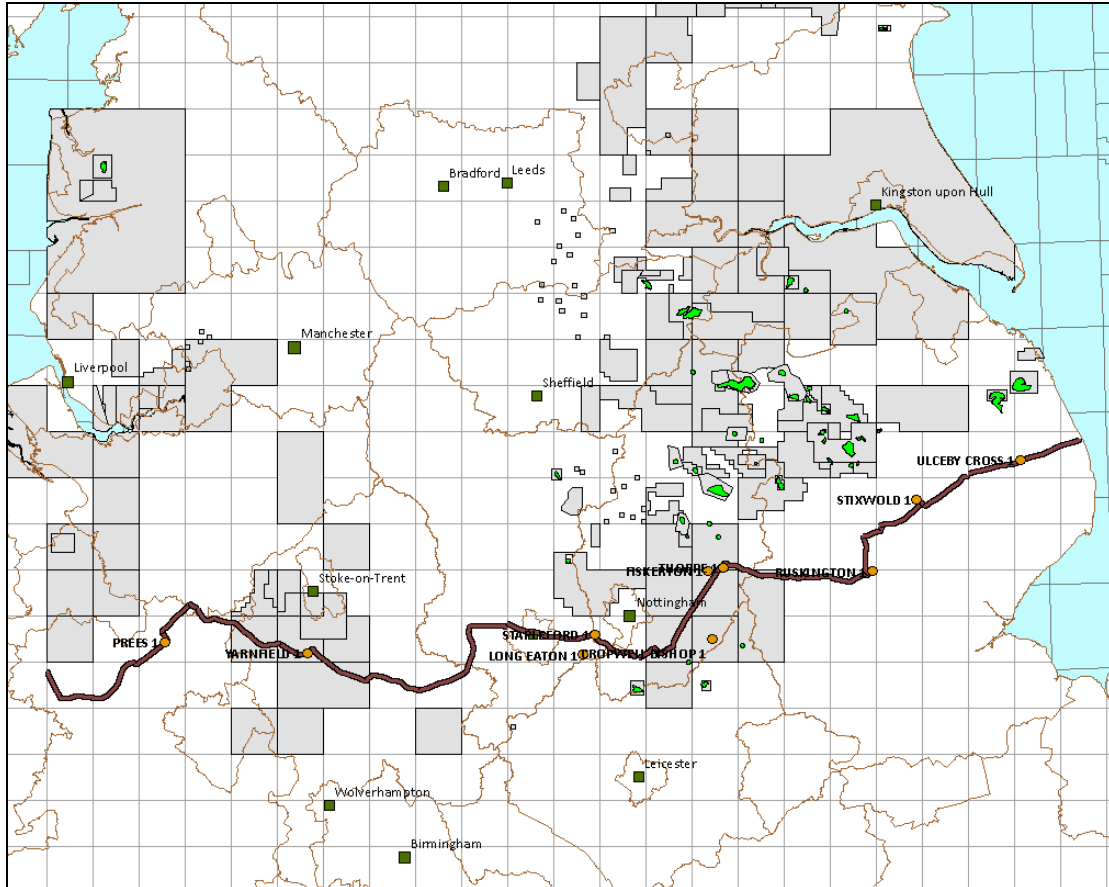


**UKOGL-RG-005 : W-E profile from Welsh Borders to Lincolnshire Coast**

This profile begins on the westernmost edge of the Permo-Triassic Cheshire Basin, where the Dinantian, Namurian and Westphalian beds are truncated by the basal Permian, which then lies directly on the Lower Palaeozoic. The strong event marking the base of the Permian dips very rapidly into the deepest part of the basin to the east, as shown by Prees-1 where the base Permian overlies a thin “Barren Red Beds” sequence at 1.69 seconds, in turn overlying rocks of Ordovician or Silurian age. It appears that most of the Upper Palaeozoic sequence has been eroded from this part of the Cheshire Basin.

At Prees-1, the top of the Triassic was encountered at 0.37 seconds, halite was encountered at 0.50 seconds and the Sherwood Sand was topped at 0.92 seconds. At Wilkesely borehole, Middle Jurassic Rocks lie at the surface and top of the Triassic lies at about 0.06 seconds. Below this, halite was encountered at about 0.19 seconds, with the top of the Sherwood Sand at about 0.82 seconds.

The profile continues eastwards to cross the Wem-Red Rock Fault complex, which forms the eastern boundary of the Permo-Triassic basin, onto the Market Drayton high, where Lower Paleozoic rocks underlie the Permian in part. Further east, the section drops down again into

the Stafford Basin, where events of quite similar character to the Permo-Trias in the Cheshire Basin are actually of Carboniferous age.

This is shown by Yarnfield-1, where the base of the Permo-Trias is at only 0.22 seconds and the well passed through Upper and Lower Coal Measures to reach the top of the Namurian at 0.72 seconds.

Immediately southeast of Yarnfield, the North Stafford-1 well demonstrates the top of a shelf carbonate Dinantian sequence at 0.94 seconds metres before reaching total depth at an estimated 1.23 seconds in the same rocks.

Continuing to the east, the profile appears to cross a major fault bounding the eastern edge of the Stafford Basin, passing through a zone with poor data quality below the Permian, which may indicate shallow basement. The Permo-Triassic and Upper Paleozoic sequences again thicken eastwards into the Needwood Basin, which extends across to the Derbyshire Dome. Hanbury-1 confirms the presence of basinal Dinantian rocks in this area, penetrating the Widmerpool Formation at 0.41 seconds before entering a series of Dinantian limestones and sandstones from 0.55 seconds to total depth at an estimated 0.70. Continuous events below the TD of this well indicate the probable presence of undeformed Lower Paleozoic rocks in this area.

Further towards the east, these deeper events rise to form the southwestern margin of the Derbyshire Dome. Near the crest of the structure, the Widmerpool Formation lies at close to sea level in the Trusley borehole beneath a thin Triassic cover.

As the profile crosses north of Derby and heads for Nottingham, the Dinantian dips away to the east and Namurian and Westphalian rocks re-appear beneath a thin cover of Triassic in the Widmerpool Basin, as proved by the presence of Westphalian A just below sea level in Stapleford-1. Long Eaton-1, just off the line of section to the south of Stapleford, encountered the Dinantian, partly in basinal facies, at 0.06 seconds and was still in the Dinantian at TD of an estimated 1.24 seconds.

Passing round the southern side of Nottingham, the northern margin of the Windmerpool Basin is defined by the Brassington Fault Belt and Cropwell Butler-1 shows the top of a shelf sequence of the Carboniferous Limestone at about 0.57 seconds on the Nottingham Platform. By this time the Permo-Triassic sequence has thickened, with the base at 0.14 seconds in Cropwell Butler-1 and the presence of a thin, recognisably Permian sequence below the Sherwood Sandstone. On the line of the profile the pre-Permian section drops into the Sleaford Half-Graben to the northeast, before being truncated by the Eakring Foston Fault between Fiskerton-1 and Thorpe-1.

Across the Caunton Anticline, from here to the high block east of Ruskington-1, the Coal Measures and Namurian are much reduced and the top of the Carboniferous Limestone lies close to the Base Permian. Beyond this, the section drops again into the Coningsby Half-Graben before rising to the Stixwold High. The presence of shallow Caledonian basement was proven here by Stixwold-1, which encountered highly deformed, probable Ordovician at an estimated 0.95 seconds. The Stixwold well also demonstrates the presence of a complete Jurassic sequence, from Kimmeridgian to Lower Lias, with a base at an estimated 0.38 seconds.

To the east of the Stixwold High, the Permian section thickens and the prominent unconformity at the base of the Permian continues to deepen, reaching around 0.98 seconds at Ulceby Cross-1. In this region, the Permian is made up of basal aeolian sands (Rotliegendes equivalent), overlain by magnesian limestones and marls. Other than a thin anhydrite near the top there are no evaporites here. The overlying Triassic beds consist of Sherwood Sandstone at the base, overlain by the red marls of the Mercia Mudstone Group. The profile ends on the North Sea coast near Sutton-on-Sea.

**Contact:**

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