

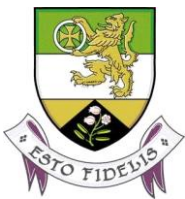
Water Framework Directive Groundwater Monitoring Programme

Site Information

Edenderry - Kishawanny Bridge



This monitoring point is a borehole that supplies the Edenderry public water supply. It had an average abstraction rate of c. 300 m³/d in 2010. A source protection report was prepared by the GSI in 2004 on which the information and ZOC contained herein are based and slightly adjusted.



Offaly

August 2011

SITE INFORMATION					
Site Name:	Edenderry - Kishawanny Bridge		County:	Offaly	
RBD:	ERBD		EU Reporting Code:	IE_EA_G_002_19_006	
Easting:	264568		GWB Name:	Trim	
Northing:	233393		GWB Code:	IE_EA_G_002	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2500PUB1008	
Hydrometric Area:	7		Water Level Monitoring Network:	Level	Flow
Townland:	KISHAWANNY UPPER			N	N
Ownership:	Offlaly Co Co				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	N		N		Y
Site Comments:	The topography is generally flat and undulating. The area is dominated by grassland but there are industrial estates, petrol stations, farms and houses located within 1 km of the borehole.				

SITE DIRECTIONS	
Location and Access Information:	From M4 take exit to Enfield and Edenderry (R402). After Carbury village turn right for Edenderry (R402). Shortly before the town the road widens and crosses a river. The well is immediately to the left after the 60km/h sign behind the bridge.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	300	Ground Elevation (m OD):	70
Borehole Log Available:	N	Total Drilled Depth (m bgl):	60.5	Depth to Bedrock (m bgl):	29
Top of Casing (m agl):	---	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):	52 to 60.5	Screen Type (PVC,Steel,other):	Slotted PVC	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):	1100	Comments on Monitoring Site:	The Kishawanny borehole was drilled in February 1986. The well was constructed with slotted inner 200 mm diameter casing from 52-60.5 m bgl. Site is underlain by significant depth (20 m +) of moderately permeable subsoils - sands and till - may explain the presence of two sets of larger diameter casing at wellhead. Driller likely to have cased off sand and gravel, and till in order to construct borehole in bedrock. There is no evidence of grout.		
Specific Capacity (m³/d/m):	29				
Static Water Level (m bgl):	5.8 (Feb 86)				
Scheme Name:	Edenderry WS	Number of Abstraction Points in the Scheme:	3	Source Report Available	Y
Source Report Info:	The GSI completed a Groundwater Source Protection Report in 2004 for the well at Kishawanny Bridge.				
Scheme Summary:	Three wells serving Edenderry. One well at Kishawanny Bridge and two wells (BH1 and BH3) in town centre. Water pumped to single large capacity reservoir.				

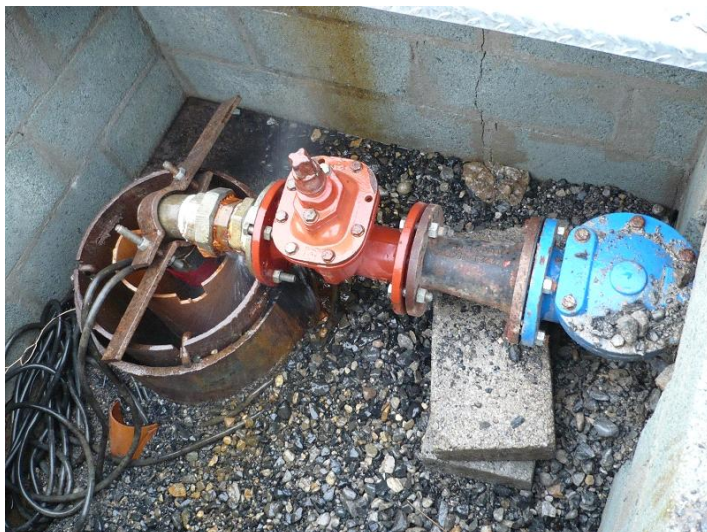
HYDROGEOLOGY								
GEOLOGY	Soil:	Cutaway/cutover peat (Cut)					Subsoil Permeability:	Low
	Subsoil:	Peat (Cut)						
	Bedrock:	Basalts & other Volcanic rocks						
HYDROGEOLOGY	Aquifer Category:	Lm	Vulnerability at Monitoring site:	Moderate	Flow Regime:	Productive fissured bedrock		
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	0.82	ZOC Delineated By:	CDM (HM)	Recharge Estimate (mm/yr):	200		
	ZOC Delineation Comments:	ZOC originally delineated by the GSI (source report 2004). ZOC modified to account for changes to supply scheme. ZOC delineated for well at Kishawanny bridge pumping at 300 m3/d plus 50%, i.e. 450 m3/d. ZOC extends to W and assumed groundwater divide in N, and importantly, takes in all of the GSI-mapped extent of Volcanics, from which well abstracts groundwater. Shape of ZOC similar to that of GSI in 2004, but boundaries adjusted to account for new abstraction regime and recharge estimate.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0	22.04	8.24	68.32	0	0	1.4	
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 13 mg/l NO3. The average ammonium concentration was 0.012 mg/l N and the maximum ammonium concentration was 0.069 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.011 mg/l P and the maximum MRP concentration was 0.061 mg/l P. The average chloride concentration was 17.4 mg/l Cl and the maximum chloride concentration was 34 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	271	210-350						
Hardness (mg/l CaCO3):	Average:	Range:						
	331	251-576						
Conductivity (uS/cm):	Average:	Range:						
	624	566-717						
Monitoring Record Period:	From:	To:						
	1996	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:		
	22.98	46.23	20.54		0.13	10.12		
OTHER INFORMATION								
BH1 in town centre: 263283E, 232535N. BH2 in town centre: 263281E, 232352N. In 2010, BH1 pumped approx. 1,050 m3/d on average. BH3 pumped 660 m3/d. Well at Kishawanny pumped just under 300 m3/d. Kishawanny well pumps water from fractures associated with two rock types: limestone and volcanics, with reportedly similar hydraulic characteristics. Well is mainly screened across the volcanics. Wells BH1 and BH3 pump from limestones.								



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 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).

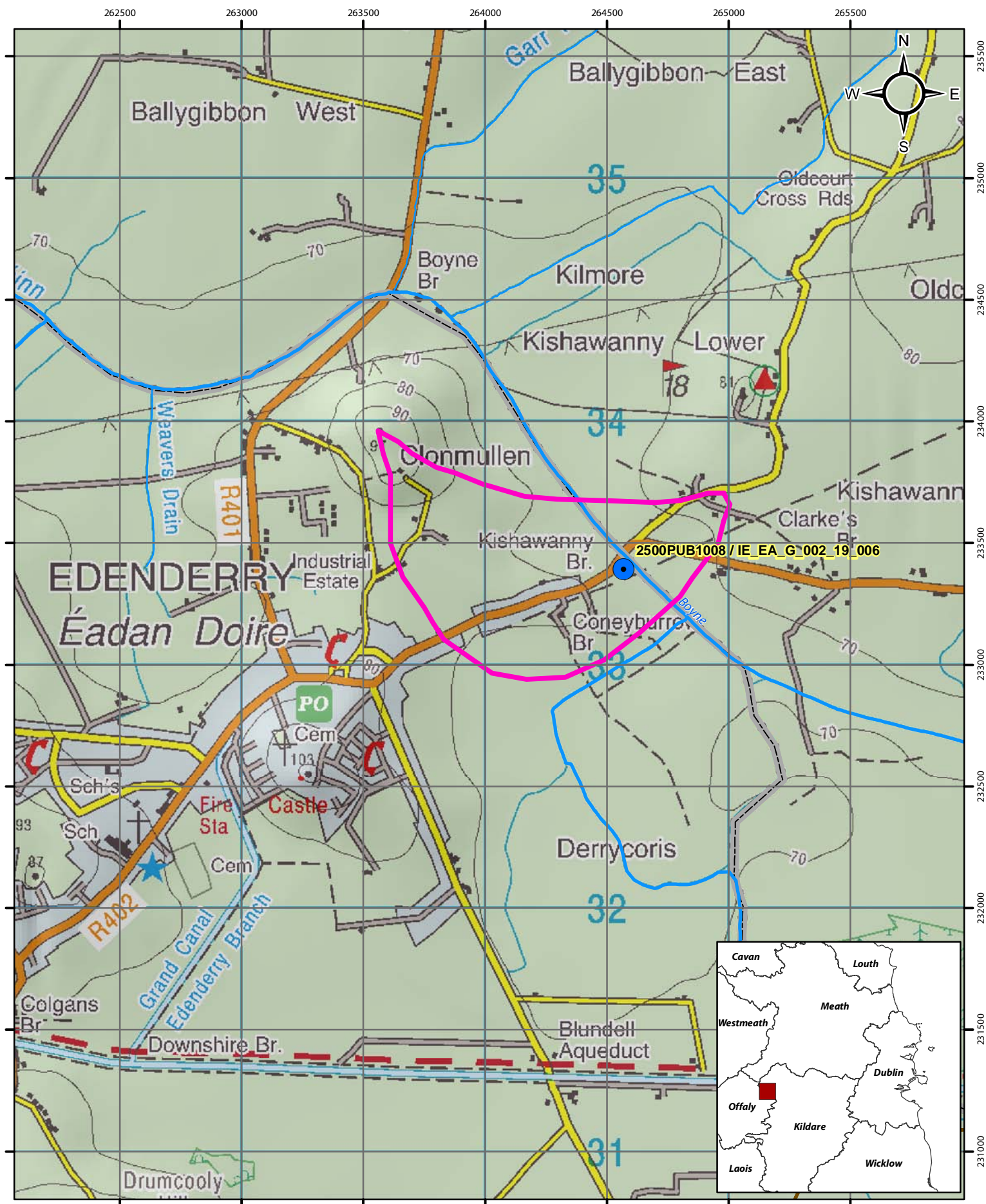
General Downgradient Distances

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:	15/02/2004
Version 1:	Prepared by	CDM (HM)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

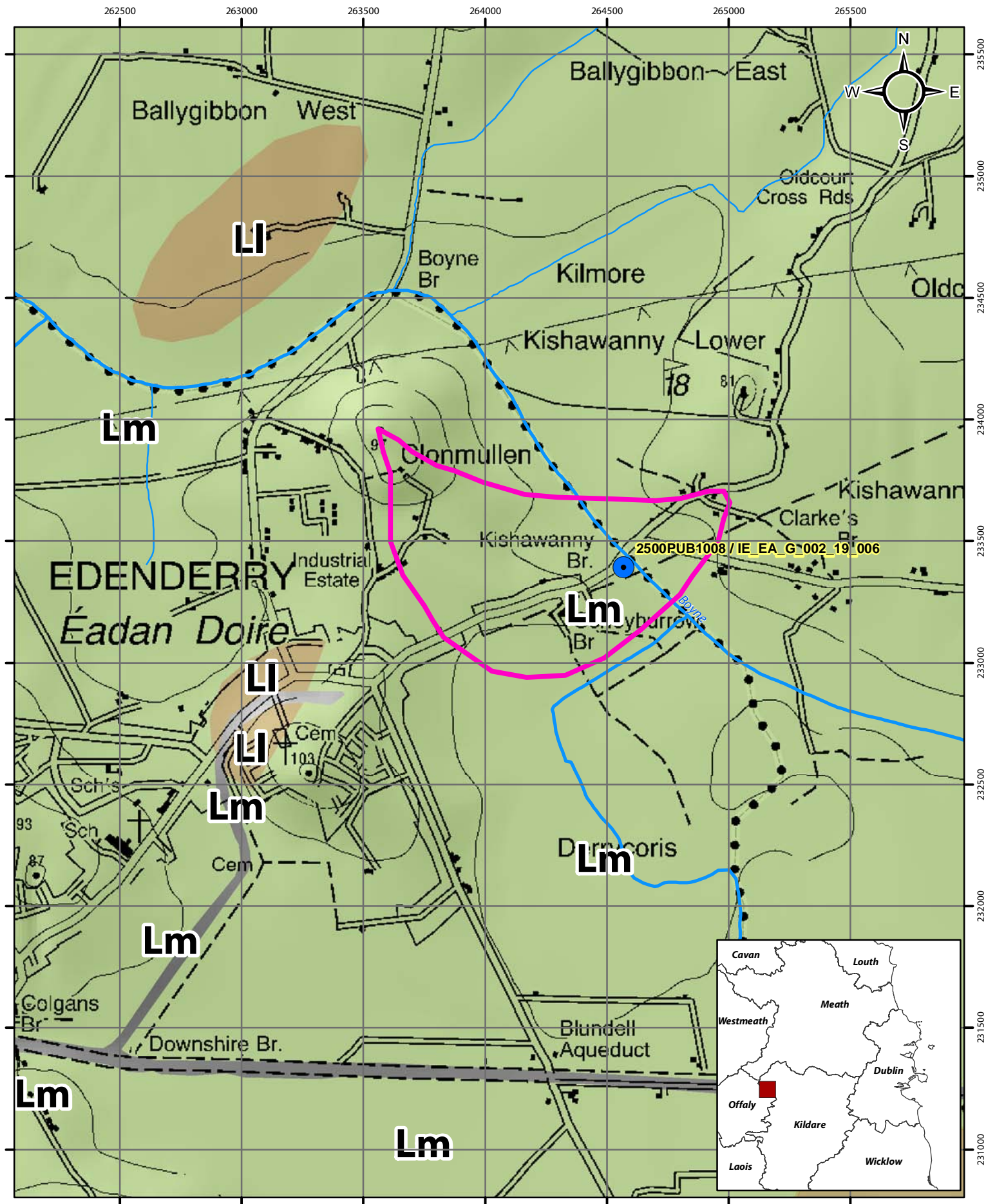


Location Map for Edenderry Kishawanny Bridge

- Abstractions
- Zone of Contribution
- River

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0 0.25 0.5 1 km



Aquifer Category Map for Edenderry Kishawanny Bridge

- Abstractions
- River
- Fault
- LI
- Lm
- Zone of Contribution

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0 0.25 0.5 1 km

262500 263000 263500 264000 264500 265000 265500

Ballygibbon West

Ballygibbon East

Oldcourt Cross Rds

Boyne Br

Kilmore

Kishawanny Lower

18

81

Clonmullen

EDENDERRY
Éadan Doire

Industrial Estate

Kishawanny Br.

2500PUB1008 / IE EA G 002 19 006

Clarke's

Coneybarrow Br.

Cem 1103

Sch's

Sch

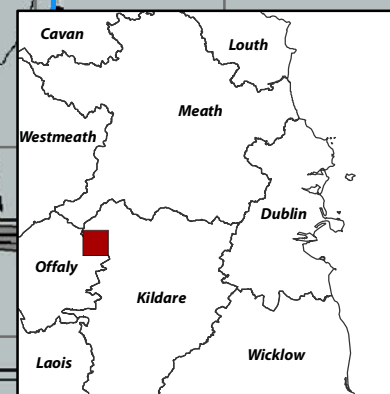
Cem

Derrycoris

Colgans Br.

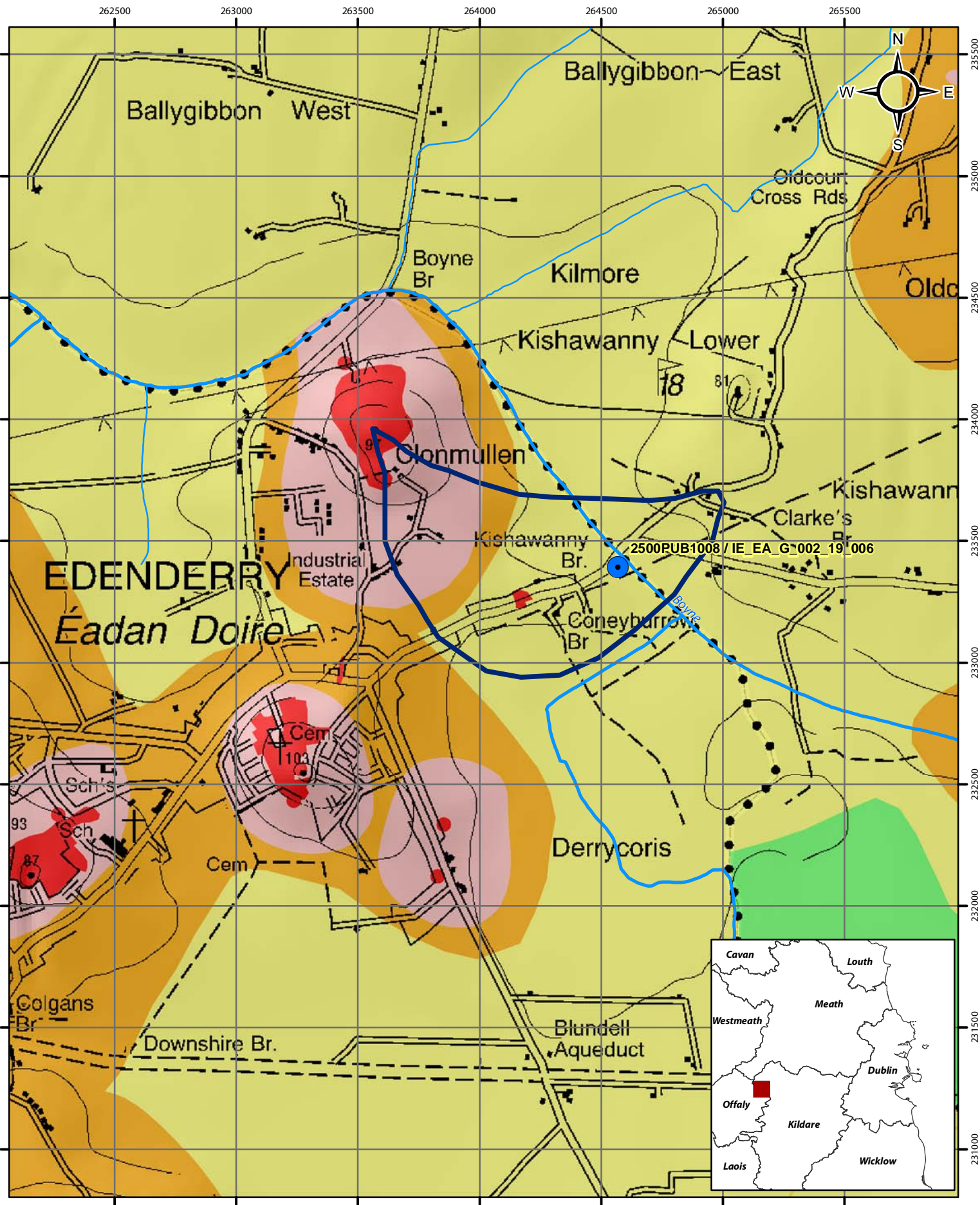
Downshire Br.

Blundell Aqueduct

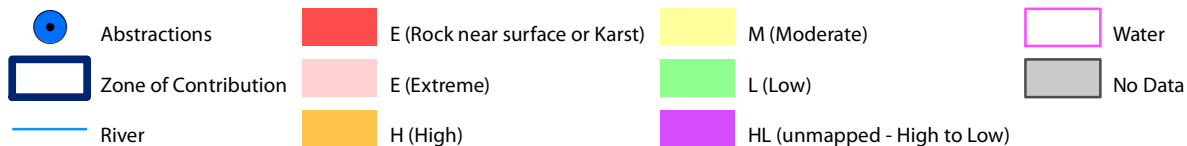


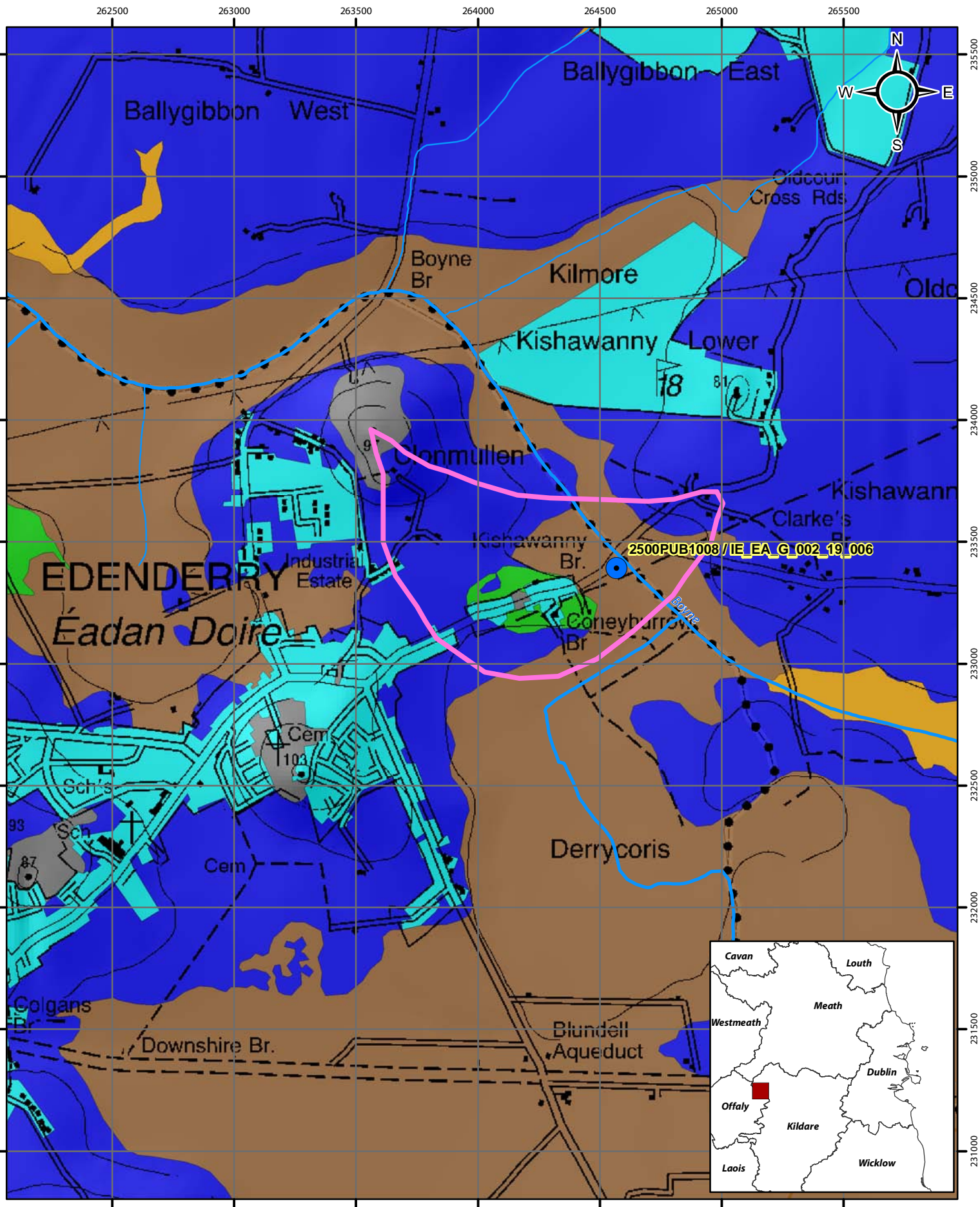
Bedrock Map for Edenderry Kishawanny Bridge

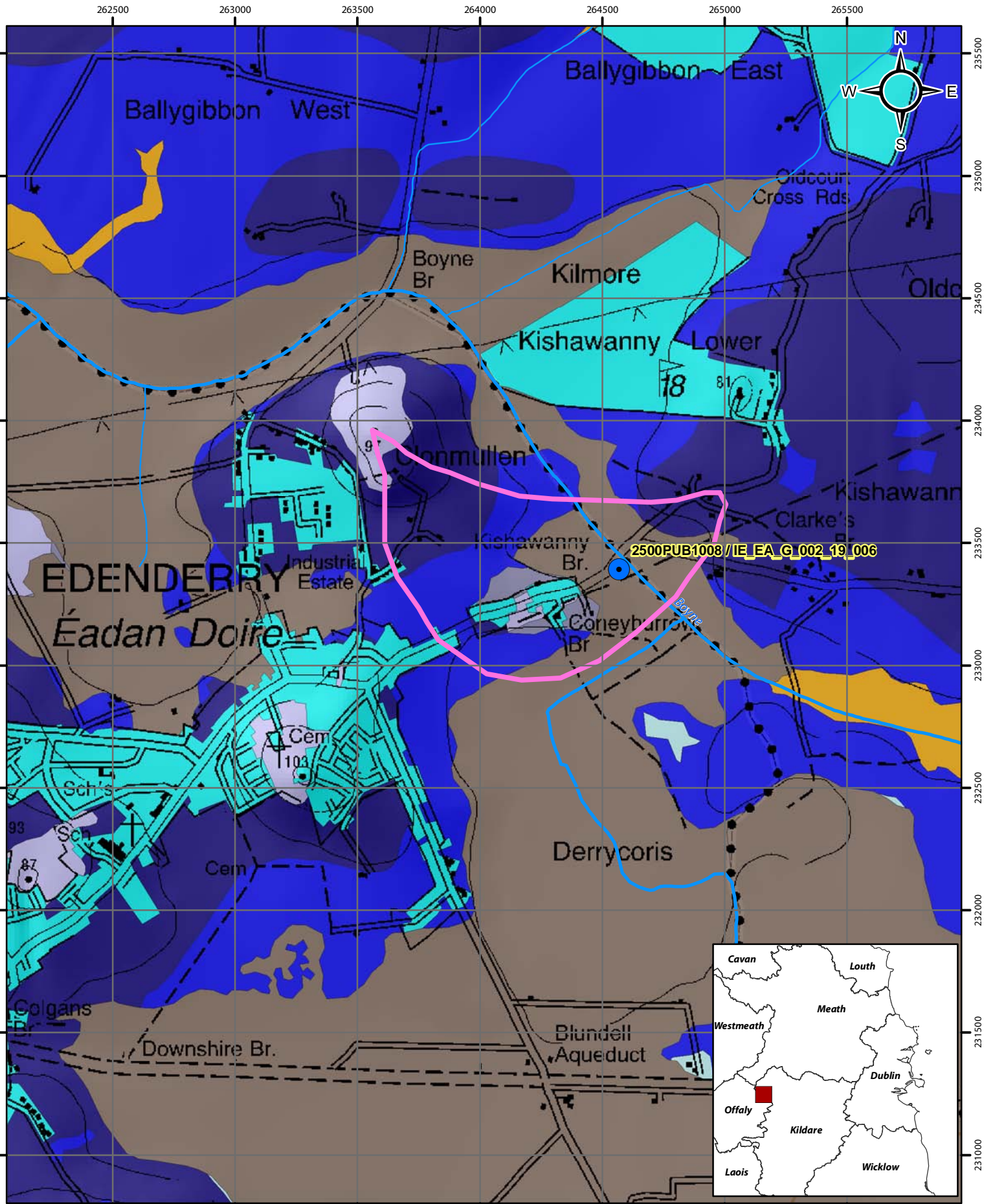
- Abstractions
- Basalts & other Volcanic rocks
- Dinantian Pure Unbedded Limestones
- Fault
- Zone of Contribution
- Dinantian Pure Bedded Limestones
- Dinantian Upper Impure Limestones
- River



Groundwater Vulnerability Map for Edenderry Kishawanny Bridge







Soils Map for Edenderry Kishawanny Bridge

