

Water Framework Directive Groundwater Monitoring Programme

Site Information **Ballyvaughan**



Ballyvaughan is a 65m deep borehole that is used as a public water supply. The abstraction rate is from 230 to 568 m³/day. The GSI have completed a source protection report for Ballyvaughan.



Clare

August 2011

SITE INFORMATION					
Site Name:	Ballyvaughan		County:	Clare	
RBD:	WRBD		EU Reporting Code:	IE_WE_G_0001_03_001	
Easting:	122000		GWB Name:	Ballyvaughan uplands	
Northing:	206299		GWB Code:	IE_WE_G_0001	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0300PUB1013	
Hydrometric Area:	30		Water Level Monitoring Network:	Level	Flow
Townland:	NEWTOWN			N	N
Ownership:	Clare Co. Co. (Public Water Scheme)				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	The source comprises a bored well, located in the middle of a field, approx. 100 m from the pumphouse on the main Ballyvaughan - Lisdoonvarna road. The well is completed above ground level in a large concrete chamber. The well is not capped, however the chamber is protected by a steel cover which is padlocked.				
SITE DIRECTIONS					
Location and Access Information:	Located 2km south of Ballyvaughan, just off the N67. The well and separate pumphouse are located in a field. The sample is taken from a tap inside the pumphouse. The local authority has a right of way across the field.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	Borehole	Abstraction Rate (m³/d):	230-568	Ground Elevation (m OD):	15
Borehole Log Available:	---	Total Drilled Depth (m bgl):	65	Depth to Bedrock (m bgl):	2.5
Top of Casing (m agl):	21	Upper Casing Diameter (mm):	200	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):	Slotted steel	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):	277-555	Comments on Monitoring Site:	Borehole is commonly referred to as the Newtown borehole. Groundwater levels are influenced by tidal fluctuations. Groundwater flow is karstic. Pumping has little influence on groundwater levels in the well, i.e. negligible drawdown. Natural groundwater flow direction is NE towards Galway Bay.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Ballyvaughan	Number of Abstraction Points in the Scheme:	1	Source Report Available	Y
Source Report Info:	Source report prepared by GSI (1999).				
Scheme Summary:	The Ballyvaughan Source is situated in the townland of Newtown approx. 1.5 km southwest of Ballyvaughan village, Co. Clare.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (BminDW)					Subsoil Permeability:	n/a
	Subsoil:	Tills (diamictos) (TLs)						
	Bedrock:	Dinantian Pure Bedded Limestones						
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	Extreme	Flow Regime:	Karstified		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	27.74	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	903		
	ZOC Delineation Comments:	GSI have delineated source protection areas for this site. Report available from Groundwater Section at GSI. ZOC based on topography and water tracing.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	70.91	22.16	5.59	1.34	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 5 mg/l NO3 and the maximum nitrate concentration was 19 mg/l NO3. The average ammonium concentration was 0.024 mg/l N and the maximum ammonium concentration was 0.103 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.011 mg/l P and the maximum MRP concentration was 0.086 mg/l P. The average chloride concentration was 16.6 mg/l Cl and the maximum chloride concentration was 35.9 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	228	133-377						
Hardness (mg/l CaCO3):	Average:	Range:						
	239	156-477						
Conductivity (uS/cm):	Average:	Range:						
	457	195-690						
Monitoring Record Period:	From:	To:						
	1995	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	---		Typical Contaminants:	---				
Risk Category:	Not at risk, high confidence		GWB Status:	Good				
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	0.00	0.00	23.41	6.19	70.40			
OTHER INFORMATION								
After exceptionally heavy rain the well becomes artesian indicating that confining conditions occur in times of high flow.								



Pump House



Sampling Location

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 NO₃)

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).

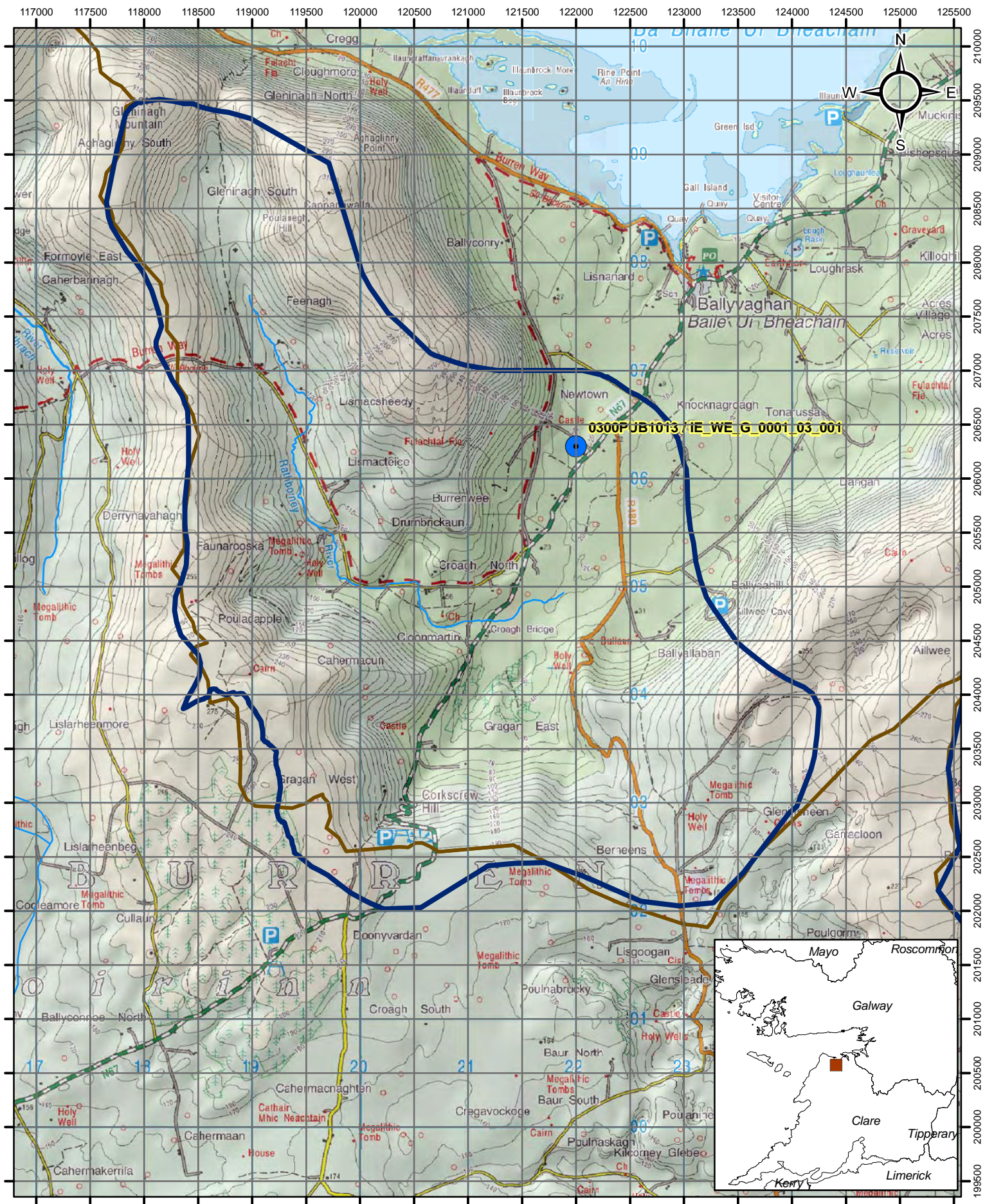
General Downgradient Distances

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:	15/02/1999
Version 1:	Prepared by	CDM (HM)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

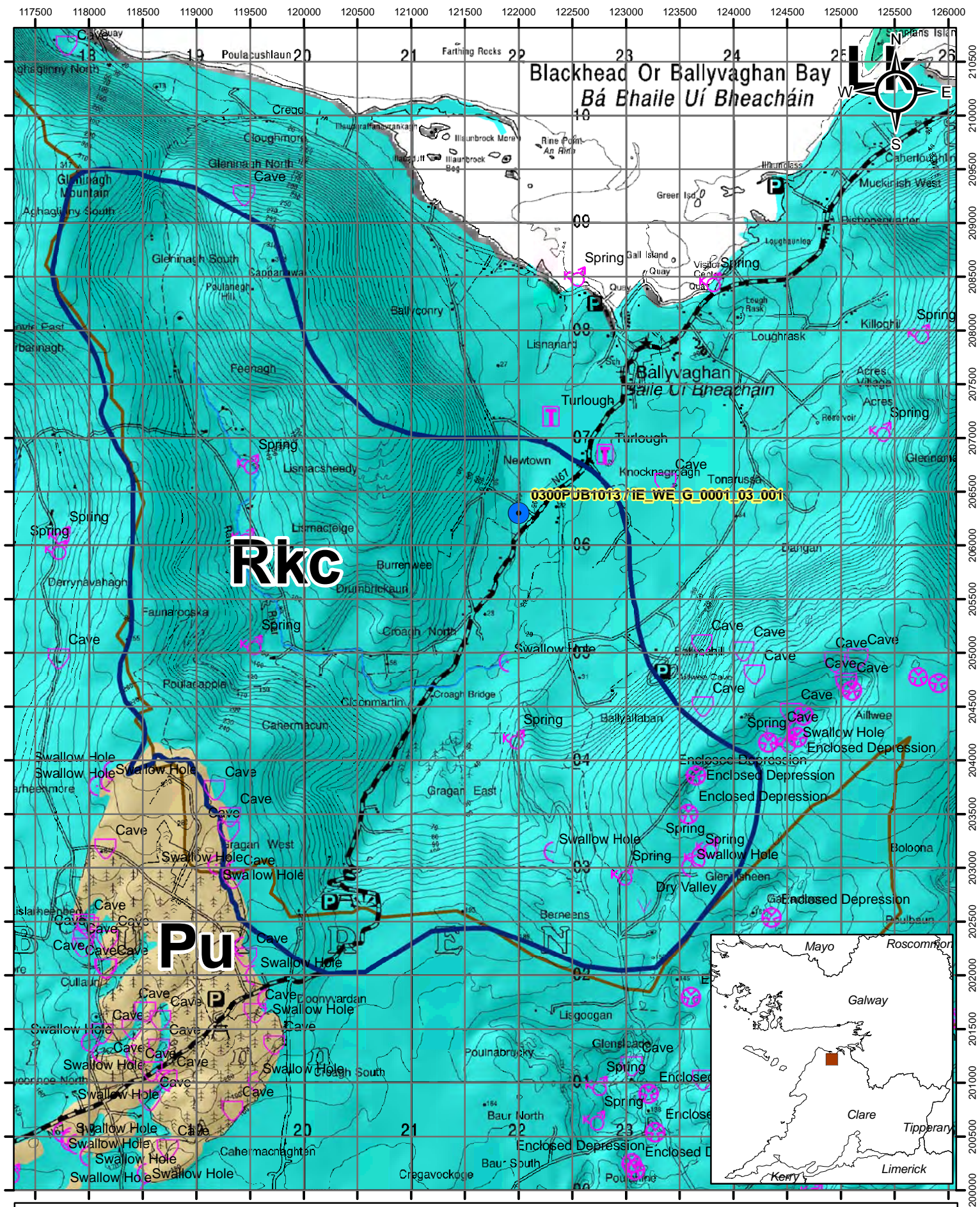


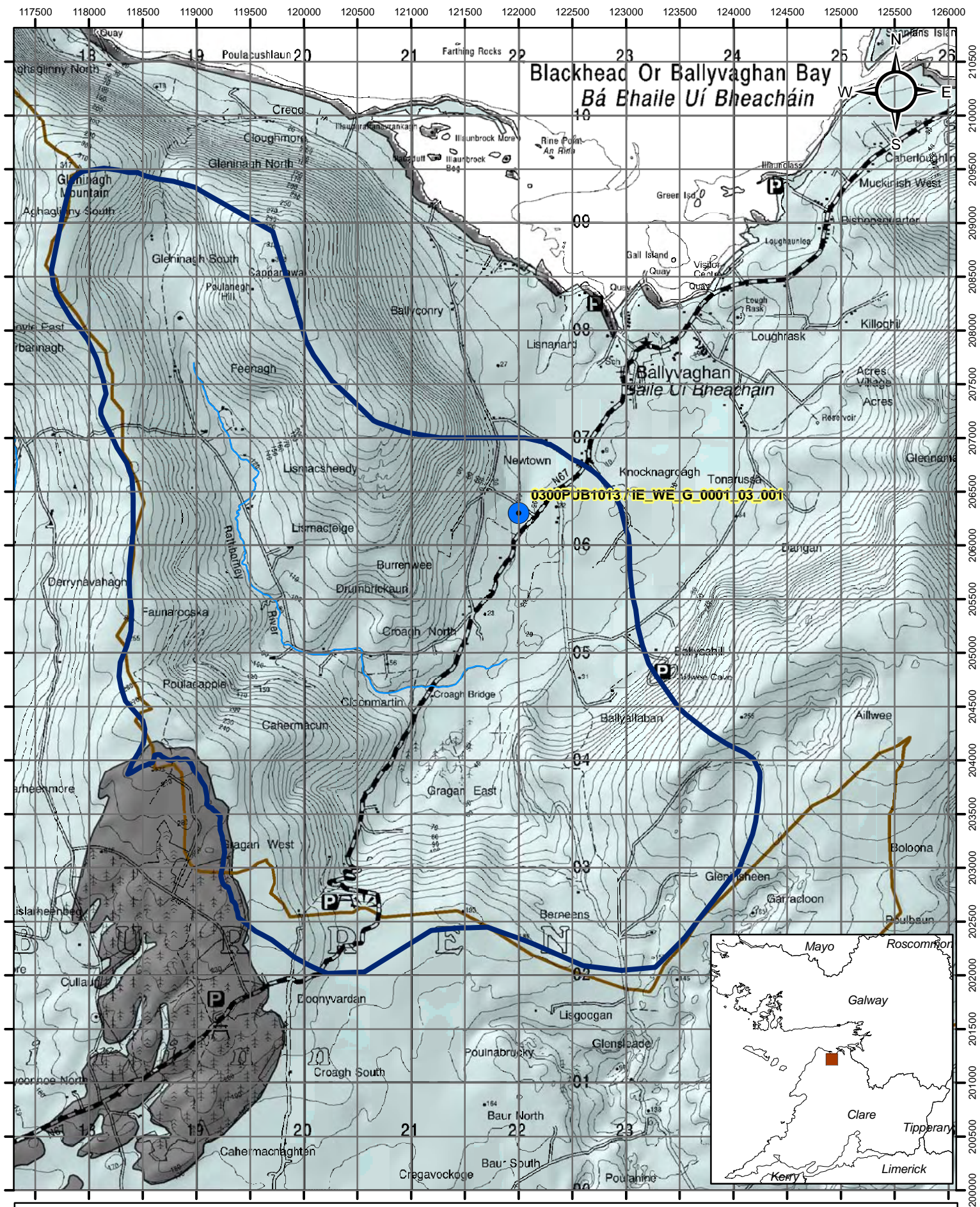
Location Map for Ballyvaughan

- Abstractions
- River Basin District
- River
- Zone of Contribution

© Ordnance Survey Ireland. All rights reserved.
Licence number EN0059208

0 0.25 0.5 1
km



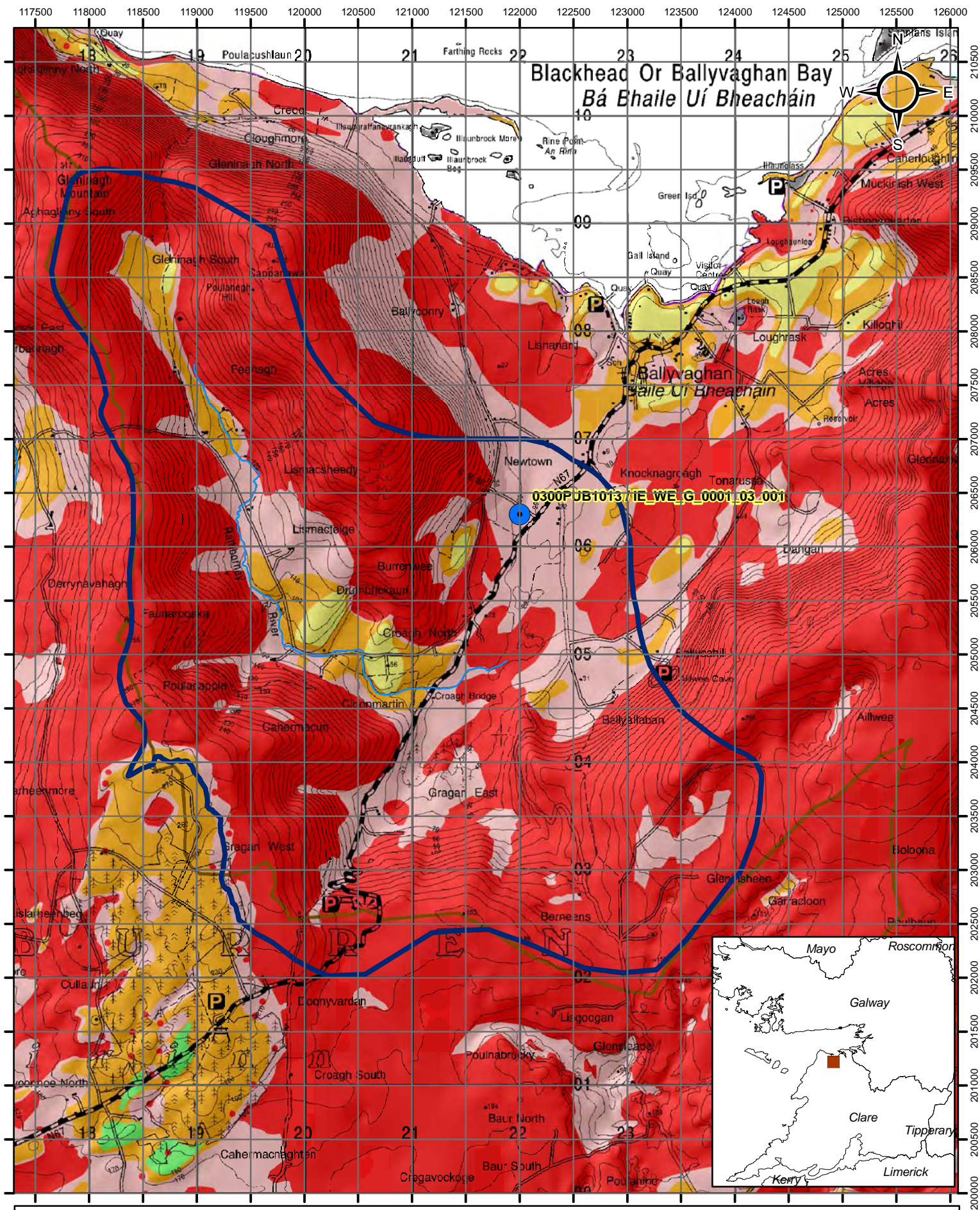


Bedrock Map for Ballyvaughan

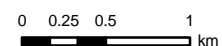
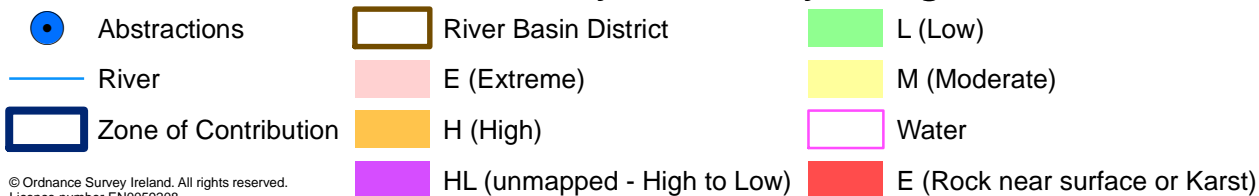
- Abstractions
- River
- Zone of Contribution
- River Basin District
- Dinantian Pure Bedded Limestones
- Namurian Shales

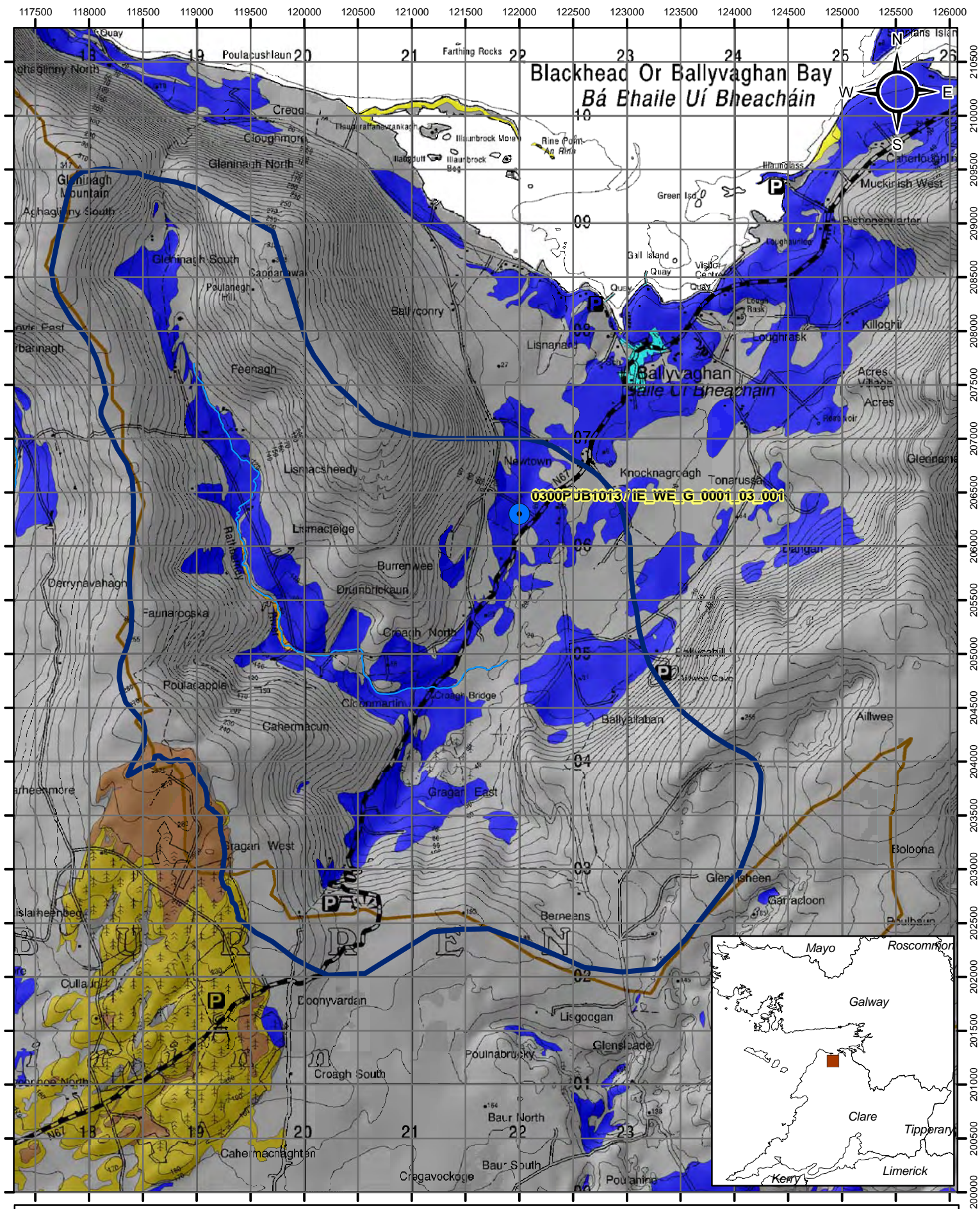
© Ordnance Survey Ireland. All rights reserved.
Licence number EN0059208

0 0.25 0.5 1
km

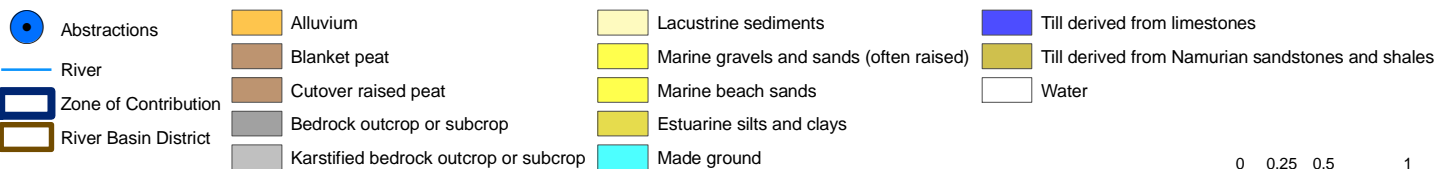


Groundwater Vulnerability for Ballyvaughan



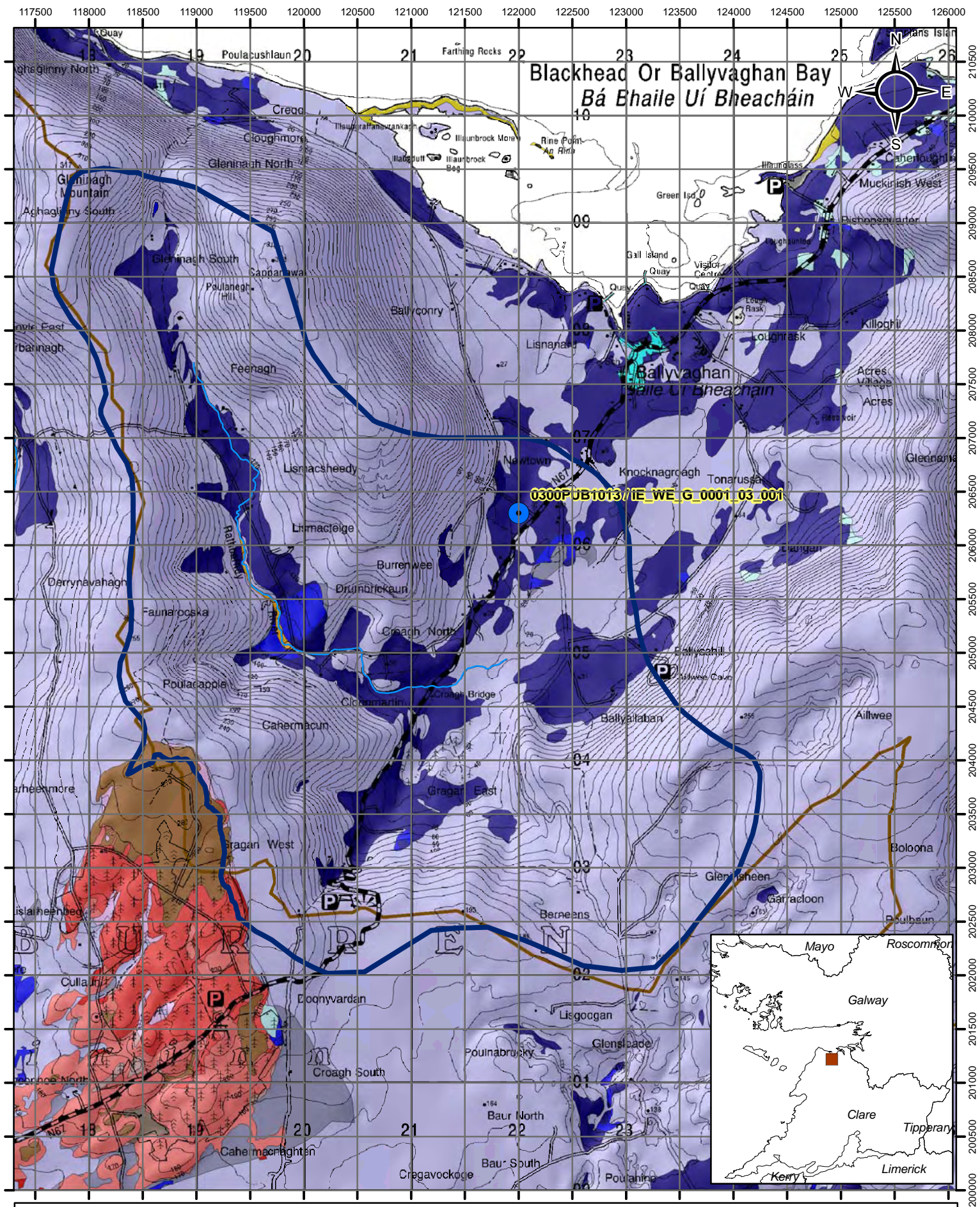


Subsoils Map for Ballyvaughan



© Ordnance Survey Ireland. All rights reserved.
Licence number EN0059208

0 0.25 0.5 1 km



Soils Map for Ballyvaughan



© Ordnance Survey Ireland. All rights reserved.
Licence number EN0059208

0 0.25 0.5 1 km