

Angus Energy are seeking planning permission for a 4-week operation to remove unexpected water from the Lower Stumble well. At the same time they are applying for a 12 month Extended Well Test (EWT). They are proposing to be on site for a total of 30 months. Essentially this application is similar in length to the 2019 application, but by breaking it down in stages and specifying 12 months for the EWT and some extended periods of inactivity they are trying to pretend it's much shorter.

How will the length of the EWT be monitored? According to the HGV movement table (Technical Note, Traffic and Transport Effects, Table 1) the planned duration of Phase 3 is 61 weeks. According to the same table, surface operations will last for a total of 86 weeks and not 18 months as Angus state in the Planning Statement. So already Angus has plans to overrun Phase 3 by more than 2 months.

Angus state that there will be a period of inactivity at the end of Phase 1 while they procure Phase 2 and 3 equipment. They further state that the membrane will not be engineered until that time. It is evident that the application for Phase 1 should be separate from Phases 2, 3 and 4. Why do they need to be on site while procuring and engineering equipment for the next phase? It is totally unnecessary.

Similarly, why do they need to be on site for 12 months while preparing the planning application for the production phase? Again it is unnecessary and inappropriate.

The application is different in some ways though, none of them good, where Angus are attempting to introduce new activities by stealth.

Angus have introduced a second flare. According to the Air Quality Assessment "there will be two flares and two generators on site". The second flare does not appear in the site plan. The Planning Statement is confused and conflicting, stating in section 8.7.7 that "a combination of operational scenarios with two flares and two generators were assessed", but in section 4.4.11 that "a single flare unit will be on site throughout the duration of the extended well test".

The acidisation operation is extended even further. The acid wash described in the 2017/8 application was a 'completion' acid wash and the Environment Agency (EA) did not consider to be a well stimulation method. They did make it clear though that well stimulation is not permitted to take place at Lower Stumble. The acidisation operation planned for the EWT is much more extensive. Angus say that they intend to use acid to clean the formation and attempt to increase flow. This is clearly well stimulation and may require a Hydraulic Fracture Plan (HFP) to be agreed with the OGA.

A new 'contingency' has been added to the EWT. Angus are now proposing to install a bridge plug to isolate sections of the formation which are producing water rather than hydrocarbons. But Angus, both in the current and the previous failed application have claimed that the water in the well is not formation water but drilling fluid that was not removed by Cuadrilla. It appears that Angus have by no means established that the water in the well is drilling fluid and not formation water, and therefore the whole Phase 1 operation is invalid and dangerous without the full safety equipment of Phase 3.

The estimated HGV movements have almost quintupled despite the application being shorter by 6 months. The total estimated number of HGV movements in the latest application is 3170. For the previous application it was 664. For the 2014 application it was 212. This is another indication that the planned activities have not reduced, but increased in scope.

Angus have used a lot of words to try and prove 'need for development'. There is no need for development.

Unconventional oil extraction has no place in an area of outstanding natural beauty.

With the UK moving towards Net Zero emissions, unconventional oil extraction has no place in the energy plan at all. It has no place in the government's strategy to rebuild Britain and fuel economic recovery across the UK following COVID. The New Deal will "promote a clean, green recovery". At a time when even China is promising to become carbon neutral by 2060, unconventional oil extraction is obsolete.

Angus claim that the UK onshore oil industry has the potential to meet 40% of the shortfall between production and consumption. Based on 2018 figures this is about 240,000 bopd. Angus consider 300 bopd at Lower Stumble to be a good result and 50-200 bopd to be commercially viable. This is an infinitesimal contribution to energy security. It is a negative contribution if the flaring of the associated gas is taken into account.

Based on Angus' more optimistic target, 800 oil wells like the Lower Stumble one will be operational in the UK with the onshore industry at full potential. And all these wells will be in Sussex, Surrey, Dorset and Hampshire, where the reserves are. Clearly, shale oil will never provide energy security without destroying the countryside.

Although the amount of oil extracted at Lower Stumble will be insignificant, the effects of the proposed operations at Lower Stumble will not, even if Angus is suggesting otherwise.

I understand that no fracking will take place at the well and it is unfortunate that the media coverage in the past concentrated on fracking, because it allows Angus to dismiss legitimate concerns by simply stating that they are not fracking. There are serious issues with the proposed operations, which should not be overlooked just because fracking has been excluded.

The duration of the operations is far too long. The Oil & Gas Authority guidance is that EWTs "are usually issued for 90 days to allow for operational delays" and "EWTs are not an alternative to production under a Field Development Plan". A year for the EWT and 30 months total seems very excessive. Angus compared Lower Stumble to Horse Hill. Although the nature of the oil in Horse Hill is similar, the current Horse Hill EWTs are 75 days long. The new ones Horse Hill are applying for are 90 days long.

The site is below Balcombe village. The village is in the direction of the prevailing wind. As a result the noxious flared gas and toxic emissions from the open vented tanks will be blown towards the village. The site is in an Area of Outstanding Natural Beauty, with protected species dwelling in ancient woodland adjacent to it.

Up to 5,000 m<sup>3</sup>/d of associated gas will be burned in the flare. This will produce up to 10 tonnes of CO<sub>2</sub> per day. It will also produce CO, NO<sub>x</sub>, particulate matter, VOCs, dioxins. Angus are arguing that flare emissions are insignificant. Their Air Quality Assessment shows otherwise: the hourly mean NO<sub>2</sub> emissions is of 'moderate' significance according to the report. In fact, there have been a few revisions of the report with inconsistent results and invalid conclusions.

Angus did not secure the ultra-low emission AEREON flare until they became concerned that the very poorly performing (and thus much cheaper to hire?) PW flare may not be available, and even now they propose to use the PW flare if they can get hold of it. Clearly protecting the environment and the local population is not the primary concern.

The oil storage tanks are open vented. Emissions from the tanks will be continuous when the well is flowing as the tanks operate at a pressure lower than the separator pressure. Emissions from the tanks include volatile organic compounds (VOCs) such as benzene, a carcinogen. No attempt is being made to scrub the gas being vented.

Angus have avoided publishing an analysis of the associated gas. An H<sub>2</sub>S level of 1.5% was measured in the oil at the nearby well site in the 1980s. Angus have declared a sulphur content of 50 mg/Nm<sup>3</sup> in the gas at their nearby Brockham Oilfield. If H<sub>2</sub>S is present, SO<sub>2</sub> will be produced when the gas is burned. H<sub>2</sub>S will be released in the tanks and vented.

Acid stimulation is a technique similar to fracking, the difference being that the acid is pumped at pressures lower than the formation parting, or fracturing pressure. According to industry experts, the treatment requires careful design and operation to minimise entry of the acid into the highly permeable sections of the formation, as this could create a high-conductivity channel breaking into unwanted gas or water producing zones. As part of the acidisation operation, additives such as surfactants, scale inhibitors and control agents are normally pumped with the acid, to avoid secondary damage caused by emulsions and precipitates produced by reactions in the wellbore or rock matrix. And yet Angus have not declared the use of any chemicals other than HCl.

There will be noise from the site, especially the generators and the flare. Balcombe residents were disturbed by the noise during the 2013 and 2018 operations. There will be smells, as no attempt is being made to scrub the gas being vented from the tanks. In 2017, a repugnant and noxious odour was detected at the B2036 road.

The operations will disturb protected and sensitive species. Again, this is not contested. However, Angus has dismissed any potential adverse environmental impacts because of the 'temporary' duration of the operations. The fact remains that they will be on site for 30 months. And that if all goes well for them they will move into production, presumably for a number of years. The 'temporary' argument as regards the environment is disingenuous and should not be allowed.

Testing of groundwater samples taken in 2019 showed an increase in dissolved CO<sub>2</sub>, methane and ethane concentrations over samples taken in 2013, before operations began. These increases are far beyond what might be expected from natural variation and are very likely to be due to the well-drilling and associated operations. Angus attempted to dismiss the increase of dissolved hydrocarbons concentration in groundwater samples by quoting figures from the 1986 Conoco well report. However, close scrutiny of the report shows that the peak figures presented are on average 224 times higher than the average figures and therefore inappropriate and misleading.

The risks during Phase 1 seem to be largely underestimated. In Phase 1, as in Phase 3, fluids will be pumped out of an oil/gas reservoir. There is no real difference.

As pointed out by the EA, there is no provision for routing the gas from the low pressure separator to a flare during Phase 1. Angus will not be able to stop oil or gas coming through with the water pumped from the well. They state that Phase 1 is completed "once the well has been cleaned up and oil begins to be seen". At this point large amounts of gas may be coming through with the oil and being released in the separator. With no flare present, these gases will be cold vented to atmosphere.

Where is the vapour from the vapour recovery tank routed during Phase 1 with no flare present? Vapour recovery is meaningless if the vapour recovered is vented to atmosphere.

According to the emergency procedures, the well would be instantly shut in at the wellhead should any emergency occur. This will be impossible during Phase 1 with no Emergency Shutdown System present.

Angus have not demonstrated that the bunded area during Phase 1 will adequately contain firewater and stormwater. The risk of a fire is still present and a storm is just as likely.

In fact, Angus do not inspire much confidence and trust. They have been vague and inaccurate in describing their operations. They have presented misleading data and ignored assessment results when they were not in line with their narrative. They have not been forthcoming with the air, flare, groundwater and noise results, which they have repeatedly promised to the Community Liaison Group. The results must be available, as Angus were required by the EA to monitor and report pollutants (NOX, CO, VOCs, methane, SO2, H2S, BTEX) both by calculation and spot testing. They were required to monitor vent gas from the tanks, surface water and groundwater. Angus claim that emergency response procedures are in place, in consultation with the emergency services. According to West Sussex Fire and Rescue Service, the documents they hold date back to 2013, when both the site plan and proposed operations were very different.

Angus state that if the EWT confirms that there are hydrocarbon reserves which could be commercially extracted, a separate planning application will be prepared for a future production phase. But it will almost certainly not end there.

Experience from the US shows that shale oil reservoirs exhibit very steep decline rates in the first 2-3 years following start-up. Companies need to keep drilling just to keep their output level. They need to drill longer lateral wells and pump more proppant, or sand, and water to stimulate the flow. The situation is similar in the UK. HHDL have not yet completed the EWTs on their first two wells at Horse Hill, but are already planning four more. The gas produced during EWTs of these new wells will be flared and water re-injected. HHDL plan to produce electricity from the gas in generators during production, but have not applied for an environmental permit yet. Large amounts of associated gas have been flared at Singleton for years (they have been operating two flares since 2007). Star Energy and Providence sought planning permission for a compressed natural gas unit in 2008 and generators to produce electricity from the gas in 2010 but neither materialised, although the wells they were seeking permission to drill at the same time did.

It is evident that extracting oil at Lower Stumble is of no benefit to anyone other than Angus. One can argue that it is not even of any benefit to Angus in the current economic climate and it is a matter of time before they run out of money, like scores of US operators in the last year, and leave the local community to deal with the consequences.