



The Rt Hon Nick Herbert CBE
Arundel and South Downs Conservative Association
38 High Street
Steyning
West Sussex BN44 3YE

28th May 2017

Dear Mr Herbert,

It was a pleasure to meet you on Friday and to show you our drilling site at Broadford Bridge. Hopefully the visit was useful to you and helped to clear up any confusion about our plans. I thought it might be helpful to confirm in writing our conversation plus some further points.

It was particularly important for me and our team to be able to demonstrate that we have all the necessary permissions required to drill the well, namely from the Oil & Gas Authority (OGA), the Environment Agency (EA), the Health & Safety Executive (HSE) and West Sussex County Council (WSSC). Despite false and defamatory claims from the pressure group called Keep Billingshurst Frack Free (KBFF), all permissions are in place. For reasons of transparency, the documents demonstrating consents are available on our website (www.ukogplc.com).

While it is preferable to drill and flow test in one operation, it is not uncommon for a well to be flow tested significantly after drilling. Our Horse Hill-1 well north of Gatwick being an example, as is the latest well drilled at the Brockham field near Dorking in January 2017. During the drilling process, significant volumes of technical data are acquired which require full analyses prior to further well-based operations. In the Horse Hill exploratory well case, we drilled the well in late 2014, fully evaluated all the gathered technical data and returned to flow test only in early 2016.

The planning consent from WSSC permits us to both drill an exploratory well and flow test for up to 14 weeks. However, the original EA permit for the Broadford Bridge-1 well, as at Horse Hill, covered only the drilling and well completion phase. Consequently, after acquiring the asset in autumn 2016, we sought permission from the EA at the beginning of this year for a variation of our existing EA permit to add a period of flow testing.

The flow test phase is designed to demonstrate conclusively that, in the event of an oil discovery, the Broadford Bridge-1 well (BB-1) can deliver an oil flow rate and recoverable oil volume that are commercially viable. The flow test EA permit variation comprises an industry standard programme using the same substances and practices as performed at Horse Hill in 2016. This application is publicly available on the EA's website. We are awaiting the EA's consent and expect the permit will be granted very shortly. Again, this permit will be a publicly available document. Interestingly, as part of the EA consultation period for the variation, EA received a very significant number of responses in support of our application and activities, something the EA admits it has not seen before in the oil and gas sector.



As our planning consent from West Sussex County Council expires in mid-September 2017, it was entirely necessary for the Company to proceed immediately with the drilling phase. It was therefore not possible for us to delay the drilling phase any further simply due to this time limitation and a commercial decision was made in March to commence operations at the earliest opportunity.

The local residents, via our meeting with the parish councils of West Chiltington, Pulborough and Billingshurst, and via personal communication, understood the need for us to proceed without delay. It was our initial intention to commence in April 2017, and we of course had no foreknowledge of any General Election and possible related sensitivities.

The newsletter spread on the internet by KBFF of 25th May 2017, expressed claims that our work at Broadford Bridge is “illegal, ill judged, irresponsible, and irregular”. Such claims are profoundly untrue and deeply offensive. We are an ethical and socially responsible company and have demonstrated that by our regular engagement with residents and parish councils.

For your information, we served a Letter of Claim from our lawyers Hill Dickinson LLP to KBFF on 26th May, referring to their defamatory comments. We have requested KBFF cease and desist from making further false claims, withdraw their comments and apologise. We are prepared to use all legal means available should KBFF fail to comply with our requests. We regret that the situation has arisen but KBFF must realise that they are bound by the same law and duty of care that they incorrectly accuse us of breaching.

For further background, the Broadford Bridge drilling site is situated on private farm land to the west of the B2133 Adversane Lane, near Billingshurst in West Sussex. As you will have seen, it is a well-screened and inconspicuous site, lying within Petroleum Exploration & Development Licence 234 (PEDL234), granted to Kimmeridge Oil & Gas Limited (KOGIL), a wholly owned subsidiary of UK Oil & Gas Investments PLC (UKOG). We have a good relationship with the closest residents whom are supportive of our activities.

Regulatory permissions to drill an exploratory borehole at the site were granted by WSCC in 2013 and EA in 2014. A modern hard-standing well pad and access track that constitute the site was constructed in late 2014.

The BB-1 well will be drilled to target four Jurassic age Kimmeridge Limestone rock units, in a look-alike geological feature to our Horse Hill oil discovery near Gatwick Airport. The well will use safe, tried and tested conventional oil field techniques, approved by the EA and HSE as used at our Horse Hill-1 well in Surrey, and at Singleton & Storrington in West Sussex and Wytch Farm in Dorset. Our conventional drilling techniques will be on a far smaller scale than at Wytch Farm, which is Europe’s largest onshore oil field.

As at the Horse Hill oil discovery, the Kimmeridge Limestone rock intervals are expected to be extensively naturally-fractured. This entirely natural fracture-system has enhanced the rock’s ability to permit oil to flow into a well at good rates. Consequently, the well does NOT require “fracking”.

The naturally fractured Kimmeridge Limestone rocks lie between 800-1300 metres (about half to just over three-quarters of a mile) beneath the surface. The faulting and fracturing within the Kimmeridge under and immediately surrounding the site does not extend upwards to the surface, terminating at the base of the 800 feet thick impermeable Lower Cretaceous Weald Clay rocks which cover the area and outcrop at the surface.

This fact is proven by the 84 conventional legacy wells drilled through the Kimmeridge rock formation in the Weald Basin, the seismic coverage we have over the site and the absence of natural oil and gas seeps at surface in the area and the wider basin (i.e. if the fractures connected with the surface, oil and gas would migrate upwards and seep naturally into the soil, as it does in many petroleum provinces around the world, and as can be seen in exposed Jurassic age rocks along the Dorset Heritage Coast).

Our drilling 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 (essentially potato starch). The drilling fluid lubricates the drill-bit and will be used while drilling through groundwater zones (i.e. those zones that may contain fresh water from percolated rain water, normally shallower than 300 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.

The Broadford Bridge 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 multiple fluid containment systems to ensure ZERO DISCHARGE of any fluids and complete isolation of surface activities from the underlying and surrounding ground.

These systems comprise; a man-made impermeable membrane and an impermeable natural clay-layer underlying the entire well pad, a membrane-lined perimeter ditch, an impermeable concrete well-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 EA approved disposal site. The integrity of the impermeable membrane was surveyed and tested prior to moving the rig on-site, a procedure which is an industry first and something we intend to make industry standard-practice.

Additionally, 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 (known as casing), which are bonded to the surrounding rock by a layer of impermeable concrete. The casing and well integrity are pressure tested during operations and subsequently at least twice per year as standard company policy (note the testing frequency is more rigorous than industry norms).

During the 30 to 40-day exploratory drilling phase, the average related traffic flow on the B2133 will be around five HGVs each way per day, plus the light commercial traffic necessary for staff transport and supplies.

During the construction of the rig last week, the heaviest period of HGV activity, about 70 loads were delivered without incident. At the end of the drilling phase, there will be a similar level of HGV activity over a 4-5 day period. Note that we do not move HGVs on Saturday PM, Sundays or Public Holidays and normally not on Saturday mornings. The levels of HGV traffic associated with drilling are thus equivalent to the construction traffic associated with a small-medium size housing development, but over a much shorter period. This traffic flow volume and management plan were part of the WSCC planning consent and is a matter of public record.

During the flow testing phase, as there is no rig present, the HGV traffic is much reduced and assuming we make a discovery, will primarily consist of tankers for oil export. As we discussed, a typical tanker carries approximately 200 barrels or about 7,000 gallons. If the well were to produce at 1,000 barrels of oil per day, the maximum tanker traffic would thus be 5 per day. However, during the flow test the well does not flow continuously at the maximum rate, so in practice the number of tankers per day would be less than five.

Should we go to a production phase, we must first obtain a new set of planning and regulatory permissions from WSCC, EA, HSE and OGA. Each well, if similar in productivity to the Horse Hill well results, could thus potentially produce initially at 1,000 barrels per day. This rate would only be during the first year of production as the rate declines over the life of the well. We estimate the flow rate decline to be about 35% per annum for each well.

Any development would be designed with as low visual impact as possible. The only items visible above ground would be oil storage tanks, like the ones currently on-site, and a concrete road tanker loading bay. Clearly with the possibility of multiple wells on the site, production would need to be controlled to keep tanker export to an acceptable level. The attached presentation shows a conceptual view of an envisaged development site. We envisage that future sites could be specifically located to be in brown field sites, near major roads or railways to minimise HGV impact. Typically, the sites, such as Broadford Bridge, would be about the size of two football pitches i.e. a small field or a large supermarket car park.

The other issue raised has been about the process commonly referred to as “acidisation”. 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 onshore oil sector in the UK including over many years in a limestone oil reservoir in the Wytch Farm oil field, Dorset, Europe’s largest onshore oil field.

At our site, diluted hydrochloric acid will be applied via a further 3-inch steel pipe through the cemented steel casings solely to the limestone oil reservoir rocks lying immediately adjacent to the well bore, again at between half to over three quarters of a mile beneath the surface. The dilute acid dissolves small amounts of the limestone (rocks comprised of calcium

carbonate) up to some tens of centimetres from the steel casing and concrete of the well bore.

We do not use hydrofluoric acid (HF), which is highly toxic. The HF is used in the oil industry to dissolve silica based rocks (i.e. sandstones and clays) not limestone rocks, so it has zero efficacy for our operations. As an aside, the HF used in other oil industry applications is primarily under strict laboratory conditions and if used under site conditions doesn't exist as an acid at the surface, it is mixed from components solely in the subsurface at the target rock unit depth.

The hydrochloric acidisation process utilised thus enables the well bore to properly connect with the encasing limestone rock and natural fracture system, thus permitting commercial fluid flow into the well bore. The reaction with the limestone neutralises the acid, forming water, calcium chloride (a highly soluble natural salt and a significant 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, indeed the acid performs exactly the same process as in domestic use (i.e. it dissolves limescale composed of calcium carbonate). It is approximately half the concentration of the hydrochloric acid typically used to improve the inflow of drinking water into public water supply abstraction wells in limestone aquifer rocks, such as the major chalk aquifers in the Southeast and Yorkshire. Note that the dilute acid is NOT forced into the well at sufficiently high pressures to artificially fracture the limestone.

The other issues we didn't have time to discuss on Friday include the benefits to the locality and the wider UK that could result from a successful Kimmeridge Limestone oil well. The well directly employs up to 40 on-site staff, including 10 Surrey-based office staff, together with an extensive direct and indirect supply chain within the south-east and wider UK.

The rig's crew also utilise accommodation, food, fuel and other supplies directly from West Sussex businesses. Site maintenance also uses local suppliers. We also utilise British-made steel for our well casing. Any produced oil will be processed in UK refineries, typically at Fawley in Southampton, the UK's largest. The UK oil industry itself provides vital feedstocks for the UK refining and chemical industry which employs around 30,000 people.

UKOG is also committed to pay 6% of gross revenues to the locality (including business rates to West Sussex County Council and a direct payment to the local community). We are in discussions with the industry advisory body, UK Onshore Oil & Gas (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 £20 to £33 million per three to four-acre production site, dependent on the number of production wells and future oil prices. Of course, this is dependent upon making a commercially-viable discovery.

The overall potential scope of Kimmeridge Limestone oil developments across the Weald to the UK was addressed in an EY study published in 2016. EY estimated the Gross Value Add to the Economy, via multiple development sites, to range from £8 billion to over £50 billion in the blue-sky scenario, with a peak direct, indirect and induced job creation potentially in the tens of thousands. Even in the blue-sky scenario such sites would utilise less than one thousandth (0.1%) of the area of a typical UK onshore Licence block. As you've seen at Broadford Bridge such sites can be located sensitively so that they are almost invisible to passers-by.

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 oil sectors. In addition to the local mineral planning authority consent and conditions (i.e. WSCC), as previously stated, our activities at Broadford Bridge are governed by the EA, HSE and the OGA.

I hope this gives you a broad understanding of the operation at Broadford Bridge. I have also attached a copy of our current corporate presentation covering the Kimmeridge Limestone Oil Play and further information is available on our website (www.ukogplc.com).

If you have further questions please don't hesitate to contact either myself or Brian. You are most welcome to visit us again at your convenience.

Yours sincerely,



Stephen Sanderson
Executive Chairman
UK Oil & Gas Investments PLC