



## 10 THINGS YOU NEED TO KNOW ABOUT BROADFORD BRIDGE

The Broadford Bridge drilling site is situated on private farm land to the west of the B2133 Adversane Lane, near Billingshurst in West Sussex. The well-screened site lies within Production and Exploration Licence PEDL234, granted by Her Majesty's Government to Kimmeridge Oil & Gas Limited, a 100%-owned subsidiary of UK Oil & Gas Investments PLC ("UKOG"). Regulatory permissions to drill an exploratory borehole at the site were granted in 2013 by West Sussex County Council and the Environment Agency. A modern hard-standing well pad was constructed in 2014. KOGI now plans to drill an exploratory well designated as Broadford Bridge-1 in the second quarter of 2017.

**1** The Broadford Bridge-1 well will be drilled to a depth of about three-quarters of a mile below the surface to target Kimmeridge Limestone rocks in a look-alike geological feature to the Horse Hill oil discovery near Gatwick Airport. The well will use safe, tried and tested conventional oil field techniques, approved by the Environment Agency and Health and Safety Directorate as used at Horse Hill in Surrey, Singleton, Storrington in West Sussex and Wytch Farm in Dorset.

**2** As at the Horse Hill oil discovery, the Kimmeridge Limestone rock intervals are extensively naturally-fractured. This entirely natural fracture-system has enhanced the rock's ability to enable oil to flow into a well at good rates. Consequently, the well does NOT require the use of the unconventional oil-field process of massive hydraulic fracturing, commonly known as "fracking". This natural fracture system lies solely within the Kimmeridge rocks which occur between a half and three-quarters of a mile beneath the surface. It does not reach above the Kimmeridge to the surface. This fact is proven by the 84 conventional legacy wells drilled in the Weald and the absence of natural oil and gas seeps at surface in the basin. Our conventional drilling techniques, which are on a far smaller scale than at Wytch Farm, Europe's biggest onshore facility holding the UK onshore's record for the deepest and longest horizontal well in similar geology, has never experienced seismicity issues. There is an overwhelming body of scientific data that demonstrates that conventional drilling does not give rise to any induced seismicity.

**3** Our activity will have ZERO IMPACT on ground water or water supplies. Even though there are no potable drinking water sources underlying or surrounding the site, it is UKOG's policy to use a water-based, non-toxic, biodegradable, zero-hazard, drilling fluid made from

modified plant starches to lubricate the drill-bit during drilling through groundwater zones (usually those shallower than 300-400 metres). This drilling fluid is used by water well drilling companies in the UK, and is registered with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS). It is also the only drilling fluid to be formally approved by the Department for the Environment, Food and Rural Affairs for use in drilling water wells for public water supply.

**4** The hard-standing well-pad is specifically designed and constructed to ensure that ZERO-fluids, including rainwater, can discharge down into the ground beneath and adjacent to the site. The pad has five liquid containment systems to ensure ZERO DISCHARGE and complete isolation of surface activities from the underlying and surrounding ground, including; both a man-made impermeable membrane and an impermeable natural clay-layer underlying the entire well pad, a membrane-lined perimeter ditch, an impermeable concrete cellar and bunding of all storage tanks and chemicals. Even rainwater from the site during operations is not discharged and is collected by tanker and sent to an approved disposal site.

**5** Before any oil can flow into the well, the well will be completely isolated from the surrounding rocks by three sets of overlapping heavy gauge steel tubing (casing) which is bonded to the surrounding rock by a layer of impermeable concrete.

**6** During the short 25 to 30-day exploratory drilling phase, the maximum related traffic flow on the B2133 will be around five HGVs per day, plus the light commercial traffic necessary for staff transport and supplies. For approximately one week at both the start and finish of the well, during the construction and dismantling of the rig, HGV traffic could reach an average of around 10 trucks per day.

**7** Acidisation or Acid-wash: there are many unfounded claims about this process, which has been used safely in the global oil and water-well drilling industry for 120 years, and over 50 years throughout the UK. This technique has been safely used over many years in a limestone oil reservoir in Europe's largest onshore oil field, Dorset's Wytch Farm. At our site diluted hydrochloric acid will be applied via steel tubing solely to the limestone rocks lying between half to three quarters of a mile beneath the surface. The dilute acid dissolves small amounts of the limestone (rocks comprised of calcium carbonate) within a few metres of the wellbore. This process enables the well bore to properly connect with the natural fracture system and permits greater fluid flow into the well bore. The reaction with the limestone neutralises the acid, forming water, calcium chloride (a natural component of sea water) and small volumes of carbon dioxide. The dilute acid (85% water, 15% hydrochloric acid) is similar in strength to that contained in domestic toilet bowl cleaners and lime scale removers. It is approximately half the concentration of the acid typically used by the public water supply industry when drilling water wells in limestone rocks. Note that the dilute acid is not forced into the well to artificially fracture the limestone.

**8** British Jobs & Taxes: The well will directly employ around 30 full time staff, 10-12 Surrey/Sussex office staff, together with an extensive direct and indirect supply chain within the south-east and wider UK. This also includes research at UK universities such as Imperial College, London. The rig's crew will also utilise accommodation, food and fuel supply directly from West Sussex. Site maintenance also uses local suppliers. We also intend to

utilise British-made steel for our well casing, further supporting UK industry. In the success case, oil produced from the well will support the UK chemical industry, which currently employs around 40,000 people.

**9** UK Taxes and Community Benefit: We are committed to pay 6% of gross revenues to the locality (including a business rates tax to West Sussex County Council and a direct payment to the local community). We are in discussions with the industry advisory body UKOOG and HMRC to finalise the mechanics of this scheme. If the well is successful the payment could equate to around £3 million per production well and possibly between £20m to £33m per three to four-acre production site, dependent on the number of production wells and future oil prices. This is dependent upon KOGI making a commercially-viable discovery. We estimate that such a successful low visual impact production site could pay taxes to the Exchequer of between £40-114 million over project life, based on current oil prices.

**10** Onshore oil and gas exploration and production is among the most regulated industries in the UK and, therefore, one of the world's safest and environmentally rigorous sectors. In addition to the local mineral planning authority consent and conditions, our activities at Broadford Bridge are governed by the Environment Agency, the Health & Safety Executive and the Oil & Gas Authority.

**Our daily lives in the UK currently require approximately 1.4 million barrels of oil per day for all our transportation (land, sea and air), all plastics and essential chemicals. Until such technologies become available to provide viable alternatives, we need oil and gas simply to survive. With the rapid decline in North Sea oil production, more than a third of this daily requirement is currently imported, and is estimated to rise to over two thirds by 2030. Imports require extensive carbon positive transportation from around the globe without the added benefits of direct and indirect jobs, supply chain and tax contribution of indigenous oil.**

*Produced by UK Oil & Gas Investments PLC ([www.ukogplc.com](http://www.ukogplc.com))*