

Water Framework Directive Groundwater Monitoring Programme

Site Information

Glanworth PWS (Tobermore)



Glanworth PWS (Tobermore Spring) is a spring used as part of a public water supply. The abstraction rate is 320m³/day. The GSI has completed a source protection report.



Cork

August 2011

SITE INFORMATION					
Site Name:	Glanworth PWS (Tobermore)		County:	Cork	
RBD:	SWRBD		EU Reporting Code:	IE_SW_G_082_04_017	
Easting:	176254		GWB Name:	Mitchelstown 1	
Northing:	107677		GWB Code:	IE_SW_G_082	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0500PUB1501	
Hydrometric Area:	18		Water Level Monitoring Network:	Level	Flow
Townland:	KILNADROW			N	Y
Ownership:	Cork County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	Ballykenly Spring is located 3.5 km north of Glanworth village.				

SITE DIRECTIONS	
Location and Access Information:	Located 3.5 km north of Glanworth village. The pumphouse is located on the main road in the townland of Ballykenly. The spring source is 150 m north of the pumphouse in a concrete sump.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	320	Ground Elevation (m OD):	50
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:	Glanworth	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	Source report prepared by GSI in 2000.				
Scheme Summary:	The scheme consists of the spring at Tobermore and the borehole at Dunmahon Bridge. The spring has been in use since 1947 while the borehole was more recently commissioned to augment the supply. There is a GSI source report for the Tobermore Spring				

HYDROGEOLOGY							
GEOLOGY	Soil:	Deep well drained mineral (AminDW)				Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictos) (TDSs)					
	Bedrock:	Dinantian Pure Unbedded Limestones					
HYDROGEOLOGY	Aquifer Category:	Rkd	Vulnerability at Monitoring site:	High to Low	Flow Regime:	Karstified	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km ²):	3.42	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	570	
	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
	0.61	5.11	0	0	0	94.28	0
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO ₃		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 56 mg/l NO ₃ and the maximum nitrate concentration was 78 mg/l NO ₃ . The average ammonium concentration was 0.016 mg/l N and the maximum ammonium concentration was 0.06 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.009 mg/l P and the maximum MRP concentration was 0.023 mg/l P. The average chloride concentration was 22.5 mg/l Cl and the maximum chloride concentration was 33.3 mg/l Cl.			
Alkalinity (mg/l HCO ₃):	Average:	Range:					
	293	250-330					
Hardness (mg/l CaCO ₃):	Average:	Range:					
	362	300-483					
Conductivity (uS/cm):	Average:	Range:					
	695	492-839					
Monitoring Record Period:	From:	To:					
	2007	2010					
RISK ASSESSMENT							
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:	Nitrate			
Risk Category:	At risk, high confidence		GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:		
	0.00	94.62	5.38	0.00	0.00		
OTHER INFORMATION							



Spring



Pump House



Spring with Overflow

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).

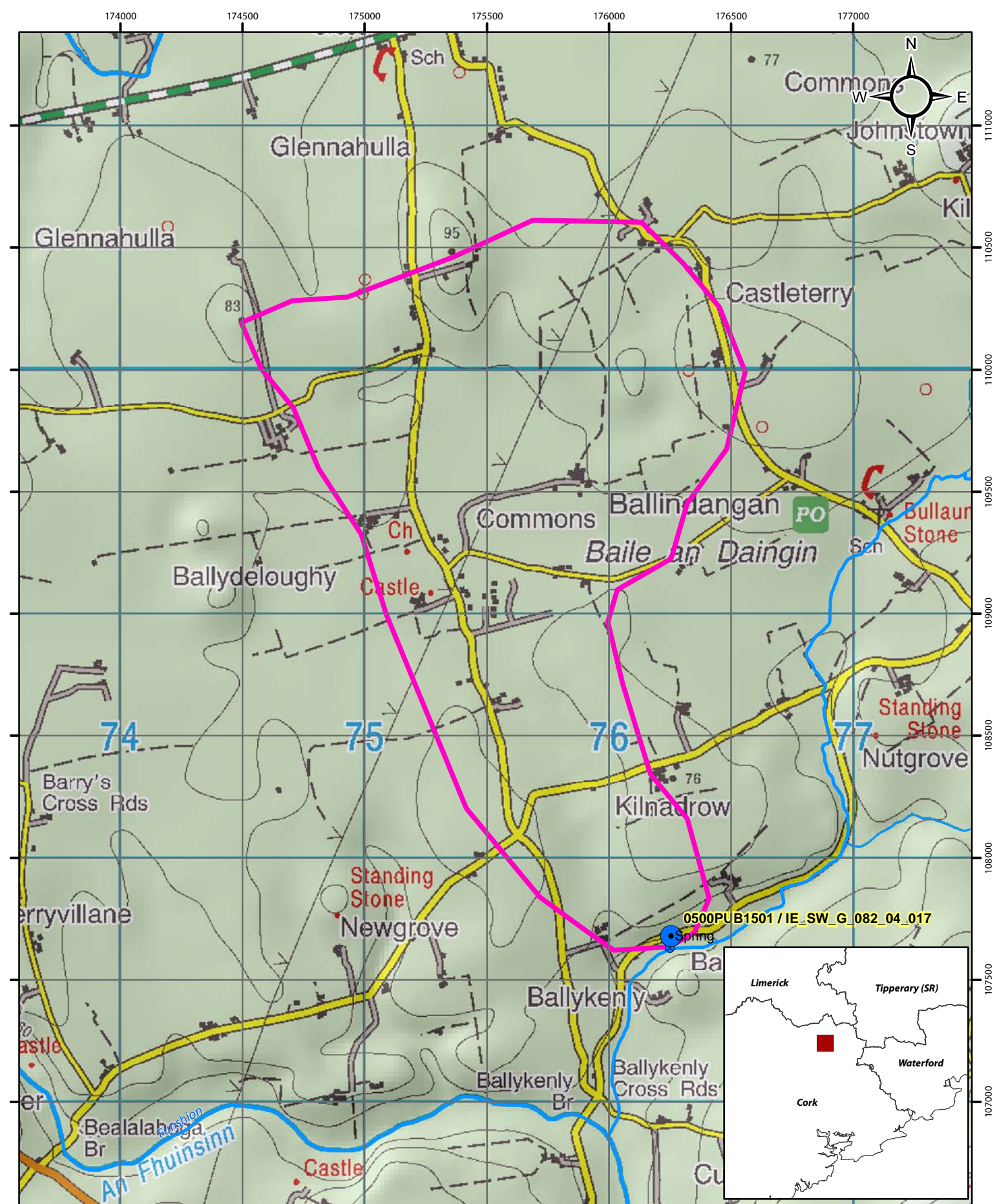
General Downgradient Distances

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.

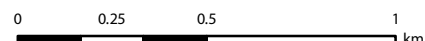
Version 0:	Prepared by	GSI	Date:	
Version 1:	Prepared by	OCM (DC)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

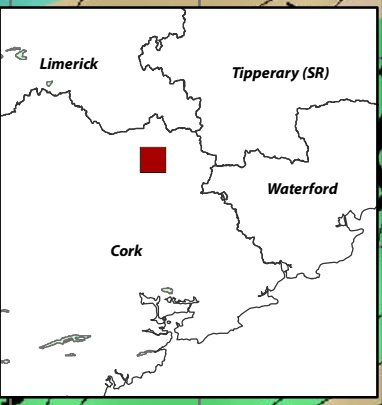
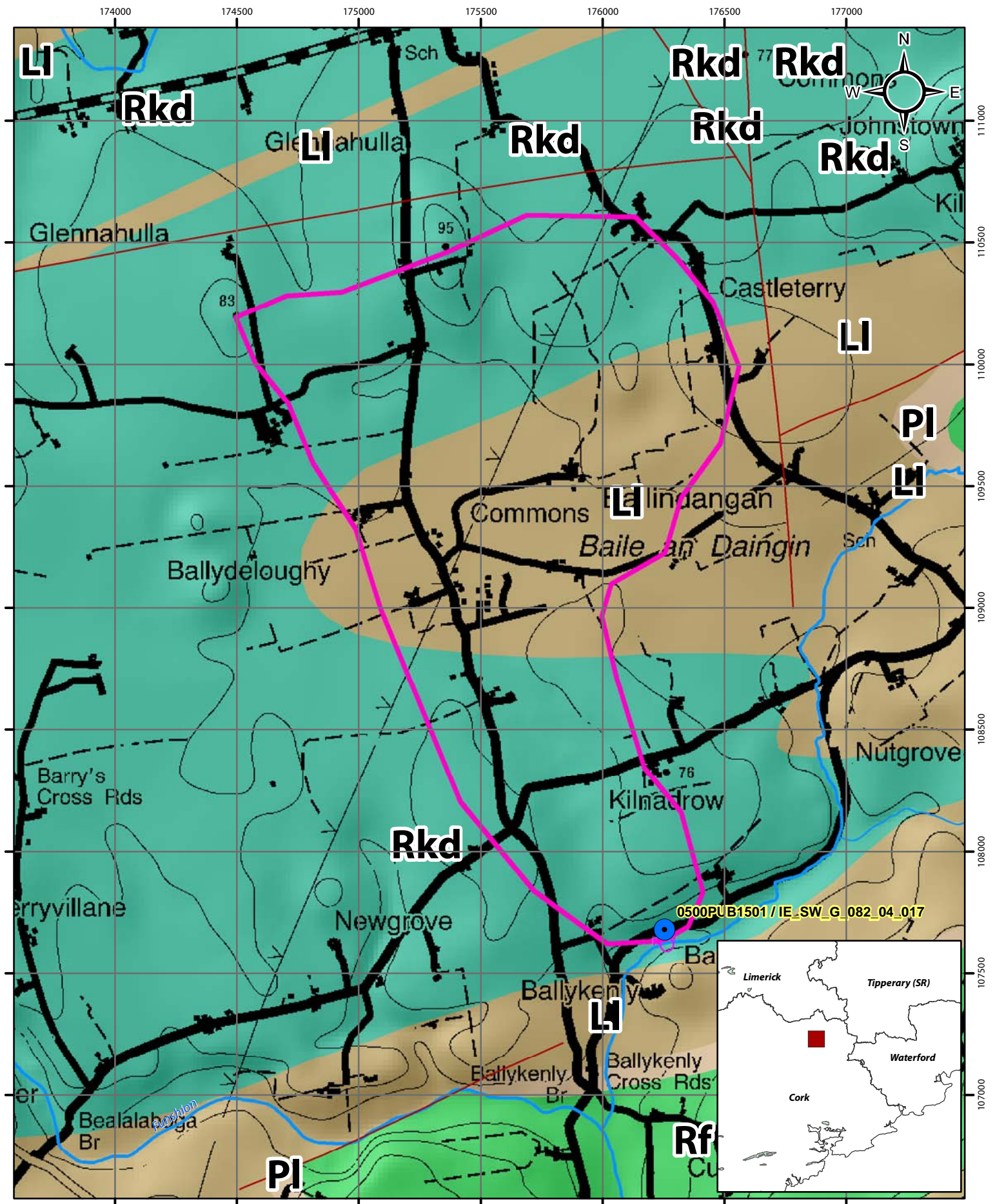


Location Map for Glanworth PWS

-  Abstractions
-  River
-  Zone of Contribution

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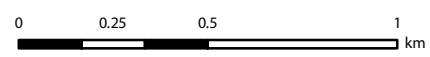




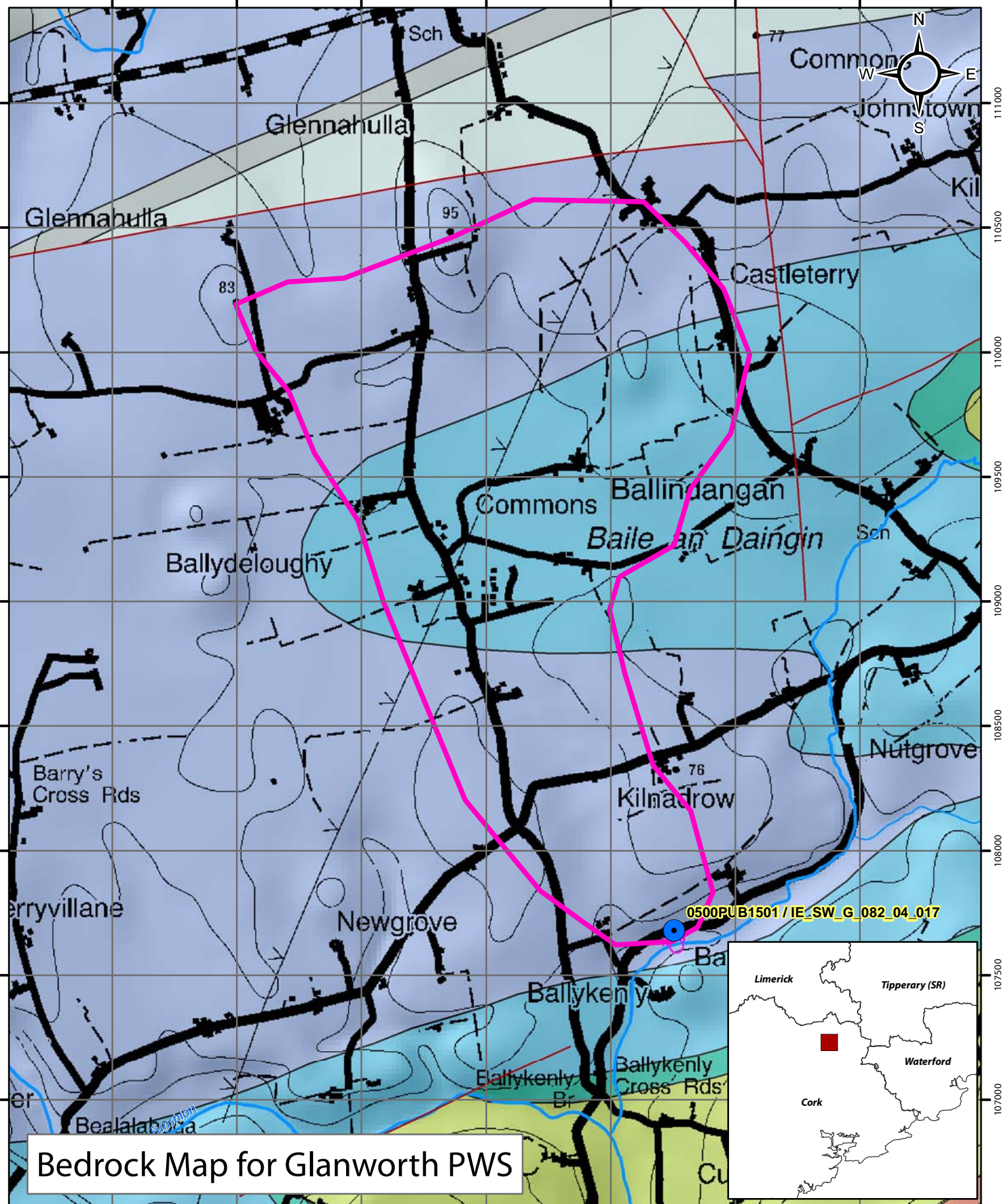
Aquifer Category Map for Glanwath PWS

- Abstractions
- Spring
- LI
- Rf
- River
- Fault
- PI
- Rkd
- Zone of Contribution

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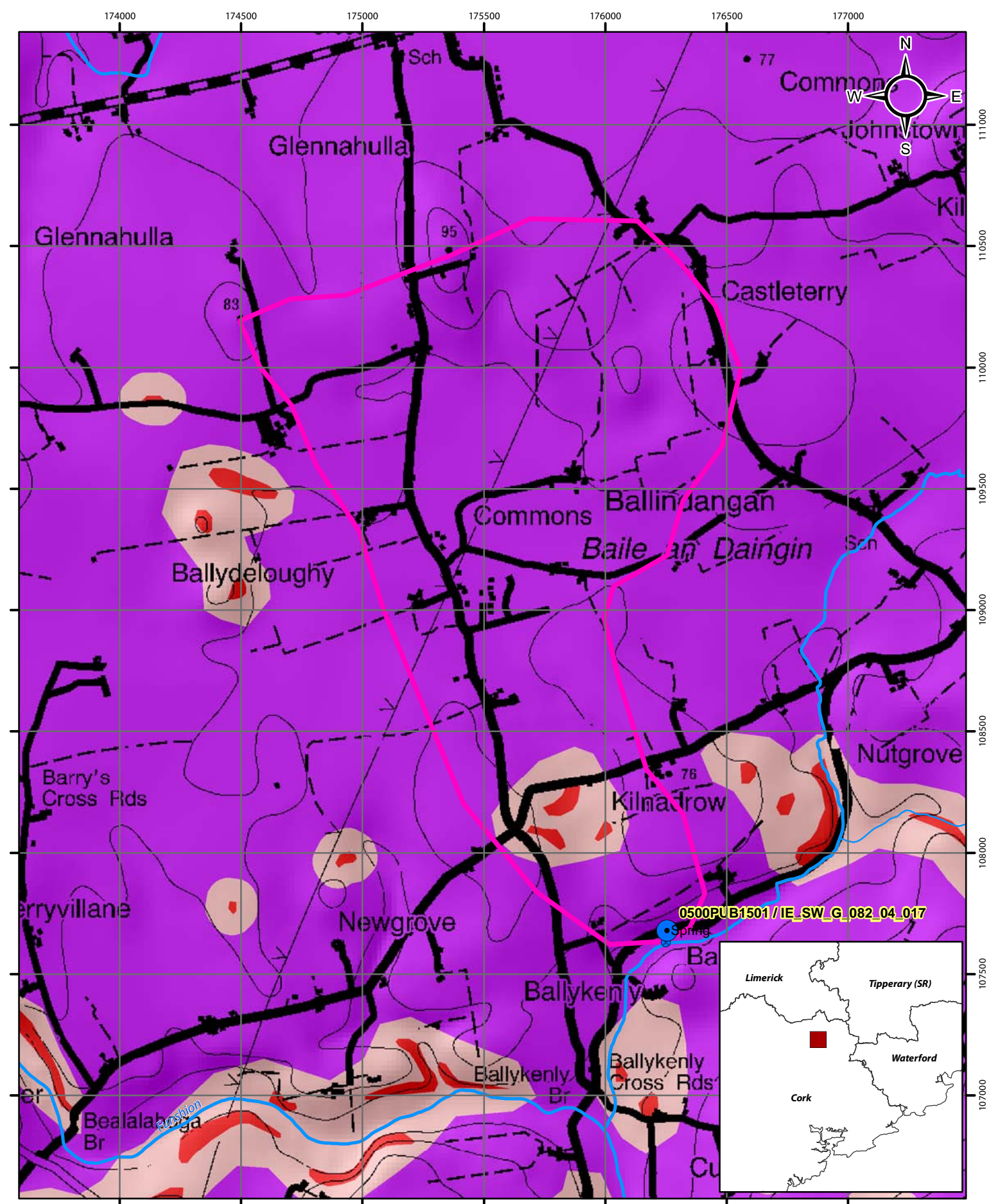


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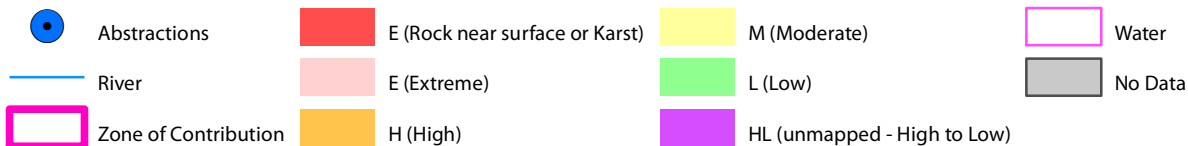


Bedrock Map for Glanworth PWS

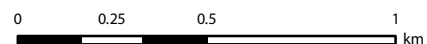
- | | | | |
|----------------------|---|------------------------------------|--------|
| Abstractions | Devonian Kiltorcan-type Sandstones | Dinantian Pure Bedded Limestones | Fault |
| River | Devonian Old Red Sandstones | Dinantian Pure Unbedded Limestones | Spring |
| Zone of Contribution | Dinantian (early) Sandstones, Shales and Limestones | Dinantian Upper Impure Limestones | |
| | Dinantian Lower Impure Limestones | | |

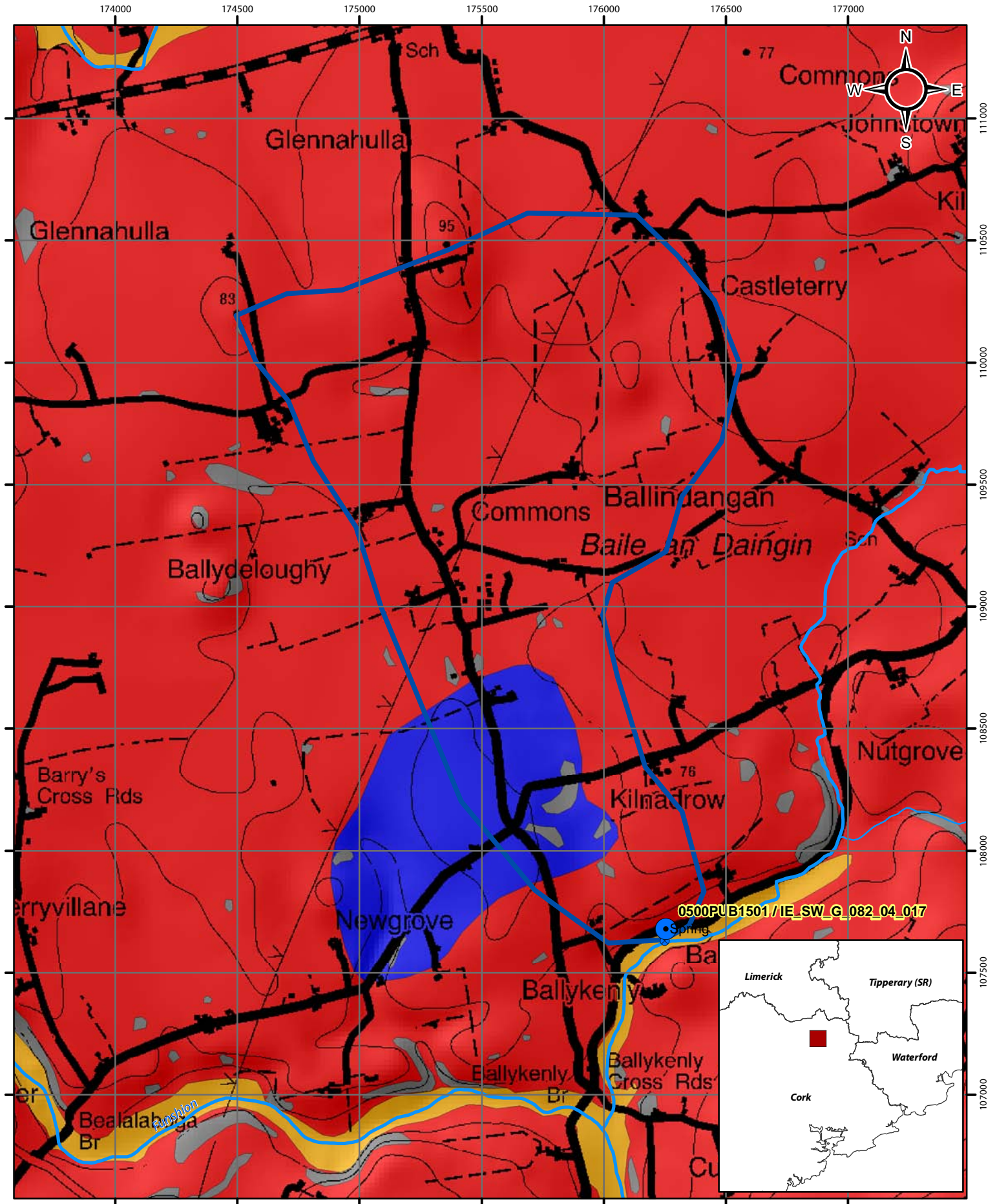


Groundwater Vulnerability Map for Glanworth PWS



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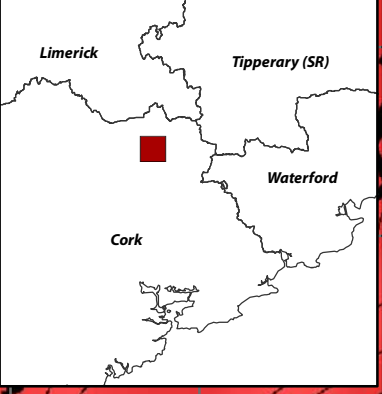
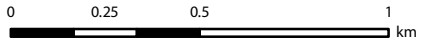




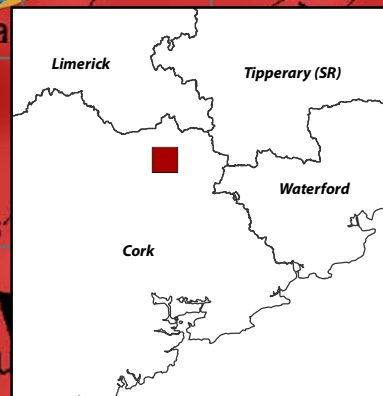
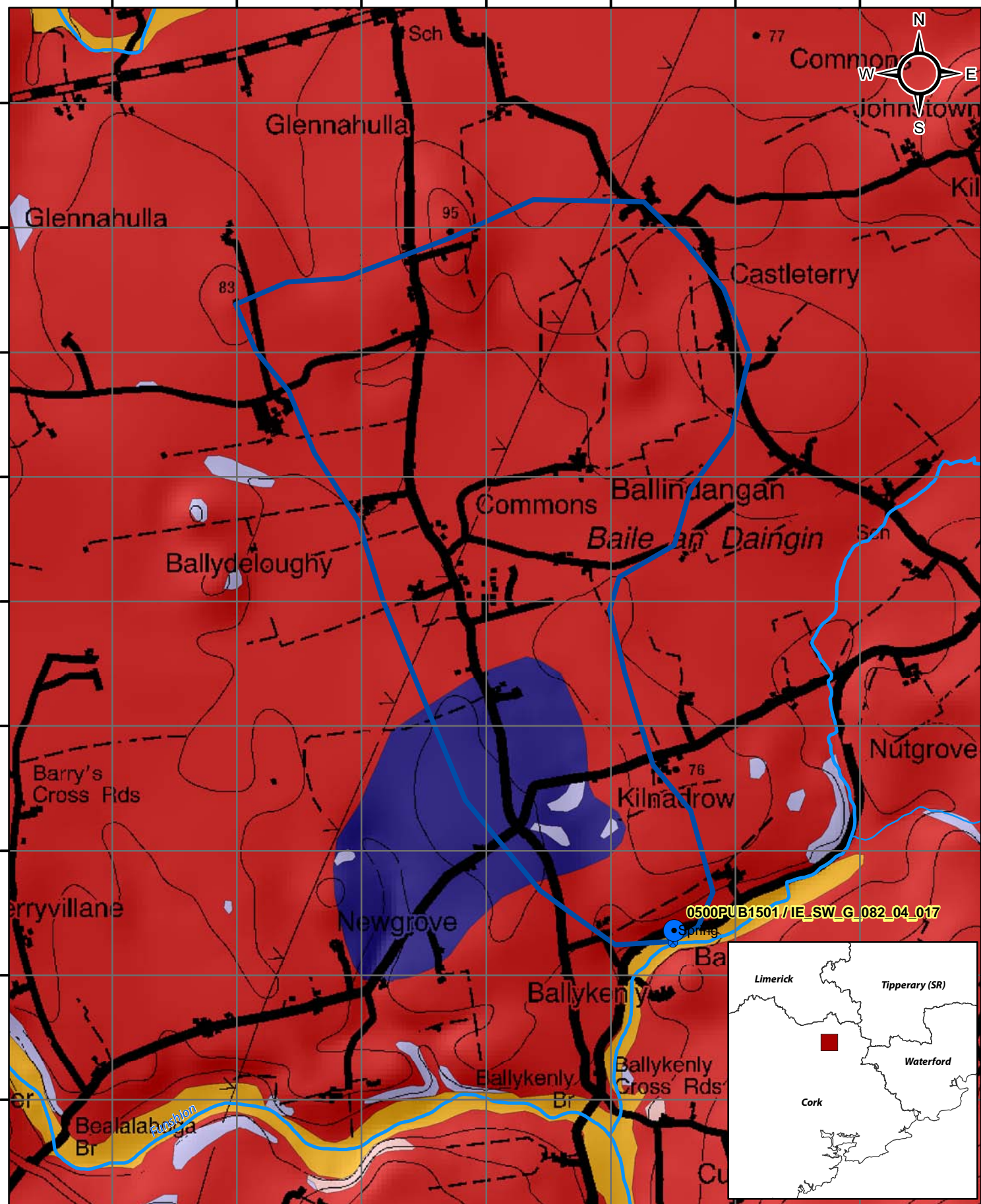
Subsoils Map for Glanworth PWS

- Abstractions
- Alluvium
- Till derived from Devonian sandstones
- River
- Bedrock outcrop or subcrop
- Till derived from limestones
- Zone of Contribution









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Soils Map for Glanworth PWS

-  Abstractions
-  River
-  Zone of Contribution
-  Acid Deep Well Drained Mineral
-  Acid Shallow Well Drained Mineral
-  Basic Deep Well Drained Mineral
-  Basic Shallow Well Drained Mineral
-  Mineral Alluvium

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0 0.25 0.5 1 km