### Hydrometric Area

**Local Authority**: Meath Co Co  
**Hydrometric Area**: 08

### Groundwater Flow

#### Discharge
- **Main discharge mechanisms**: Groundwater will discharge from this GWB to the streams overlying the aquifer where the rock is in hydraulic continuity with the riverbed. This discharge is the baseflow flow of the rivers, which supports summer flows. Dry Weather flows suggest that summer baseflow is quite low and it is likely that discharge from this aquifer will be peaky and the majority of flow to the river will occur shortly after a rainfall event. Groundwater may also discharge from this aquifer along the geological contact with the limestone, which forms the boundary of the body.
- **Hydrochemical Signature**: There are no hydrochemical data available for this GWB at this time. The groundwater is expected to be soft to moderately hard with a calcium bicarbonate signature. It is expected the groundwater will be Siliceous.

#### Recharge
- **Main recharge mechanisms**: Diffuse recharge will occur 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. Due to the generally low permeability of the aquifers within this GWB, a high proportion of the recharge will then discharge rapidly to surface watercourses via the upper layers of the aquifer, effectively reducing further the available groundwater resource in the aquifer.

#### Key properties
- **Main aquifer lithologies**: Undifferentiated Namurian Rock (NAM) Shale & Sandstone.
- **Main aquifer**
- **Aquifer type(s)**: Undifferentiated Namurian Rock (NAM) Shale & Sandstone.

#### Topography
- **This GWB is located in Co. Meath between Navan and Duleek. The area lies on the topographic boundary between the Boyne and Nanny River catchments. The elevations are highest along the catchment boundary where they rise to around 120 m OD. These elevations fall towards the rivers in the area, which generally lie at around 40 m OD as they exit the body.**

#### Lithologies
- **The dominant subsoil lithology overlying this GWB is till, mainly derived from Namurian sediments, although some limestone-derived tills are seen closer to the contact with the limestone. There are smaller areas of alluvium and gravel deposits along the River Nanny floodplain.**

#### Overlying Strata
- **Thickness**: The depth to which open fractures are encountered below ground will determine the depth of significant groundwater flow in the aquifer since it is not considered that the rock has any primary porosity. In such low permeability rocks it is considered that the majority of groundwater flow will occur in the upper 3m and groundwater flow in fractures does not typically occur below 10m.
- **% Area aquifer near surface**: Thin subsoils are present at the tops of the hills, which are located along the northeastern and northwestern boundary of the body.

#### Vulnerability
- **The vulnerability is highly variable and significant areas of all classifications are seen.**

### Geology and Aquifers

#### Key structures
- **At the end of the Carboniferous Period, the Variscan Orogeny uplifted and folded the Namurian rocks into a series of broad shallow folds, which are also cut by faults. The deformation front was located in the south of the country, meaning that its effects are seen most strongly in the southwest, diminishing further north. Faulting in the Namurian appears to be less common than in the underlying rocks, faults are likely to have become infilled by weathered shale.**

#### Associated surface water bodies
- Nanny

#### Associated terrestrial ecosystems
- Thomastown Bog (1593), Ballath Woods (1579)

#### Area (km²)
- 46

### Summary

**Realtage 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</td>
<td>Nanny</td>
<td>Thomastown Bog (1593), Ballath Woods (1579)</td>
<td>46</td>
</tr>
</tbody>
</table>

**Information to be added at a later date**
Groundwater & surface water interactions

Typically, swallow holes and collapse features are located at the boundary between Namurian and Limestone Rocks. This is due to the acidic waters from the Namurian flowing on to the pure limestones and causing increased dissolution over a small area. Such features are of great importance to the surface water and groundwater interactions of the adjacent water body. Special care must be taken in consideration of the pressures on the adjacent limestone GWB because of the ability of surface pollutants in rivers from the Namurian to pass directly into the groundwater of the limestone with out any attenuation in the unsaturated zone.

Conceptual model

This GWB is located in County Meath between Navan and Duleek. This is a moderately hilly area with elevations ranging from 140 m OD along the catchment boundary to 70 m OD. The extent of the body is defined to the west by the river catchment boundary between the Nanny and the Boyne Rivers, and elsewhere by the extent of the Namurian rock in this area. The GWB is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur. Recharge occurs diffusely through the subsoils and via outcrops. It takes place mainly in the upland areas where subsoils are thinner and 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 occurs 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 30-50 mbgl. Flow path lengths are relatively short, and in general are between 100 and 500 m. Groundwater discharges to the numerous small streams crossing the aquifer, and to the springs and seeps.

Attachments

Instrumentation
Stream gauge: 08016, Borehole Hydrograph: None, EPA Representative Monitoring boreholes: None

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.

<table>
<thead>
<tr>
<th>Formation Name</th>
<th>Code</th>
<th>Description</th>
<th>Rock Unit Group</th>
<th>Aquifer Classification</th>
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</thead>
<tbody>
<tr>
<td>Balrickard Formation</td>
<td>BC</td>
<td>Coarse sandstone, shale</td>
<td>Namurian Undifferentiated</td>
<td>PI</td>
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<tr>
<td>Cruiceraith Member</td>
<td>DRcr</td>
<td>Limestone conglomerate, crinoid rudstone</td>
<td>Namurian Undifferentiated</td>
<td>PI</td>
</tr>
<tr>
<td>Donore Formation</td>
<td>DR</td>
<td>Shale, sandstone, limestone</td>
<td>Namurian Undifferentiated</td>
<td>PI</td>
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<tr>
<td>Loughshinny Formation</td>
<td>LO</td>
<td>Dark micrite &amp; calcarenite, shale</td>
<td>Dinantian Upper Impure Limestones</td>
<td>Lm</td>
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<tr>
<td>Lower Palaeozoic rocks</td>
<td>LP</td>
<td>undifferentiated</td>
<td>Ordovician Metasediments</td>
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<td>Walshestown Formation</td>
<td>WL</td>
<td>Shale, sandstone, limestone</td>
<td>Namurian Undifferentiated</td>
<td>PI</td>
</tr>
</tbody>
</table>

Well Hydrograph at EPA Monitoring Station MEA142