## Carrick-on-Suir 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>16 – Suir</td>
<td>Duag, Glengalla, Glenboy, Nier, Glasha, Clodiagh (Portlaw), Blackwater (Kilmacow), Suir, Smartcastle Stream, Blackwater (Kilmacow), Langaun,</td>
<td>Portlaw Woods, Fiddow Island, Lower River Suir</td>
<td>116</td>
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<tr>
<td>Local Authority</td>
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<td>S. Tipperary Co Co</td>
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<td>Kilkenny Co Co</td>
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### Geology and Aquifers

#### Topography
- The outcrop area of the Kiltorcan Sandstone best defines the area of this aquifer. The Kiltorcan Sandstone is found along the foothills of Slievenamon, the Comeragh Mountains and the Knockmealdown Mountains. Therefore the land surface slopes up towards the contact with the Devonian rocks and falls towards the Carboniferous rocks.

#### Aquifer type(s)
- RF: Regionally Important Fractured Aquifer

#### Main aquifer lithologies
- KT: Kiltorcan Formation – Yellow & red sandstone & green mudstone
- PG: Porters Gate Formation – Sandstones shales and thin limestones

#### Key structures.
- Daly (1988) described a gradual change from sandstone to shale moving upwards from the Kiltorcan and into the Porters Gate Formation, which means that separate aquifer classifications for each formation cannot be made.

#### Key properties
- Results of aquifer testing undertaken in the aquifer are very variable. Daly (1985) reports estimates of 5 m³/day to 1850 m³/day, and suggests that the highest values are likely to be associated with low-lying areas close to anticlines or faults. Daly suggests that sandstone permeabilities are in the order of 0.5 to 20 m/day, increasing up to 80 m/day in localised areas. Transmissivity will be reduced at depth, where the Kiltorcan Formation is thinner in the center of the synclines and permeability is reduced by the deep burial.

#### Thickness
- Geophysical borehole logging data suggest that significant water movements occur at depths of over 60m where the aquifer is not confined by overlying shaly limestones. Where confined, active groundwater circulation is expected to be much more limited, but some deep flow has been inferred from mineral exploration boreholes at depths of over 200m (Daly, 1985). Kiltorcan Formation is thinner in the center of the synclines and permeability is reduced by the deep burial.

### Overlying Strata

#### Lithologies
- To the east of Slievenamon there are deposits of limestone-derived till which give way to sandstone-derived till which is the dominant type over the area. There are small patches of sand and gravel deposits around the area.

#### Thickness
- The thickness is variable. This is because the Kiltorcan lies in a transitional landscape from mountains to river valley. Therefore depth to bedrock can vary from 1-10m but is mostly between 3 and 5m.

#### % area aquifer near surface
- Vulnerability
- The vulnerability is also variable for the same reason as the subsoil thickness. HIGH vulnerability is most common.

### Recharge

#### Main recharge mechanisms
- Most recharge occurs where the formation outcrops or is in hydrogeological continuity with overlying sands & gravel deposits that are scattered throughout the area. There is probably considerable point recharge from the Devonian rocks.

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

### Discharge

#### Springs and large known abstractions (m³/d)
- Cloran (2509), Clogheen (136), Derrinalur (5), Poulnagunoge (32), Coolnamuck, Piltown/ Fiddown (780)
- TOTAL =>3462

#### Main discharge mechanisms
- There is no obvious discharge zone for groundwater moving at depth in this aquifer, but it probably flows via large faults and complex pathways into shallower groundwaters and from there to surface water bodies where outcrop areas are at the lowest elevations.

#### Hydrochemical Signature
- Waters are ‘soft’ to ‘moderately hard’ in the sandstones and ‘hard’ to ‘very hard’ in the shales and limestones of the upper parts of the Porters Gate Formation. The hydrochemical signature varies between calcium bicarbonate and calcium-magnesium bicarbonate. Daly suggests that the signature depends on the thickness of overlying subsoil, with calcium-magnesium waters being associated with areas of thicker subsoil. The bedrock strata at the base of this aquifer are Siliceous, towards the upper parts of the Porters Gate Formation there are some Calcareous beds.
**Groundwater Flow Paths**

Substantial artesian flows have been recorded in this aquifer due to the pressure of the water table in the elevated outcrop area. Evidence from drilling in the Kiltorcan Formation shows that the largest well yields are obtained at relatively low elevations, close to major structural features and where at least 40 m of the upper part of the Kiltorcan is penetrated.

**Groundwater and Surface water interactions**

The balance of abstraction with recharge will require careful attention, particularly if considering portions of the aquifer which are confined and/or which occur as isolated faulted blocks.

**Conceptual model**

The Kiltorcan & Porters Gate formations define the extent of this groundwater body in the area of Carrick-on-Suir. In plan, one meandering continuous and mostly unbroken line represents the outcrop of the rock, but this groundwater body must be viewed in three dimensions. The rocks in question extend underground underneath the Carrick-on-Suir Syncline limestones from the foothills of Slievenamon to Clonmel and Carrick-on-Suir. Down-dip towards the middle of the synclines, the aquifer becomes progressively more confined by an increase in thickness of the overlying beds. There is considerable groundwater flow through the bedrock, which is considered a major aquifer.

**Attachments**

**Instrumentation**

- Stream gauge: 16013, 16054, 16102, 16062, 16061
- EPA Representative Monitoring boreholes: none
- Waterford - Poulavanogue (#86 - S229124), Derrinlaur (#40 - S249225), S. Tipperary - Coolnamuck (#48 - S383214), Clonmel East (Kilcash) WS(#18 - 310282), Cloran (Fethard RWSS @ spring)(#47 - S280335).

**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.