

Rossinver GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
Hydrometric Area 36 Leitrim Co. Co. Sligo Co. Co.	Rivers: Glenaniff, Duff, Ballagh, Ballaghnatrillick, Black, County, Roogagh. Streams: 452 unnamed streams Lakes: None identified.	Ben Bulben, Gleniff and Glenade Complex and Arroo Mountain (O’Riain, 2004).	56
Topography	This narrow, E-W aligned GWB meanders along the northern slopes of the mountains that are west of Lough Melvin. The Lough itself constitutes the GWB’s eastern boundary. The western boundary comprises a topographic divide (Hydrometric Area 35) and more productive aquifers provide the northern (fractured rock) and southern (karstified rock) boundaries. The topography rapidly changes from gently slopes in the valleys to steeper, more mountainous zones. Elevations sharply increase south-westwards, from 30 mAOD at Lough Melvin to c.570 mAOD at the top of Benwisikin. Surface water generally flows northwards, either towards Lough Melvin over the eastern end of the body, or as tributaries of the Rivers Duff and Ballaghnatrillick over the central and western zones.		
Geology and Aquifers	Aquifer type(s)	This GWB is predominantly underlain by LI : Locally important aquifer, moderately productive only in local zones. There is also an area of Rk : Regionally important karst aquifer dominated by conduit flow along the western boundary.	
	Main aquifer lithologies	Dinantian Shales and Limestones (62.21%) is the main bedrock group within the GWB although band of Dinantian Upper Impure Limestones (34.52%) are located along the southern boundary. The small area (2.18%) of karst aquifer is classified as a Dinantian Pure Bedded Limestone. The remaining area of the GWB comprises Dinantian Sandstones (c.1%) and a small area of Granites and other intrusive rocks (<1%). Refer to Table 1 for details.	
	Key structures.	The rock succession dips to the south by 5-10°.	
	Key properties	No data are available for this GWB however, yields are expected to be limited and transmissivity values are thought to be <20 m ² /d, and possibly <10 m ² /d in the shale-dominated lithologies. Storativity is also expected to be low. Groundwater gradients are expected to be relatively steep, given the relatively low permeability of the rock and mountainous topography. Flow is expected to be down-gradient, which is generally northwards. <i>(Dinantian Shales and Limestones Aquifer Chapter)</i>	
	Thickness	Most groundwater flux is expected to be in the uppermost part of the aquifer comprising a broken and weathered zone typically less than 3 m thick, a zone of interconnected fissuring 10-15 m thick, and a zone of isolated poorly connected fissuring typically less than 150 m.	
Overlying Strata	Lithologies	No data are available for the majority of the GWB (c.80% - Leitrim and NI). Over the very western portion of the body, the subsoil is dominated by peat (9%) and then by scree/shallow rock (7%). These proportions would be expected where the topography is similar i.e. upland zones.	
	Thickness	Although available data are limited, the distribution of outcrops and steeper topography suggest that the subsoil in this GWB is relatively thin i.e. mainly less than 3 m thick and unlikely to be greater than 10 m thick .	
	% area aquifer near surface	<i>[Information will be added at a later date]</i>	
	Vulnerability	Although no data are available, the vulnerability is likely to be extreme over a large proportion of this GWB, especially in the upland areas.	
Recharge	Main recharge mechanisms	Diffuse recharge occurs via rainfall percolating through the thinner/more permeable subsoil and rock outcrops. Due to any low permeability subsoil deposits and the aquifers, a high proportion of the effective rainfall will discharge to the streams in the GWB. In addition, the steep slopes in the upland areas promote surface runoff. The high stream density is likely to be influenced by the lower permeability rocks.	
	Est. recharge rates	<i>[Information will be added at a later date]</i>	
Discharge	Important springs and high yielding wells	Springs: None identified. Sources: None identified. Excellent Wells: None identified. Good Wells: None identified.	
	Main discharge mechanisms	The main groundwater discharges are to the rivers and streams crossing the GWB, reflecting short groundwater flow paths. Small springs and seeps are likely to issue at the stream heads and along their course. Groundwater may also flow into the down-gradient, higher permeability Lm GWB.	

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Hydrochemical Signature	There are no data available for this GWB. <i>National classification:</i> Dinantian Rocks (excluding Sandstones) Calcareous. Generally Ca- HCO ₃ signature. Alkalinity (mg/l as CaCO ₃): range of 10-990; mean of 283 (2454 data points) Total Hardness (mg/l): range of 10-1940; mean of 339 (2146 data points) Conductivity (µS/cm): range of 76-2999; mean of 691 (2663 data points) <i>(Calcareous/Non calcareous classification of bedrock in the Republic of Ireland report)</i>
Groundwater Flow Paths	In the absence of inter-granular permeability, groundwater flow is expected to be concentrated in upper fractured and weathered zones and in the vicinity of fault zones. Unconfined flow paths are likely to be short (30-300 m), with groundwater discharging rapidly to nearby streams and small springs. Overall, the flow direction will be northwards towards Lough Melvin (eastern portion of the GWB) or the coastline.
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	<ul style="list-style-type: none"> • The GWB is bounded by more productive aquifers to the north and south, Lough Melvin to the east, and a topographic divide to the west. Elevations range from 30-570 mAOD and the topography spans lower lying valleys to more mountainous uplands. • The GWB is composed of low transmissivity rocks. Most of the groundwater flux is likely to be in the uppermost part of the aquifer comprising: a broken and weathered zone typically less than 3 m thick; a zone of interconnected fissuring typically less than 10-15 m; and a zone of isolated fissuring typically less than 150 m. • Recharge occurs diffusely through the subsoil and rock outcrops, although is limited by any thicker low permeability subsoil and the bedrock itself. Most of the effective rainfall is not expected to recharge the aquifer. • Flow paths are likely to be short (30-300 m) with groundwater discharging rapidly to the streams crossing the aquifer, and to small springs and seeps. Overall, the flow directions are expected to be to the north, as determined by the topography.
Attachments	Figure 1. Table 1.
Instrumentation	Stream gauges: None identified. EPA Water Level Monitoring boreholes: None identified. EPA Representative Monitoring points: (LEI 27)
Information Sources	MacDermot, C.V. Long C.B. and Harney S.J (1996) <i>Geology of Sligo-Leitrim: A geological description of Sligo, Leitrim and adjoining parts of Cavan, Fermanagh, Mayo and Roscommon, to accompany bedrock geology 1:100,000 scale map, Sheet 7, Sligo - Leitrim.</i> With contributions from K. Carlingbold, G. Stanley, D. Daly and R. Meehan. Geological Survey of Ireland, 100pp. O' Riain, G. 2004. <i>Water Dependent Ecosystems and Subtypes (Draft).</i> Compass Informatics in association with National Parks and Wildlife (DEHLG). WFD support projects.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.

Figure 1. Location and boundaries of Rossinver GWB

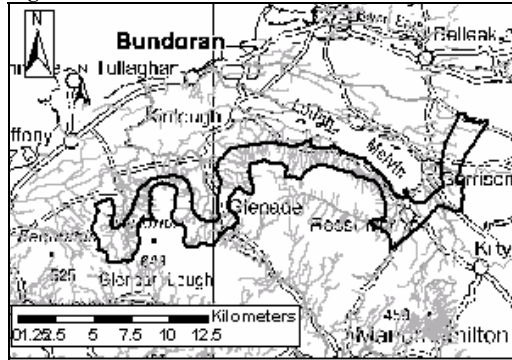


Table 1. List of Rock units in Rossinver GWB

Rock Unit Name	Code	Description	Rock Unit Group	Aquifer Class.	% Area
Benbulbin Shale Formation	BB	Calcareous shale with minor calcarenite	Dinantian Shales and Limestones	Ll	62.21%
Glencar Limestone Formation	GC	Dark fine limestone & calcareous shale	Dinantian Upper Impure Limestones	Ll	34.52%
Dartry Limestone Formation	DA	Dark fine-grained cherty limestone	Dinantian Pure Bedded Limestones	Rk	2.18%
Mullaghmore Sandstone Formation	MU	Sandstone, siltstone & shale	Dinantian Sandstones	Lm	1.03%
Dolerite and Gabbro	d	Dolerite & gabbro, commonly silica poor	Granites & other Igneous Intrusive rocks	Pl	0.05%