Deel - Mayo GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
34 Mayo Co Council		**Rivers**: Deel, Bar Deela, Shanvolahan. **Lakes**: Louhgdathlee, Nacrumpaun, Nacloghlea, Keeran, Brackloon.	Bellacorick Bog Complex (001922)	37
Topog-raphy	The GWB occupies an area between Nephin Beg mountain and Crossmolina. The land surface characterised by a mountainous terrain in the southwestern part of the GWB which flattens toward the northeastern part of the GWB. The GWB is bounded by the poorly productive rocks of the Malranny, Bellacorrick-Killala and Lahardaun GWB's. Elevations range from 70-170 mAOD.			
Geology and Aquifers	**Aquifer categories**	The main aquifer category in this GWB is: **Lm**: Locally important aquifer which is generally moderately productive.		
	Main aquifer lithologies	This GWB is composed of Dinantian Sandstones, namely the Mullaghmore, and Minnaun Sandstone Formations. Table 1 presents the lithologies in the GWB.		
	Key structures	Faults comprise the boundaries with the poorly productive aquifers, trending NE-SW, NW-SW and E-W. The dips are 5-10^o to the northwest.		
	Key properties	In general, Dinantian Sandstones, given their dominant sandstone lithology, which generally results in a higher fissure permeability, has the potential to be a transmissive aquifer. Data are sparse (2 wells), with specific capacities of 0.2 and 0.3 m^3/d/m. The data suggests low transmissivity, however, in the vicinity of faults, it may be higher. A hydrograph, given in Figure 1, is available for a borehole located in the Dinantian Sandstones north of Ballycastle. The annual variation of the water level is generally less than 2 m. Storativity in the aquifer is expected to be relatively high, in the order of 2%. Water levels are generally 4-6 m below ground level. Gradients are expected to be greater than 0.001.		
	Thickness	Most groundwater flux is likely to be in the upper part of the aquifer, comprising three broad zones: a zone comprising a broken and weathered zone typically less than 3 m thick; a zone of interconnected fissuring up to 40 m thick; and a zone of isolated poorly connected fissuring typically less than 150 m. Frequent water strikes up to 36 m below rock head are recorded within this GWB. Fissure permeability is generally more developed in the top 20 to 30 metres of fractured weathered rock and close to fault zones.		
Overlying Strata	**Lithologies**	The subsoils are dominated by blanket peat. Table 2 gives a list of subsoil types present in the GWB.		
	Thickness	Available data indicate that the thickness are 4-8m.		
	% area aquifer near surface	*[Further Information to be added at a later date]*		
	Vulnerability	*[Further Information to be added at a later date]*		
Recharge	**Main recharge mechanisms**	Diffuse recharge occurs via rainfall percolating through the subsoil and rock outcrops. A high proportion of the available recharge will discharge to the streams where there is blanket peat and low permeability till present.		
	Est. recharge rates	*[Information to be added to and checked]*		
Discharge	**Large springs and large known abstractions (m^3/d)**	None		
	Main discharge mechanisms	The main groundwater discharges are to the streams, rivers and lakes.		
	Hydrochemical Signature	It has a $CaHCO_3$ signature. [n=2] Alkalinity (mg/l as $CaCO_3$): 250, 262; Total Hardness (mg/l): 252, 262; Conductivity (μS/cm): 552, 577; Iron 0.5, 3.0 mg/l; Manganese 0.07, 0.78 mg/l.		
Groundwater Flow Paths		Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. There are frequent water strikes up to 36 m, indicating that there is a well connected fissured zone, enabling an element of regional groundwater flow. Flow paths can be expected to be relatively long, and are likely to be up to 2000 m. Groundwater flow directions are expected to follow topography, generally in an northerly and easterly direction.		
Groundwater & Surface water interactions		The GWB is crossed by the Bellacorick Bog Complex which is dependent on groundwater (Duchas national heritage data). Groundwater will contribute baseflow to the streams and rivers.		

Conceptual model	• The GWB occupies an area between Nephin Beg mountain and Crossmolina. The land surface is characterised by a mountainous terrain in the southwestern part of the GWB which flattens toward the northeastern part of the GWB. Elevations range from 70-170 mAOD. • The GWB is bounded by the poorly productive rocks of the Malranny, Bellacorrick-Killala and Lahardaun GWB's. • The groundwater body is composed primarily of Dinantian Sandstone which is considered to have the potential for relatively high fissure permeability. Data are sparse (2 wells), with specific capacities of 0.2 and 0.3 m^3/d/m. The data suggests low transmissivity, however, in the vicinity of faults, it may be higher. Storativity is approximately 2%. • Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. There are frequent water strikes up to 36 m in this GWB, indicating that there is a well connected fissured zone, enabling an element of regional groundwater flow. • Gradients are expected to be greater than 0.001. Water levels are generally 4-6 m below ground level. • Recharge occurs diffusely through the subsoils and via outcrops. • It has a $CaHCO_3$ signature. • Flow paths can be expected to be relatively long, and are likely to be up to 2000 m. Groundwater flow directions are expected to follow topography, generally toward the coast. • Groundwater will discharge to and contribute baseflow to streams, rivers and lakes.
Attachments	Table 1, 2 & Figure 1 and 2.
Instrumentation	**Stream gauges:** None **EPA Water Level Monitoring boreholes:** None **EPA Representative Monitoring points:** None
Information Sources	Long, B., Mac Dermot, C.V., Morris, J.H., Sleeman, A.G., Tietzsch-Tyler, D., (1992). *A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 6, North Mayo.* Geological Survey of Ireland Map Series Report. Geological Survey of Ireland. Aquifer Chapters: The Dinanatian Sandstone Aquifers.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.

Table 1 Rock units in GWB

StratCode	UnitName	Descript	RockUnit	AquiferCat
MN	Minnaun Sandstone Formation	X-bedded sandstone and siltstone.	Dinantian Sandstones	Lm
MU	Mullaghmore Sandstone Formation	Sandstone, siltstone & shale	Dinantian Sandstones	Lm

Table 2. subsoils in GWB

Parent Material	Code	% Area gwb
Alluvium	A	1.17
Blanket peat	BktPt	86.71
Gravel (sandstone & shale) Devonian/Carboniferc	GDCSs	1.12
Limestone sands and gravels (Carboniferous)	GLs	0.01
Lakes	Lake	0.15
Sandstone till (Devonian)	TDCSs	7.52
Limestone till (Carboniferous)	TLs	1.16
Metamorphic till	TMp	2.16

Figure 1. Groundwater Hydrograph]

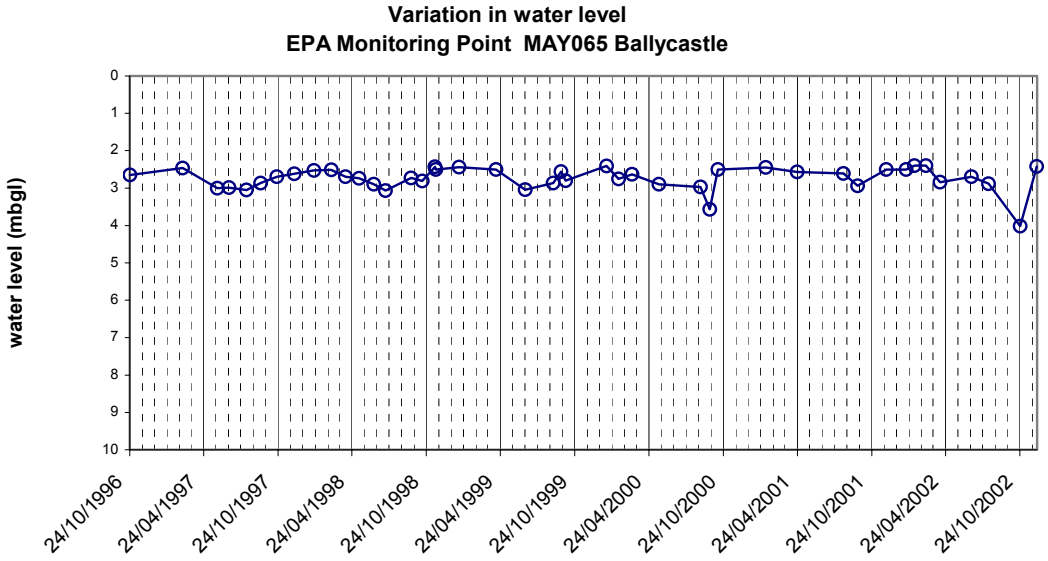

Figure 2 Boundaries and Location of GWB