

Scartaglin GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km ²)
22 Kerry Co. Co.	Rivers: Fahaduff, Little Maine, Croaghane, Brown Flesk, Dogue, Quagmire, Gweestin, Laune, Deenagh, Beheenagh, Ownykeagh, Glantane, Oughreagh, Longfield, Glanateenty. Lakes: Doolig, Lockagh, Kilbrean.	Killarney National Park, Macgillicuddys Reeks and Caragh River Catchment (000365)	472
Topography	Most of this GWB is a dissected upland plateau with general elevations of 160 to 240 metres OD. Highest elevations are in the northeast at over 400 metres. Lowest elevations, in the west, are about 50 metres OD.		
	Geology and Aquifers	Aquifer categories	LI: Locally important aquifer which is moderately productive only in local zones (96%). Pu: Poor aquifer which is generally unproductive (2%). Rkd*/Pending Classification: * Where these rocks occur in other areas they are classified as Rkd. In this GWB they may be karstified but are unlikely to be regionally important due to their small size (<10km ²) – a new classification code to represent these areas is pending (2%).
Main aquifer lithologies		Namurian Undifferentiated (73%), Namurian Sandstones (16%), Namurian Shales (10%), Dinantian Pure Unbedded Limestones (1%) and a tiny area of Dinantian Upper Impure Limestones (<0.1%)	
Key structures		The Namurian and Dinantian rocks have been folded by the Variscan Orogeny into a series of east-west trending anticlines and synclines, with associated systems of faults and joints which created some pathways for groundwater movement.	
Key properties		The Namurian rocks are composed of a variety of thin sandstones, siltstones, flagstones, mudstones and shales. Hydrogeological data are poor for all formations except the Upper Namurian Beds. The sandstone beds within the rock groups have a slightly higher permeability than the shales due to their greater ability to fracture. Water levels have been recorded at depths of more than 20 m but in general the water table is close to the surface reflecting the low permeability of the rock. There are a number of artesian supplies where the sandstone beds are confined by the shales and mudstones. Wells are generally low yielding although some have recorded yields of more than 100 m ³ /d. Specific capacities are usually low being less than 5 m ³ /d/m.	
Thickness		The rock units themselves are extremely thick, but the depth of active groundwater circulation is probably limited to about 120 metres. The sole exception to this is the groundwater system in the Gneevgullia limestone aquifer, where a spring water temperature of up to 17 degrees Celsius implies groundwater circulation down to at least 500 metres.	
Overlying Strata	Lithologies	<i>Subsoil Types identified in Scartaglin GWB by Teagasc Parent Material Mapping (Draft): Alluvium (A); Blanket Peat (BktPt); Karstified Limestone bedrock at surface (KaRck); Lake sediments (undifferentiated) (L); Made Ground (Made); Rock outcrop and rock close to surface (Rck); Till – Devonian Sandstone Till (TDSs), Limestone Till (TLs), Namurian Sandstone & Shale Till (TNSSs).</i> Large areas of peat occur as blanket bogs on the higher ground in the west on the poorly drained Namurian shales and sandstones.	
	Thickness	Depth to bedrock has not been mapped in this GWB.	
	% area aquifer near surface		
	Vulnerability	Vulnerability has not been mapped in this GWB. Namurian till is classed as having a low permeability as, although in some areas it has a stony matrix, there is still generally a high clay content due to the weathering of shale clasts.	
Recharge	Main recharge mechanisms	Apart from the tiny area of karstic limestone around Gneevgullia, there are no aquifers with regional flow systems which might include losing streams, so recharge will be diffuse, from rainfall percolating through the subsoil or areas of outcropping rock. The proportion of the effective rainfall that will recharge the aquifer is determined by the permeability of the soil and subsoil, and by the slope.	
	Est. recharge rates	To be assessed.	

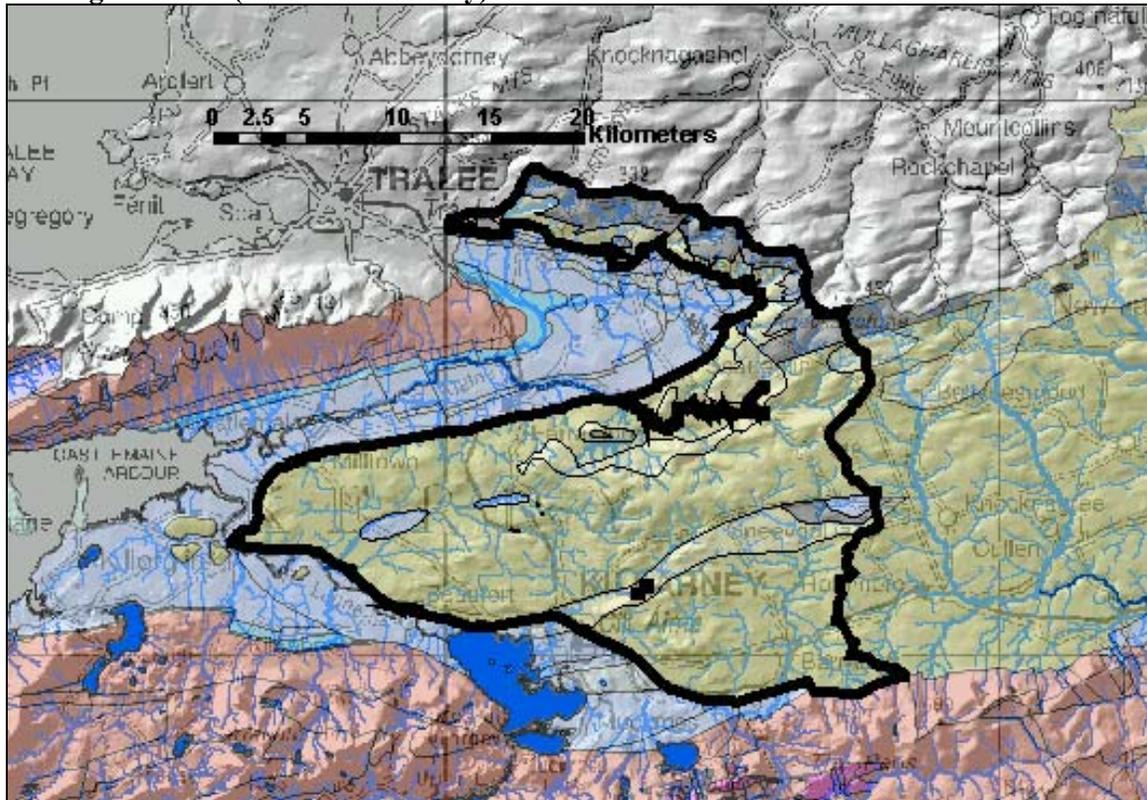
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Discharge	Large springs and high yielding wells (m³/d)	<p><i>Note: The following data need to be checked and updated by RBD Project Consultants.</i></p> <p>Data from GSI Well Database:</p> <p>Excellent BHs: Scrahanaveal (436 m³/d) Cordal East (641 m³/d)</p> <p>Good BHs: Beheenagh (218 m³/d) Gortacappul (218 m³/d) Tullagubbeen (164 m³/d) Kilcummin GWSS (>100 m³/d) Ballyhar Creamery (190 m³/d)</p> <p>Springs: Gneevgullia WSS (545 m³/d) = abstraction rate, (intermediate yield) <i>NB: This warm spring issues from a small karstic limestone unit and represents in part a deeper groundwater system, although at times it also includes shallow cold water.</i> Coolcorcan Spring (455 m³/d)= abstraction rate, (intermediate yield)</p> <p>Additional data from EPA Groundwater Sources List:</p>
	Main discharge mechanisms	<p>Due to the generally low permeability of the aquifers within this GWB and the high slopes, a high proportion of the recharge will discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing the available groundwater resource in the aquifer.</p>
	Hydrochemical Signature	<p>The hydrochemical signature is Calcium Bicarbonate, and the water is generally soft to slightly hard (<150 mg/l as CaCO₃). The pH ranges between 5.5 and 8; low pH (<6.5) is quite a common problem. The main groundwater quality problems due to the natural conditions in the ground and the natural chemistry of groundwater are caused by iron (Fe). A high proportion of wells in the Namurian rocks have high iron concentrations and to a lesser extent manganese (Mn). Nitrate levels do not appear to be elevated much above background.</p>
Groundwater Flow Paths	<p>These rocks have no intergranular permeability; groundwater flow occurs in fractures and faults. Permeability is highest in the upper few metres but generally decreases rapidly with depth. In general, groundwater flow is concentrated in the upper 15 m of the aquifer, although deeper inflows from along fault zones or connected fractures can be encountered. Significant yields can be obtained where boreholes are drilled into known fault zones. However, yields are not necessarily sustainable, as the fracture networks are generally not extensive or well connected but primarily concentrated in the vicinity of the fault zones. Springs occur in some instances on fault zones. Groundwater levels are about 1.5-15 m below ground level, and will generally follow the topography. Close to the rivers and streams, water levels will be near ground level. Surface water features are considered to be in hydraulic continuity with the water table. Groundwater flow will be local. Groundwater flow paths are generally short, typically 30-300 m, 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.</p>	
Groundwater & Surface water interactions	<p>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.</p> <p><i>Carraundulken Quarry Spring (Gneevgullia WSS) is an exception to this general picture, and represents (in part) a different flow system in a karstic limestone aquifer at depth.</i></p>	

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Conceptual model	<ul style="list-style-type: none"> • The groundwater body is bounded to the east and south by the topographic high and surface water divide which forms the boundary with Rathmore and other GWBs. • The topography of this body is mainly upland, with ground level rising from about 50 metres OD to the highest elevations of 400 metres OD on the catchment boundary. • The groundwater body is comprised of rocks with low transmissivity and storativity, although localised zones of enhanced permeability occur along fault zones. • Flow occurs along fractures, joints and major faults. Flows in the aquifer are generally concentrated in a thin zone at the top of the rock, although deeper groundwater flows along faults and major fractures. • Diffuse recharge occurs across the GWB through the subsoils and rock outcrops. Due to the generally low permeability of the aquifers within this GWB and the high slopes, a high proportion of effective rainfall will runoff, or discharge rapidly to surface water courses via interflow and shallow flow. Where water levels within the unconfined aquifer are high, potential recharge will also be rejected. • The water table can vary between a few metres up to more than 10 m below ground surface, depending upon topography. Groundwater is generally unconfined. Flow path lengths are generally short, ranging 30-300 m. Local groundwater flow directions are controlled by local topography. Overall, groundwater flows to south and east from the topographic highs. • Groundwater discharges to the numerous streams and rivers crossing the aquifer, which are gaining, and to springs. A small volume of groundwater may cross-flow into the adjacent GWBs.
Attachments	Hydrochemical Signature (Figure 1); Groundwater Hydrograph (Figure 2)
Instrumentation	Stream gauges: 22002, 22029, 22033, 22043, 22044, 22045, 22046. EPA Water Level Monitoring boreholes: Kilcummin GWS (KER 41) EPA Representative Monitoring points: Quirke’s Sand Pit (Killarney) (KER 112)
Information Sources	Pracht M (1997) <i>Geology of Kerry-Cork: a geological description, to accompany bedrock geology 1:100,000 scale map, Sheet 21, Kerry - Cork</i> . Geological Survey of Ireland. 70pp
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

Scartaglin GWB (For reference only)



List of Rock units in Scartaglin GWB

Rock unit name and code	Description	Rock unit group	Aquifer Classification
<i>Ballydeenlea Formation (BL) –three tiny areas</i>	<i>White fine-grained limestone breccia</i>	<i>Cretaceous</i>	<i>Ll (as surrounding rocks)</i>
Namurian (undifferentiated) (NAM)	Black shale & sandstone	Namurian Undifferentiated	Ll
Feale Sandstone Formation (FS)	Sandstone, siltstone & shale	Namurian Sandstones	Ll
Glenoween Shale Formation (GN)	Grey silty mudstone	Namurian Shales	Ll
Cloone Flagstone Formation (CF)	Greywacke, siltstone & silty shale	Namurian Sandstones	Ll
Clare Shale Formation (CS)	Mudstone, cherty at base	Namurian Shales	Pu
Dinantian limestones (undifferentiated) (DIN)	Undifferentiated limestone	Dinantian Pure Unbedded Limestones	<i>Rk^d*/Pending Classification</i>
Dirtoge Limestone Formation (DI)	Bioclastic cherty grey limestone	Dinantian Upper Impure Limestones	Ll
Cracoean Reef Member (CLcr)	Unbedded calcilutite limestone	Dinantian Pure Unbedded Limestones	<i>Rk^d*/Pending Classification</i>