

Water Framework Directive Groundwater Monitoring Programme

Site Information **Charlestown**



The spring at Charlestown is used for public water supply. The abstraction rate is 340 m³/d on average, but the spring discharge is much larger and monitored by the EPA.



Mayo

August 2011

SITE INFORMATION					
Site Name:	Charlestown		County:	Mayo	
RBD:	WRBD		EU Reporting Code:	IE_WE_G_0064_16_005	
Easting:	145600		GWB Name:	Moy SG	
Northing:	299499		GWB Code:	IE_WE_G_0064	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2200PUB1010	
Hydrometric Area:	34		Water Level Monitoring Network:	Level	Flow
Townland:	TOMBOHOLLA			Y	Y
Ownership:	Mayo Co. Co.				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	Surrounded by grassland.				
SITE DIRECTIONS					
Location and Access Information:	Drive c. 1 km west on the N5 from Charlestown centre. After Lowpark, take first large road left. Follow this road c. 2.3 kms in a SW direction until you reach a small 4-way crossroads. Spring is located in field at NW corner of cross-roads. The sample is taken directly from the spring source.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	340	Ground Elevation (m OD):	---
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:	The spring has a large overflow that is monitored by the EPA.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Charlestown PWS	Number of Abstraction Points in the Scheme:	1	Source Report Available	N
Source Report Info:	---				
Scheme Summary:	The spring source serves Charlestown and is pumped to an offsite reservoir. The supply is chlorinated only.				

HYDROGEOLOGY							
GEOLOGY	Soil:	Deep poorly drained mineral (AminPD)				Subsoil Permeability:	Moderate to Low
	Subsoil:	Tills (diamictons) (TLPSsS)					
	Bedrock:	Dinantian Pure Bedded Limestones					
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	High to Low	Flow Regime:	Karstified	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	0.58	ZOC Delineated By:	Tobin (CK)	Recharge Estimate (mm/yr):	846	
	ZOC Delineation Comments:	ZOC based on an assessment of assumed recharge, available spring discharge data (mean discharge is taken to be approximately 1,700m³/day), geology and topography. Spring issues at till/peat and sand and gravel / esker boundary. Groundwater flow direction assumed to be SE-NW.					
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified
	0	0	0	0	0	100	0
HYDROCHEMISTRY							
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 9 mg/l NO3 and the maximum nitrate concentration was 14 mg/l NO3. The average ammonium concentration was 0.017 mg/l N and the maximum ammonium concentration was 0.106 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.023 mg/l P and the maximum MRP concentration was 0.15 mg/l P. The average chloride concentration was 17.2 mg/l Cl and the maximum chloride concentration was 20 mg/l Cl.			
Alkalinity (mg/l HCO3):	Average:	Range:					
	247	92-340					
Hardness (mg/l CaCO3):	Average:	Range:					
	251	114-320					
Conductivity (uS/cm):	Average:	Range:					
	495	316-579					
Monitoring Record Period:	From:	To:					
	1996	2010					
RISK ASSESSMENT							
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:	Phosphate			
Risk Category:	At risk, high confidence		GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:		
	0.00	0.00	0.00	80.42	19.58		
OTHER INFORMATION							



Site overview

Sample Location

Water Level Monitoring Station

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

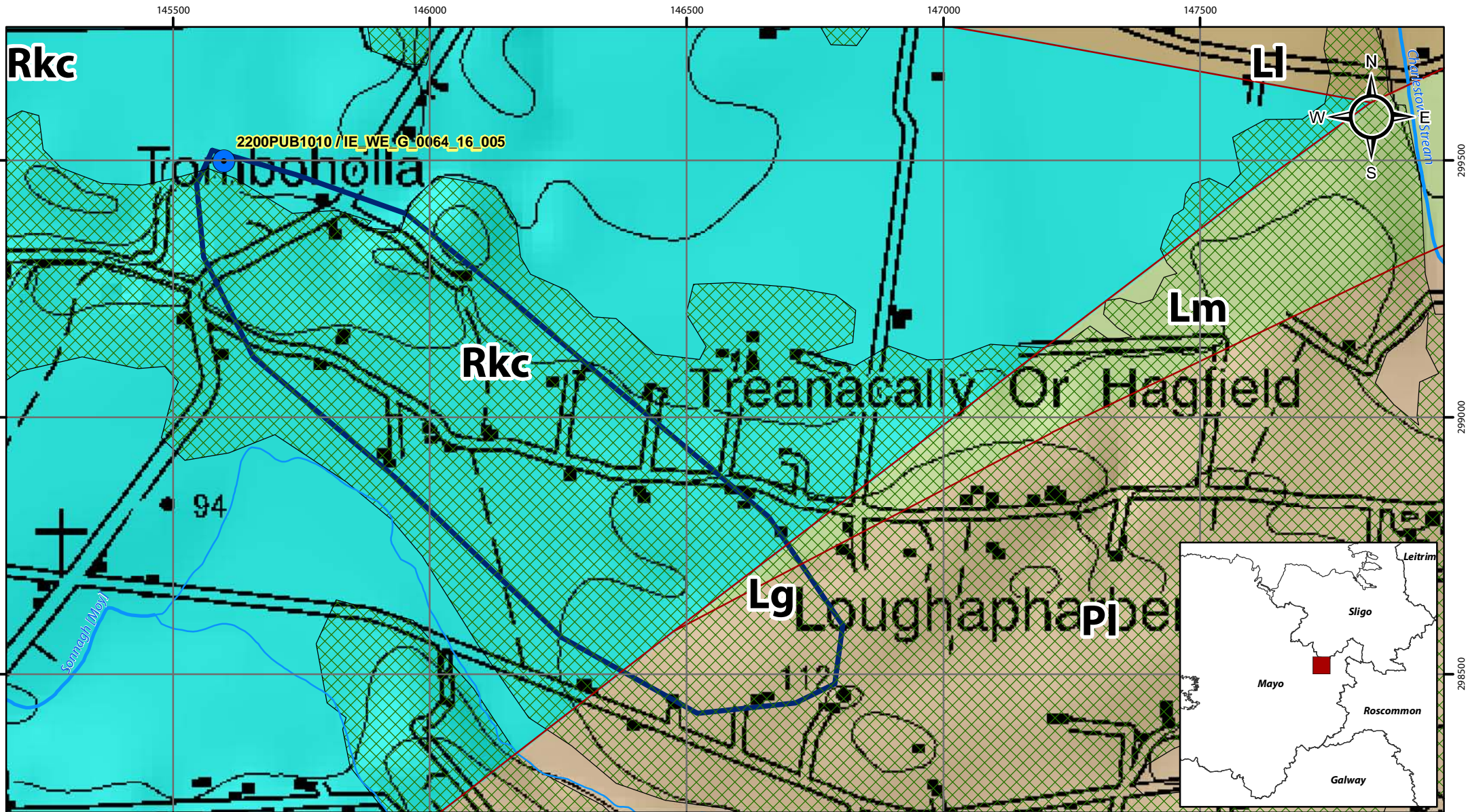


Location Map for Charlestown

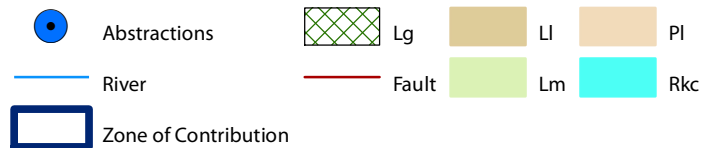
- Abstractions
- River
- Zone of Contribution

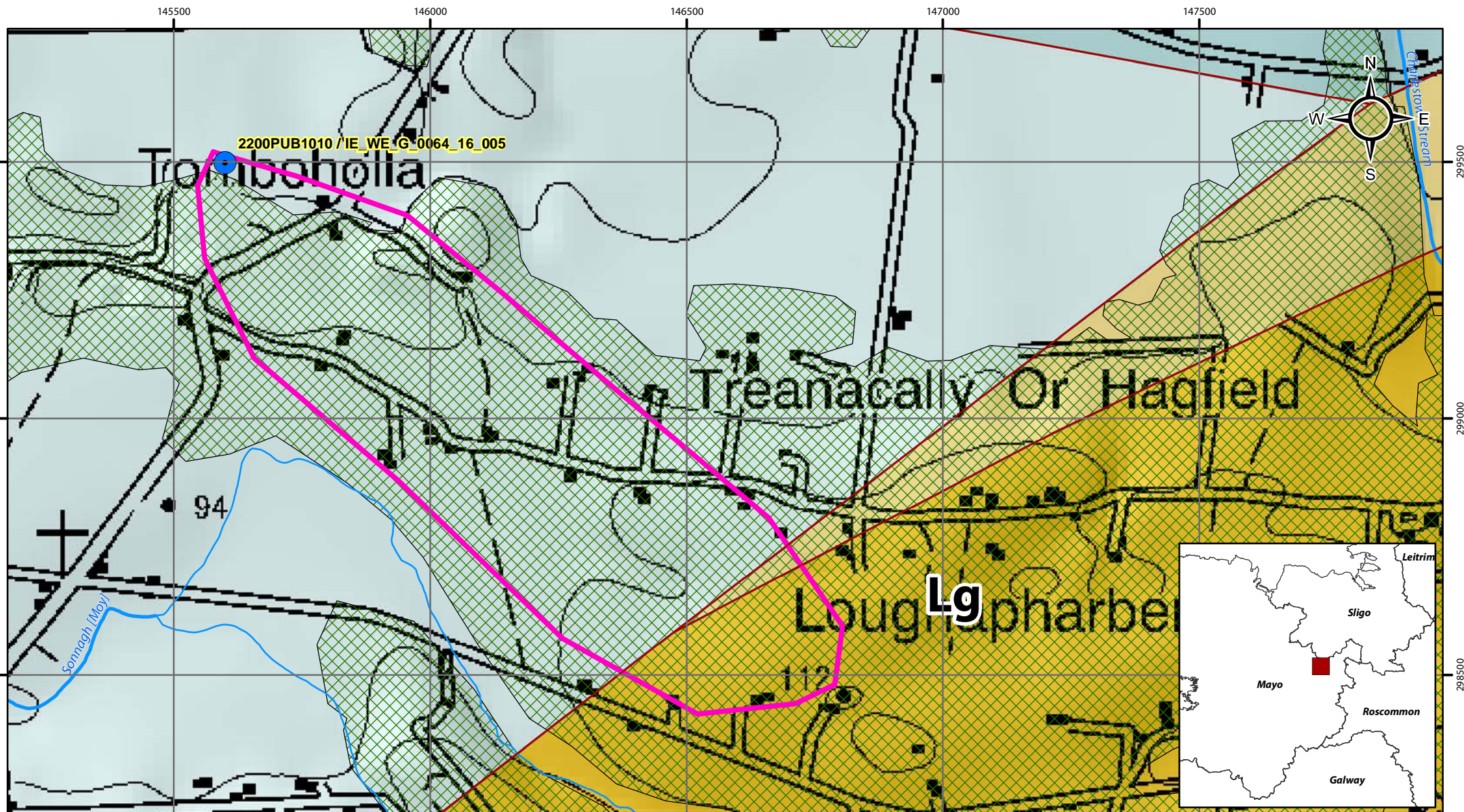
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0 0.25 0.5 1 km



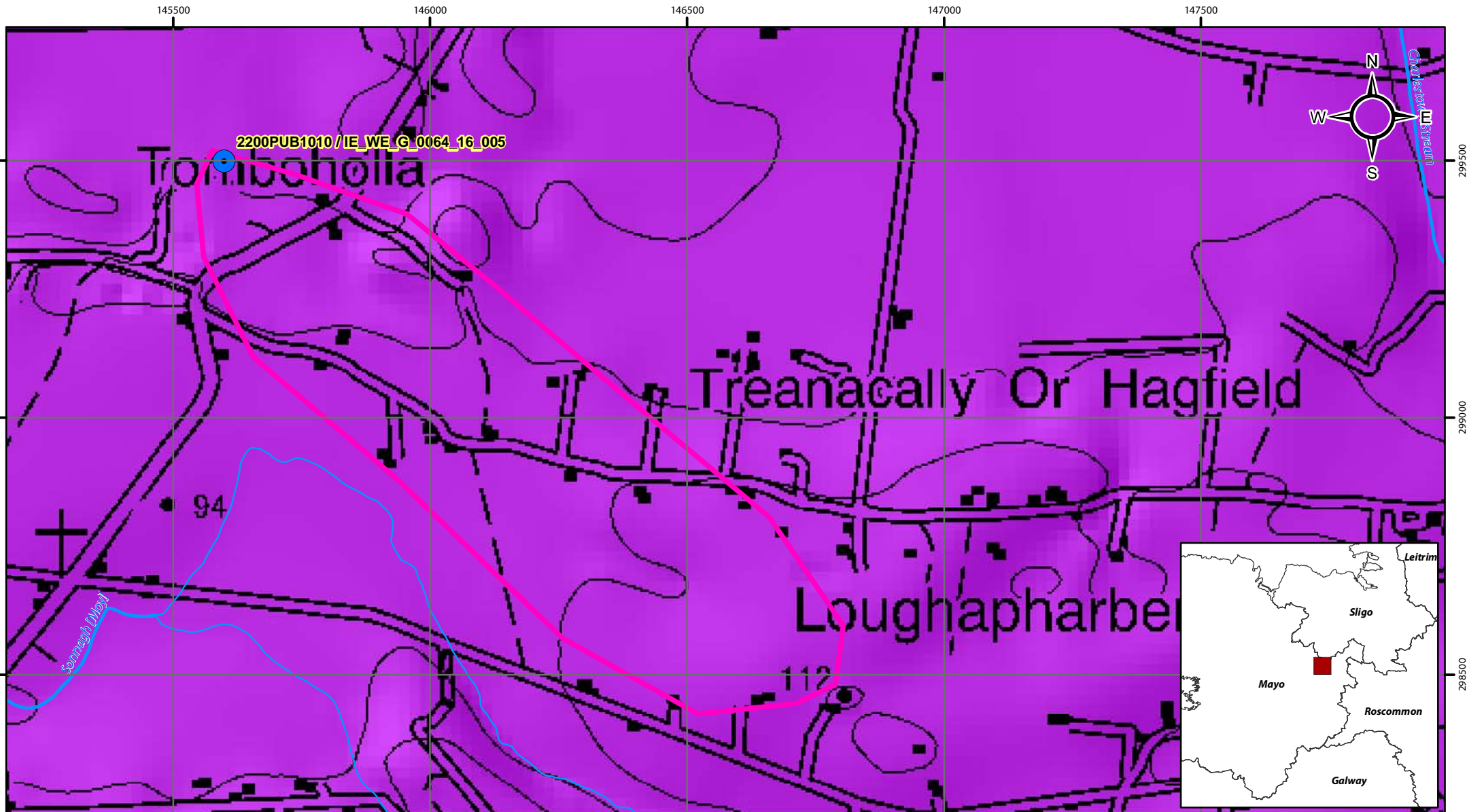
Aquifer Category Map for Charlestown



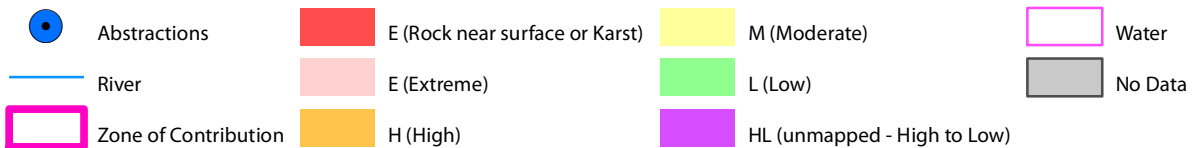


Bedrock Map for Charlestown

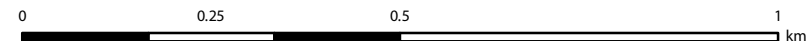
- Abstractions
- Dinantian Pure Bedded Limestones
- Dinantian Shales and Limestones
- Lg
- River
- Dinantian Sandstones
- Ordovician Volcanics
- Zone of Contribution
- Fault

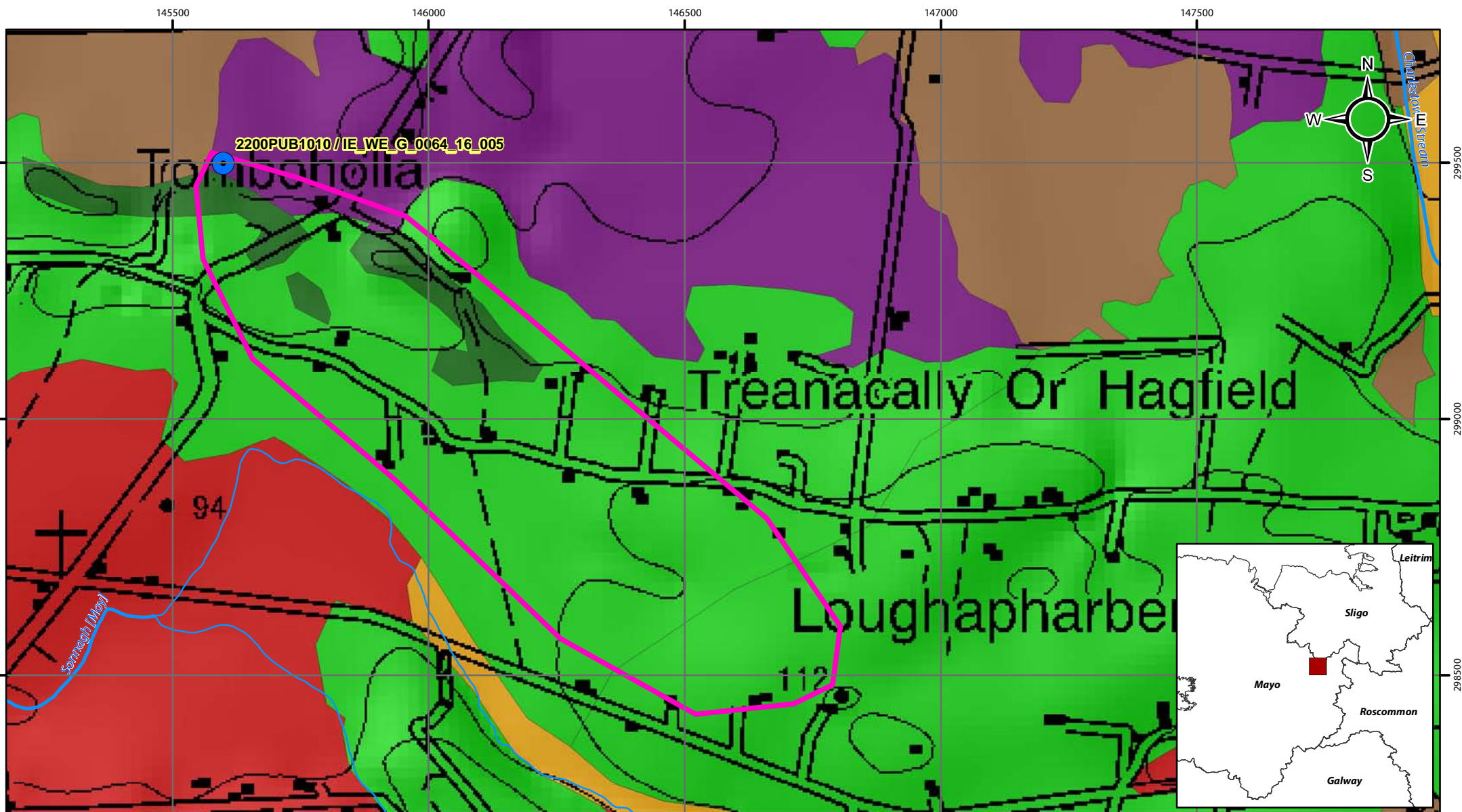


Groundwater Vulnerability Map for Charlestown

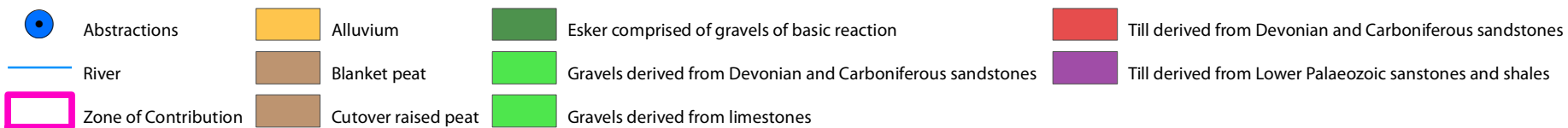


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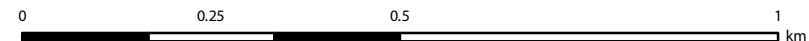


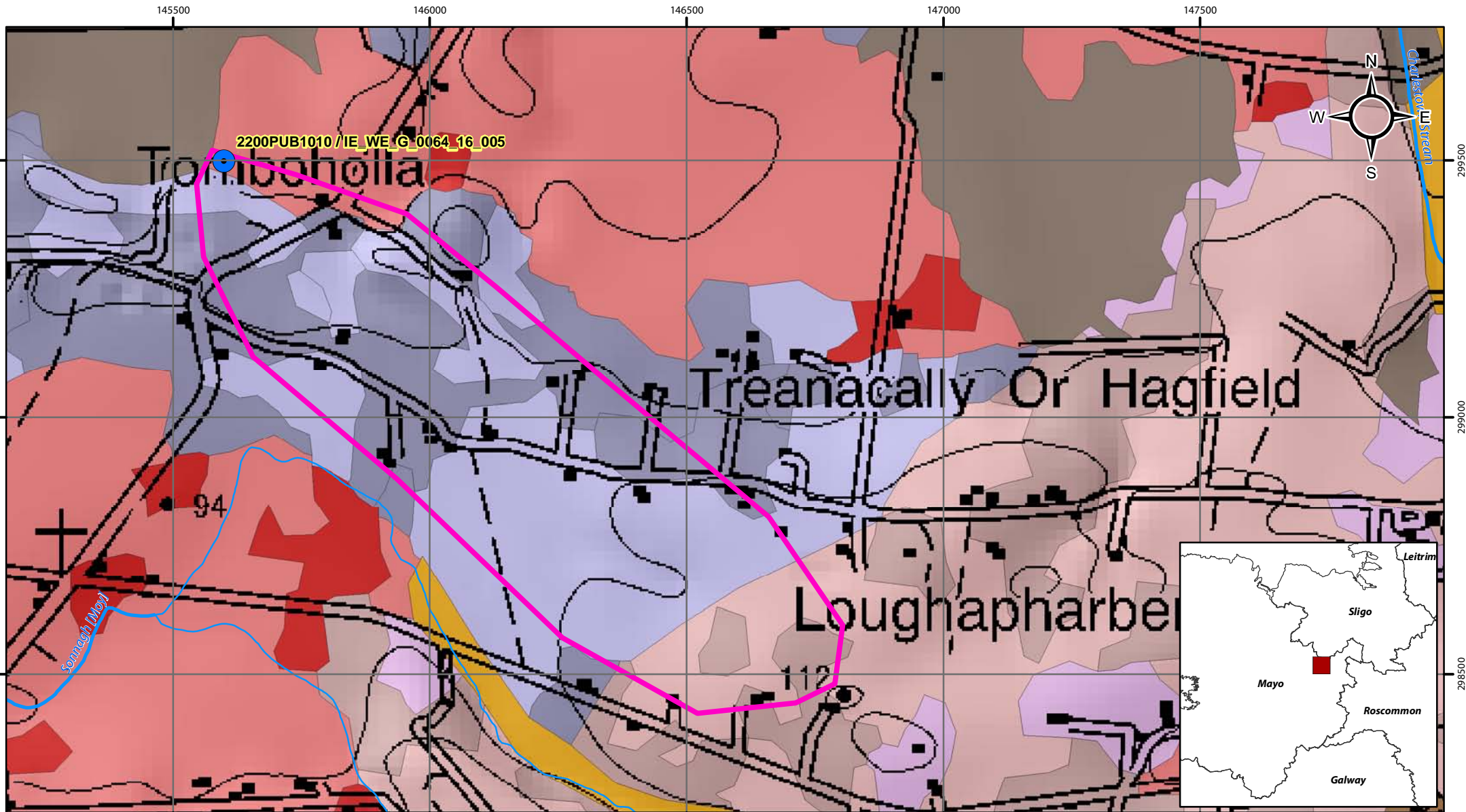


Subsoils Map for Charlestown



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Soils Map for Charlestown

