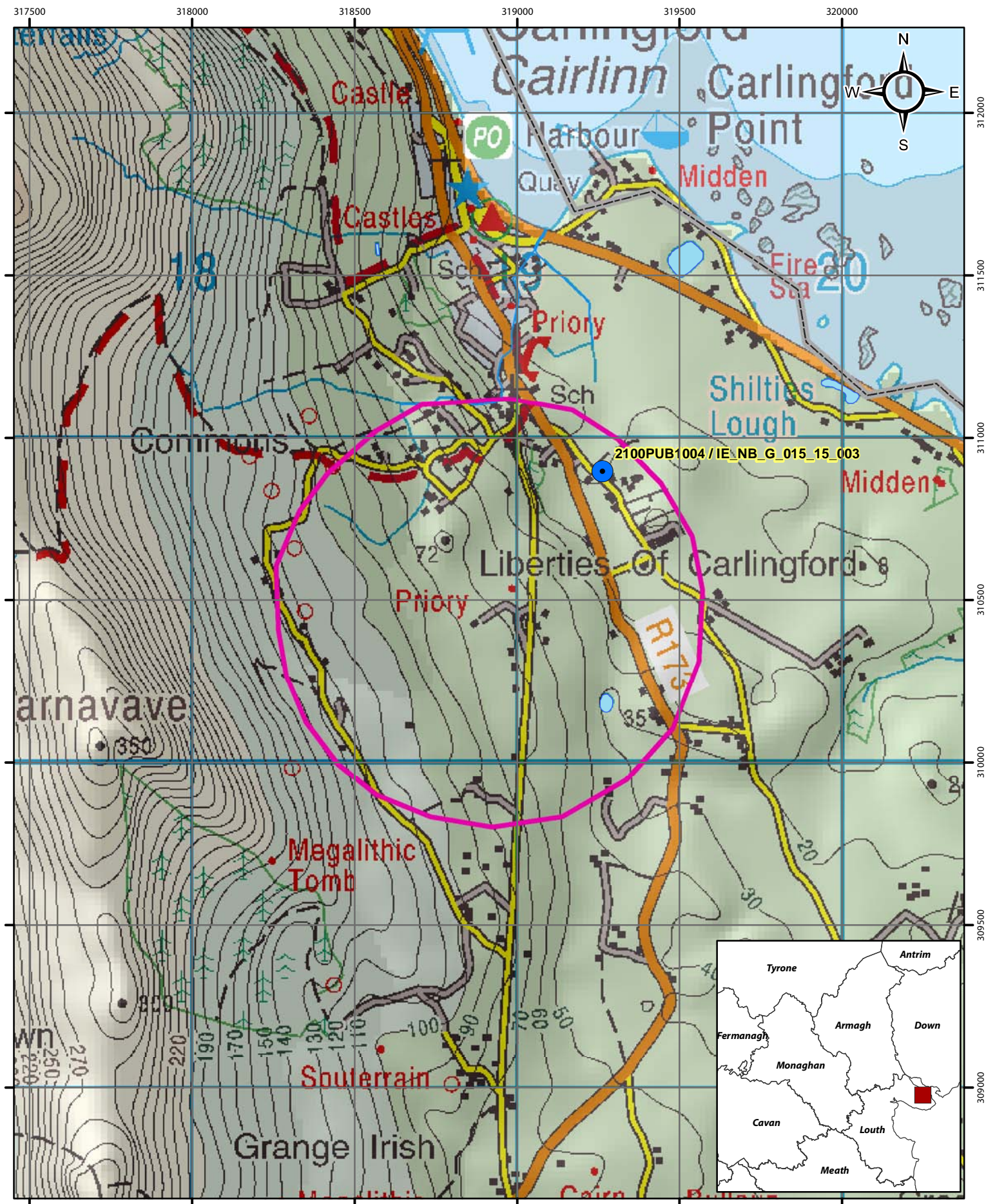
General Downgradient Distances

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	GSI	Date:	
Version 1:	Prepared by	Tobin (CK)	Date:	Apr 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

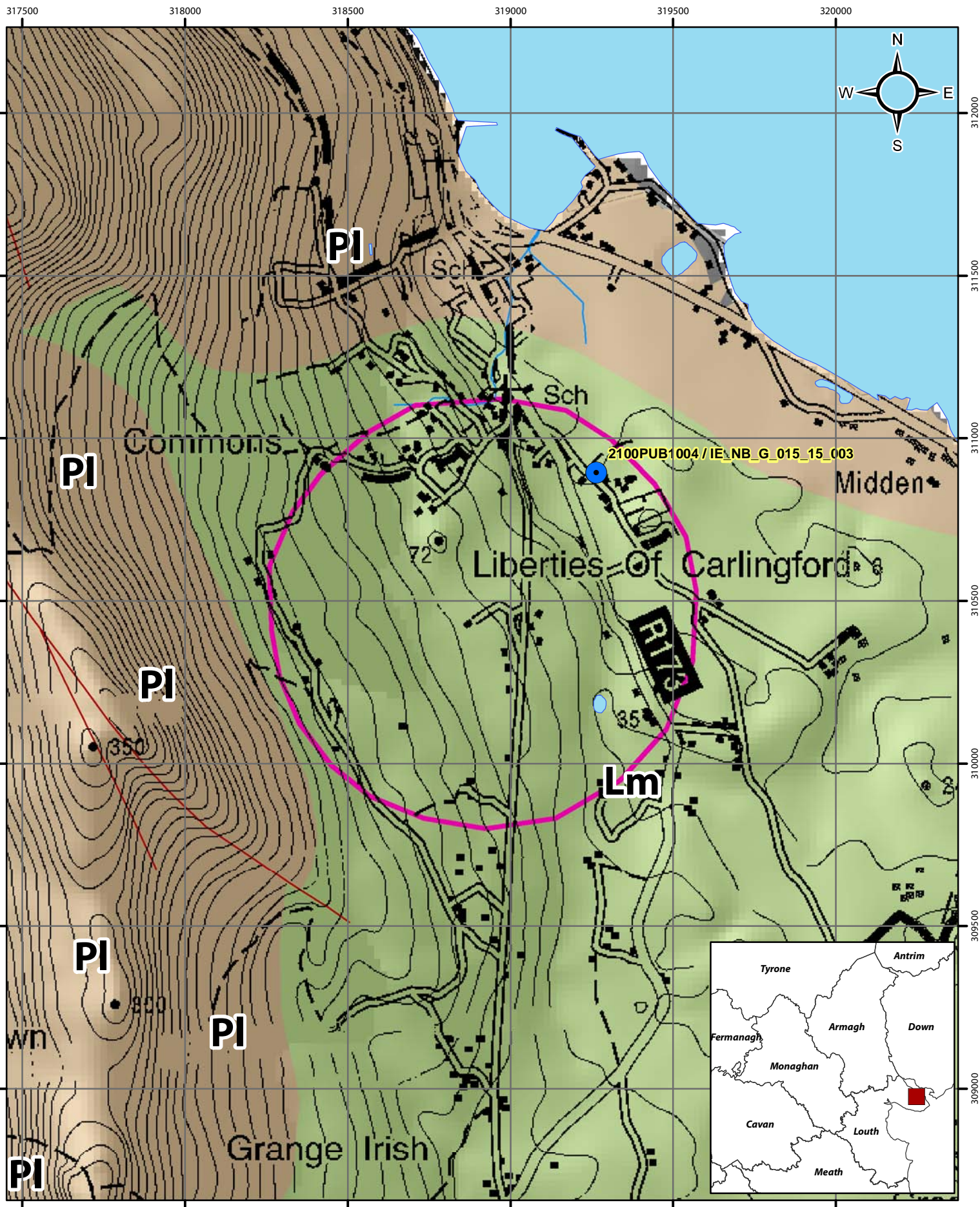


Location Map for Carlingford

-  Abstractions
-  Lakes
-  River
-  Zone of Contribution

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0 0.25 0.5 1 km

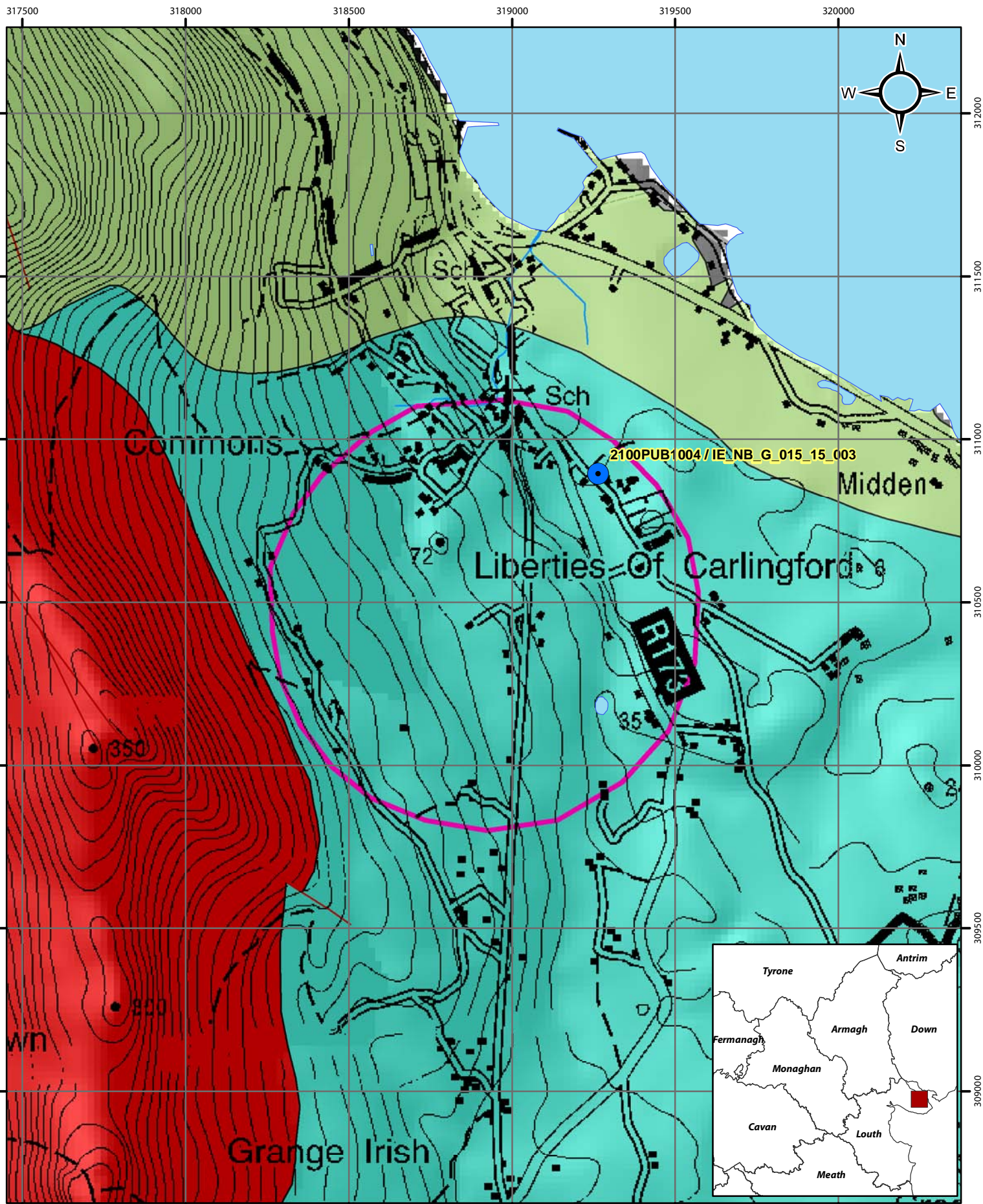


Bedrock Map for Carlingford

- Abstractions
- Lm
- Lakes
- River
- PI
- Fault
- Zone of Contribution

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0 0.25 0.5 1 km

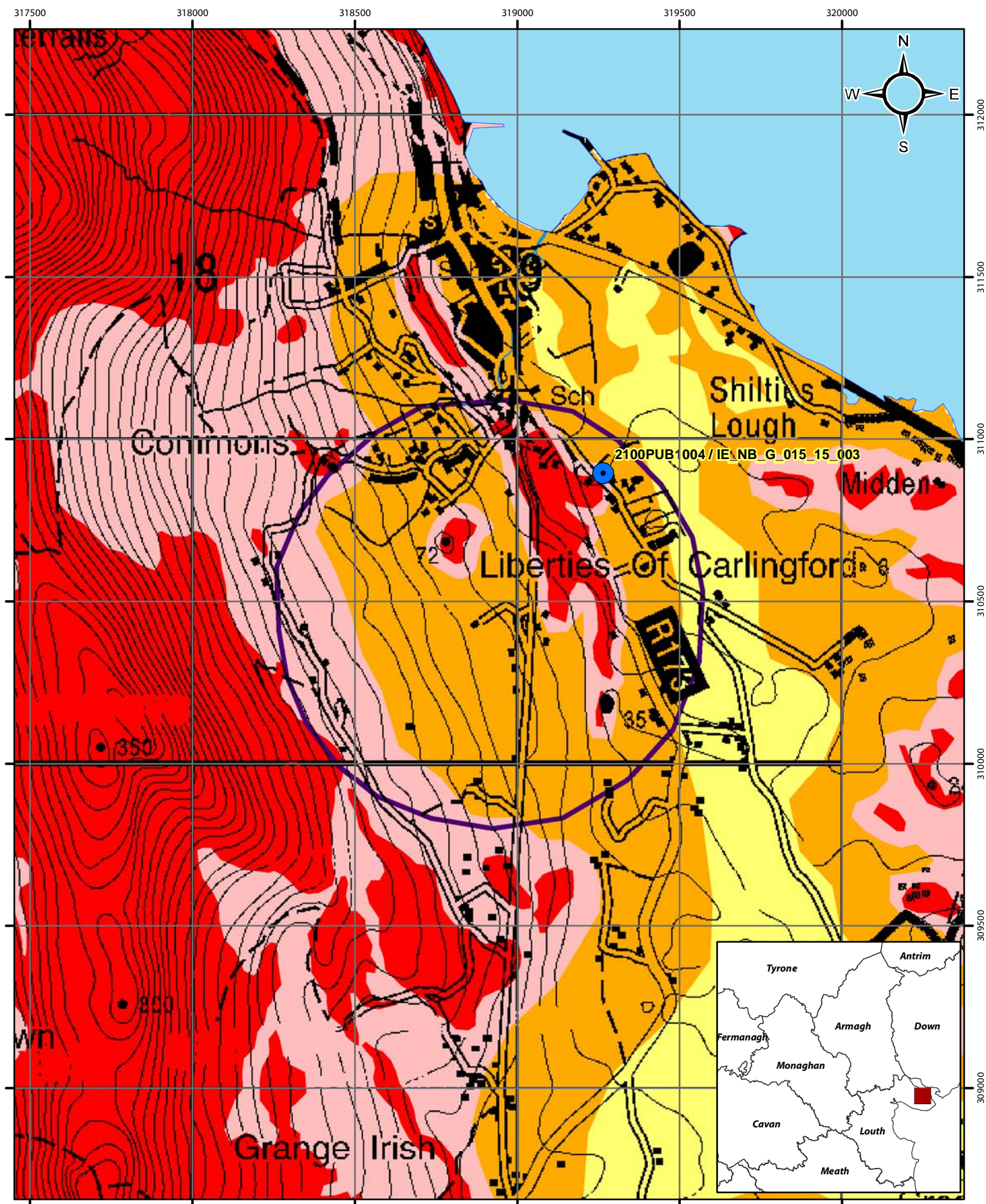


Bedrock Map for Carlingford

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

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0 0.25 0.5 1 km



Groundwater Vulnerability Map for Carlingford



Abstractions

100

near surface or Karst)

M (Moderate)

 E (Extreme)

L (Low)

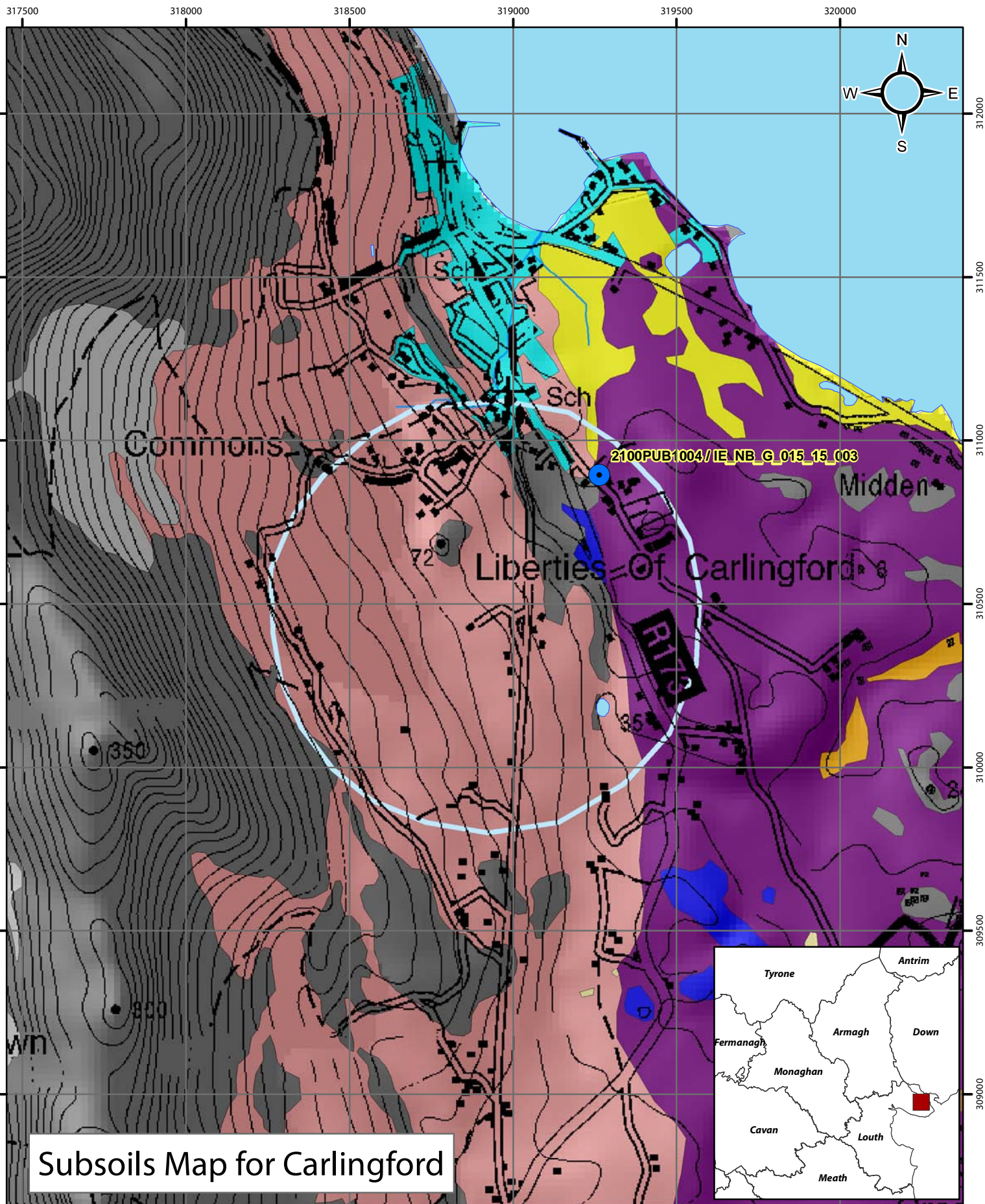
 H (High) Lake

— River

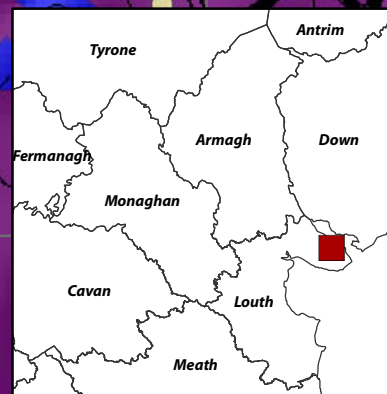
Zone of Contribution

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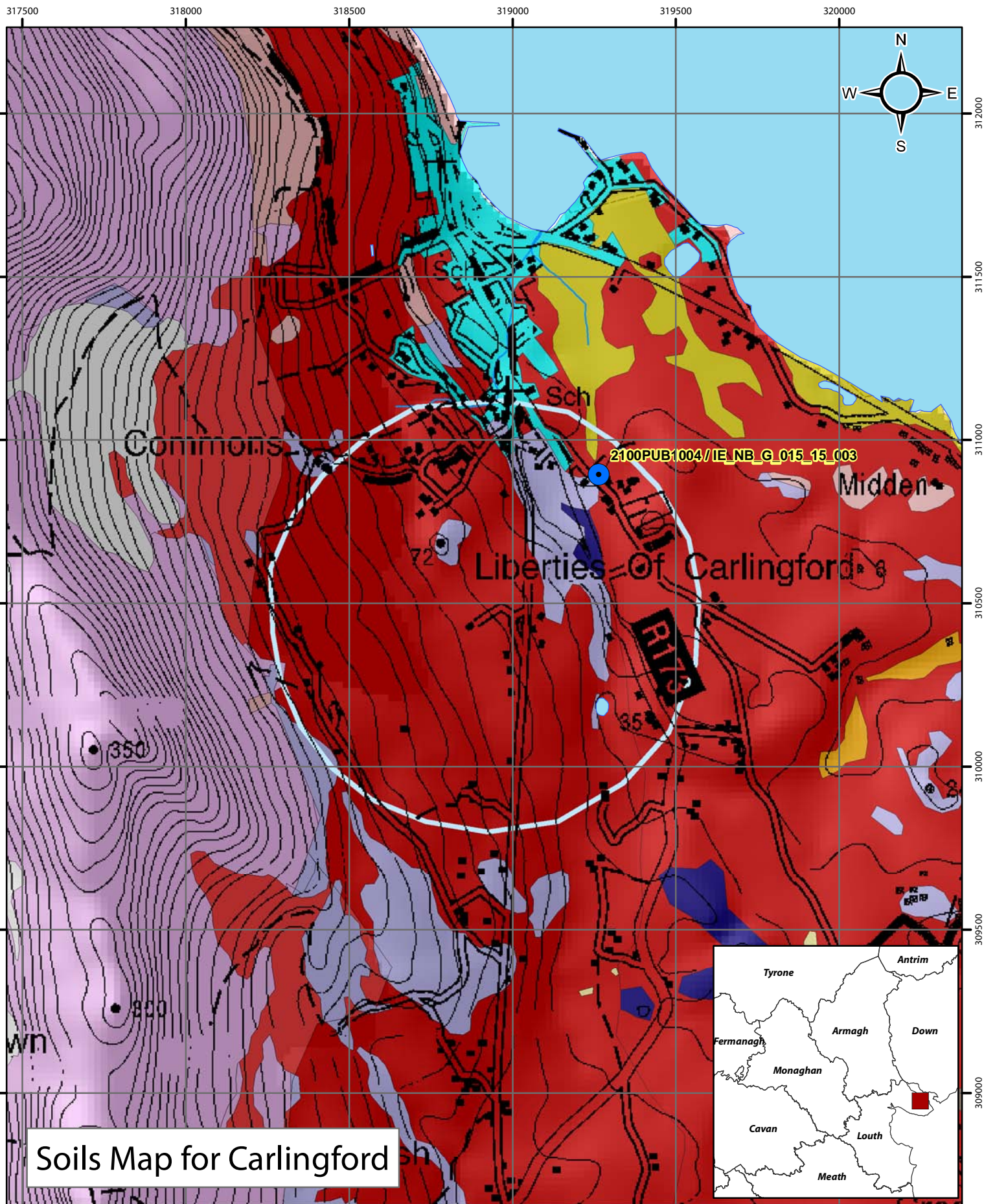
A horizontal scale bar with tick marks at 0, 0.25, 0.5, and 1 km. The bar is divided into four equal segments by vertical lines corresponding to the tick marks.



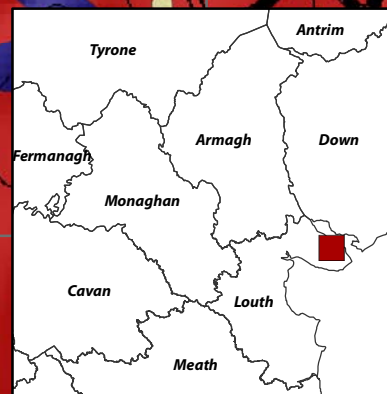
Subsoils Map for Carlingford



- | | | | |
|----------------------|------------------------------|----------------------------|---|
| Abstractions | Lakes | Cutover raised peat | Bedrock outcrop or subcrop |
| River | Scree | Lacustrine sediments | Marine gravels and sands (often raised) |
| Zone of Contribution | Alluvium | Till derived from granites | Till derived from Lower Palaeozoic sanstones and shales |
| Made ground | Till derived from limestones | | |



Soils Map for Carlingford



- | | | | |
|---------------------------------|-----------------------------------|------------------------------------|------------------------|
| Abstractions | Acid Deep Well Drained Mineral | Basic Shallow Well Drained Mineral | Scree |
| River | Acid Poorly Drained Peaty Mineral | Basic Shallow/Rocky/Peaty Mineral | Marine Sands & Gravels |
| Zone of Contribution | Acid Shallow Well Drained Mineral | Cutover/Cutaway Peat | Made |
| Lakes | Acid Shallow/Rocky/Peaty Mineral | Mineral Alluvium | |
| Basic Deep Well Drained Mineral | Lacustrine | | |