Water Framework Directive

Groundwater Monitoring Programme

Site Information

Lanesboro - ESB

Lanesboro ESB is a borehole that is part of the Lanesboro public water supply. The borehole is abstracting approximately 2000m³/day.

Longford

August 2011

SITE INFORMATION

Site Name:	Lanesboro - ESB	County:	Longford		
RBD:	Shannon IRBD	EU Reporting Code:	---		
Easting:	200803	GWB Name:	Lanesborough		
Northing:	269526	GWB Code:	IE_SH_G_135		
Site Use:	Drinking Water (PWS)	Drinking Water Code:	2000PUB1009		
Hydrometric Area:	26	Water Level Monitoring Network:	Level	Flow	
Townland:	RATHCLINE		N	N	
Ownership:	Longford Co Co				

Water Quality Monitoring Network:	Surveillance	Operational (Point)	Operational (Diffuse)
	N	N	N

Site Comments:	Lanesboro PWS comprises a borehole at the ESB power station and a further two boreholes at Lisreevagh - See Lanesboro Lisreevagh.

SITE DIRECTIONS

Location and Access Information:	In Lanesborough, the ESB site is on the right hand side leaving the village before the river.
Additional Comments:	---

WELL INFORMATION

Monitoring Point Type:	BH	Abstraction Rate (m^3/d):	2000	Ground Elevation (m OD):	45
Borehole Log Available:	---	Total Drilled Depth (m bgl):	---	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 (m^3):	---
Gravel Pack Interval (m bgl):	---	Gravel Pack Volume (m^3):	---	Open Hole Interval (m bgl):	---
Potential Yield (m^3/day):	---	Comments on Monitoring Site:	PH Mc Carthy are engineers working on the scheme.		
Specific Capacity (m^3/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Lanesboro PWS	Number of Abstraction Points in the Scheme:	3	Source Report Available	N
Source Report Info:	---				
Scheme Summary:	Lanesboro consists of three boreholes (1 at ESB and 2 at Lisreevagh) abstracting approximately 4000m^3/day. ESB BH provides approximately 2000m^3/day. BH 1 at Lisreevagh abstracts 1100m^3/day and BH 3 abstracts 800m^3/day.				

HYDROGEOLOGY

GEOLOGY	Soil:	Made/Built land (Made)			Subsoil Permeability:	Moderate
	Subsoil:	n.a. (Made)				
	Bedrock:	Dinantian Pure Bedded Limestones				
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	High	Flow Regime:	Karstified
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	5.85	ZOC Delineated By:	TOBIN (CK)	Recharge Estimate (mm/yr):	129
	ZOC Delineation Comments:	ZOCS prepared for boreholes at Lisreevagh and ESB. Highly difficult to delineate ZOCs which are based on geology, topography, abstraction rate and assumed groundwater flow directions (SE-NW / E-W). ZOCs require considerable field mapping to define flow direction. The ZOC accounts for 100% of the abstraction rate; assumed that there is hydraulic connection with the Shannon.				

Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	3.08	3.65	31.95	19.67	41.22	0	0.43

HYDROCHEMISTRY

Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	---
Alkalinity (mg/l HCO3):	Average:	Range:		
	---	---		
Hardness (mg/l CaCO3):	Average:	Range:		
	---	---		
Conductivity (uS/cm):	Average:	Range:		
	550	690-741		
Monitoring Record Period:	From:	To:		
	2001	2007		

RISK ASSESSMENT

Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse	Typical Contaminants:	Phosphate
Risk Category:	At risk, high confidence	GWB Status:	Poor

Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:
	0.00	2.84	20.94	33.50	42.72

OTHER INFORMATION

Boreholes

Boreholes

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).

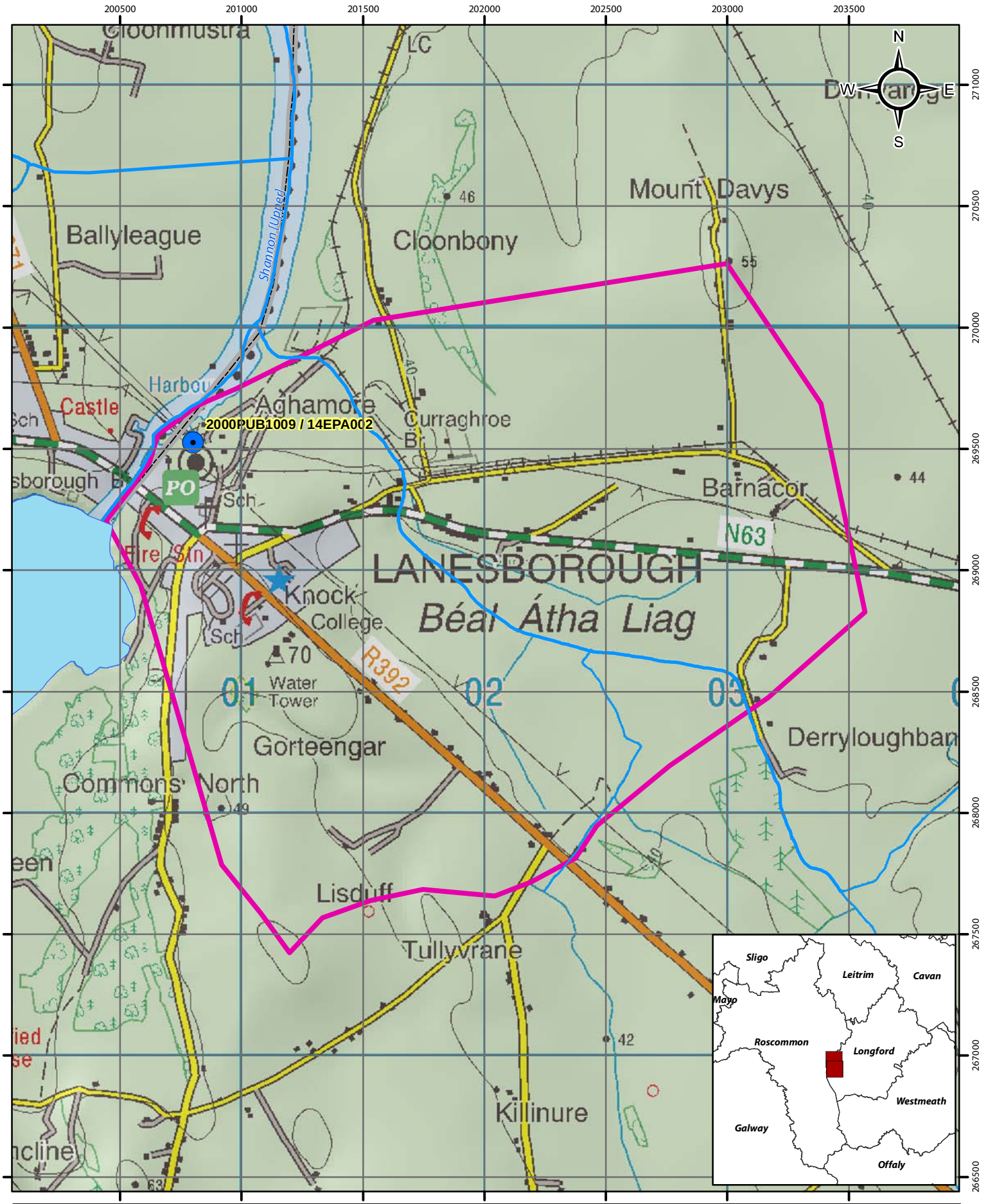
General Downgradient Distances

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
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		Date:	
Version 1:	Prepared by	Tobin (CK)	Date:	Apr 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	



Location Map for Lanesboro-ESB

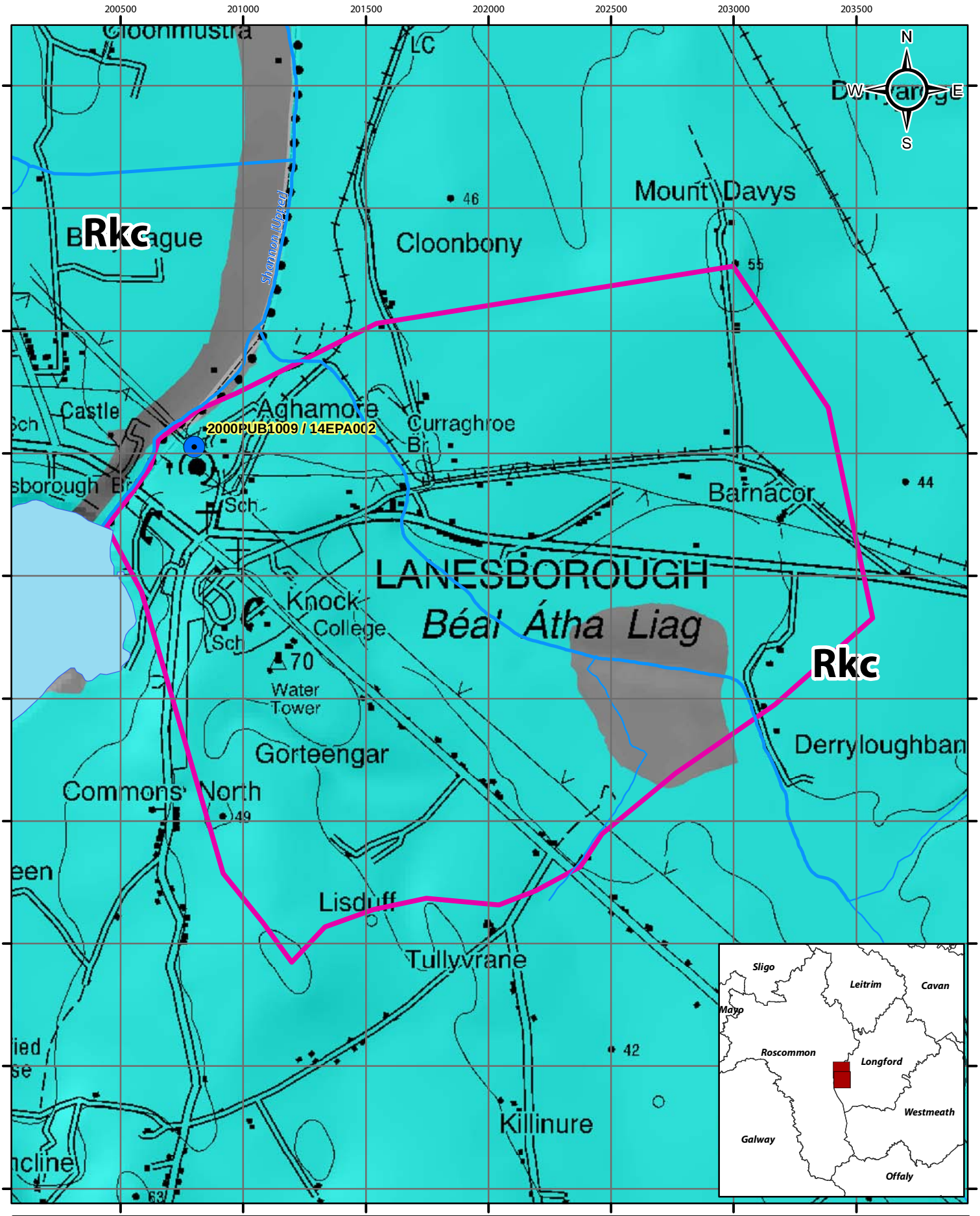
Abstractions

Lakes

River

Zone of Contribution

0 0.25 0.5 1 km



Aquifer Category Map for Lanesboro-ESB

Abstractions

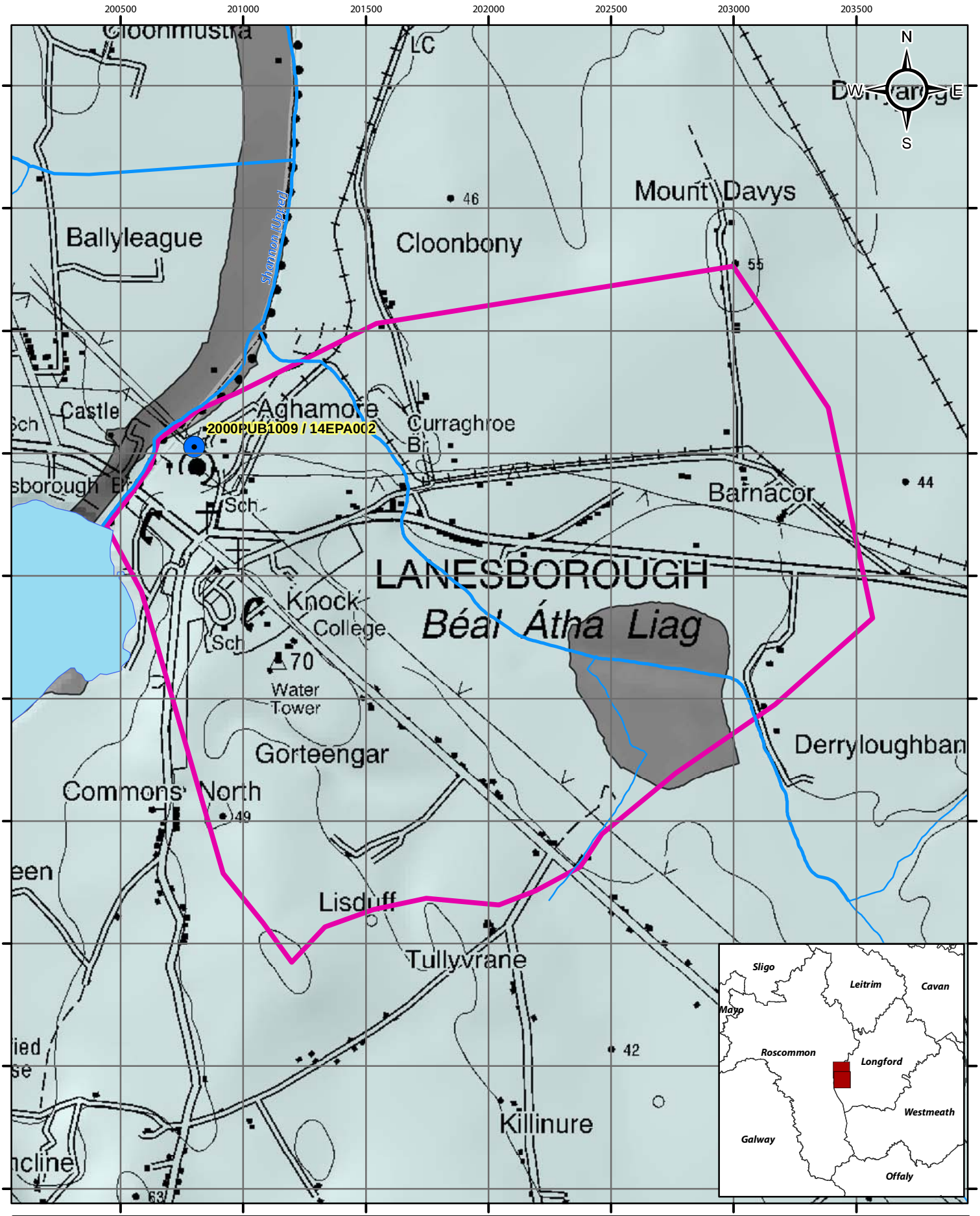
Lakes

River

Rkc

Zone of Contribution

0 0.25 0.5 1 km



Bedrock Map for Lanesboro-ESB

Abstractions

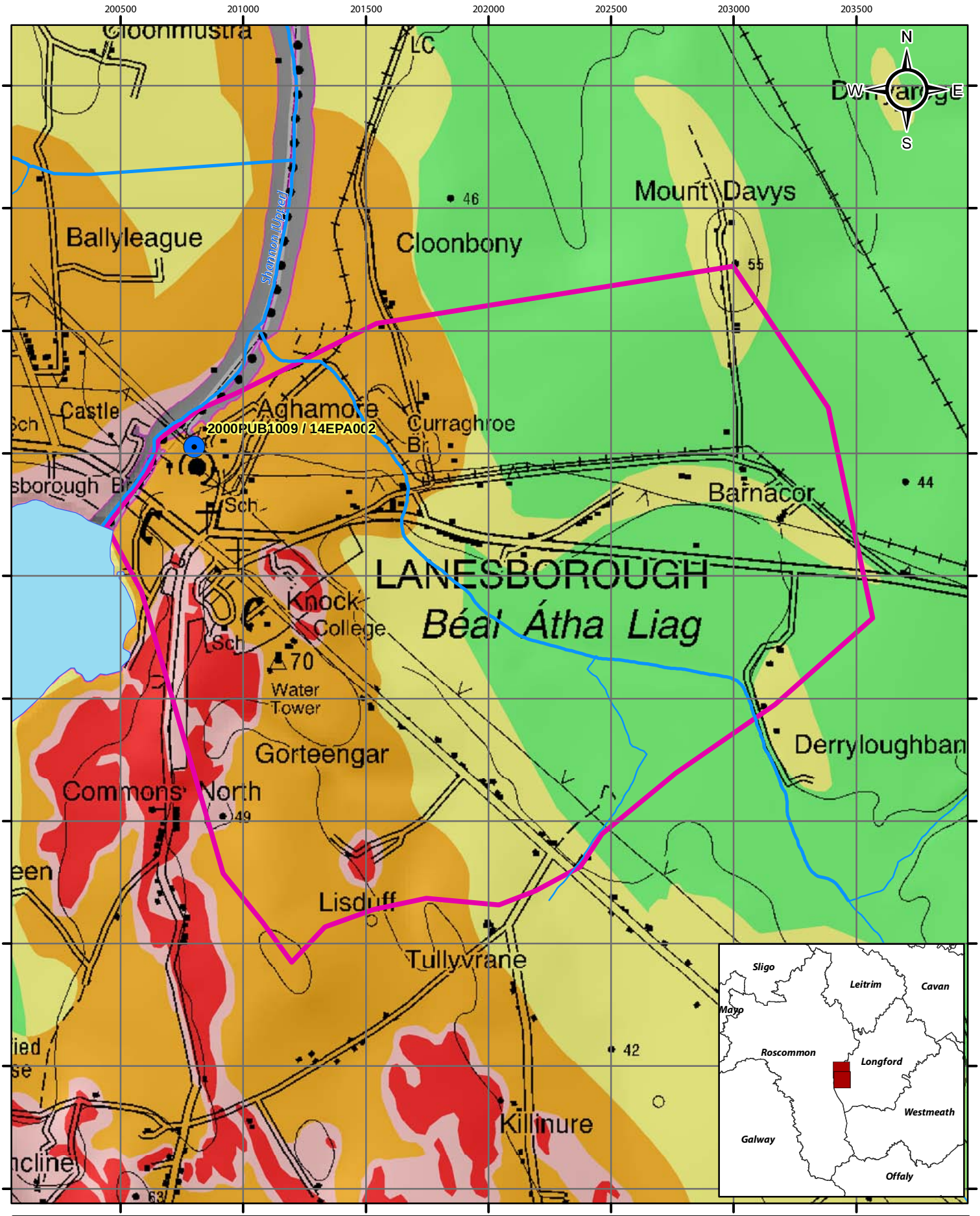
River

Zone of Contribution

Lakes

Dinantian Pure Bedded Limestones

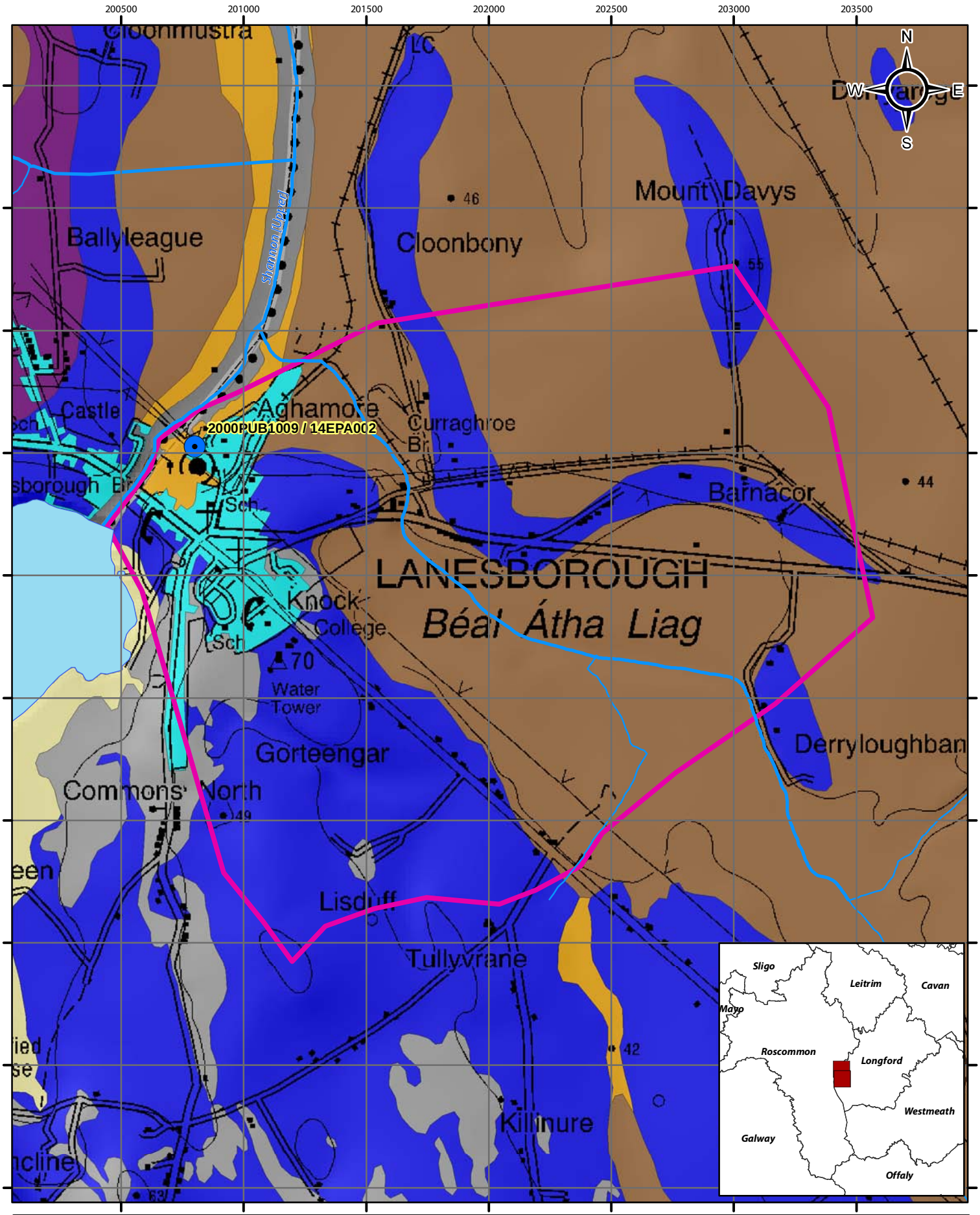
0 0.25 0.5 1 km



Groundwater Vulnerability Map for Lanesboro-ESB

- Abstractions
- River
- Zone of Contribution
- Lakes
- E (Rock near surface or Karst)
- E (Extreme)
- H (High)
- M (Moderate)
- L (Low)
- Water

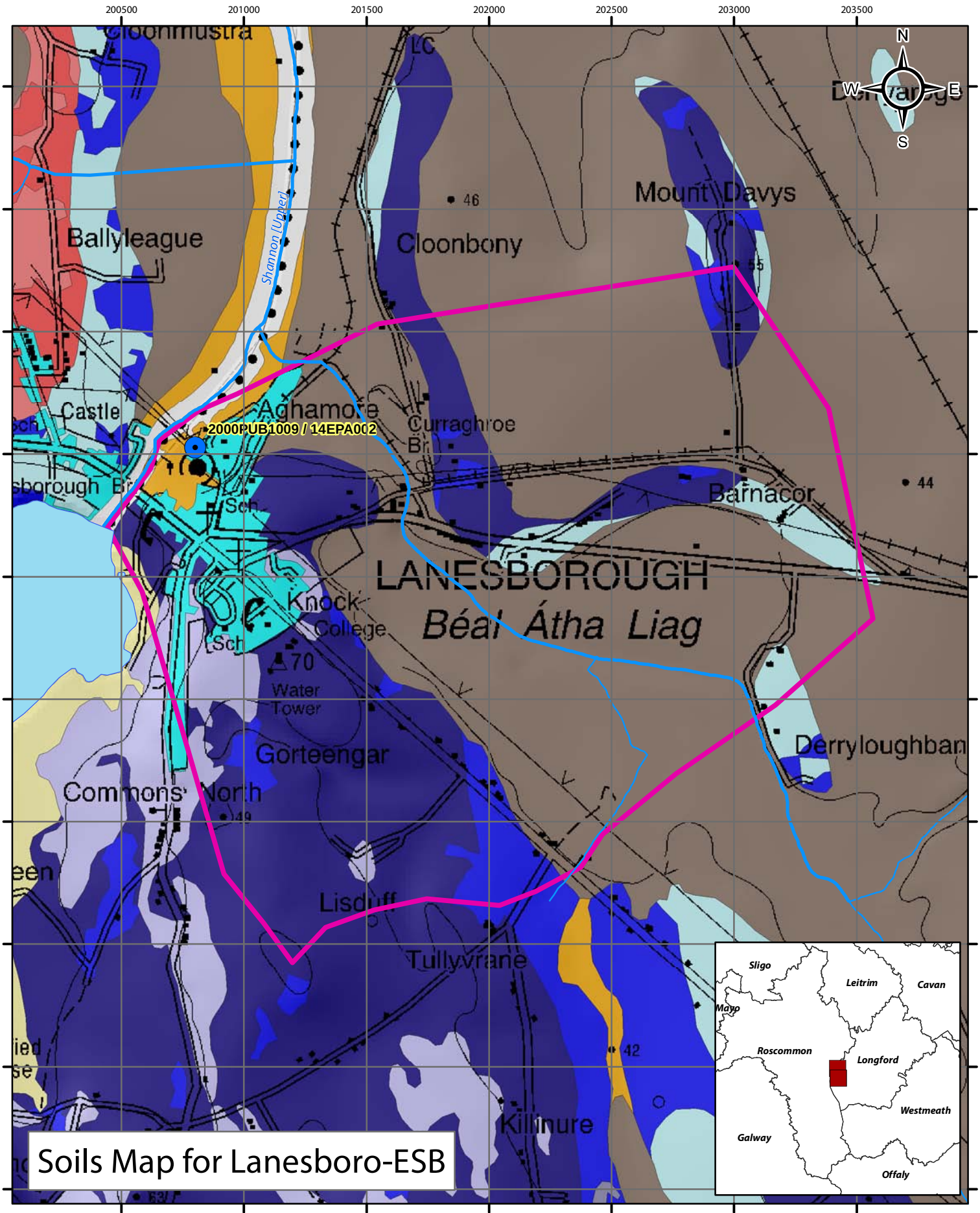
0 0.25 0.5 1 km



Subsoils Map for Lanesboro-ESB

- Abstractions
- River
- Zone of Contribution
- Lakes
- Water
- Alluvium
- Made ground
- Cutover raised peat
- Lacustrine sediments
- Till derived from limestones
- Till derived from Lower Palaeozoic sanstones and shales
- Karstified bedrock outcrop or subcrop

0 0.25 0.5 1 km



Water Framework Directive

Groundwater Monitoring Programme

Site Information

Lanesboro - Lisreevagh BHs

Lanesboro - Lisreevagh comprises two boreholes abstracting approximately 1900m³/day. There is also a site folder for Lanesboro - ESB.

Longford

August 2011

SITE INFORMATION

Site Name:	Lanesboro - Lisreevagh BHs	County:	Longford	
RBD:	Shannon IRBD	EU Reporting Code:	---	
Easting:	201066	GWB Name:	Lanesborough	
Northing:	265549	GWB Code:	IE_SH_G_135	
Site Use:	Drinking Water (PWS)	Drinking Water Code:	2000PUB1009	
Hydrometric Area:	26	Water Level Monitoring Network:	Level	Flow
Townland:	LISREEVAGH		N	N
Ownership:	Longford Co. Co.			

Water Quality Monitoring Network:	Surveillance	Operational (Point)	Operational (Diffuse)
	N	N	N

Site Comments:	Lanesboro PWS comprises a borehole at the ESB power station and a further two boreholes at Lisreevagh - See Lanesboro Lisreevagh.

SITE DIRECTIONS

Location and Access Information:	In Lanesborough, take a last left before the river Shannon and approximately 3.8km south take another left and the boreholes are approximately 500m along the narrow road.
Additional Comments:	---

WELL INFORMATION

Monitoring Point Type:	BH	Abstraction Rate (m³/d):	1900	Ground Elevation (m OD):	60
Borehole Log Available:	---	Total Drilled Depth (m bgl):	---	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:	PH Mc Carthy are engineers working on the scheme.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Lanesborough PWS	Number of Abstraction Points in the Scheme:	3	Source Report Available	N
Source Report Info:	---				
Scheme Summary:	Lanesboro consists of three boreholes (1 at ESB and 2 at Lisreevagh) abstracting approximately 4000m³/day. ESB BH provides approximately 2000m³/day. BH 1 at Lisreevagh abstracts 1100m³/day and BH 3 abstracts 800m³/day.				

HYDROGEOLOGY

GEOLOGY	Soil:	Deep well drained mineral (BminDW)			Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictons) (TLs)				
	Bedrock:	Dinantian Pure Bedded Limestones				
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	High	Flow Regime:	Karstified
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	9.64	ZOC Delineated By:	TOBIN (CK)	Recharge Estimate (mm/yr):	295
	ZOC Delineation Comments:	ZOCS prepared for boreholes at Lisreevagh and ESB. Highly difficult to delineate ZOCs which are based on geology, topography, abstraction rates and assumed groundwater flow directions (SE-NW / E-W). ZOCs require considerable field mapping to define flow direction. ZOC accommodates >150% abstraction rate.				

Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	7.12	14.56	71.22	2.79	3.24	0	1.07

HYDROCHEMISTRY

Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	---
Alkalinity (mg/l HCO3):	Average:	Range:		
	---	---		
Hardness (mg/l CaCO3):	Average:	Range:		
	---	---		
Conductivity (uS/cm):	Average:	Range:		
	550	690-741		
Monitoring Record Period:	From:	To:		
	2001	2007		

RISK ASSESSMENT

Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse	Typical Contaminants:	Phosphate
Risk Category:	At risk, high confidence	GWB Status:	Poor

Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:
	0.00	20.42	71.32	4.26	4.00

OTHER INFORMATION

Data Summary Sheet - July 2011

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Groundwater Threshold Values

Groundwater threshold values for selected parameters:
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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.

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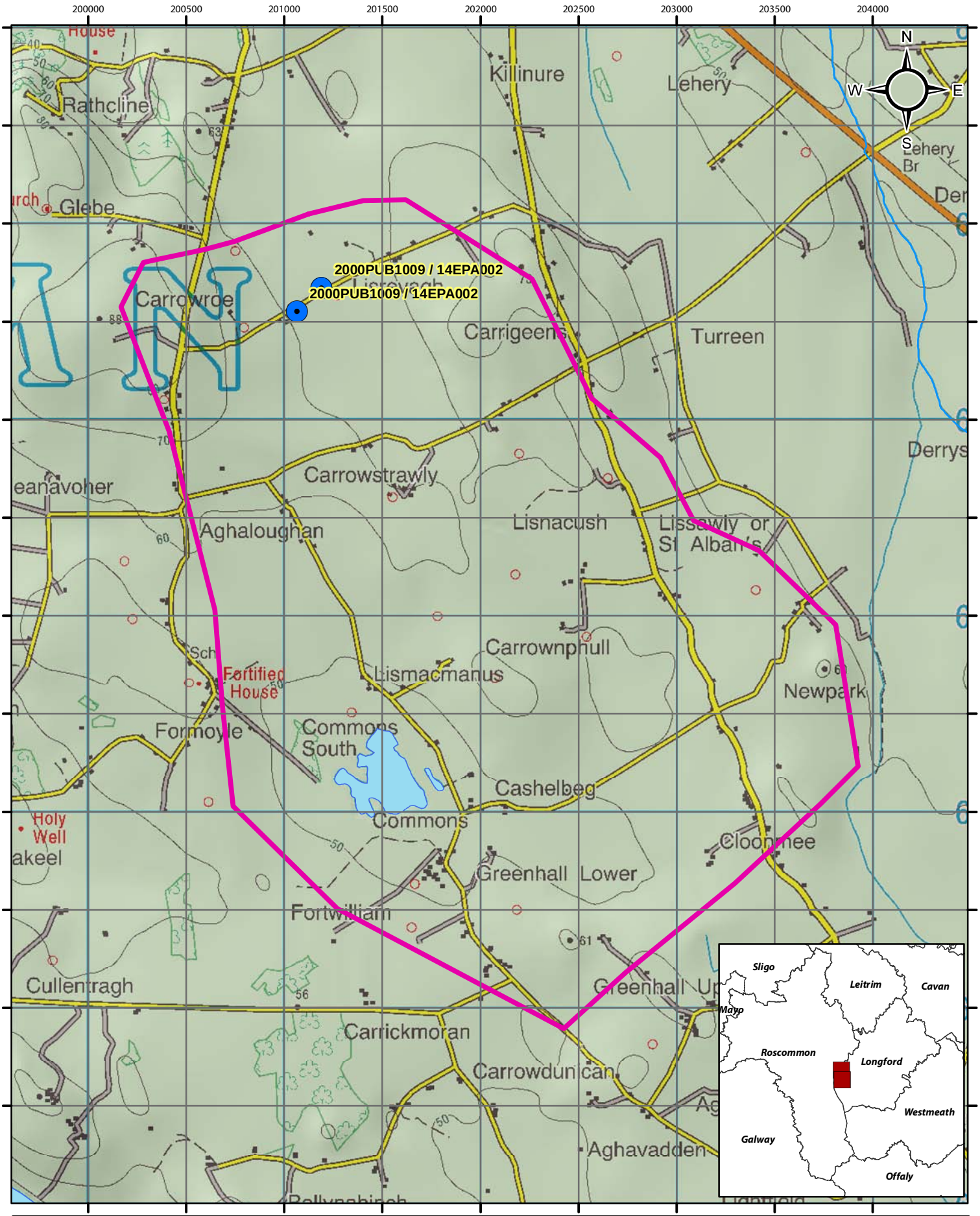
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	



Location Map for Lanesboro-Lisreevagh

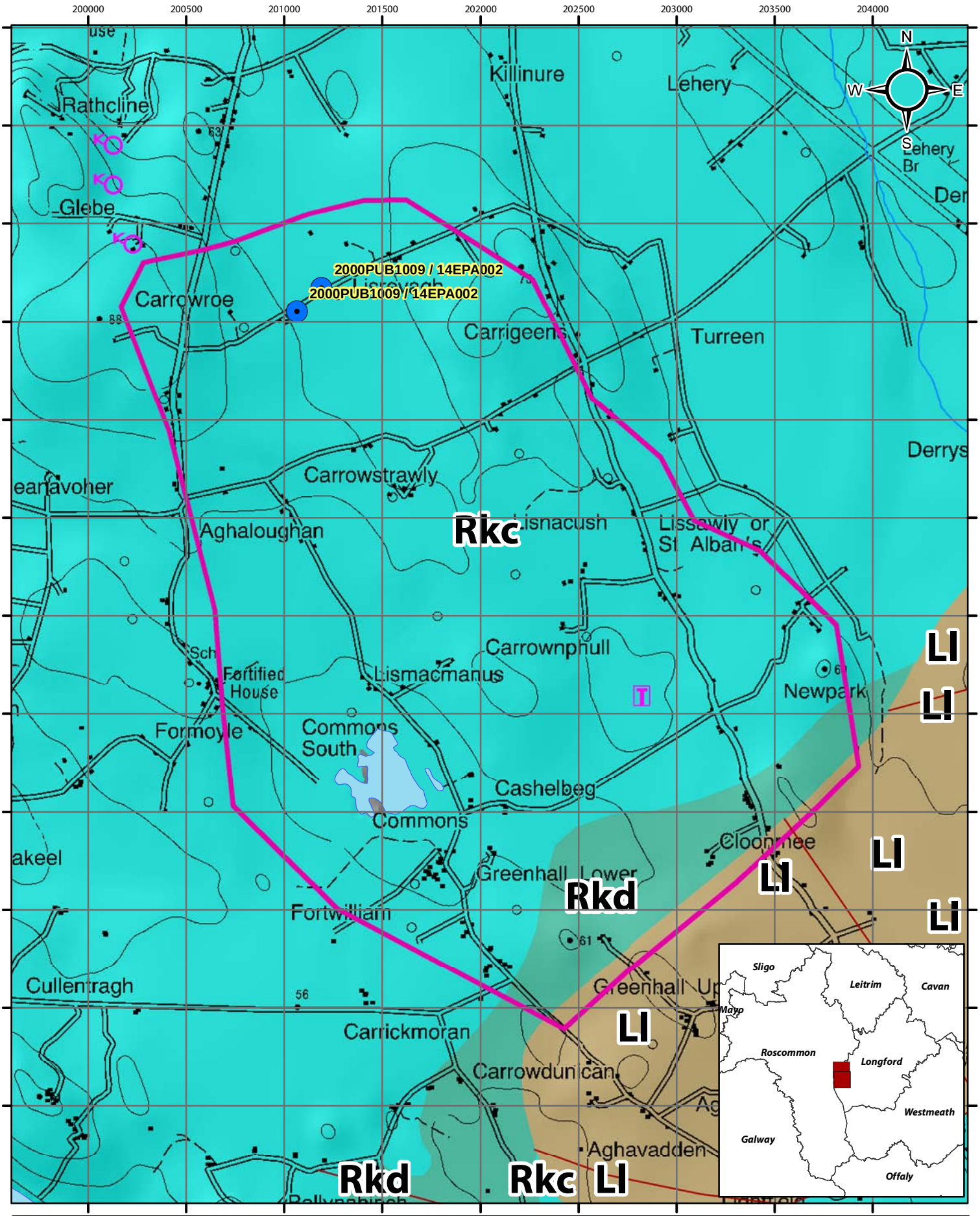
Abstractions

Lakes

River

Zone of Contribution

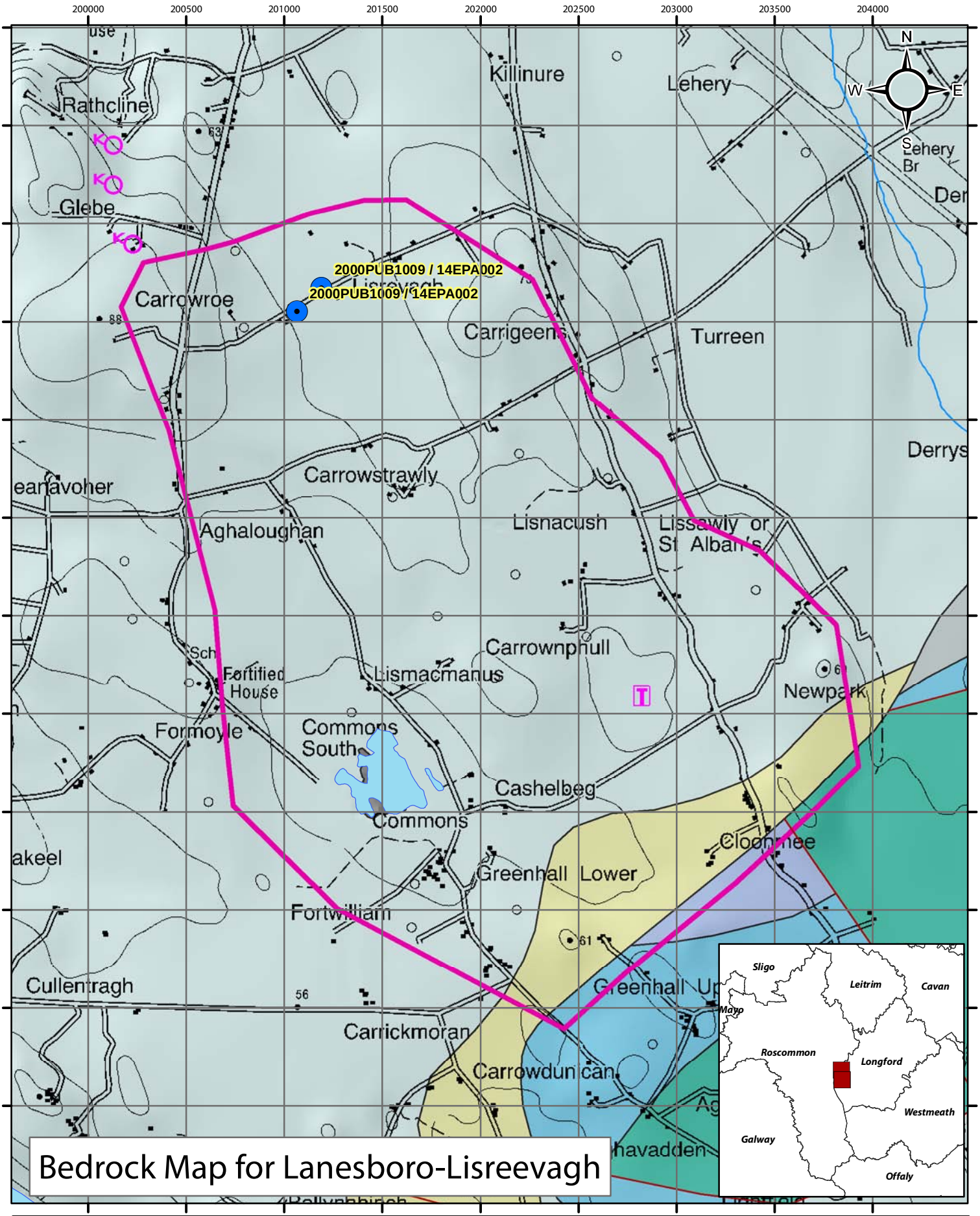
0 0.25 0.5 1 km



Aquifer Category Map for Lanesboro-Lisreevagh

Abstractions
Lakes
Fault
LI
River
Borehole
Rkc
Zone of Contribution
Turlough
Rkd

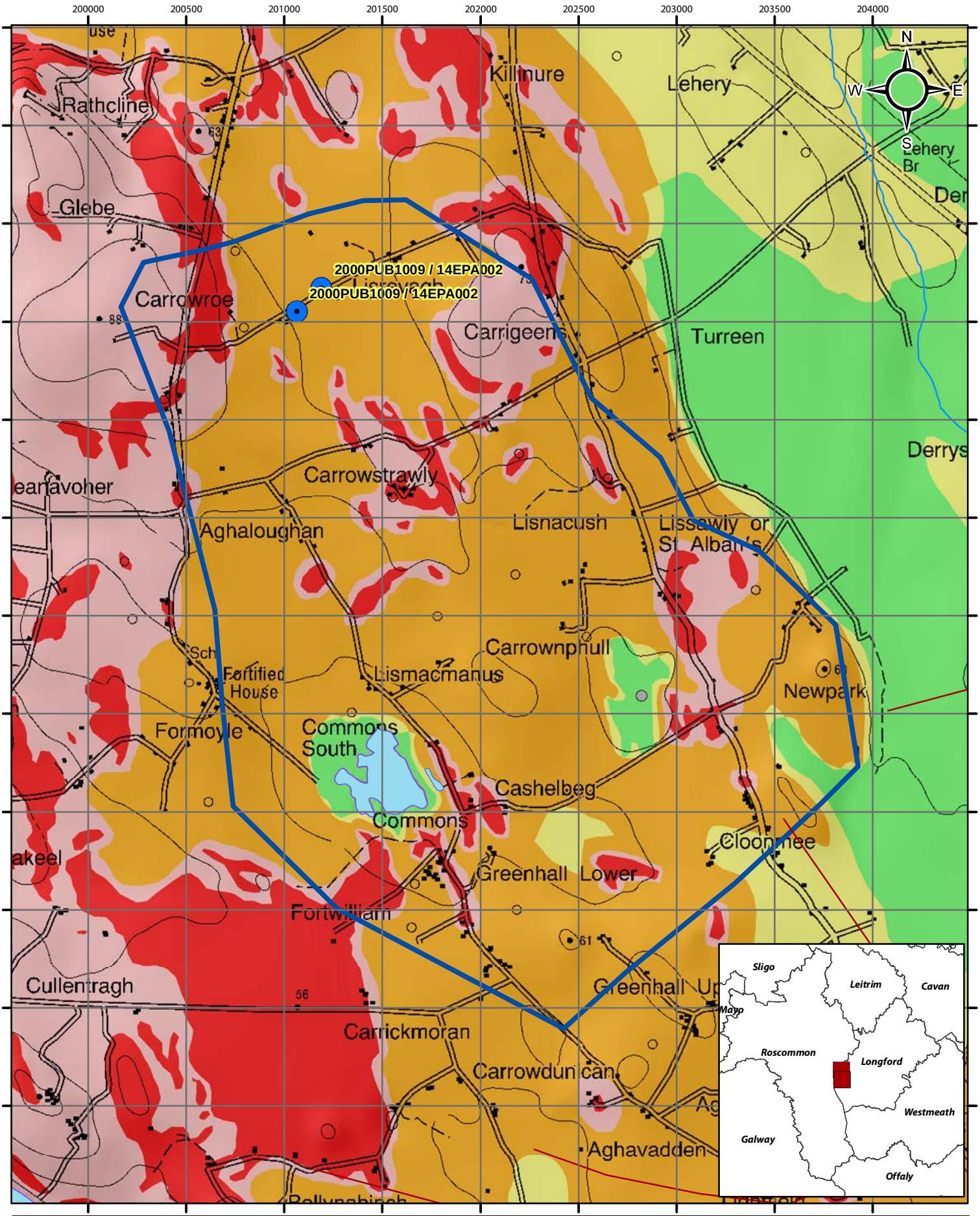
0 0.25 0.5 1 km



Bedrock Map for Lanesboro-Lisreevagh

Abstractions
River
Zone of Contribution
Lakes
Fault
Borehole
Turlough
Dinantian (early) Sandstones, Shales and Limestones
Dinantian Dolomitised Limestones
Dinantian Lower Impure Limestones
Dinantian Pure Bedded Limestones
Dinantian Pure Unbedded Limestones
Dinantian Upper Impure Limestones

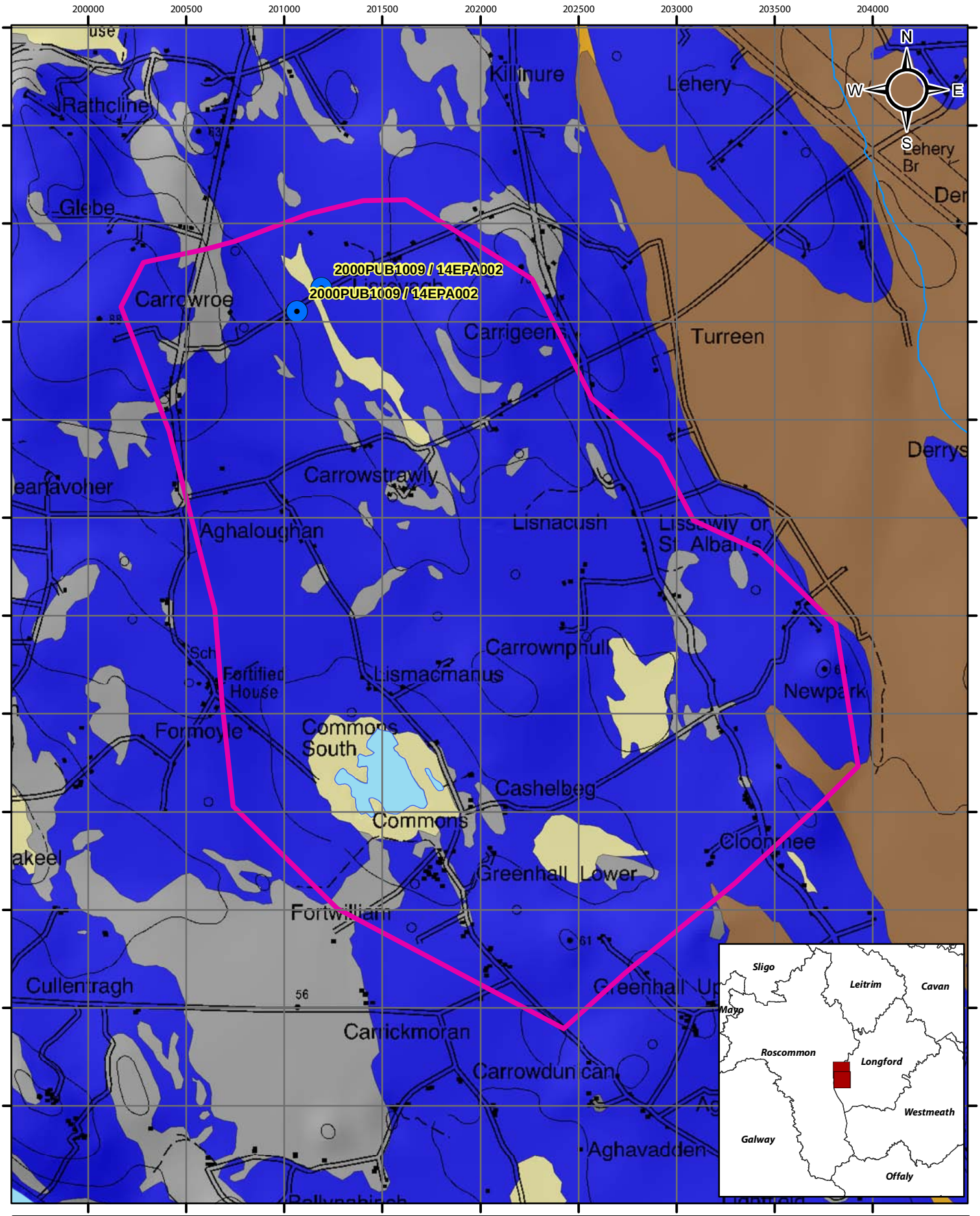
0 0.25 0.5 1 km



Groundwater Vulnerability Map for Lanesboro-Lisreevagh

- Abstractions
- River
- Zone of Contribution
- Lakes
- E (Rock near surface or Karst)
- E (Extreme)
- H (High)
- M (Moderate)
- L (Low)
- HL (unmapped - High to Low)
- Water
- No Data

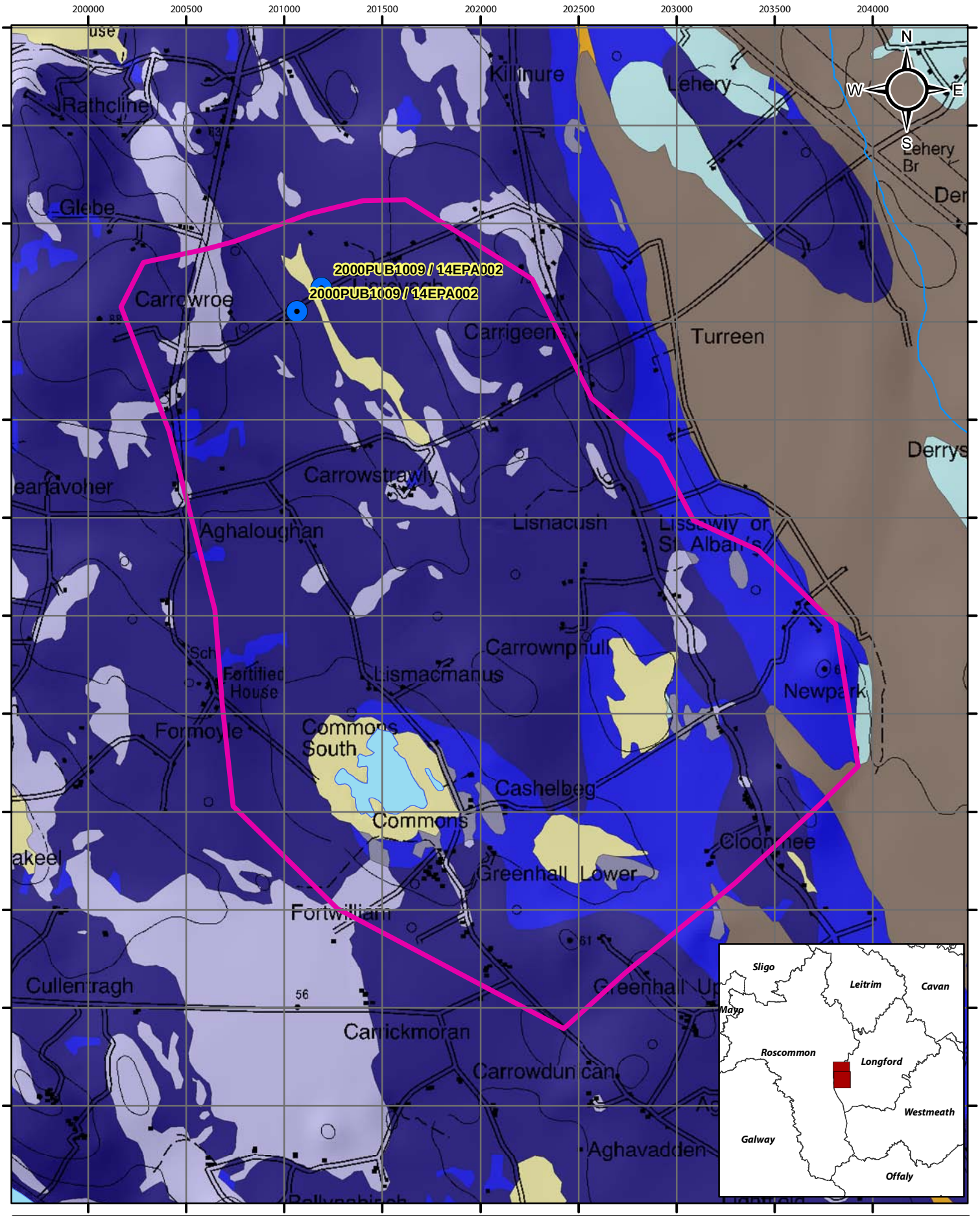
0 0.25 0.5 1 km



Subsoils Map for Lanesboro-Lisreevagh

- Abstractions
- River
- Zone of Contribution
- Lakes
- Alluvium
- Cutover raised peat
- Bedrock outcrop or subcrop
- Karstified bedrock outcrop or subcrop
- Lacustrine sediments
- Till derived from limestones
- Water

0 0.25 0.5 1 km



Soils Map for Lanesboro-Lisreevagh

- Abstractions
- River
- Zone of Contribution
- Lakes
- Basic Deep Well Drained Mineral
- Basic Deep Poorly Drained Mineral
- Basic Poorly Drained Peaty Mineral
- Basic Shallow Well Drained Mineral
- Basic Shallow Poorly Drained Mineral
- Cutover/Cutaway Peat
- Mineral Alluvium
- Lacustrine
- Water

0 0.25 0.5 1 km