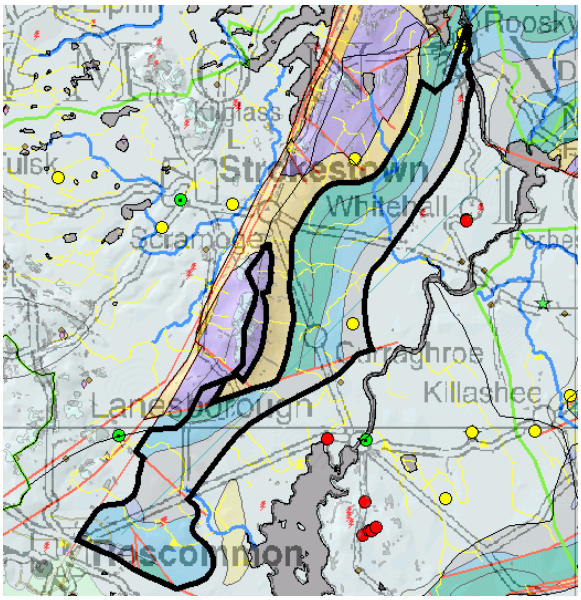
Curraghroe Groundwater Body: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
26 – Hind Lough Ree Roscommon Co. Co.		**Rivers:** Feorish (Tarmonbarry), Clooneigh. **Stream:** Curraghroe.	(000599) Clooncraff/Cloonlarge Bog; (000602) Corbo Bog; (001642) Lough Boderg and Lough Bofin	81
Topography	This GWB consist of a main area that flanks the ridge formed by the Strokestown Inlier to the east and south, and a small area at the top of the ridge east of the summit of Slieve Bawn. Ground elevations range in the main part of the body from 40-60 mAOD, lowest in the east and north. The ground slopes gently to the east, away from the Strokestown ridge. Much of the east and north of the body is quite flat (40-50 mAOD), with large areas of cut peat. Ground elevations in the small part of the body on Slieve Bawn range from 120-260 mAOD and slopes are very steep.			
Geology and Aquifers	Aquifer categories	The main aquifer categories are: **LI:** Locally important aquifer which is moderately productive only in local zones, with some areas of **PI:** Poor aquifer which is generally unproductive except for local zones		
	Main aquifer lithologies	The main aquifer lithologies are Dinantian Upper Impure Limestones, Dinantian Lower Impure Limestones, Dinantian Pure Unbedded Limestones and Dinantian (early) Sandstones, Shales and Limestones with some Ordovician Metasediments and Volcanics.		
	Key structures	This groundwater body is part of the Strokestown Inlier, a fault bounded inlier with a core of Ordovician metasediments, flanked by Dinantian Sandstones, Dinantian (early) Sandstones, Shales and Limestones, and Dinantian Impure Limestones (Upper & Lower). The Dinantian Sandstones rest unconformably on Ordovician metasediments. The major northeast southwest trending Strokestown Fault lies to the northwest of the inlier. This groundwater body, occurs on the southeast flank of the inlier.		
	Key properties	No data on hydrogeological properties specific to this groundwater body are available. Aquifer properties of the Dinantian Upper Impure Limestones vary across Ireland influenced by lithological variations and variations in the extent of deformation. In this area transmissivity in the Dinantian Upper Impure Limestones is expected to be low. A pumping test at Lorrha WS, in the Nenagh GWB southwest of Lough Derg, indicates an aquifer permeability of 5 m/d in the Upper Impure Limestones. The borehole there intercepts a large fissure, so this value is at the high end of what would be expected for this rock unit group. Transmissivities are typically in the range of 2-20 m^2/d. The Banagher WS, abstracting from the same rock unit group in the Banagher GWB, has similar characteristics: a single large fault zone supplies the source, resulting in a transmissivity estimate of 45-70 m^2/d. An aquifer permeability of 20 m/d was estimated from the thin flowing interval at the source. Within the Dinantian Lower Impure Limestones, transmissivities are likely to be in the range 2-20 m^2/d, with most values at the lower end of the range. Dinantian (early) Sandstones, Shales and Limestones aquifer properties are expected to have similarly low permeabilities however more frequent areas of enhanced permeability could be encountered in the Meath Formation (ME), a limestone which is generally described as having a lower shale content than other Dinantian (early) Sandstones, Shales and Limestones. Overall the rock units in this groundwater body are not considered to be major aquifers, although there can be some local enhancement of permeability due to structural deformation. Storativity in the rocks in this groundwater body will be low.		
	Thickness	In the low permeability rocks which make up this groundwater body most groundwater flow will be within the top 15 m of the rock. A weathered zone of a few metres is generally underlain by a zone of interconnected fissures of about 10 m. Deeper flow can occur in areas that have undergone a high degree of structural deformation and faulting, where the resulting fissures have remained open. In poor aquifers such as the Ordovician Metasediments groundwater flow is likely to be restricted to the upper few metres, where weathering and fracturing have been most intense.		
Overlying Strata	Lithologies	Large areas of cut peat occur in the east and north east of the body. The remaining areas are till covered apart from occasional areas of alluvium and rock outcrop or shallow rock. *Subsoil Types identified in body by Teagasc Parent Material Mapping: Cut Peat (Cut); Till (TDSs, TLPDSs, TLs); Rock outcrop and rock close to surface (Rck), Karstified Limestone outcrop & Karstified Limestone close to surface (KaRck) and Alluvium (A).* *[More information to be added at a later date]*		
	Thickness	Available depth to bedrock data indicate a general subsoil thickness ranging from 0-10 m over the GWB. Some areas of rock outcrop and shallow rock occur within the body.		
	% area aquifer near surface	*[Information will be added at a later date]*		
	Vulnerability	A Groundwater Vulnerability Map has been prepared for County Roscommon as part of the Roscommon GWPS. Most of the north of the body has been mapped as Low Vulnerability, with small areas of Moderate Vulnerability and occasional small pockets of High and Extreme Vulnerability. The western segment of the GWB that is underlain by Ordovician Metasediments at the top of the ridge is designated as Extreme Vulnerability. In the south of the body there are areas of Moderate and High Vulnerability as well as an area of Extreme Vulnerability in the southwest corner of the body.		

Recharge	Main recharge mechanisms	Diffuse recharge will occur over the entire GWB via rainfall percolating through the subsoil. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. Percolation of recharge will be somewhat restricted particularly in the east of the body due to the extensive covering of peat and the typically associated underlying lacustrine clay or clayey till. The subsoil in this GWB is of 'low' permeability. In the small area of the body on Slieve Bawn, the steep slopes will increase runoff and restrict the amount of effective rainfall recharging the aquifer in that area. *Note: Subsoil permeability has been mapped as part of the County Roscommon Groundwater Protection Scheme.* *[Information to be added at a later date]*
	Est. recharge rates	*[Information will be added at a later date]*
Discharge	Important springs and high yielding wells (m^3/d)	There are no major abstractions or large springs currently listed in this groundwater body. Four wells with 'Good' yields are recorded in the GSI borehole database. A number of small supplies and group schemes are listed in the EPA sources list.
	Main discharge mechanisms	The main discharges will be local, to the main rivers and their tributaries crossing the groundwater body.
	Hydrochemical Signature	There are no EPA Representative Monitoring Points in this groundwater body. Groundwater from the Dinantian rocks has a calcium-bicarbonate signature. Hardness, alkalinity and electrical conductivities vary between the different rock unit group aquifers, however. In the Dinantian (early) Sandstones, Limestones and Shales and the Lower Impure Limestones, groundwaters are Hard to Very Hard (typically ranging between 380–450 mg/l), and high electrical conductivities (650–800 μS/cm) are often observed. Alkalinity is also high, but less than hardness (250-370 mg/l as $CaCO_3$). Within the Impure Limestones, iron and manganese concentrations frequently fluctuate between zero and more than the EU Drinking Water Directive maximum admissible concentrations (MACs). Hydrogen sulphide can often reach unacceptable levels. These components come from the muddy parts of these rock units and reflect both the characteristics of the rock-forming materials and the relatively slow speed of groundwater Groundwaters from Ordovician Metasediments elsewhere in the country have been found to be quite variable in hydrochemistry. Hardness ranged from 'soft' to 'moderately hard', with a hydrochemical signature of calcium bicarbonate to calcium magnesium bicarbonate. The groundwater chemistry in the Ordovician Metasediments can be influenced by the mineralogy of the subsoil, with some areas showing slightly higher hardness and alkalinity, where the overlying tills include limestone clasts which chemically alter the recharging waters.
Groundwater Flow Paths		These rocks are devoid of intergranular permeability; groundwater flow occurs in fractures and faults. Permeability is highest in the upper few metres of bedrock, but decreases rapidly with depth. In general groundwater flow is concentrated in the upper 15 m of the aquifer. Local zones of high permeability can be encountered near fault zones and in areas of intensive fracturing. Groundwater flow in this body will be of a local nature. The segment of the body on Slieve Bawn is hydraulically isolated from the main part of the body by the location of the topographic high and the Scramoge South GWB. It is included in this body due to its small size and similar hydrogeological characteristics. Groundwater flow paths are generally short, with groundwater discharging to small springs, or to the streams and rivers that traverse the aquifer. Flow directions are expected to approximately follow the local surface water catchments. Groundwater is generally unconfined in this groundwater body but can become partially confined beneath low permeability subsoils.
Groundwater & Surface water interactions		Groundwater and surface water interactions require special attention where terrestrial ecosystems are dependant on a sustainable balance between the two. A number of raised bogs and lakes are recorded in this groundwater body that may have some localised interaction with groundwater.

Conceptual model	• This GWB consist of a main area which flanks the ridge formed by the Strokestown Inlier to the east and south, and a small area at the top of the ridge east of the summit of Slieve Bawn. Ground elevations in the main part of the body range from 40-60 mAOD, lowest to the east and north. The ground slopes gently to the east, away from the Strokestown ridge. Much of the east and north of the body is quite flat (40-50 mAOD), with large areas of cut peat. Ground elevations in the small part of the body on Slieve Bawn range from 120-260 mAOD and slopes are very steep. • The body is bounded to the east and south by the contact with the Dinantian Pure Bedded Limestones of the Funshinagh GWB. It is bounded to the west in part by the contact with the Ordovician Metasediments of the Slieve Bawn Telton GWB and in part by the Dinantian Sandstones of the Scramoge South GWB. The short northern boundary is formed by a topographic high and groundwater divide which coincides with the surface water catchments boundary. • This groundwater body is composed of low permeability rocks, although localised zones of enhanced permeability can occur along faults and in the vicinity of fault zones. Groundwater flows along fractures joints and major faults. • Recharge occurs diffusely over the entire GWB via rainfall percolating through the subsoil. Percolation of recharge may be restricted due to the covering of low permeability subsoil, particularly in the east and north of the body. The steep slopes on Slieve Bawn will increase runoff and reduce the amount of effective rainfall recharging the aquifer in the Slieve Bawn segment of the body. • Groundwater is generally unconfined in this groundwater body but can become partially confined beneath low permeability subsoils where present in sufficient thickness. • Most groundwater flow will occur within the top 15 m of the bedrock, comprising a weathered zone of a few metres and a connected fractured zone below this. Deep-water strikes in more isolated faults/fractures can be encountered in areas that have undergone a high degree of structural deformation and faulting. Groundwater flow in this body will be of a local nature. Groundwater flow paths will generally be short. The segment of the body on Slieve Bawn is hydraulically isolated from the main part of the body by the location of the topographic high and the Scramoge South GWB. It is included in this body due to its small size and similar hydrogeological characteristics. • Groundwater will discharge to the streams and rivers crossing the body. • A number of bogs and lakes are recorded in this groundwater body which may be locally dependent on groundwater.
Attachments	None
Instrumentation	Stream Gauges: (26155) Kilteevan, L. Ree Trib.; (26224) Cloonybeirne, Stream. (No dry weather flow data available.) EPA Water Level Monitoring boreholes: None EPA Representative Monitoring boreholes: None
Information Sources	Morris J.H., Somerville I.D. and MacDermot C.V. (2002). *Geology of Longford-Roscommon.* A Geological Description to Accompany the Bedrock Geology 1:100,000 Bedrock Series Sheet 12. With contributions by D.G. Smith, M. Geraghty, B. McConnell, K. Carlingbold, W. Cox, D. Daly. Geological Survey of Ireland, 121pp. (Publication pending). Aquifer Chapters: Dinantian Upper Impure Limestones; Dinantian Lower Impure Limestones; Dinantian Pure Unbedded Limestones; Dinantian (early) Sandstones, Shales and Limestones; Ordovician Metasediments.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

Curraghroe GWB (For Reference)



List of Rock units in Curraghroe GWB

Rock unit name and code	Description	Rock unit group
Argillaceous Limestone (AL)	Dark limestone & shale, chert	Dinantian Upper Impure Limestone
Waulsortian Limestone (WA)	Massive unbedded lime mudstone	Dinantian Pure Unbedded Limestone
Ballysteen Formation (BA)	Dark muddy limestone, shale	Dinantian Lower Impure Limestone
Moathill Formation (MH)	Limestone, calcareous sandstone, shale	Dinantian (early) Sandstones, Shales and Limestones
Meath Formation (ME)	Limestone, calcareous sandstone	Dinantian (early) Sandstones, Shales and Limestones
Finnalaghta Formation (FA)	Blue-grey greywacke & black argillite	Ordovician Metasediments
Lackan Formation (LN)	Feldspathic sandstone with jas[er	Ordovician Metasediments