

Water Framework Directive Groundwater Monitoring Programme

Site Information

Bog of the Ring - PW3



This monitoring point, represented by abstraction well PW3, is part of the larger Bog of the Ring PWS. PW3 is presently pumping approximately 1,109 m³/day from a productive fissured limestone aquifer. The GSI have published a groundwater source protection zone report for the Bog of the Ring wellfield.

SITE INFORMATION					
Site Name:	Bog of the Ring - PW3		County:	Fingal	
RBD:	ERBD		EU Reporting Code:	IE_EA_G_014_06_008	
Easting:	317407		GWB Name:	Lusk-Bog of the Ring	
Northing:	259985		GWB Code:	IE_EA_G_014	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0900PUB1003	
Hydrometric Area:	8		Water Level Monitoring Network:	Level	Flow
Townland:	Ring Commons			N	N
Ownership:	Fingal Co. Co.				
Water Quality Monitoring Network:	Surveillance	Operational (Point)		Operational (Diffuse)	
	Y	N		N	
Site Comments:	Single well, part of larger wellfield. Well is located on slightly elevated grounds surrounded by bogs or agricultural lands.				
SITE DIRECTIONS					
Location and Access Information:	From M1 take exit towards Naul (R122). Then take the second road to the left (at the crossroads, 0.5 km from M1 roundabout) and drive for about 2 km until you reach a T-junction. Take left and drive for about 200 meters (well is on right-hand side behind fencing at crossroads).				
Additional Comments:	PW3 is on, and clearly visible from, Bog Road, at junction with road to Curragh Bridge. The wellhead is fenced in behind a locked gate.				
WELL INFORMATION					
Monitoring Point Type:	Borehole	Abstraction Rate (m³/d):	1109	Ground Elevation (m OD):	42
Borehole Log Available:	Y	Total Drilled Depth (m bgl):	53	Depth to Bedrock (m bgl):	18.3
Top of Casing (m agl):	1	Upper Casing Diameter (mm):	450	Lower Casing Diameter (mm):	300
Final Borehole Depth (m):	53	Upper Casing Bottom Depth (m bgl) :	24.4	Lower Casing Bottom Depth (m bgl):	14
Screen Interval (m bgl):	14-53	Screen Type (PVC,Steel,other):	Johnson SS	Screen Slot Size (mm):	3
Grout Type (cement,bentonite):	---	Grouted above (m bgl):	---	Grout Volume Injected (m³):	---
Gravel Pack Interval (m bgl):	14-53	Gravel Pack Volume (m³):	---	Open Hole Interval (m bgl):	---
Potential Yield (m³/day):	>1,500	Comments on Monitoring Site:	The well is screened from 14 m bgl to total depth at 53 m bgl. The annular space is filled with a filter pack of unknown composition and grain size range. There is no indication or confirmation that the annular space above the gravel pack was grouted. The borehole construction log suggests that the upper 4 m of 300 mm screen is set across a "sandy, clayey gravel" above the limestone bedrock, although an apparent outer 450 mm diameter casing was set to 24.4 m bgl.		
Specific Capacity (m³/d/m):	195				
Static Water Level (m bgl):	0.37				
Scheme Name:	Bog of the Ring	Number of Abstraction Points in the Scheme:	4	Source Report Available	Y
Source Report Info:	GSI published a Groundwater Source Protection Zone Report in March 2005. The report was commissioned by Fingal County Council (FCC). FCC also commissioned and published a Hydrogeological Assessment Report in October 2006.				
Scheme Summary:	Four boreholes are used for the Bog of the Ring Public Water Supply. Currently, all four boreholes are active, and supply a combined volume of around 3,500 m³/d. Following treatment the water is pumped to Jordanstown Reservoir which supplies the Balbriggan area.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (AminDW)					Subsoil Permeability:	Low
	Subsoil:	Tills (diamictos) (TNSSs)						
	Bedrock:	Dinantian Upper Impure Limestones						
HYDROGEOLOGY	Aquifer Category:	Lm	Vulnerability at Monitoring site:	Low	Flow Regime:	Productive fissured bedrock		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	19.28	ZOC Delineated By:	GSI	Recharge Estimate (mm/yr):	59		
	ZOC Delineation Comments:	ZOC delineated by the GSI on the basis of groundwater level monitoring data and numerical modelling. Both Inner and Outer Source Protection Areas were defined. See GSI, 2005 - Bog of the Ring Groundwater Source Protection Zones, March 2005. Available from the groundwater section at GSI.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	9.77	2.23	4.72	12.14	71.14	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was <1 mg/l NO3 and the maximum nitrate concentration was 1 mg/l NO3. The average ammonium concentration was 0.113 mg/l N and the maximum ammonium concentration was 0.171 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.029 mg/l P and the maximum MRP concentration was 0.232 mg/l P. The average chloride concentration was 26.9 mg/l Cl and the maximum chloride concentration was 37 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	293	248-350						
Hardness (mg/l CaCO3):	Average:	Range:						
	394	339-493						
Conductivity (uS/cm):	Average:	Range:						
	761	373-926						
Monitoring Record Period:	From:	To:						
	2007	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Abstractions and diffuse agricultural		Typical Contaminants:		---			
Risk Category:	At risk, high confidence		GWB Status:		Poor			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	4.46	15.53	29.69	46.17	4.16			
OTHER INFORMATION								
The well is potentially drawing on water from both the limestone bedrock and a sandy, clayey gravel. The relative contributions from each are not known. The available well construction log indicates water inflows from the gravel at 16 m bgl and from a reported "cavity" in the limestone at 45-47 m bgl. The limestone is part of the Loughshinny Formation. Drilling was terminated at 53 m bgl apparently because of loss of air pressure, normally indicative of a cavity.								



Site Location



Site Overview



Well head

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).

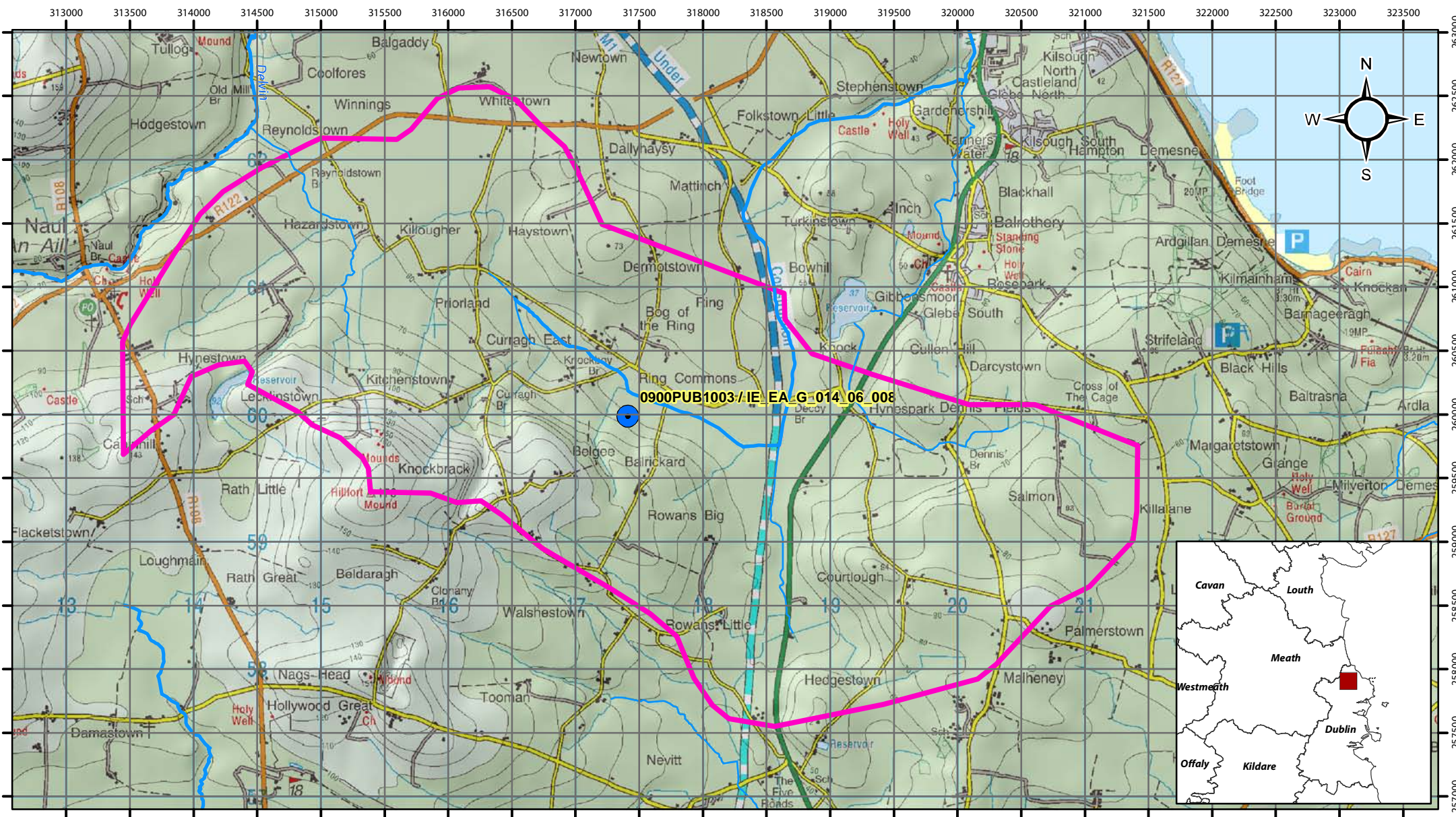
General Downgradient Distances

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:	01/03/2005
Version 1:	Prepared by	CDM (HM)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

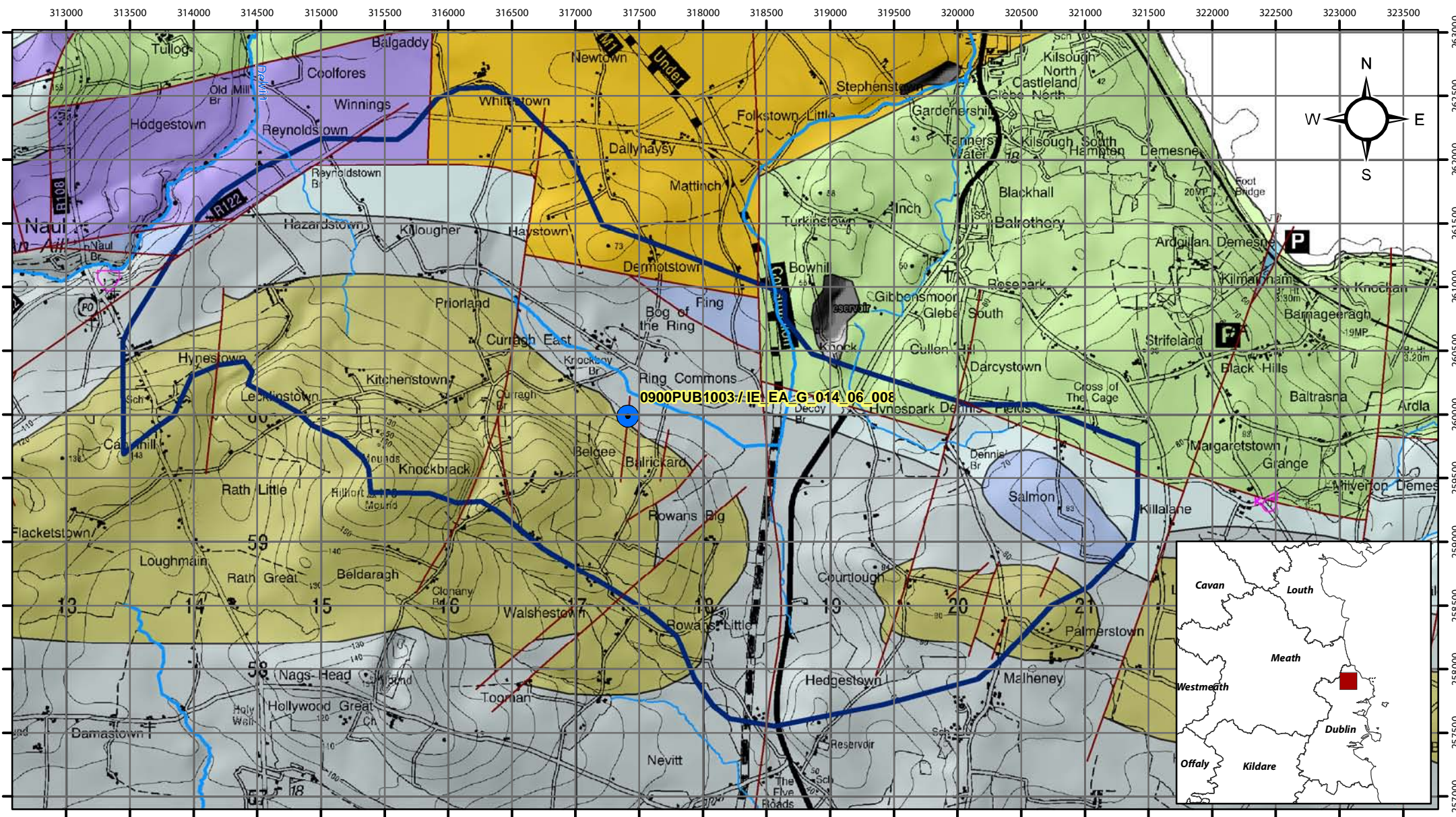


Location Map for Bog of the Ring PW3

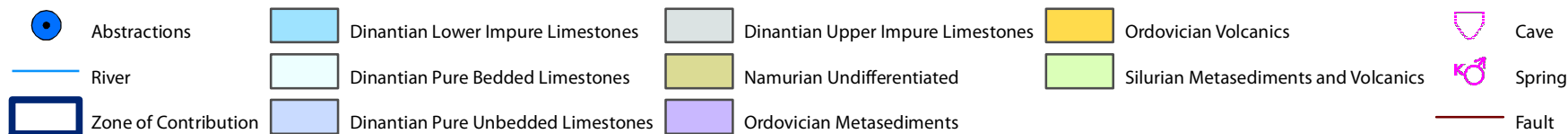
-  Abstractions
-  River
-  Zone of Contribution

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0 0.25 0.5 1
km

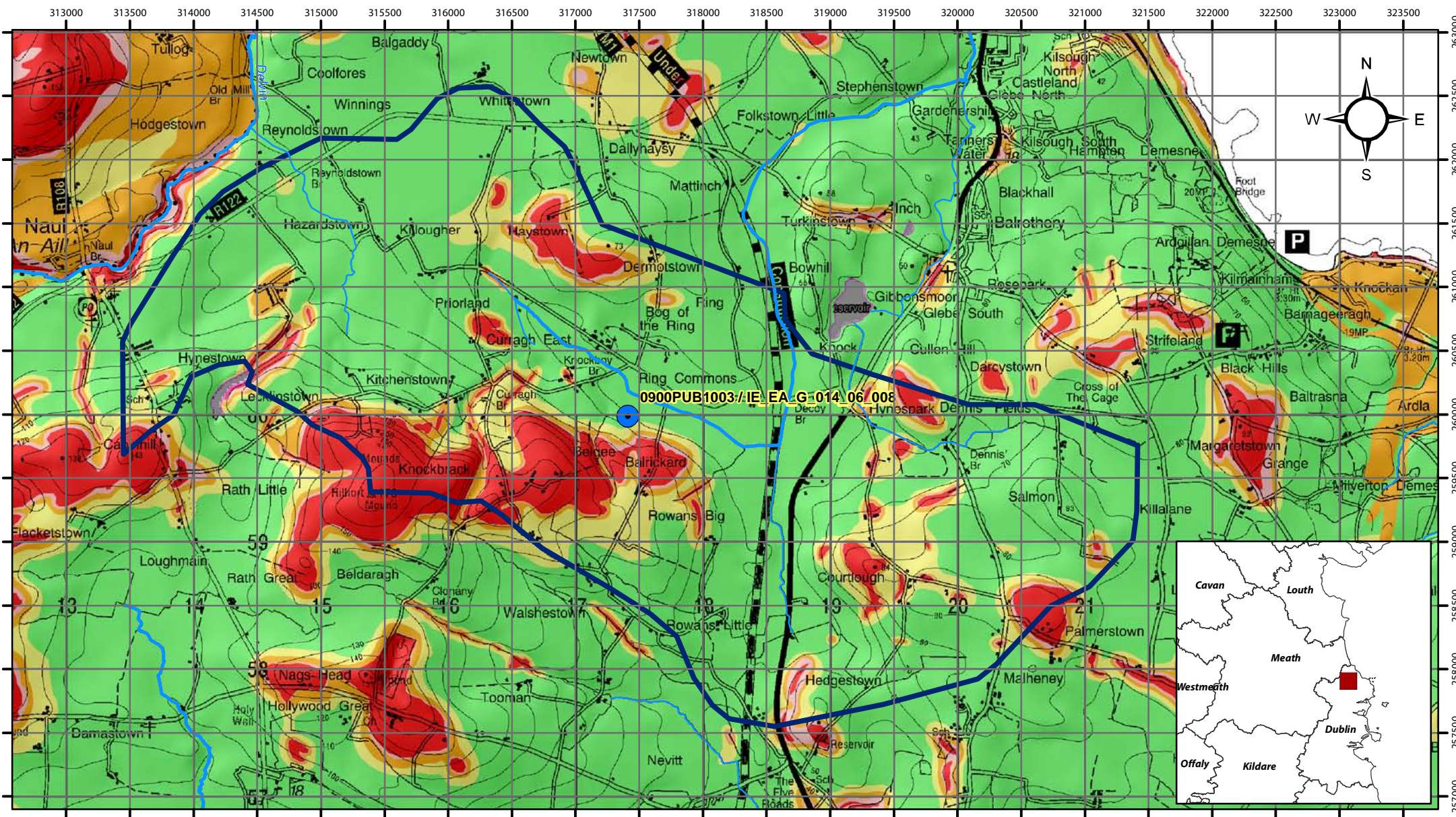


Bedrock Map for Bog of the Ring PW3

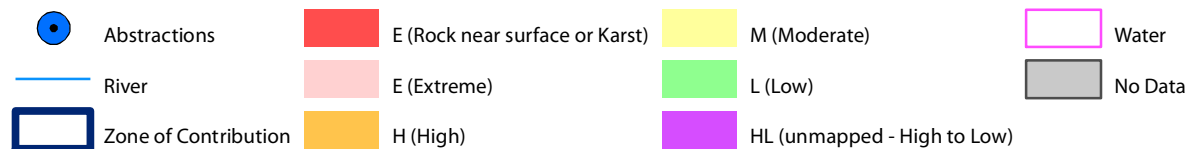


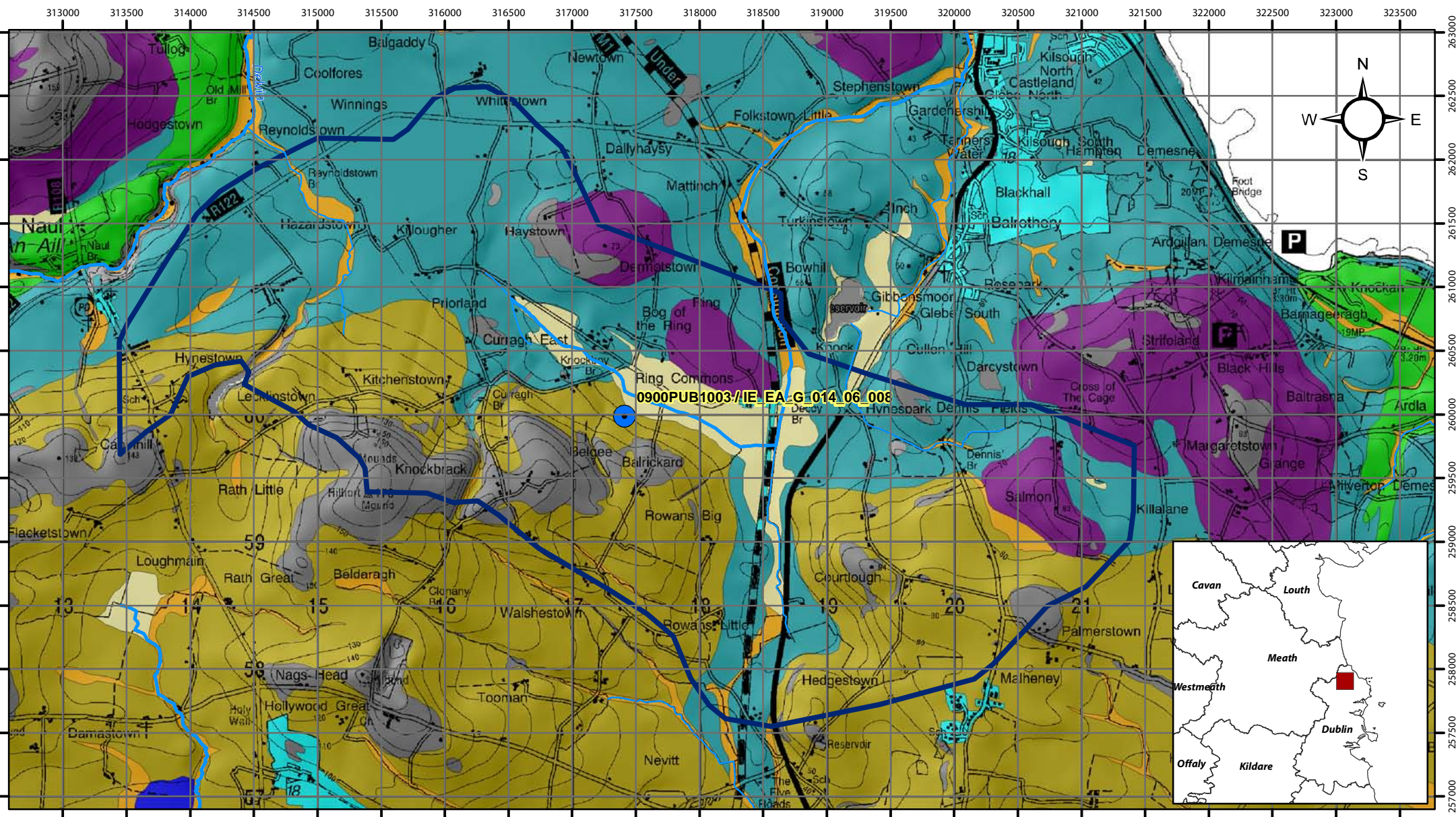
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0 0.25 0.5 1
km

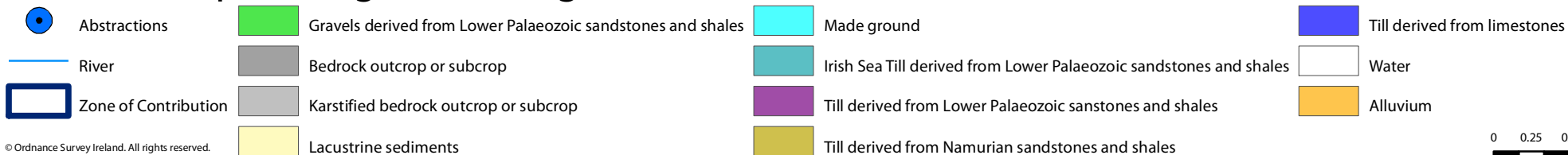


Groundwater Vulnerability Map for Bog of the Ring PW3



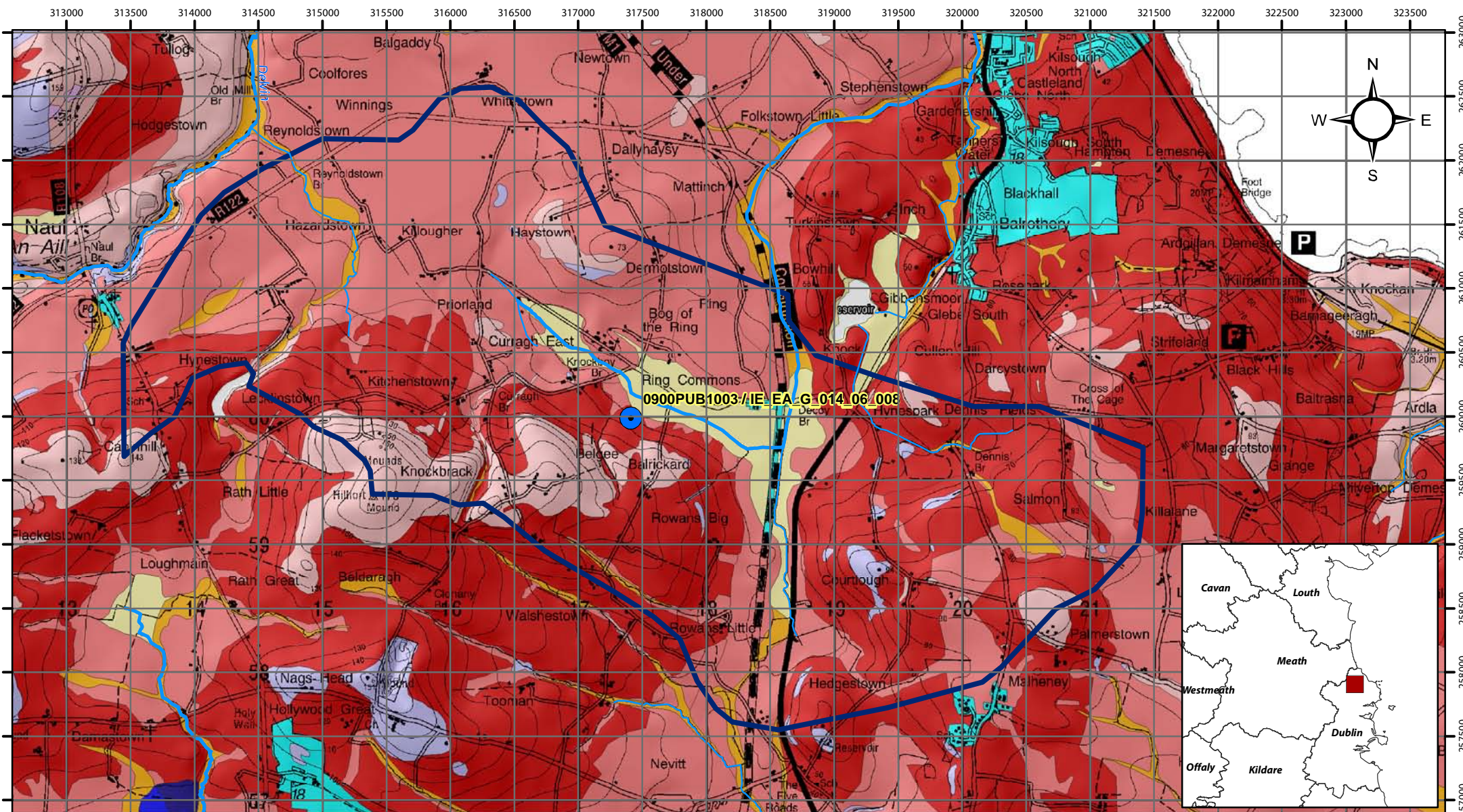


Subsoils Map for Bog of the Ring PW3



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0 0.25 0.5 1
km



Soils Map for Bog of the Ring PW3

