

**Bansha GWB: Summary of Initial Characterisation.**

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km <sup>2</sup> )
16 – Suir S. Tipperary Co Co Limerick Co Co		Fidaghta, Ara, Aherlow	Bansha Wood	16
<b>Topography</b>		The topography of this area is an elevated elongate ridge, which is a direct reflection of the geology. The Devonian rocks underlying this ridge from Slievenamuck (369mOD) to the area just east of Bansha, appear to have been forced up above the limestones by tectonic forces.		
<b>Geology and Aquifers</b>	Aquifer type(s)	Rf : Regionally important Fractured aquifer		
	Main aquifer lithologies	KT : Kiltorcan Formation - Yellow & red sandstone & green mudstone		
	Key structures.	The rocks have undergone at least one major phase of structural deformation. The Kiltorcan sandstone has in other parts of South Tipperary reacted in a brittle manner to the deformation, allowing the development of a denser network of fracturing and fractures permeability than in the shalier sandstones elsewhere in the aquifer. Although major faults may not be mapped it is most likely that they exist on a smaller scale.		
	Key properties	Results of aquifer testing undertaken in the aquifer are very variable. Daly (1985) reports estimates of 5 m <sup>3</sup> /day to 1850 m <sup>3</sup> /day, and suggests that the highest values are likely to be associated with low-lying areas close to anticlines or faults. Daly suggests that sandstone permeabilities are in the order of 0.5 to 20 m/day, increasing up to 80m/day in localised areas. Transmissivity will be reduced at depth, where the Kiltorcan Formation is thinner in the centre of the synclines and fractures are closed by the deep burial.		
	Thickness	Geophysical borehole logging data suggest that significant water movements occur at depths of over 60m where the aquifer is not confined by overlying shaly limestones. Where confined, active groundwater circulation is expected to be much more limited, but some deep flow has been inferred from mineral exploration boreholes at depths of over 200m (Daly, 1985). Kiltorcan Formation is thinner in the centre of the synclines and permeability is reduced by the deep burial		
<b>Overlying Strata</b>	Lithologies			
	Thickness			
	% area aquifer near surface	Rock is close to the surface over the surface of this aquifer.		
	Vulnerability	Vulnerability is mostly EXTREME.		
<b>Recharge</b>	Main recharge mechanisms	Most recharge will be diffuse from precipitation falling on the area. The thin covering of subsoils and the permeable and fractured nature of the bedrock will allow a high percentage of effective rainfall to enter the aquifer.		
	Est. recharge rates	<i>[Information will be added at a later date]</i>		
<b>Discharge</b>	Springs and large known abstractions	None		
	Main discharge mechanisms	There is no obvious discharge zone for groundwater moving at depth in this aquifer, but it probably flows via large faults and complex pathways into shallower groundwaters and from there to surface water bodies where outcrop areas are the lowest elevations.		
	Hydrochemical Signature	Waters are 'soft' to 'moderately hard' in the sandstones. The hydrochemical signature varies between calcium bicarbonate and calcium-magnesium bicarbonate. Daly suggests that the signature depends on the thickness of overlying subsoil, with calcium magnesium waters being associated with areas of thicker subsoil. The bedrock strata of this aquifer are <b>Siliceous</b> , but there may be some localities where there are <b>Calcareous</b> beds in the top layers of the formation.		
<b>Groundwater Flow Paths</b>		Substantial artesian flows have been recorded in this aquifer due to the pressure of the water table in the elevated outcrop area. Evidence from drilling in the Kiltorcan Formation shows that the largest well yields are obtained at relatively low elevations, close to major structural features and where at least 40 m of the upper part of the Kiltorcan is penetrated.		
<b>Groundwater &amp; surface water interactions</b>		The balance of abstraction with recharge will require careful attention, particularly if considering portions of the aquifer which are confined and/or which occur as isolated faulted blocks.		

<b>Conceptual model</b>	A conceptual analogy has been drawn to the Kiltorcan Sandstone of the Carrick-on-Suir syncline. This has been done because there has been more study on the latter and both appear similar in physiographic nature. This groundwater body must be viewed in three dimensions. The rocks in question extend underground underneath the limestones to the south. The aquifer becomes progressively more confined by an increase in thickness of the overlying beds. The aquifer has not been greatly exploited by public supply abstraction.
<b>Attachments</b>	
<b>Instrumentation</b>	Stream gauge: 16105 Borehole Hydrograph: none EPA Representative Monitoring boreholes: None
<b>Information Sources</b>	Daly, D., Keegan, M., & Wright, G., (2001) Co. Tipperary (South Riding) Groundwater Protection Scheme. Daly, E.P. (1985). Groundwater Resources of the Nore River Basin: Hydrogeology of the Kiltorcan Aquifer System. Unpublished internal GSI report.
<b>Disclaimer</b>	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae