

### Clonaslee GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km <sup>2</sup> )
Laois Co. Co. Hydrometric Area 14		Rosenallis Stream, Barrow, Glenlahan, Murglash, Owenass, Blackwater (Laois), Owenahallia	Slieve Bloom Mountains	33
<b>Topography</b>		This groundwater body is located at the base of the northeastern slopes of the Slieve Bloom Mts. In the northern area of the groundwater body occupies elevations from 200 to 100m OD. There is a clear break in slope located within the area of the body from the mountainous to lowland topography. On the eastern limb of the groundwater body it occupies higher elevations ranging up to 305mOD at Conlawn Hill, which lies on the boundary between the Barrow and the Nore catchments.		
<b>Geology and Aquifers</b>	Aquifer type(s)	<b>Rf:</b> Regionally Important Fractured Aquifer.		
	Main aquifer lithologies	Clonaslee Member – CWcl – Medium to coarse grained creamy sandstones		
	Key structures.	The strata dip northwards at 10 – 20°. A number of faults with a N-S direction are noted in the area of the Clonaslee well field		
	Key properties	Transmissivity 20 to 90 m <sup>2</sup> /d. Storativity = 8.4 x 10 <sup>-4</sup>		
<b>Overlying Strata</b>	Lithologies	The lithology of the subsoil varies with the elevation. There is peat on the elevated slopes of the mountains, lower down the mountain we find Limestone Till. Rock outcrops both at the peak of the mountain and in an area between the peat and limestone.		
	Thickness	Thickness of the subsoil is varied but is mostly below 10m in thickness.		
	% area aquifer near surface	There is a about 25% of the area of the aquifer which can be considered near the surface.		
	Vulnerability	Vulnerability is highly varied over the area of this groundwater body. To the northeast there is a large area of Extreme vulnerability and also at Conlawn Hill, the remained is a mix of High to Moderate vulnerability.		
<b>Recharge</b>	Main recharge mechanisms	Most recharge takes place where the overburden is less than 5m thick or where sands and gravels exist.		
	Est. recharge rates	<i>[Information will be added at a later date]</i>		
<b>Discharge</b>	Springs and large known abstractions (m <sup>3</sup> /d)	The Clonaslee well field lies near the northeast limit of the groundwater body, with a large zone of contribution up gradient. The combined abstraction of these wells is 1820m <sup>3</sup> /d.		
	Main discharge mechanisms	There is some evidence of springs at the lower section of the sandstones (e.g. St. Brigit's Well, Rosenallis), implying recharge is being rejected by the lower permeability layers. (Barber 1979)		
	Hydrochemical Signature	Samples taken during the pumping tests on the production wells indicate hard waters. The hydrogeological settings would imply that softer water would be more typical of these strata. The bedrock layers of this groundwater body are <b>Siliceous</b> .		
<b>Groundwater Flow Paths</b>		The general groundwater flow direction is naturally downhill radiating from the peak of the Slieve Bloom Mountains. The groundwater flow is initially unconfined, but as it travels through the Clonaslee Sandstone underneath the Lower Limestone Shales it becomes confined.		
<b>Groundwater &amp; surface water interactions</b>		There is the possibility of leakage through the Till or Lower Limestone shale were there to be excessive pumping of the Clonaslee well field.		
<b>Conceptual model</b>	This aquifer is defined to the west and south by the River Barrow catchment and to the east and north by the extent of the Clonaslee Flagstone Formation. The aquifer recharges in the upper parts of the mountains where there is a very thin subsoil covering. The groundwater flows northwards. There is some discharge at the contact with the lower permeability limestones. North of the contact, i.e. over most of the Clonaslee well field, the aquifer is considered to be confined by the overlying Lower Limestone Shale Formation and artesian conditions exist in three or four of the production wells. By drilling through the limestone and pumping the confined sandstone the wells are better protected from pollution from above.			
<b>Attachments</b>				
<b>Instrumentation</b>		Stream gauge: 14050 Borehole Hydrograph: None EPA Representative Monitoring boreholes: None		

<b>Information Sources</b>	<p>Barber, W. (1979) Evaluation of Groundwater Resources of the Clonaslee Area Co. Offaly. Georex Limited.</p> <p>Hand, M.G. (1987) Aquifer Protection Policy in Ireland - A Case Study. IAH (Irish Group) 7<sup>th</sup> Annual Groundwater Seminar.</p> <p>Deakin, J., Fitzsimons, V., Gately, C., Wright, G. 2002. <i>Laois Groundwater Protection Scheme</i>. Geological Survey of Ireland.</p> <p>Daly E.P. (1994) Groundwater Resources of the Nore River Basin. Geological Survey of Ireland.</p>
<b>Disclaimer</b>	<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>