

**Slieveardagh Hills GWB: Summary of Initial Characterisation.**

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km <sup>2</sup> )
16 Suir / 15 Nore S. Tipperary Co Co		King's (Kilkenny),	None listed.	41
<b>Topography</b>		The northern side of the hills rises rapidly from the limestone lowlands (140m) to form a scarp (240-300m) and then drops gradually to the limestone lowland (90m) on the southern side. The north and northwestern side of the hills are more elevated than the southwest side.		
<b>Geology and Aquifers</b>	Aquifer type(s)	<b>Lm:</b> Locally Important Aquifer, generally moderately productive.		
	Main aquifer lithologies	LF: Lickfinn Coal Formation - Sandstone, shale, fireclay, and coal seams. This formation comprises a number of sub groups not represented on the current GSI maps (Archer <i>et al.</i> 1996) which are of critical importance if the groundwater flow mechanisms are to be properly understood. Daly (1980) Divides the bedrock sequence as follows from the surface down – Clay (0-6m), Shale (6-13m), Glengoolie Sandstone (13-19m), Siltstone (19-25m), Shale (25-31), Siltstone (31-41m) Main Rock Sandstone (41 - +60). There is a correlation drawn between the Slieveardagh Hills and the Castlecomer Plateau, the Swan Sandstone is seen as equivalent to the Main Rock Sandstone and the Clay Gall Sandstone is seen as equivalent to the Glengoolie Sandstone.		
	Key structures.	The sandstones are well jointed in a north-northwest to south-southwest direction. Faults encountered in the colliery have not proved to be water bearing. The strata are folded into a complex series of elongated northeast-southwest trending anticlines and synclines. There are a number of vertical faults, especially in the eastern end of the coalfield, trending north-northeast to south-southwest with downthrows to the east and west.		
	Key properties	Transmissivity estimated at 101.8 m <sup>2</sup> /d (Daly 1980). Storage coefficient 3.7 – 6.7 x 10 <sup>-4</sup> .		
	Thickness	The thickness of the sandstone strata is typically around 20m thick, but the can extend to great depths (+300m)		
<b>Overlying Strata</b>	Lithologies	Limestone till is seen to the east and south of the aquifer where the subsoil thickness is greater. Over most of the area the rock is close to surface.		
	Thickness	Subsoil thickness is mostly very low <3m although there are reported to be deeper deposits near river valleys e.g. over 20m of subsoil deposits at the valley floor at Springfield.		
	% area aquifer near surface	There are significant areas of outcrop within the groundwater body.		
	Vulnerability	The area of this groundwater body can be considered to be of EXTREME vulnerability at outcrop, though there may be a small area of lower vulnerability around the area of Commons. However, over most of the body the aquifer is confined and therefore vulnerability is LOW.		
<b>Recharge</b>	Main recharge mechanisms	Recharge occurs directly to the exposed aquifer surface. Most recharge will occur to the north of the aquifer where the outcrop elevation is higher.		
	Est. recharge rates	[Recharge estimates will be added at a later date]		
<b>Discharge</b>	Springs and large known abstractions (m <sup>3</sup> /d)	Coalbrook (636), Ballincurry (272), Gorteen.		
	Main discharge mechanisms	Discharge of groundwater from this aquifer is to the surface water bodies that are flowing towards the southeast. Groundwater flow is to the southeast but it will converge towards the river course as the water table approaches the base of the river.		
	Hydrochemical Signature	The waters are calcium/magnesium bicarbonate waters although those at Springfield contain small quantities of sodium bicarbonate. The magnesium content of these waters is higher than that in the Castlecomer aquifers. The levels of manganese are high whereas iron is present only in the mine waters. As most of the mining in this coalfield has been in the Upper Glengoolie seam, problems with water quality are mostly likely to arise in the Glengoolie Sandstone, which underlies this coal seam. The bedrock strata of this aquifer are <b>Siliceous</b> .		
<b>Groundwater Flow Paths</b>		The sandstones outcrop at a higher elevation at the northwest side of the hills; as a result the general direction of groundwater movement in the sandstone will be from the northwest to the southeast. In areas where mining has been extensive both rapid recharge and discharge of water are facilitated by shafts and drainage adits etc.		
<b>Groundwater and Surface water interactions</b>		River valleys in this area are normally perpendicular to the axis of the synclines. Because the outcrop area of the aquifer is small, large abstractions could cause significant drawdown, which might have an impact on any groundwater dependent ecosystems.		

<b>Conceptual model</b>	The area of this groundwater body is defined by the extent of the Lickfinn Formation in the Slieveardagh Hills in Co Tipperary. Although the groundwater bearing sandstone units consist of two layers within the Lickfinn Formation the whole area is chosen to represent the groundwater body. From a resource perspective any drilling on the hills within the boundary of the groundwater body will intersect the aquifer layers underground. Groundwater recharges to the north and flow down hill to the southeast where it discharges to the associated surface water bodies. Both sandstone units are confined and have small artesian discharges.
<b>Attachments</b>	GSI Well Hydrograph at Ballincurry
<b>Instrumentation</b>	Stream gauge: None GSI Borehole Hydrograph: Ballincurry (TY 55/65 - S278485) EPA Representative Monitoring boreholes: Coalbrook WS (borehole)(#24- S272512), Ballincurry (borehole)(#46-S276486)
<b>Information Sources</b>	Daly, E.P. (1980b) The drilling and testing of two boreholes, and groundwater development in the Westphalian Sandstones of the Slieveardagh Hills, Co. Tipperary. <i>GSI Internal Report</i> . Daly, D., Keegan, M., & Wright, G., (2001) Co. Tipperary (South Riding) Groundwater Protection Scheme.
<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

**Well Hydrograph,  
Ballincurry Td, Co. Tipperary 55/65  
NGR S 278 485**

