

Blessington GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
Wicklow Co. Co. Kildare Co. Co. Hydrometric Area 09		Minor Streams	Poulaphouca Reservoir (731)	7
Topography		Blessington is approximately 48 km southwest of Dublin and 10 km southeast of Naas. The Blessington area is on the western side of the Wicklow Mountains with elevations between 180 m and 250 m OD. The topography of the region reflects the glacial overburden rather than any change in bedrock structures. Surface drainage is southeastwards into the Pollaphuca Reservoir and then northeast and west via the River Liffey.		
Geology and Aquifers	Aquifer type(s)	Lg: Locally important sand/gravel aquifer		
	Main aquifer lithologies	The dominant sediments are the gravels, deposited in a subaqueous environment by glacial meltwaters which drained into a glacial lake which existed between the Wicklow Mountains and the margin of the ice sheet		
	Key structures.	The gravels occur as delta deposits on the flanks of a ridge. The deposits are characterised by steeply dipping foreset beds and interbedded sands and gravels. Limestone is the dominant clast type.		
	Key properties	The Blessington sand and gravel aquifer has a high permeability and transmissivity although some evidence indicates this permeability may be patchy in places. Groundwater gradients in the general area may range from approximately 0.007 to 0.07. A number of quarries are located within the aquifer, which typically indicates deposits with very little silt or clay.		
Thickness	The aquifer varies in thickness, but is generally 10 to 35 m thick.			
Overlying Strata	Lithologies	To the west, south and east of Blessington there are poorly to moderately permeable Lower Palaeozoic tills, matrix supported and characterised by a generally silty to silty sandy texture.		
	Thickness	West and north of the reservoir the Lower Palaeozoic tills seem to be much thicker (up to 14 m) and locally overlie gravelly deposits.		
	% 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 from such gravel aquifers is considered to be low and no more 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. Where the water table lies below the local river network it is likely that some stream water may pass into the aquifer. This will be most likely in the higher elevations where a river flows onto the aquifer from where it has previously been flowing over impermeable subsoil or bedrock.		
	Est. recharge rates	<i>[Information to be added at a later date]</i>		
Discharge	Springs and large known abstractions	Blessington PWS (400 m ³ /d)		
	Main discharge mechanisms	Groundwater will discharge from this aquifer where the water table comes to the surface of the gravel deposits e.g. at springs and at the southern boundary of the aquifer.		
	Hydrochemical Signature	Analyses indicate a calcium bicarbonate type, which is hard and typical of a limestone-dominated gravel aquifer. The samples contained abnormally high chloride values (75-80 mg/l) and 57 mg/l of sodium. While these values for sodium and chloride pose no threat to health, they may indicate some contamination and further monitoring should be carried out to establish if this aquifer is being contaminated, perhaps by salting of road surfaces.		
Groundwater Flow Paths		The groundwater flow direction is generally to the southeast towards the Pollaphuca Reservoir but locally it is dependent on topography. Groundwater is generally close to the surface. The static water levels in wells range up to 20 metres below ground level.		
Groundwater & surface water interactions		The interaction between surface waters and groundwater within the area of this GWB is complex. The nature of this interaction is determined by the location of the water table within the aquifer. It can be seen that local streams are discontinuous and apparently sink below surface where the aquifer is highly permeable and the water table is below the river stage.		
Conceptual model	The Blessington GWB is approximately 48 km southwest of Dublin and 10 km southeast of Naas, on the western side of the Wicklow Mountains. Elevations range between 180 m and 250 m OD. The extent of the GWB is defined to the south and east by the location of Pollaphuca Reservoir and to the north and west by the extent of gravel in the area. The GWB is composed of high permeability sands and gravels derived from limestone. The permeability is variable in places i.e. at higher elevations where the water table may be below the more permeable layers. Recharge occurs diffusely through the subsoils. Groundwater flow in the aquifer is unconfined and is generally in a NW to SE direction. This aquifer will discharge via springs and seeps at the extremities of the deposit.			

Attachments	
Instrumentation	Stream gauge: Borehole Hydrograph: None EPA Representative Monitoring boreholes: WIC033, WIC048
Information Sources	McConnell B, Philcox M, Sleeman A G, Stanley G, Flegg A M, Daly E P, Warren W P (1994) <i>A Geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 16, Kildare-Wicklow</i> . Geological Survey of Ireland, 70 pp. Wright G R, Woods L (2003). <i>County Wicklow Groundwater Protection Scheme Report</i> to Wicklow County Council. Geological Survey of Ireland Woods L, Wright G R (2003) Blessington Gravel Aquifer. Groundwater Source Protection Report. Report to Wicklow County Council. Geological Survey of Ireland
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

