

### Clifden GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km <sup>2</sup> )
15- Nore Kilkenny S. Tipperary		Nore, Ennisnag Stream, Bregagh, Desart Stream, King's, Munster, Glory, Caherlesk Stream, Ballintaggart Stream, Brownstown Stream	Red Bog, Mount Juliet	259
<b>Topography</b>		This a low-lying area between the South Kilkenny Uplands and the Slieveardagh Hills. West of the Nore the drainage direction is towards the Kings River from the south, north and west. East of the Nore, water flows east from the drainage divide between the Nore and the Barrow.		
<b>Geology and Aquifers</b>	Aquifer type(s)	<b>LI</b> – Locally Important Aquifer, moderately productive only in local zones		
	Main aquifer lithologies	BU - Butlersgrove Formation - Very dark grey shaly limestone BA – Ballysteen Formation - Fossiliferous dark-grey shaly limestone WA – Waulsortian Limestones - Massive unbedded lime-mudstone DW – Durrow Formation - Shally fossiliferous & oolitic limestone AG – Aghmacart Formation - Dark shaly limestone		
	Key structures.	Geological structures may have a more important control on groundwater flow in the east where they are more prevalent. There are alternating north/south trending anticlines and synclines located in the southeastern area of this groundwater body. East of Kilkenny town there is a large syncline running north/south.		
	Key properties	No information is available on the hydrogeological properties of this groundwater body. Estimated transmissivities can be considered to range 1 – 10m <sup>2</sup> /d.		
	Thickness	Effective thickness is not expected to be large but the bedrock may permeable to depths of around 25m in some areas.		
<b>Overlying Strata</b>	Lithologies	Glacial Till		
	Thickness	Typically between 1 and 3m with some large areas of <1m thickness		
	% area aquifer near surface	30%		
	Vulnerability	Mostly HIGH with areas of EXTREME e.g. Stoneyford, and small areas of LOW to the south		
<b>Recharge</b>	Main recharge mechanisms	Recharge to this groundwater body will be limited where there are no areas of exposed rock.		
	Est. recharge rates	<i>[Information will be added at a later date]</i>		
<b>Discharge</b>	Springs and large known abstractions	Highrath GWS (32), Tobernagibboge (Spring), Kilbride GWS (10), Knocktopher, Kilmaganny,		
	Main discharge mechanisms	Discharge from this groundwater body can occur via one of the number of springs located at various points through out the area. East of the Nore the groundwater body discharges to the Kings River and to the east of the Nore the discharge will be directly to the Nore.		
	Hydrochemical Signature	The bedrock strata of this groundwater body are <b>calcareous</b> .		
<b>Groundwater Flow Paths</b>		Groundwater flow paths will be short because the bedrock is not considered to constitute a regionally important aquifer. It is likely that most groundwater flow circulates in the upper tens of metres, recharging and discharging in local zones. The age of the groundwater is considered to be young. In areas of structural deformation this could lead to local zones of increased secondary permeability.		
<b>Groundwater &amp; surface water interactions</b>		This groundwater body is unlikely to have a developed karstic flow system so there will still be some interaction between the surface and groundwaters. It is important to note the location of springs as these indicate areas where groundwater enters surface water. The opposite is also found a few kilometres SW of Kilkenny town in the form of swallowholes, which are considered an important pollution threat to the groundwater body.		
<b>Conceptual model</b>	This groundwater body consists of the Ballysteen and Calp-type limestones around Kilkenny town. The recharge to the aquifer is mostly diffuse where there are areas of extreme vulnerability but there are also swallowholes recorded within the area. Groundwater flow will be greatest in the upper layers of the bedrock where most weathering has taken place. The flow directions are similar to the surface drainage patterns. The borehole hydrograph at Greatol shows the depth to the water table can vary over 6m in a single year. Discharge from the aquifer will be to the associated surface water bodies either as baseflow or as springs. Certain local areas of this aquifer may have a more permeable network of fissures and fractures developed allowing more groundwater flow. These areas may be located where structural features have deformed the limestone.			

<b>Attachments</b>	(Figure 1) EPA Borehole Hydrograph
<b>Instrumentation</b>	Stream gauge: 15011, 15046, 15023, 15009, 15025 EPA Borehole Hydrograph: GREATOAL (KIK109) EPA Representative Monitoring boreholes: None
<b>Information Sources</b>	
<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

**EPA Borehole Hydrograph at Station KIK109**

