

1st Draft Aran (Donegal) Island GWB Description September 2005

Aran Island (Donegal) GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km ²)
Donegal Co Co	Lakes: Shore, Nameena, Ashesky, Namuck, Sheskin, Laur, Cronagarn, Meenawillin. Rivers: Owenballinta. Streams: Approximately 10 unnamed streams.	Coastal Lagoons (O’Riain, 2004).	~ 19
Topography	Aran Island is located approximately 3km from the mainland (Northwest Donegal GWB). Aran is a rugged mountainous island, characterised by steep slopes and cliffs. Elevations range from 0-220 mAOD. The population of the island is recorded at 543 people (Census 2002).		
Geology and Aquifers	Aquifer categories	The main aquifer category is: PI: Poor aquifer which is generally unproductive except for local zones.	
	Main aquifer lithologies	The island is composed mainly of the Ards Quartzite. Granite is present along the southern and eastern margins of the island.	
	Key structures	A large NW-SW trending syncline is mapped in the southern half of the island. The bedding dips from 45 to 70 degrees.	
	Key properties	There are no data available. Low transmissivities are expected. Storativity is expected to be low (<0.5%). The data are inadequate to calculate groundwater gradients, however, these are expected to be greater than 0.01.	
	Thickness	Most groundwater flux will be in the uppermost part of the aquifer.	
Overlying Strata	Lithologies	Only the eastern half of the island is mapped. Blanket Peat is mapped on the uplands. Till and outcropping rock are present on the lower slopes. A large proportion of the island has rock outcropping.	
	Thickness	1-3m (Donegal Groundwater Protection Scheme).	
	% area aquifer near surface	<i>[Further Information to be added at a later date]</i>	
	Vulnerability	Extreme vulnerability (Donegal Groundwater Protection Scheme).	
Recharge	Main recharge mechanisms	Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops.	
	Est. recharge rates	<i>[Information to be added to and checked]</i>	
Discharge	Large springs and large known abstractions (m³/d)	None known.	
	Main discharge mechanisms	Shallow groundwater is likely to discharge mainly to the small lakes, or to seeps along the coastline, but the limited bedrock transmissivity means that the baseflow component of the total streamflow will be low.	
	Hydrochemical Signature	No data are available within this particular GWB.	
Groundwater Flow Paths	Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the lakes, or to seeps along the coastline. Groundwater flow directions are expected to follow topography.		
Groundwater & Surface water interactions	Shallow groundwater will discharge locally to the small lakes, small springs and seeps. Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow is likely to be relatively low.		

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Conceptual model	<ul style="list-style-type: none"> • Aran Island is located 3km from the mainland (Northwest Donegal GWB). Aran is a rugged mountainous island, characterised by steep slopes and cliffs. • The GWB is composed primarily of low transmissivity rocks. • Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. • Diffuse recharge is expected to occur via rainfall percolating through the subsoil and rock outcrops. • Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the lakes, or to seeps along the coastline. • Flow directions are expected to follow topography. • It is unlikely that any major groundwater - surface water interactions occur. Baseflow is likely to be relatively low.
Attachments	Figure 1.
Instrumentation	<p>Stream gauges: None EPA Water Level Monitoring boreholes: None EPA Representative Monitoring points: None</p>
Information Sources	<p>Lee M. and Fitzsimons V. (2004). <i>County Donegal Groundwater Protection Scheme</i>. Main Report. Draft Report to Donegal County Council. Geological Survey of Ireland 58pp. Long, C.B. & McConnell B.J. (1997) <i>Geology of North Donegal: A geological description to accompany bedrock geology 1:100,000 scale map, Sheet 1 and part of Sheet2, North Donegal</i>. With contributions from P. O'Connor, K. Claringbold, C. Cronin and R. Meehan. Geological Survey of Ireland. 87pp. O' Riain, G., (2004). <i>Water Dependent Ecosystems and Subtypes Draft Report</i>. WFD Support Projects. Compass Informatics in association with National Wildlife and Parks Service (DEHLG).</p>
Disclaimer	<p>Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.</p>

Figure 1. Aran Island.

