LOCAL GEOLOGICAL SITES
UTTLESFORD DISTRICT

UfdG37 Wicken Water boulders, Arkesden

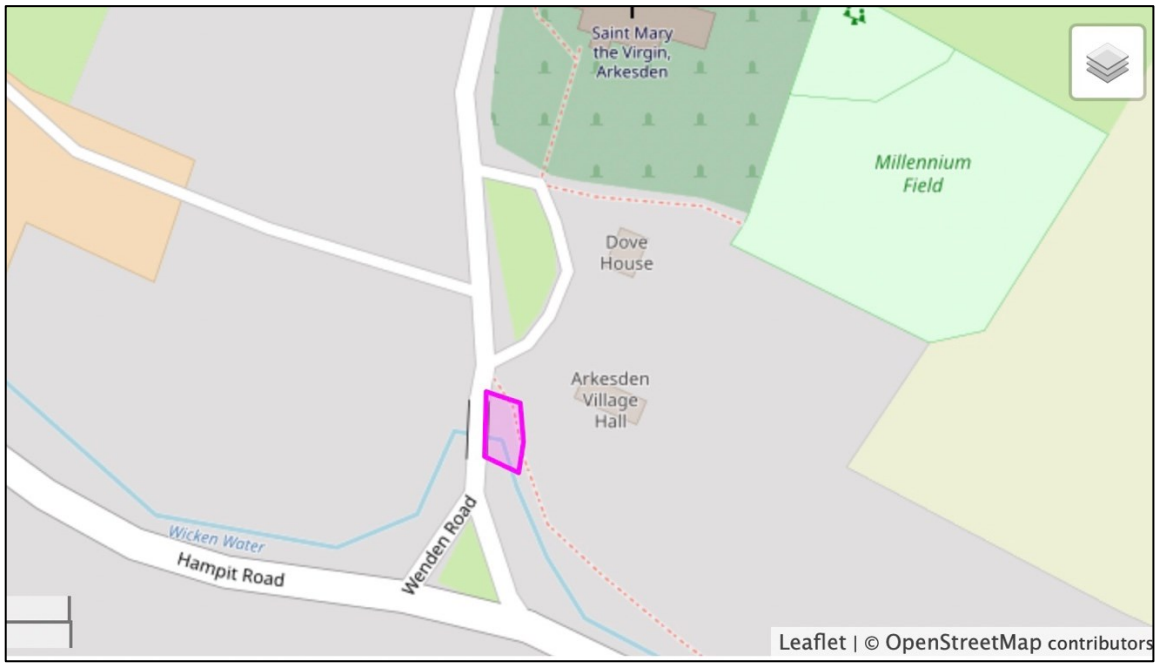
Site location: The bed of the Wicken Water (a stream running through Arkesden village), adjacent to the road bridge.

Grid Reference: TL 4821 3449

Status: Publicly accessible

Summary of the geological interest:

A large concentration of glacial erratic boulders can be seen in the bed of the Wicken Water, the stream running through the village. The boulders are on the west side of the road bridge near the village hall. There are at least 12 stones here, one about 1.5 by 1.1 metres in size, and they are of two types, Hertfordshire puddingstone and sarsen. The stones are safe to visit provided care is taken when traversing the stream bed. The stream bed is usually dry. They are situated at the apex of a hairpin bend in the river.



Site Assessment. *Local Geological Sites (LoGS) in Essex are assessed using criteria based on DEFRA guidance. An assessment form is used which asks key questions under four value categories: scientific, educational, historical and aesthetic. This site has been assessed and qualifies under these criteria.*

Scientific interest and site importance

The large concentration of boulders in the bed of the Wicken Water is extremely unusual. They are by the road bridge and consist of boulders of Hertfordshire puddingstone and sarsen stones. There are at least 12 boulders here, of varying sizes and shapes, the largest boulder being a colourful slab of Hertfordshire puddingstone 1.5 metres by 1.1 metres in size. Most of the stones are obscured by silt from the stream or covered in moss. A sarsen stone is present at each end of the bridge itself.

Date of selection/last revision:
March 2024

Hertfordshire puddingstone contains well-rounded flint pebbles bound together with quartz cement, making it a very tough rock. Sarsen stones are boulders of extremely hard sandstone. They are distinctly different rocks but were both formed under the same conditions around 55 million years ago when the climate of Britain was very hot. Both rocks are very resistant to erosion. The formation of silcretes (which include puddingstone and sarsens) has been the subject of recent scientific debate. Research has compared the conditions under which puddingstones and sarsens were formed with the present-day climate in the Kalahari Desert and parts of Australia.

Arkesden is unique in Essex for the number of erratic boulders that are scattered around the village. They can also be seen on the roadside, by the inn, and in private gardens. One of the large sarsens in the stream bed has a circular hole which may be a pothole formed by a torrent of meltwater beneath the ice sheet. This near circular hole, with its distinctive spiral and sudden constriction halfway down, is typical of a pot-hole drilled out by hard pebbles caught up in turbulent high-pressure water. The boulders are situated beneath the road bridge, which was opened in 1911, and are found at the apex of a hairpin bend in the stream. It is not known whether this location is significant. A.E. Salter, in his 1914 paper, refers to the stones in the stream bed here.

Most of the boulders of Hertfordshire puddingstone that are found in Essex are thought to have originated in Hertfordshire and were brought to Essex by the Thames when it flowed far to the north of its present course. Sarsens are thought to have been brought into Essex from the chalk hills to the north by ice. However, the large number of stones in the stream bed here raises the possibility that there might have once been a more local source (Lucy 2015). Such boulders are usually concentrated in river valleys as they have slowly moved downhill under gravity during the ice age.

The Wicken Water Boulders on the occasion of the Geologists' Association visit in 2015. The 'pothole' can be seen in the foreground. Photo: G.Lucy

References:

HOWGATE, M.E. 2020. On the sarsen-stones of Arkesden and the nearby chalk escarpment. *Essex Naturalist*. No. 37 (New Series). Pages 277-289.

LUCY, G. 2014. The Arkesden boulders. *Essex Naturalist*. Vol. 31 (New Series). Pages 41-43.

SALTER, A.E. 1914. Sarsen, basalt and other boulders in Essex. *Essex Naturalist*. Vol. 17. Pages 186-199.