Beltra Lough North 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**: Adergool **Lakes**: Bofeenaun, More, Beg, Levally, Nambrackkeagh.	Lough Conn and Lough Cullin (000519)	25

Topography		The GWB occupies an area from Beltra to L. Conn, comprising a NE-SW trending valley named Glen Nephin. It occupies the area between Nephin Beg Mountain range and high ground to the south of the valley. Elevations range from 10-130 mAOD. The main surface drainage is north and northwest to L. Conn, which provides the eastern boundary. The northern and southern boundaries are with the poor aquifers of the Foxford and Lahardaun GWB's. The western boundary is the surface water divide with hydrometric area 32 and is the boundary with Beltra Lough South GWB.
Geology and Aquifers	**Aquifer categories**	The main aquifer category in this GWB is: **Lm**: Locally important aquifer which is generally moderately productive (14 km^2). **Rk^c:** Regionally important karstified aquifer dominated by conduit flow (11 km^2).
	Main aquifer lithologies	This GWB is composed of Dinantian Sandstones and Dinantian Pure Bedded Limestones. See Table 1 for a list of rock units.
	Key structures	Faults trending N-S and SW-NE are the main fault sets. The beds dip 10-20^o in various directions.
	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 limited to 1 well in the neighbouring Beltra Lough South GWB. The data suggests a transmissivity in the order of 10-20 m^2/d. In the vicinity of faults, it may be higher. Storativity in the aquifer is expected to be relatively high, in the order of 2%. Water levels are 0-7 m below ground level. Gradients are expected to be greater than 0.001. There are no data for the Dinantian Limestones. Transmissivities are expected to range from 1 m^2/d to greater than 250 m^2/d. Storativity is expected to be low - approximately 0.01-0.02 (Daly, 1985). Gradients are expected to be greater than 0.0005.
	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 30 m thick; and a zone of isolated poorly connected fissuring typically less than 150 m. Most groundwater flows in the limestones is an epikarstic layer a couple of metres thick and in a zone of interconnected solutionally-enlarged fissures and conduits that extends approximately 30 m below this.
Overlying Strata	**Lithologies**	The subsoils are dominated by till and blanket peat.
	Thickness	There are no data specific to the GWB, however, data from neighbouring GWB's suggest that the thickness are 3-10 m.
	% 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 identified.
	Main discharge mechanisms	The main groundwater discharges are to the streams, rivers and lakes.
	Hydrochemical Signature	There are no data available, however, data from the Deel-Mayo GWB is presented as follows. 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. High alkalinities and hardness (in the order of 300 and 350 mg/l $CaCO_3$) are expected for the Limestones. Electrical conductivity is also expected to be high, approximately 700 μS/cm.
Groundwater Flow Paths		Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. 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 to the northwest.

Groundwater & Surface water interactions	Groundwater will discharge locally to streams and rivers crossing the aquifer and also to small springs and seeps. Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow to rivers and streams is likely to be relatively low.
Conceptual model	• The GWB occupies an area from Beltra to L. Conn, comprising a NE-SW trending valley named Glen Nephin. It occupies the area between Nephin Beg Mountain range and the ground to the south of the valley. Elevations range from 10-130 mAOD. The main surface drainage is north and northwest to L. Conn. • The groundwater body is composed of Dinantian Sandstones and Dinantian Pure Bedded Limestones. Transmissivity in the sandstones is in order of 10-20 m^2/d. In the vicinity of faults, it may be higher. Storativity in the aquifer is expected to be relatively high, in the order of 2%. • Transmissivities are expected to range from 1 m^2/d to greater than 250 m^2/d in the Dinantian Pure Bedded Limestones. Storativity is expected to be low - approximately 0.01-0.02. • Groundwater flow is expected to be concentrated in fractured and weathered zones and in the vicinity of fault zones. Gradients are expected to be greater than 0.0005. Water levels are generally 0-7 m below ground level. • Recharge occurs diffusely through the subsoils and rock 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 L. Conn. • Groundwater will discharge to and contribute baseflow to streams, rivers and lakes.
Attachments	Table 1 & Figure 1.
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

Figure 1. Boundaries and Location of GWB