# Longwood GWB: Summary of Initial Characterisation.

<table>
<thead>
<tr>
<th>Hydrometric Area</th>
<th>Associated surface water bodies</th>
<th>Associated terrestrial ecosystems</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meath Co. Co. Hydrometric Area 07</td>
<td>Blackwater, Boyne, Knights Brook River, Dollystown Bog (1577), Rathmoylan Esker (557)</td>
<td></td>
<td>50</td>
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</tbody>
</table>

## Topography
This groundwater body is located in southwest Co. Meath around the village of Longwood. The area is low-lying with elevations ranging from 70 to 100 mOD. Elevations are in general decreasing from the southeast to the northwest.

## Aquifer type(s)
Table: Aquifer type(s)

<table>
<thead>
<tr>
<th>Aquifer type(s)</th>
<th>Lithologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>L: Locally important aquifer, moderately productive only in local zones</td>
<td>Waulsortian Limestone (WA) Massive Unbedded Lime / mudstone</td>
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</tbody>
</table>

## Main aquifer lithologies
Waulsortian Limestone

## Key structures
Faulting in the area of this groundwater body is in southeast to northwest direction.

## Key properties
Although very little water-well information is available for this area, drilling information from mining companies suggests that the limestones at Longwood are weathered and karstified. (Cullen 1985)

## Thickness
Drilling in the Longwood area indicated 15m of soft black shaly limestone. This is underlain by more solid and compact limestone, within which a major fissure was located within a 2m thick layer of light coloured limestone at 55 to 57m b.g.l. (Cullen 1985)

## Lithologies
The dominant subsoil lithology in this area is limestone-derived till. There are also numerous gravel deposits, mostly small, e.g. eskers.

## Subsoil thickness
Subsoil thickness is generally between 3 and 10m. It must be noted that subsoil thickness, as is the case all over Ireland, is highly variable even over short distances.

## % area aquifer near surface
There are small areas where rock is close to the surface or outcropping. The main areas occur to the north and northeast, where there are some areas of higher elevation.

## Vulnerability
Vulnerability is in general Moderate but with significant areas of both High and Low.

## Main recharge mechanisms
Recharge will be dominantly diffuse. Highest recharge rates can be expected where the subsoil is thinnest and most permeable. There is no evidence of point recharge (losing rivers or sink holes), which is common in Karst limestones.

## Est. recharge rates
[Information will be added at a later date]

## Discharge
EPA Source Register – Longwood (175m³/d), Brannockstown, Trammon, Cloncone, Ballinaskea.

As described earlier there are warm springs located around 2.5km southeast of Longwood town.

## Main discharge mechanisms
This groundwater body discharges to the surface water features that overlie it and also to the adjacent surrounding groundwater body. Warm spring discharges at St Gorman’s Spring and Ardanew Spring indicate some deep groundwater flow in the area.

## Hydrochemical Signature
The data from the Longwood public supply source show that the water has a calcium bicarbonate signature and has typical electrical conductivity values of around 700µS/cm and can be considered to be HARD to VERY HARD water.

## Groundwater Flow Paths
The majority of groundwater flow in this aquifer can be considered to take place in the upper 3m where the bedrock is weathered and an epikarst layer may have developed. This groundwater flow will be rapid and there will be little storage in the aquifer as it is expected that groundwater flow occurs through preferential flow paths. Below this groundwater flow will be concentrated along a network of fractures, fissures and conduits, which in local areas may be interconnected, allow greater development of a flow network. Such fissuring and fracturing decreases with depths and does not normally extend below 50mb.g.l. Groundwater flow directions will be from the local point of recharge to the local discharge area e.g. a river.

Drilling evidence at Longwood indicates that the groundwater is flowing under pressure in confined fractures at depths of 55m below ground. A well drilled around 1.4km east of Longwood encountered a major fracture at this depth, which then produced an artesian flow of around 100m³/d. (Cullen 1985).
Groundwater & surface water interactions

Groundwater and surface water interactions are of particular concern in areas where protected ecosystems have some dependency on groundwater. Of note is Doolystown Bog, a small remnant of raised bog located 5 km west of Rathmoylan, all that remains of a much larger bog which has been largely cut away. The remaining portions, however, are still of scientific interest as the bog supports a good diversity of species and displays several typical bog features.

Despite being burnt and affected by drainage operations, this bog is one of the most interesting in the county, one of its attractive features is a pronounced hummock and hollow topography on its surface. This feature is indicative of active growth on the bog and is atypical for this region. Over the past 30 years, the southern side of the site has been reduced in size by afforestation. The bog margins have been affected by turbarry, drainage and reclamation and many areas are drying out.

Conceptual model

This groundwater body is located in southwest Co. Meath around the village of Longwood. The area is low-lying with elevations ranging from 70 to 100 mOD. The groundwater body is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur. The area of Waulsortian around Longwood defines the extent of the GWB. Recharge occurs diffusely through the subsoils and via outcrops. It takes place mainly in the upland areas where subsoils are thinner or more permeable. The aquifers within the GWB are generally unconfined, but may become locally confined where the subsoil is thicker and/or lower permeability. Most flow in this aquifer will occur near the surface. In general, the majority of groundwater flow will occur in the upper 10 m, comprising a weathered zone of a few metres and a connected fractured zone below this. However, deep-water strikes in more isolated faults/ fractures can be encountered at 50-70 mbgl. Flow path lengths are relatively short, and in general are between 30 and 300 m. The regional groundwater flow direction is to the northwest although on a local scale groundwater will follow the local hydraulic gradient towards rivers in the area.

Attachments

Durov Diagram & Map

Instrumentation

Stream gauge: 07002, 07003

Borehole Hydrograph: The EPA monitor the groundwater level in the borehole south of Doolystown (MEA134), but the results are not representative of this groundwater body as there is a sand and gravel body overlying this aquifer.

EPA Representative Monitoring boreholes: Longwood (MEA018)

Information Sources


Disclaimer

Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae.