

# Weald Basin Summary

The Weald Basin has a long history of oil and gas exploration; there are 13 producing sites in the basin, some almost 30 years old. Hydrocarbons were first produced in the 19th century.

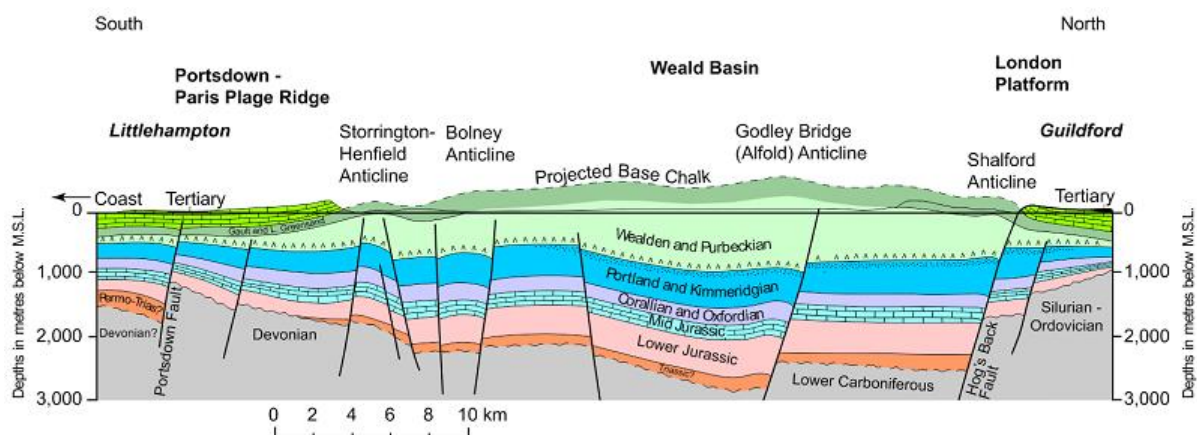
The British Geological Survey, commissioned by the Department of Energy and Climate change has studied the Jurassic shales of the Weald Basin. The results are based upon detailed seismic mapping of (7,600 miles) and from 248 existing oil and gas wells. The total volume of potentially productive shale in the Weald Basin was estimated using a 3D geological model.

There is unlikely to be any shale gas potential, but there could be shale oil resources in the range of 2.2-8.5 billion barrels of oil (290-1100 million tonnes) in the ground, reflecting uncertainty until further drilling is done. A reasonable central estimate is 4.4 billion barrels of oil (591 billion tonnes).

It should be emphasised that this figure refers to an estimate for the entire volume of oil in the rock, not how much can be recovered. It is still too early to determine how much could technically be extracted at a commercial rate. In time, the drilling and testing of new wells will give an understanding of achievable, sustained production rates. For more information on the difference between these resources, or “oil in place” estimates and the recoverable reserves see here:

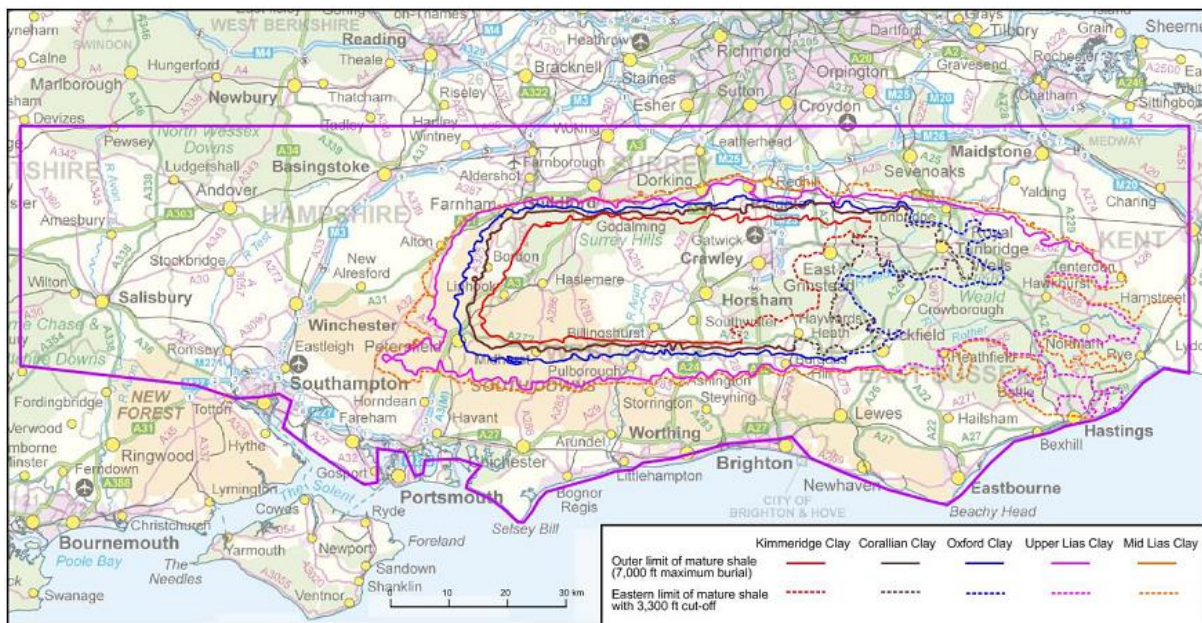
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The Jurassic of the Weald Basin (Figure 1) contains five organic-rich, marine shales: the Lower Jurassic Mid and Upper Lias, the Oxford Clay, Corallian Clay and Kimmeridge Clay. These have thicknesses of up to 300 feet, 220 feet, 500 feet, 260 feet and 1,800 feet respectively.



*Figure 1. Schematic geologic cross section through the Weald Basin (and projected estimate of sediment removed by uplift and erosion)*

Where they have been buried to a sufficient depth to generate oil, all five have potential shale oil resources and are similar, but on a smaller scale, to the producing shale oil provinces of North America (e.g. Barnett, Woodford and Tuscaloosa). Further hybrid (combined conventional and shale) oil potential may exist, which has also proven to be successful in North America (e.g. the Bakken oil system). Figure 2 shows the outline of the mature shale area for each of the five units.

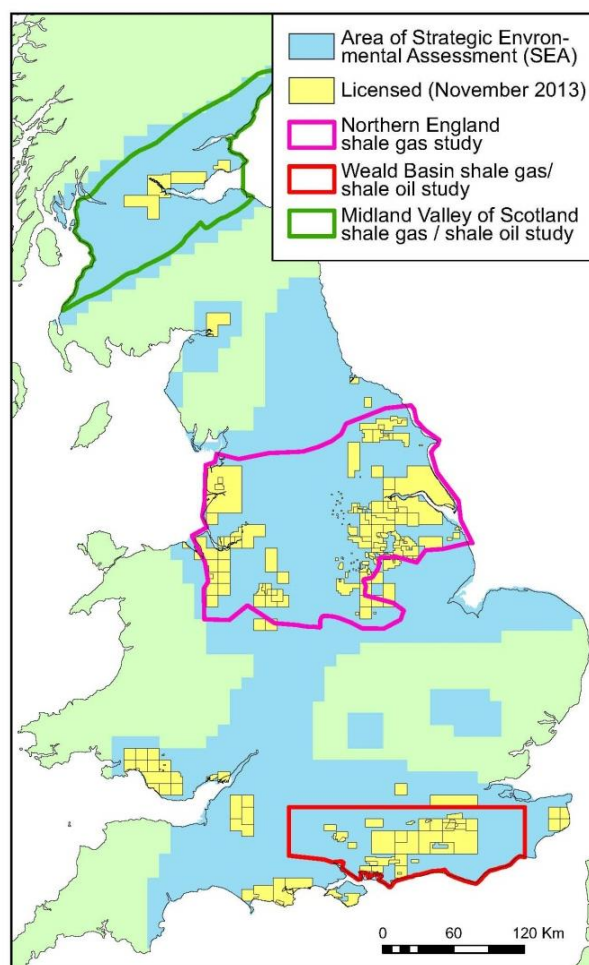


*Figure 2. Summary of areas prospective for shale oil in Jurassic shale intervals of the Weald Basin (basemap ©Crown copyright 2013)*

The report suggests that the shales’ organic carbon contents are relatively low (usually below 2%) and their oil saturation index is low when compared to shale oil producing areas in North America. However as there are shallower conventional oil fields in the Weald basin this would suggest that there are optimum conditions for oil generation in some areas within the basin.

Even the deepest Jurassic shales are unlikely to be sufficient mature, determined by burial depth, heat flow and time, to allow for significant shale gas generation. Therefore the study indicates that there is no shale gas potential in the Jurassic shales, and that the shallow conventional gas is believed to have been generated in association with the oil or sourced from deeper horizons which cannot be mapped.

This is the second detail BGS report summarising the background geological knowledge and resource assessment of the UK's shale gas basins. These are creating preliminary in-place resource calculations for three study areas in Britain (Figure 3).



*Figure 3. Location of the DECC/BGS study areas, area of the Strategic Environmental Assessment underway for future licensing and the currently licensed acreage. Other shale gas and shale oil plays may exist.*

The first study, published in June, reviewed the Bowland-Hodder shales across Northern England, which covers 11 counties in the North of England. The central scenario estimates there is likely to be some 40 trillion cubic metres (1,300 trillion cubic feet) of shale gas in the ground. This is the entire volume of gas contained in the rock formation, not how much can be recovered. It is likely that only the most prospective intervals of this large volume could be commercially exploited. For further information see here:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/209305/DECC\\_BGS\\_BowlandShaleGasReport\\_MEDIA\\_SUMMARY.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/209305/DECC_BGS_BowlandShaleGasReport_MEDIA_SUMMARY.pdf)

The third study is now underway and will be completed in the summer. It covers the Midland Valley of Scotland. Estimates will be made for both the oil and gas 'in-place' resources of the Carboniferous strata of central Scotland.