Corrib Gravel GWB Group: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
30 Mayo and Galway Co. Co.	**Rivers**: Sinking and Dalgan **Lakes**:		24

Topography		Within the Corrib catchment there are three sand/gravel deposits that are considered to be a single gravel GWB group, located in the vicinity of Ballyhaunis and Tuam. The location and boundaries are shown in Figure 1. They are considered together because they have a similar configuration, i.e., similar morphology, located within the same catchment, located in low-lying areas with similar land use patterns and each is greater than 4 km^2 (required for reporting under the WFD). The deposits are located in a relatively low-lying flat area, situated between 60 and 100 m OAD. The surface drainage is largely to the southwest.
Geology and Aquifers	**Aquifer categories**	The sand/gravel deposit in the vicinity of Ballyhaunis is greater than 10 km^2, however the saturated thickness is generally unknown. The deposits in the vicinity of Tuam are between 1 and 10 km^2, and the saturated thickness is generally unknown. Accordingly, the deposits are classified as **Locally Important Sand and Gravel Aquifers (Lg)** (DELG/EPA/GSI (1999).
	Main aquifer lithologies	Glaciofluvial limestone sand/gravel deposits and alluvial sand/gravel deposits (Meehan, 2004). Pit faces at Ballyhaunis show units of sand up to 1 m thick interbedded with cobble units greater than 4 m thick (Doak, 1995).
	Key structures	N/A
	Key properties	Total average discharge of approximately 12,000 m^3/d is estimated from the spring at Ballyhaunis (Doak, 1995). Sand/gravel aquifers generally consist of unconsolidated coarse grained material, usually containing less than 8% fines (O'Suilleabháin, 2000). Typically transmissivity is generally greater, ranging from 200 – 1500 m^2/d. Storativity is expected to be high (10%). Water levels are generally close to or at ground surface. Groundwater is likely to be unconfined. The data are inadequate to calculate groundwater gradients, but these are expected to be greater than 0.001.
	Thickness	At Ballyhaunis, thickness is generally greater than 20 m (Doak, 1995). Thicknesses of 7-27 m are recorded in the deposits near Tuam.
Overlying Strata	**Lithologies**	Alluvium, cutover peat and lacustrine deposits occupy areas within the sand/gravel deposits. Generally, alluvium is present in narrow strips along streams and rivers.
	Thickness	The thickness of alluvium, cutover peat and lacustrine deposits are generally less than 3 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 unsaturated sand/gravel. Due to the high permeability of sand/gravel, a high proportion of the available recharge will percolate down to the water table. The rivers flowing through the aquifers such as the River Deel at Crossmolina may also provide additional recharge.
	Est. recharge rates	*[Information to be added to and checked]*
Discharge	**Large springs and large known abstractions (m^3/d)**	Ballyhaunis 12,000 m^3/d (average total spring discharge)
	Main discharge mechanisms	Groundwater discharges to small and large springs, rivers/streams that flow through the deposits.
	Hydrochemical Signature	Data available for springs at Ballyhaunis indicate that the GWB has a calcium bicarbonate signature. Values are given below for certain parameters for Ballyhaunis Spring. Ballyhaunis: Alkalinity (mg/l) (n=14) average = 280, range 100-368 Conductivity (mg/l) (n=15) average = 667, range 509-800 Hardness (mg/l) (n=14) average =295, range 128-368.
Groundwater Flow Paths		The length of flow paths depend on the size of the sand/gravel deposit. In general, locally important sand/gravel aquifers are expected to have relatively short flow paths, i.e., up to several hundreds of metres and regionally important sand/gravel aquifers are likely to have longer flow paths, perhaps up to several kilometres. Generally the drainage density is low over sand/gravel areas.

Groundwater & Surface water interactions	In general groundwater from sand/gravel deposits located in river valleys discharges to the streams/rivers flowing through the valley. Hydraulic connection between the groundwater in the aquifer and the stream is expected to be high, thus water will be able move into and out of the aquifer depending on the river stage.
Conceptual model	• The GWB consists of sand/gravel deposits, located in the vicinity of Tuam and Ballyhaunis. • The deposits are located in a relatively low-lying flat area, situated between 60-100 m OAD. The surface drainage is largely to the southwest. • The aquifers comprise glaciofluvial sand/gravel deposits and alluvial sand/gravel deposits. • Transmissivity is expected to range from 200 to 1500 m^2/d. • The sand/gravel aquifers are generally greater than 10 m thick. • The data are inadequate to calculate groundwater gradients, but these are expected to be generally greater than 0.001. • Diffuse recharge occurs via rainfall percolating through the unsaturated sand/gravel. • Groundwater discharges to small and large springs, rivers/streams that flow through the deposits. • The groundwater has a calcium bicarbonate signature. • The length of the flow paths is variable – depending on the extent of the sand/gravel aquifers; ranging from several hundred metres to over 1 km.
Attachments	Figure 1.
Instrumentation	**Stream gauges:** 30029, 30045 **EPA Water Level Monitoring boreholes:** none **EPA Representative Monitoring points:** none
Information Sources	DELG/EPA/GSI (1999) *Groundwater Protection Schemes.* Department of the Environment and Local Government, Environmental Protection Agency and Geological Survey of Ireland. Doak, M.J., (1995). *The Vulnerability to Pollution and Hydrochemical Variation of Eleven Springs (catchments) in the Karst Lowlands of the West of Ireland.* MSc Sligo Regional Technical College. O' Riain, G., (2004). *Water Dependent Ecosystems and Subtypes Draft Report.* WFD Support Projects. Compass Informatics in association with National Wildlife and Parks Service (DEHLG). O'Suilleabháin, C., (2000). *Assessing the boundary between high and moderately permeable subsoils.* Unpublished MSc., University of Dublin. Department of Civil, Structural and Environmental Engineering, Trinity College Dublin. Meehan, R.T., (2004) *Subsoils Map for counties Galway and Mayo*. Map produced as part of EPA Soil and Subsoil Mapping Project (formerly FIPS-IFS). Teagasc, Kinsealy.
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 extent of Corrib Gravel GWB Group