

Shanahoe GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
15 – Nore Laois Co Co Kilkenny Co Co S. Tipperary Co Co		Goul, Rathdowney Stream, Erkina, Gully, Nore, Ballytarsna, Ballyroan	Galmoy Fen, Coolacurragh Wood, Grantstown Wood And Lough, River Nore/Abbyleix Woods Complex, Shanahoe Marsh.	89.8
Topography		The highest elevations found in the area of this groundwater body are at the boundary between the Nore and Suir basins just southwest of Urlingford. Drainage here is to the north until the small streams meet the Erkina and Goul river where the river courses turn to the east. Moving further north the drainage is continuously east or southeast where are hills and troughs that cross cut the area of the groundwater body.		
Geology and Aquifers	Aquifer type(s)	Rf : Regionally Important Fractured Aquifer. Lm : Locally Important Aquifer, generally moderately productive		
	Main aquifer lithologies	WAdo: Dolomitised Waulsortian limestone CS : Crosspatrick Formation - Pale grey cherty crinoidal limestone		
	Key structures.	A large number of faults are likely to have an effect on the rate and direction of groundwater flow at the southern end of this groundwater body.		
	Key properties	Trasmissivities in the dolomite range from 50 – 500m ² /d and Permeabilities from 0.5 – 10m/d. The storage coefficient is in the order of 10 ⁻³ – 10 ⁻⁴ . The wide range of transmissivity values are largely due to the variability in the intensity of dolomitisation.		
	Thickness	The effective thickness of the aquifer is very variable and depends on the intensity of dolomitisation in a given area. Dolomitisation is not just a near surface phenomenon, consequently significant permeability has been found at depths greater than 100m. In cross section, it becomes apparent that the two bands form the ends of a large U-bend structure (part of the central syncline of Kilkenny), which runs underneath the Slieveardagh Hills and the Castlecomer Plateau at depths of over 300m.		
Overlying Strata	Lithologies	There is a large area of gravels in the southwest of Laois, part of which overlies this groundwater body. These gravels are considered to be too thin to be an aquifer. To the north there are more areas overlain by till, of which there are two types; till dominated by gravel and till derived from limestone.		
	Thickness	The thickness of subsoil is generally less than 5m; there are also smaller areas to the south where there is rock close to surface. The thickest subsoil sections are to be found in the northern area of the groundwater body.		
	% area aquifer near surface	There are areas of outcrop to the southern area of the groundwater body.		
	Vulnerability	The overall vulnerability for the area is MODERATE with isolated areas of EXTREME. To the north there is a significant area of LOW vulnerability where there is an increase in subsoil thickness.		
Recharge	Main recharge mechanisms	Most recharge to this aquifer is likely in the areas to the south where there is increased elevation and thinner subsoil, which appears to be permeable gravels.		
	Est. recharge rates	[Recharge rates will be calculated at a later date]		
Discharge	Springs and large known abstractions (m ³ /d)	Rathbeg, Inchirourke (320) Dairyhill (Ballacolla GWS) (142), Whitehall (Rathdowney WS) (450),		
	Main discharge mechanisms	In the Urlingford – Mountrath Lowlands the aquifer discharges to the Erkina and the Nore and to smaller streams often via small springs (frequently ephemeral).		
	Hydrochemical Signature	Dolomite areas in the Nore are indicated to be very hard waters with high Mg/Ca ratio. Waters have a Calcium/Magnesium Bicarbonate type. The bedrock strata of this aquifer are Calcareous .		
Groundwater Flow Paths		This is the one aquifer in the Nore River Basin where significant amounts of deep (>200m) groundwater flow may occur. The following area cited as evidence (1) This aquifer is continuous at depths under the centre of the basin. (2) There is significant permeability at depth (3) There is a head difference of more than 30m between the discharge levels in the two lowlands, which could provide the hydraulic drive. (4) The large springs at Callan – Bennettsbridge Lowlands (5) the slightly elevated temperature of some of the discharge waters from this aquifer in the Callan – Bennettsbridge lowlands.		
Groundwater and Surface water interactions		Some karst features such as caves, a turlough, highly permeable zones and surface solution are found in parts of this aquifer. In areas where the aquifer is close to the surface, the drainage density is low.		

Conceptual model	This groundwater body is defined to the north by the extent of dolomitised Waulsortian limestone and to the south by the Crosspatrick Limestone. The southwestern boundary is defined by the Nore/Suir catchment boundary. The dolomitisation of the original limestones has resulted in increased porosity. Subsequently other processes such as faulting, development of joints and karstification enhanced this porosity. The end product is a rock that is quite porous and permeable and which has been reduced in some places to the consistency of sand. Groundwaters in the outcrop areas of this aquifer are unconfined except for a number of small, generally low-lying areas where it is confined by till or peat big.
Attachments	(Figure 1) GSI Borehole Hydrograph at Middlemount
Instrumentation	Stream gauge: 15043, 15044 GSI Borehole Hydrograph: Middlemount (LS 28/2 - S326788) EPA Representative Monitoring boreholes: Bawnmore GWS (#50 - S558661), Galmoy GWS (#17 - S302712),
Information Sources	Buckley, R. & Fitzsimons, V (2002) Kilkenny Co Co Groundwater Protection Scheme. Daly, E. P. (1993) Hydrogeology of the Dolomite Aquifer in the Southeast of Ireland. Geol. Surv. Ire. Unpubl. Rep. Daly, E.P. (1994) Groundwater resources of the Nore River Basin. Geol. Surv. Ire. Unpubl. Rep.
Disclaimer	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 at Middlemount LS 28/2

