Summerhill GWB: Summary of Initial Characterisation *(This GWB deleted from list 7/9/04)*

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km^2)
Meath Co. Co. Hydrometric Area 07		Knightsbrook	None	~ 3
Topography		This GWB lies to the west of Summerhill in south Co. Meath. The area is low lying although it does appear to have a slightly hummocky surface. The majority of the area is located at 90 m OD.		
Geology and Aquifers	Aquifer type(s) Main aquifer lithologies	Lg: Locally Important Gravel Aquifer Sand and Gravel. Clean, coarse morainic & esker gravels. Drilling in the area indicates that the gravels can be confined within layers of till and under morainic material.		
	Key structures.	N/A		
	Key properties	A hydrogeological investigation in this area has shown that the gravels are not very permeable and may have high clay content in places. Analysis of pumping test data from the area suggests moderate transmissivity values of around $45m^2/d$. There is a gravel pit located at Summerhill, Clondoogan Pit, which typically indicates workable amount thickness of gravel deposits.		
	Thickness	By definition (DELG/EPA/GSI, 1999) this gravel deposit must be at least 10m thick. It appears from water level data that there is a generally a greater thickness of unsaturated gravels in the centre of the body with the water table coming closer to the surface at the perimeter of the GWB. Drilling records in the area suggest the depth to bedrock is greater than 10m.		
Overlying Strata	Lithologies	Can be overlain in places by till.		
	Thickness	Highly variable		
	% Area aquifer near surface	High		
	Vulnerability	High		
Recharge	Main recharge mechanisms	This GWB is recharged from rainwater percolating through the topsoil and unsaturated sand and gravel deposits. Surface runoff is probably less than 20% of effective rainfall. The presence of less permeable layers in the deposit, even if thin, can create perched water tables and prevent recharge of the true water table.		
	Est. recharge rates	*[Information to be added at a later date]*		
Discharge	Springs and large known abstractions	None		
	Main discharge mechanisms	Groundwater will leave this aquifer where the water table is above river stage and a permeable river bed exists. There is also likely to be groundwater seepage from the extremities of the gravel body at the lower elevations, which may appear as springs, seeps or a rise in baseflow to a river. Water may also come to the surface where there is a boundary to groundwater flow i.e. an impermeable layer of till within the gravel deposit.		
	Hydrochemical Signature	Analysis of wells in the area indicates very hard water.		
Groundwater Flow Paths		Although the aquifer is permeable groundwater velocity is slow because storativity is high and water table elevations are generally subdued. This also means that discharge to rivers will not be flashy and will be sustained through drier periods of the year. Groundwater levels in the area suggest that groundwater flow northward towards the Knightsbrook River. The flow of groundwater through the gravel aquifer may be hindered by interbedded till, which act as a boundary to groundwater flow. Drilling evidence indicate that in the area around Bull Ring (1 km west of Summerhill village) the gravels are contained within a pocket of less permeable material. A pumping test conducted in the area showed boundaries existed in close proximity to the pumping well, well inside the mapped extremities of the gravel deposit. Although this was considered to be an extreme case it does indicate that (a) the deposit is not homogeneous and (b) the gravel deposit is a local aquifer and groundwater will not develop regional flow paths.		
Groundwater & surface water interactions		The interaction between surface water and groundwater through out this aquifer is complex and will depend on the position of the water table. The nature of this interaction will not be uniform over the area of the body. During flooding, when the river stage is above the water table in the gravel aquifer, river water will seep into the gravel aquifer. The aquifer provides storage for this rainwater and it is not until the river stage has reduced and the hydraulic gradient is reversed that the water is released into the river. This phenomenon is known as bank storage and is indicative of a high interactive surface water groundwater system. It also accounts for the fact that such rivers bounded by gravel aquifers have a less 'flashy' flooding and higher baseflow and dry weather flow.		

Conceptual model	This GWB lies to the west of Summerhill in south Co. Meath. The area is low lying although it appears to have a slightly hummocky surface. The extent of the body is defined by the presence of gravel deposits more than 10 m thick. The GWB is composed of permeable sand and gravel deposits with a high storativity. Recharge occurs diffusely through the overlying topsoil. The aquifer is generally unconfined, but may become locally confined where lower permeability deposits overlie the gravels. The water table within gravel aquifers is usually flat and therefore the depth to water will depend on the topography of the area. The flow paths within the aquifer are constrained by the extent of the deposit and therefore will not develop to a regional scale. Groundwater discharge will occur via springs and seeps along the lowest boundary of the body and also along river courses. There may also be discharge to rivers as baseflow where the water table lies above the river stage.
Attachments	
Instrumentation	Stream gauge: None Borehole Hydrograph: None EPA Representative Monitoring boreholes: None
Information Sources	DELG/EPA/GSI (1999) *Groundwater Protection Schemes.* Department of Environment & Local Government, Environmental Protection Agency & Geological Survey of Ireland, joint publication. Woods L, Meehan R, Wright GR (1998) *County Meath Groundwater Protection Scheme*. Report to Meath County Council. Geological Survey of Ireland. 54 p.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae