

To:	Stephen Sanderson / Brian Alexander	From:	Envireau Water
Ref:	P:\UKOG Broadford Bridge (2166)\BB CPRE resp r1.docx	Pages:	3
Re:	Broadford Bridge - CPRE Objection Letter 12 <sup>th</sup> April 2017	Date:	19/06/2017

## 1 Introduction

The CPRE/Sussex Countryside Trust (CPRE) submitted a letter to the Environment Agency (EA) objecting to an application to vary the existing Mining Waste Permit for the Broadford Bridge site (Application number EPR/AB3806CG/V003). In that letter reference is made to advice provided by Mr Graham Warren (a retired Chartered Engineer), and presents comments on risk to groundwater and public water supplies.

This note aims to provide some clarification around the comments which are presented by CPRE.

Envireau Water is a specialist hydrogeological and water resources consultancy with many years' experience. They were not involved in the preparation of the Mining Waste Permit variation application or the groundwater risk assessment undertaken for the site. The clarification provided below is based on a totally independent review of local geology and hydrogeology from standard references (such as geological maps), as well as information presented in the groundwater risk assessment dated May 2012.

## 2 CPRE Claims

Without repeating the CPRE claims in detail, they can be summarised as:

- Connection between aquifers, springs and the River Arun via geological faults.
- Concern over the strategic public water supply, particularly Southern Water's river intake from the River Arun at Hardham.
- The presence of "possible shallow gas".

### 3 Connection Between Aquifers

The Broadford Bridge site is located on geological strata called the Weald Clay. The Weald Clay does not support large abstractions of water used for public water supply. It can support small domestic and agricultural supplies (livestock drinking, wash down etc), but wells and boreholes if used near continuously tend to have a decreasing yield with time, due to the poor supply of water in the strata, as a result of the clay.

The Weald Clay forms a cap on top of the Tunbridge Wells Sand which lies below the site at a depth of about 281m. Where these sands occur at or near the surface, for instance around Tunbridge Wells, they provide important water supplies. However, at the depth below the Broadford Bridge site they do not and are likely to contain water that is highly mineralised (salty) with little or no resource value.

CPRE refer to *“the over-lying aquifers of the Hastings Beds and the sandstone and limestone lenses in the Weald Clay”*. The Hastings Beds are a group of strata within the Wealden Group, below the Weald Clay. The Hastings Beds include the Tunbridge Wells Sand, the Grinstead Clay, the Wadhurst Clay and the Ashdown Beds. The Hastings Beds lie BELOW the site at a depth of 281m and extend to a depth of 610m.

Important aquifers to the south of Broadford Bridge include the Chalk and Greensand. However, there is no connection between the site and these layers. These layers would in geological time have been above the site and have been removed through geological time by erosion.

Water in the River Arun primarily comes from rainfall runoff, off the clay soils covering the catchment. It does not receive significant groundwater until it crosses the Greensand and Chalk in the south of the catchment, and as mentioned above these strata are not connected to the site.

The Broadford Bridge site does not lie in the Arun catchment and therefore does not contribute runoff to the River Arun.

CPRE make comment about faults connecting the proposed drilling activities at the Broadford Bridge site to springs and rivers. While faults are shown on the geological map, faults through clay rarely, if ever act as pathways for water (or in this case oil). This is because, as the clay strata moves it smears and seals itself. Indeed, if this were not the case, then oil would be emerging naturally at the surface from deep underground.

### 4 Public Water Supply

The Broadford Bridge site is not connected to the River Arun, either via groundwater or surface runoff. It will therefore not put the Southern Water river intake at risk.

The drilling does not affect any strategic water supply aquifers and will not affect the balance of water resources.

### 5 Shallow Gas

CPRE have taken comments about shallow gas out of context. Methane gas occurs in the shallow geology everywhere. It does not necessarily occur in useful or dangerous concentrations but it is present. This shallow methane is generated by microorganisms in the subsurface which break down natural organic materials such as wood and leaves, and other dead organisms. This is termed *“Biogenic Methane”*. The construction of all oil

and gas wells must cater for the chance of shallow biogenic gas accumulations, and is standard practice. Such accumulations, if present, do not pose an environmental risk.

## **6 Mitigation and Monitoring**

As with any construction activity, mitigation measures are put in place to reduce risks to as close to zero as possible. For instance: Kimmeridge Oil & Gas Limited use the product “PureBore” during their drilling operations, which is the same product that is used when public water supply companies like Southern Water drill water wells and boreholes; the drill site is underlain by an impermeable membrane to stop any spillages of fuel etc. from entering the ground; there is a secondary barrier around all the drilling equipment that contains water, and which may result in spillages; any rainfall runoff from the site is collected in the surrounding “moat” and taken off site in tankers for safe disposal via a Southern Water treatment facility.

Together with this mitigation it is important to check that it is working. This is what the scheme of monitoring is designed to do. It is not necessary to monitor for everything that is on the site, but it is important to monitor for indicators of the materials used in the drilling process and which are stored on the site. In the highly unlikely event that indicators are detected then action can be taken to identify the source and stop it.

**Envireau Water**

**19/06/2017**