

Water Framework Directive Groundwater Monitoring Programme

Site Information

Castletownroche WS (Sp 2)



Castletownroche WS is a spring used as a public water supply. The abstraction rate is 1650m³/day. A GSI source report has been completed.



Cork

August 2011

SITE INFORMATION					
Site Name:	Castletownroche WS (Sp 2)		County:	Cork	
RBD:	SWRBD		EU Reporting Code:	IE_SW_G_082_04_007	
Easting:	168541		GWB Name:	Mitchelstown 1	
Northing:	103656		GWB Code:	IE_SW_G_082	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0500PUB1203	
Hydrometric Area:	18		Water Level Monitoring Network:	Level	Flow
Townland:	BALLINVOHER			N	N
Ownership:	Cork County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	---				
SITE DIRECTIONS					
Location and Access Information:	Ballinvoher Spring is located 1.5 km north of Castletownroche east of the Awbeg River. Access is from a laneway off the main road to Shanballymore. Redstone Well is another spring in the scheme which is directly across the river.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	1650	Ground Elevation (m OD):	69
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:	Castletownroche	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 sources are located on either side of the Awbeg River opposite to each other about 1.5 km north of Castletownroche. The supply was set up in 1954 and serves approximately 1,600 people (1998). Each spring has its own reservoir on either side of the valley				

HYDROGEOLOGY							
GEOLOGY	Soil:	Deep well drained mineral (AminDW)				Subsoil Permeability:	n/a
	Subsoil:	Tills (diamictons) (TNSSs)					
	Bedrock:	Dinantian Upper Impure Limestones					
HYDROGEOLOGY	Aquifer Category:	LI	Vulnerability at Monitoring site:	Extreme	Flow Regime:	Karstified	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km ²):	6.03	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	570	
	ZOC Delineation Comments:	The GSI delineated a ZOC on based on topography, an estimated discharge of 5888 m ³ /d and recharge . See the source report for details.					
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	3.58	8.85	0	0	0	87.57	0
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO ₃		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 38 mg/l NO ₃ and the maximum nitrate concentration was 46 mg/l NO ₃ . The average ammonium concentration was 0.023 mg/l N and the maximum ammonium concentration was 0.15 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.006 mg/l P and the maximum MRP concentration was 0.01 mg/l P. The average chloride concentration was 22.3 mg/l Cl and the maximum chloride concentration was 25 mg/l Cl.			
Alkalinity (mg/l HCO ₃):	Average:	Range:					
	303	270-376					
Hardness (mg/l CaCO ₃):	Average:	Range:					
	356	300-512					
Conductivity (uS/cm):	Average:	Range:					
	658	501-805					
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:		
	4.92	95.08	0.00	0.00	0.00		
OTHER INFORMATION							



Site Location



Pump 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 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).

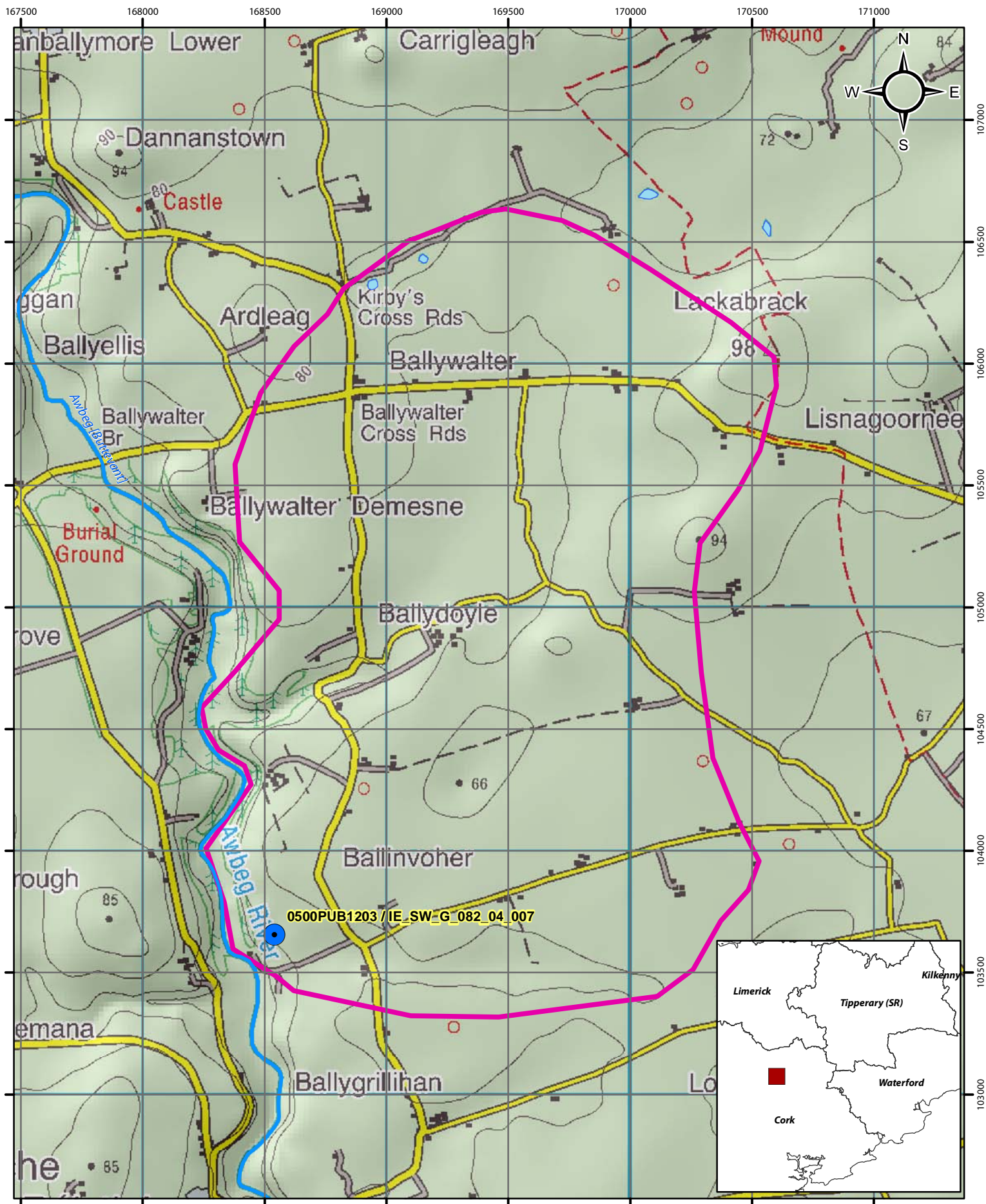
General Downgradient Distances

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:	

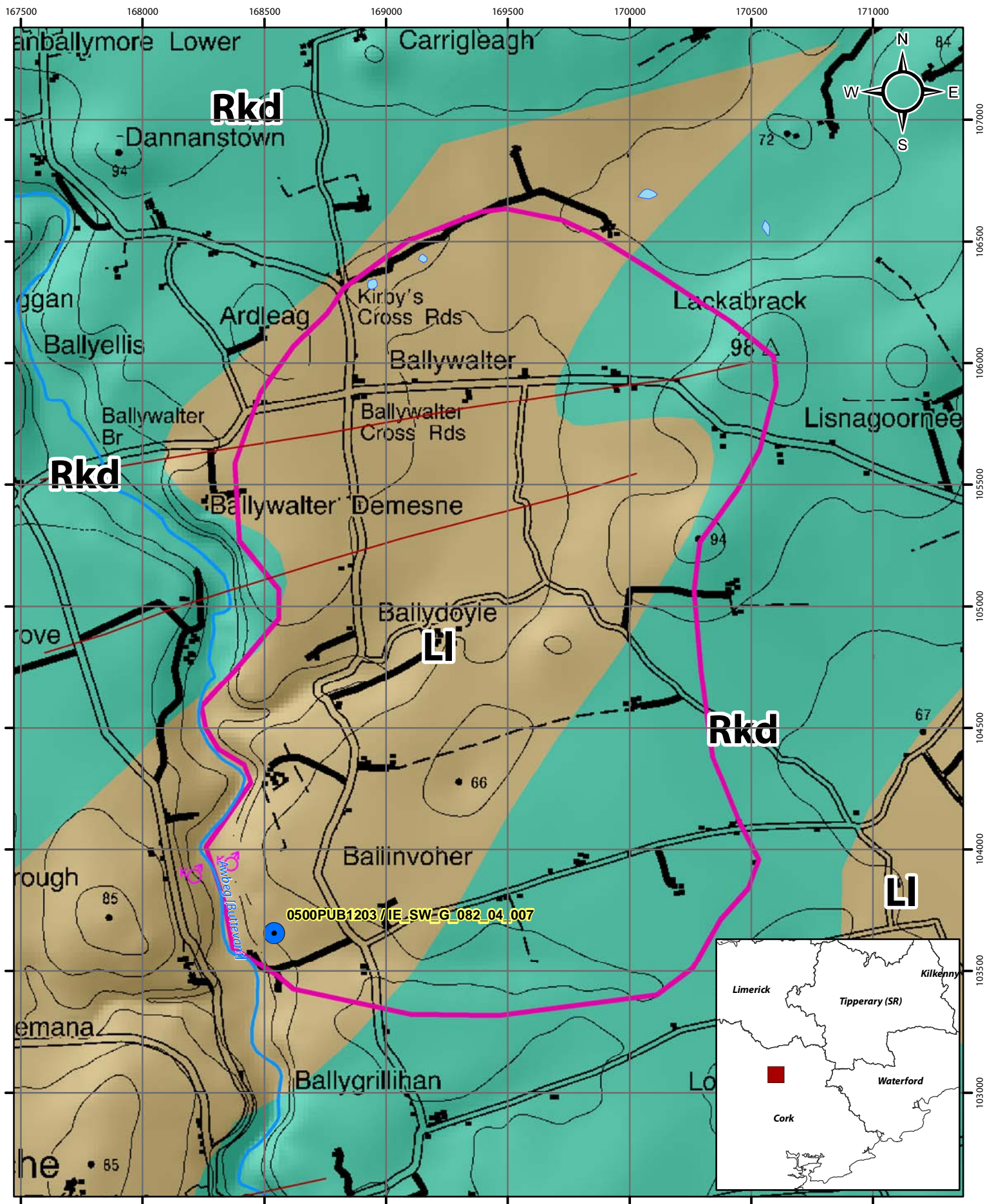


Location Map for Casteltownroche WS

- Abstractions
- River
- Zone of Contribution
- Lakes

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0 0.25 0.5 1 km

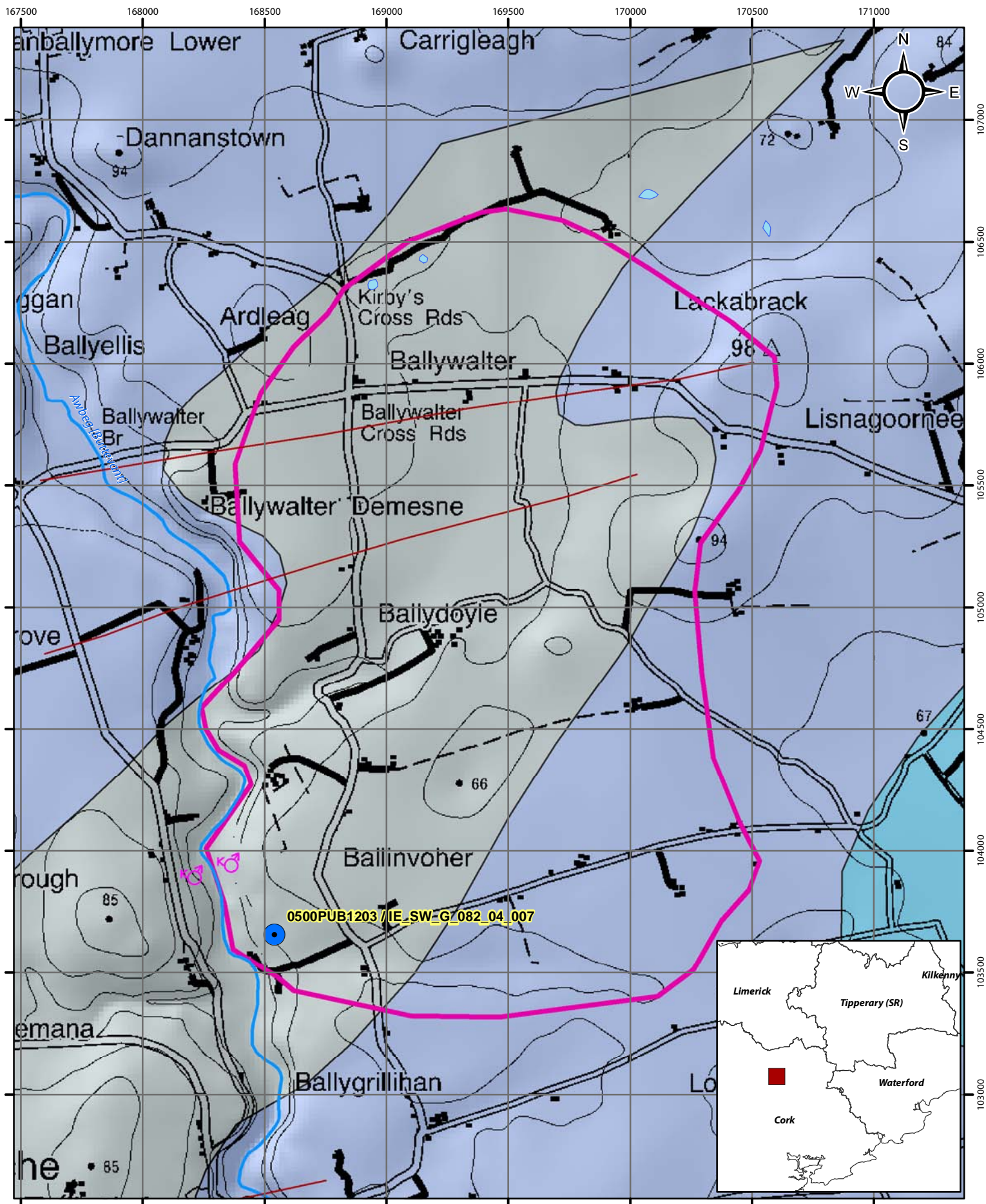


Aquifer Category Map for Casteltownroche WS










- Abstractions
- River
- Fault
- Zone of Contribution
- ☿ Spring
- Lakes
- LI
- Rkd

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0 0.25 0.5 1 km

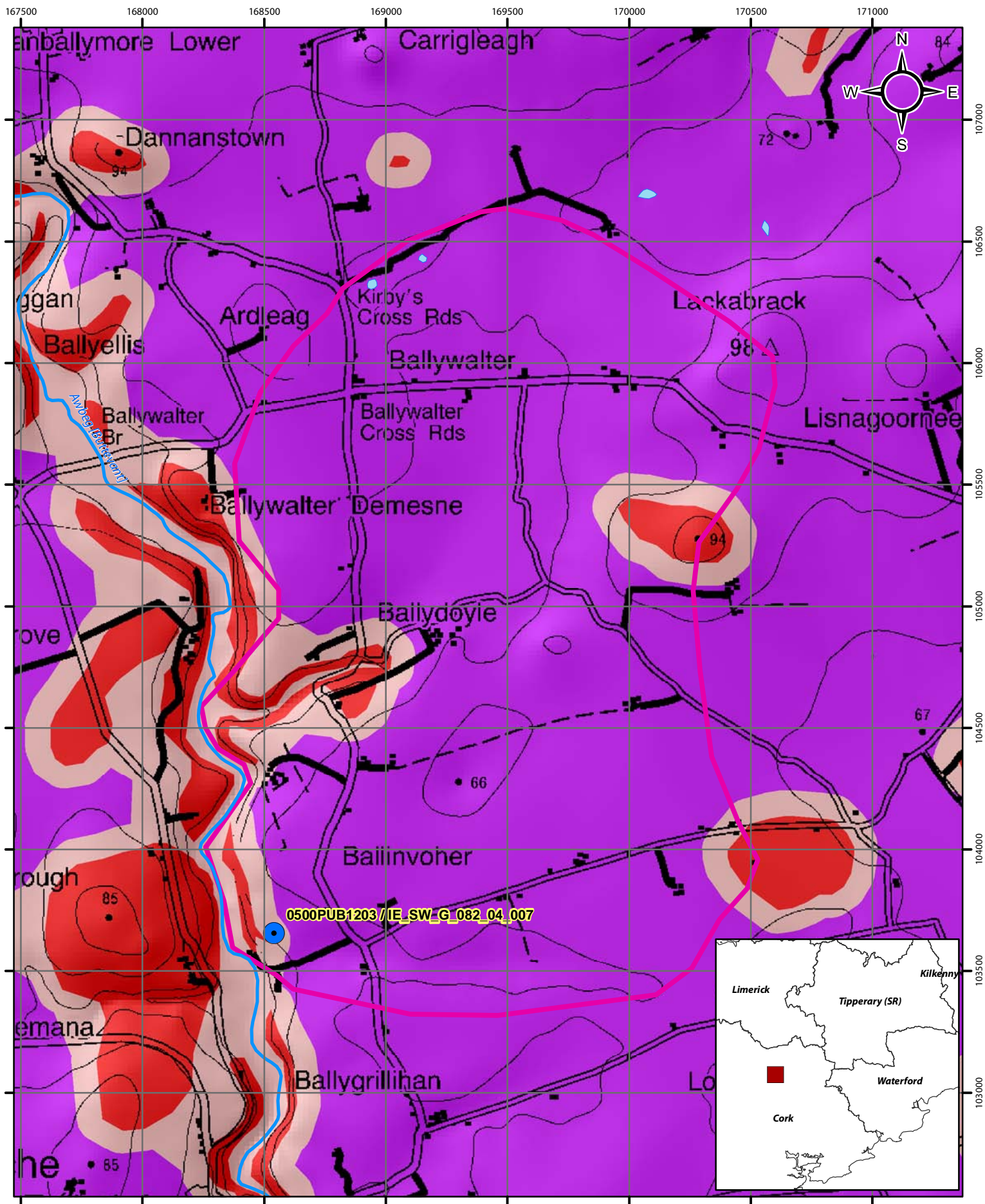


Bedrock Map for Casteltownroche WS

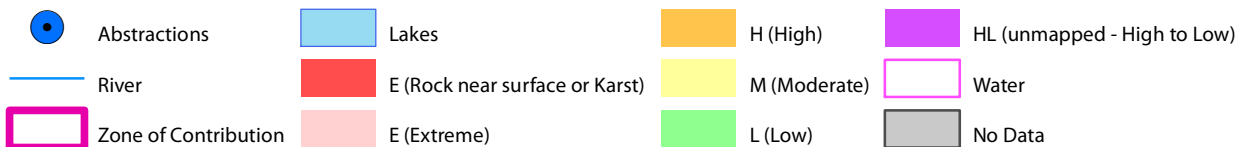
- | | | |
|---|--|--|
|  Abstractions |  Fault |  Dinantian Lower Impure Limestones |
|  River |  Spring |  Dinantian Pure Unbedded Limestones |
|  Zone of Contribution |  Lakes |  Dinantian Upper Impure Limestones |

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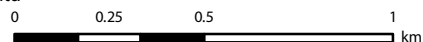
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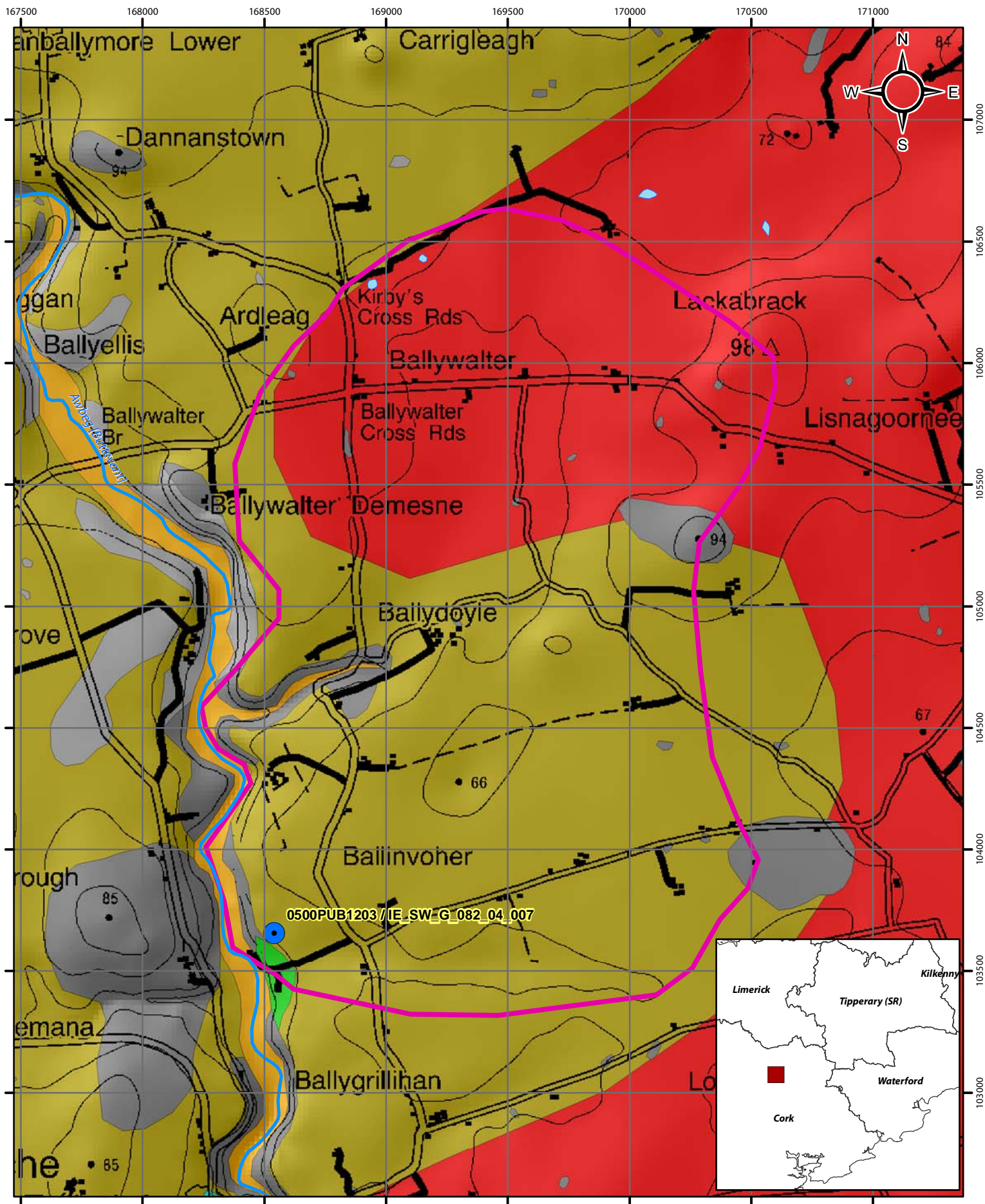


Groundwater Vulnerability Map for Casteltownroche WS



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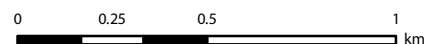


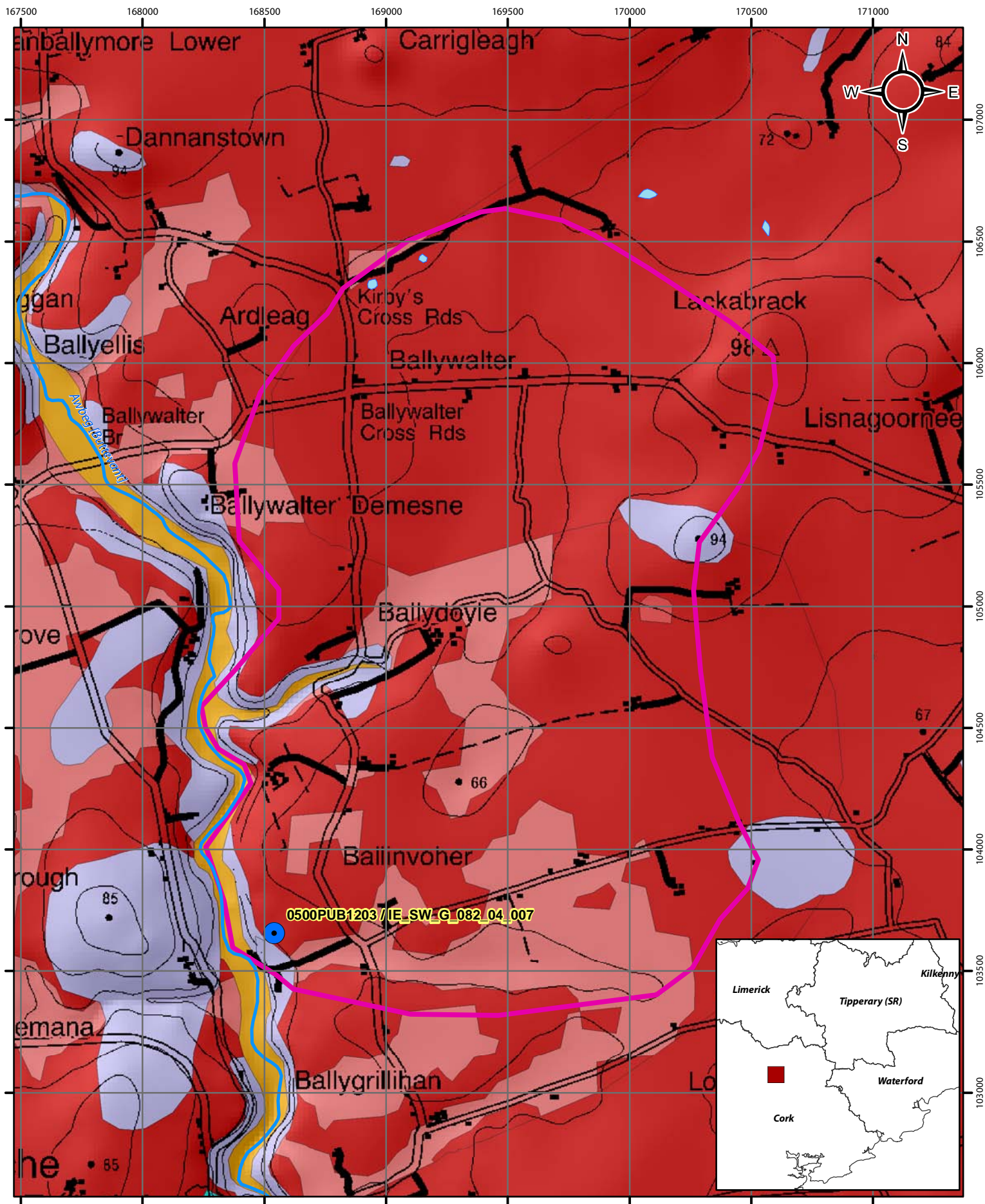


Subsoils Map for Casteltownroche WS

- | | | | |
|----------------------|-------------|---------------------------------------|--|
| Abstractions | Lakes | Bedrock outcrop or subcrop | Till derived from Devonian sandstones |
| River | Alluvium | Gravels derived from limestones | Till derived from Namurian sandstones and shales |
| Zone of Contribution | Made ground | Karstified bedrock outcrop or subcrop | |

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Soils Map for Casteltownroche WS

- | | | | |
|----------------------|----------------------------------|------------------------------------|------|
| Abstractions | Lakes | Acid Poorly Drained Peaty Mineral | Made |
| River | Acid Deep Well Drained Mineral | Basic Shallow Well Drained Mineral | |
| Zone of Contribution | Acid Deep Poorly Drained Mineral | Mineral Alluvium | |

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0 0.25 0.5 1 km