

Definition of Hydraulic fracturing and wider definitional issues

Introduction

The Joint Authorities have in their proposed plan sought to create a difference in approach between operations to explore conventional and unconventional geologies and a definition of hydraulic fracturing which is out with the statutory definition that is contained within the Petroleum Act revised by Infrastructure Act 2015.

The definition of hydraulic fracturing and the split between conventional and unconventional are essentially intertwined. To the best of our knowledge no other local plan has attempted to split hydrocarbons in this way or to define hydraulic fracturing in anything other than that which statute requires.

The recent judgement from Justice Holgate confirms what is already known that the Written Ministerial Statement seeks to put forward government policy which must be given material consideration and regard to but can be departed from as long as proper justification is provided.

In the view of the industry the authority has;

- 1) failed to provide adequate justification for their proposals under planning grounds,
- 2) misunderstood the differences in actual operations,
- 3) put forward a view on government policy that is wrong, and
- 4) ignored the safeguards and regulatory controls put in place by other regulators.

The industry's overarching concern is that the Joint Authority's approach will cause differences in approach between the regulatory bodies, especially those that regulate below ground activities, which potentially has a negative impact on how safety and environmental protection is managed on sites.

It must be recognised that hydraulic fracturing is simply a discrete technical process within a wider oil and gas operation and only involves the use of pumping equipment at the well site and supporting materials (water, additives and potentially a proppant). The number of pumps required, and therefore the associated development impacts, are directly proportionate to the size of the fracturing operation.

Potential development impacts are directly proportionate to the scale of the fracturing operation and would include:

- Additional vehicle movements for the delivery and removal of the pumps and supporting materials.
- The management of any noise issues during their operation.

In all cases these issues can be addressed through the normal planning process, through traffic management and any noise mitigation measures.

The statutory definition of hydraulic fracturing within the Petroleum Act, revised by the Infrastructure Act 2015, was established to afford protection to the nationally most sensitive environmental designations from the potential impacts of larger scale fracturing activities, where a large number of vehicle movements and associated impacts such as noise may affect these sites.

The Joint Authority's definition by default seek to extend the protections afforded by the Petroleum Act, revised by Infrastructure Act 2015, to cover all fracturing operations, which is wholly disproportionate to the potential impact, which, outside the Act definition, should be considered on a case by case basis.

Conventional versus Unconventional

The term conventional and unconventional has been used by petroleum engineers for a number of years and was introduced when shale oil and gas from shale rock was first discovered many decades ago. Because the hydrocarbons were tightly held within the source rock or a tight formation rather than migrated to a closed structure as in most reservoirs, this led to the term unconventional. It does not reflect anything other than a geological description.

It would appear that the Joint Authorities' have tried to justify the differences between conventional and unconventional geologies on the basis that projects involving hydraulic fracturing have a greater impact – this being the case there are already tools in place within the PPG and NPPF to assess a planning application.

It is clear from the tables at the back of the Joint Authority's' document (LPA 87) that there is significant misunderstanding between the extraction of either conventional or unconventional hydrocarbons:

- In either process the drilling and work over rigs are essentially the same and will be chosen based on geology, conditions on noise, visual impact in terms of height and also, to a certain extent, on how long the process takes. Fundamentally the rigs used are the same irrespective of the target geological horizon.
- Construction of the well pad, wastewater removal and 'NORM' are common to both conventional and unconventional resource exploration, and production.
- Site construction, the erection of security fences, noise barriers, cellar construction, mobilisation of the rig etc. are also the same

The reality is, as stated in Natalie Lieven QC's opinion previously submitted to the Examination, that the Joint Authorities appear to be confusing the proposed extraction methodology, with the geology.

There is therefore no justification for a split between conventional and unconventional and indeed all of the impacts reviewed as part of the planning process can be assessed using the current rules and guidance within NPPF and PPG.

Definition of Hydraulic Fracturing

At the second Inspector meeting of the interested parties there were three potential definitions discussed:

1. Infrastructure Act 2015

The Infrastructure Act introduced in January 2015 defined "Associated hydraulic fracturing" as hydraulic fracturing of shale or strata encased in shale which—

(a) is carried out in connection with the use of the relevant well to search or bore for or get petroleum, and

(b) involves, or is expected to involve, the injection of—

(i) more than 1,000 cubic metres of fluid at each stage, or expected stage, of the hydraulic fracturing, or

(ii) more than 10,000 cubic metres of fluid in total.

As previously stated, this definition is consistent with the approach taken by the European Commission in its recommendation in relation to high volume hydraulic fracturing (Commission Recommendation of 22 January 2014 on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing (2014/70/EU): eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0070&from=EN - URL no longer exists. In the UK, this kind of high volume hydraulic fracturing has not been used to explore and produce from conventional assets onshore.

2. Planning Practise Guidance 2014 Paragraph 129 Reference ID: 27-129-20140306

PPG 2014 introduced the following definition:

'Hydraulic fracturing is the process of opening and/or extending existing narrow fractures or creating new ones (fractures are typically hairline in width) in gas or oil-bearing rock, which allows gas or oil to flow into wellbores to be captured.'

As discussed at the meeting this definition of hydraulic fracturing was defined under "Annex A: Shale Gas, coalbed methane and underground coal gasification"

This definition is therefore clearly for shale gas, which has been superseded by the Infrastructure Act.

3. Surface Development Restrictions for Hydraulic Fracturing - Government Response to the Consultation June 2016

This document was introduced into the meeting by the Joint Authorities. This was a response to a consultation in June 2016 aimed at defining sites, which would come under the secondary legislation connected with the Infrastructure Act 2015 and how the restrictions would in practice be made.

(gov.uk/government/uploads/system/uploads/attachment_data/file/532428/Governm ent_Response_Surface_Restrictions_for_Hydraulic_Fracturing.pdf) - URL no longer exists.

The paragraph brought up by the Joint Authorities appears in Annex A of the Government response:

"Where a licensee is required (by their licence or a consent issued under it) to obtain the Secretary of State's consent before carrying out hydraulic fracturing which is not associated hydraulic fracturing, the Secretary of State will apply this policy as if that consent was a HFC."

This paragraph appeared in the Annex to the document and was used as justification for defining hydraulic fracturing in a broader sense than in the Infrastructure Act.

However, the Annex in question needs to be seen in the context of the overall consultation.

As explained at the Examination the reason for Annex A was not to introduce a new definition of hydraulic fracturing but to close an anomaly created by the Infrastructure Act. In the infrastructure Act associated hydraulic fracturing was deemed to be defined by involving liquid that involved more than 1,000 cubic metres of fluid at **each** stage. Annex A ensures that the definition encompasses 1,000 cubic metres of fluid at **any** stage:

'In addition, these restrictions will apply where an operator is required to get consent from the Secretary of State for hydraulic fracturing that is not "associated hydraulic fracturing" and therefore to meet an equivalent range of safeguards to those set out in section 50 of the Infrastructure Act 2015.'

In particular, the Secretary of State intends to require that such consent be obtained for any operations which use more than 1,000 cubic metres of fluid at any single stage, or expected stage, of the hydraulic fracturing, unless an operator can persuasively demonstrate why requiring such consent would not be appropriate in their case. The use of such amounts in one or more stages could well lead in some cases to similar impacts as operations which use 10,000 cubic metres of fluid in total. Therefore, similar assurances over all the circumstances relating to the consent are likely to be as necessary for a single fracturing stage of this scale as it is with the aggregate effect of multiple stages. This cautious approach makes particular sense while the new industry gets underway during the early stages of exploration and will be reviewed once hydraulic fracturing operations are more common to determine whether it is still appropriate at that point.'

The Government response goes on to state:

'We do not consider that the restrictions need to be extended any further than this. Drilling for conventional hydrocarbon resources has been conducted safely for decades, including, for example, in National Parks and AONBs. The conventional onshore oil and gas industry is well-established and existing evidence shows that it can comply with the strict requirements that are already in place for protected areas.'

There is therefore no justification for the Joint Authorities to state that they can therefore create their own definition.

Looking at this another way

The process of hydraulic fracturing has been used for many decades as referenced in the Royal Society and Royal Academy report in 2012. It has been used extensively in North America, and over 200 wells onshore in the UK and a high proportion of recent wells in the North Sea gas fields. It can therefore not be considered novel as per the joint authority submission. Hydraulic Fracturing for shale gas resource uses exactly the same techniques as used onshore before but given the increased depth of the resource, higher pressures and higher volumes of water are used.

The Royal Society and Royal Academy report in 2012 was asked to identify the major risks associated with hydraulic fracturing and whether these risks be effectively managed.

The report identified the following risk areas:

- Handling of fracturing fluids
- Water extraction
- Managing and disposal of wastewaters
- Disposal of solid wastes
- Managing methane and other emissions
- Well integrity

- Fracture monitoring, propagation and growth
- Seismicity

Each of these risk areas are regulated by bodies outside the Mineral Planning Authorities and supplemented by industry best practice:

Risk	Regulation	Industry Best Practice
Handling of fracturing fluids	Environment Agency by environmental permit	Public disclosure of all chemicals used as per UKOOG shale gas well guidelines
Water extraction	Environment Agency by extraction licence Water company statutory consultee as part of planning process as per Infrastructure Act	Site location chosen to avoid truck movement of water where possible MOU with Water industry and UKOOG
Managing and disposal of wastewaters	Environment Agency via environmental permits	UKOOG Shale gas well Guidelines (Reference)
Disposal of solid wastes	Environment Agency via environmental permits	UKOOG Shale gas well Guidelines (Reference)
Managing methane and other emissions	Environment Agency via environmental permits	UKOOG Baseline monitoring guidance (reference)
Well integrity	Health and Safety Executive via Borehole regulations (reference)	UKOOG Shale gas well Guidelines (Reference) Oil and Gas UK well integrity guidance (Reference)
Fracture monitoring, propagation and growth	Environment Agency approval of Hydraulic fracturing Plan prior to Hydraulic Fracturing Consent by the BEIS Secretary of State	

Seismicity	Oil and Gas Authority approval of Hydraulic fracturing Plan prior to Hydraulic Fracturing Consent by the BEIS Secretary of State	
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The impacts that are within the regulatory oversight of the Joint Authorities are those that are normally associated with all onshore oil and gas development (as well as other development) namely noise, light, landscape and visual impact and transport movement, these were identified in the Joint Authorities note (LPA 87).

As presented within our previous submission, the only high-volume hydraulic fracturing activity that has taken place onshore in the UK in the last six years under the current regulatory regime has been in Lancashire at the Preston New Road Site run by Cuadrilla in the last quarter of 2018.

The relevant potential surface impacts at PNR were:

- Noise from the frac pumps which was controlled by planning condition and was achieved through mitigation with acoustic housing of the frac pumps.
- Associated traffic movement from the delivery of sand, chemicals and diesel and staff turnaround. Traffic planning and storage on site to allow buffering of materials and smoothing out peak traffic flows were classic mitigations. A traffic management plan was approved by the Local MPA.
- Air quality was monitored as the pumps and trucks used diesel fuel. The levels were kept within environmental permits as approve by the Environment Agency.
- Storage of chemicals and sand were required on site; however, storage units were low lying (<5 – 10 metres high). Storage and chemical handling is regulated through the Environment Agency.
- Lighting remained consistent with normal well operations and did not change substantially with hydraulic fracturing and was part of the approved lighting plan.

In addition to the above impacts hydraulic fracturing will involve the use of water. Where possible operators will choose sites that have access to mains water in order to avoid the need to truck water onto site. This arrangement will be through a commercial arrangement with the local water company who as part of the infrastructure act 2015 are a statutory consultee to the planning process and will be able to make representations and, if acceptable define appropriate parameters. In addition, UKOOG has memorandum of understanding with the main water trade bodies to ensure that both industries work together to ensure there is no impact to residential water supplies. In the absence of a local water supply the operator may decide to abstract water from local boreholes. This is a process that is regulated under permit by the Environment Agency as with other industries.

The potential environmental impacts associated with onshore oil and gas developments are not unique, in planning terms, when compared to any other development such as construction and quarrying. Similarly, when compared to many industries which receive planning permission, our operations will be temporary in nature.

The joint authorities identified in previous submissions that their justification for a different definition as set out in statute. However, they did not demonstrate why their existing controls/powers in these areas were inadequate to control surface impacts from hydraulic fracturing which is a specific sub-surface well completion technique.

Link with Other Regulators

If the current definition as identified by the Joint Authorities is allowed it is imposing a level of additional (and unnecessary and unjustified) planning oversight on to matters that fall within the stewardship of other regulators.

Those who are most likely to be affected by impacts (especially in relation to air quality given their close proximity to the fracking operations) are the drilling crew - yet as a matter of policy the HSE will only carry out mandatory site inspections to ensure on-site compliance of HSE legislation (based on decades of experience) in circumstances where the frac job involves the injection of fluids at the volumes set down in the statutory definition.

By applying their definition, the Joint Authorities are essentially usurping the role of the HSE and instating by way of planning policy a higher standard of oversight on the actual operation of the site's equipment than the HSE deems necessary.

The same point holds for the OGA that a mandatory frac plan is only required for jobs where the statutory definition volume limit is proposed to be breached. This is because below that limit the OGA recognise that the sub-surface impacts arising (including seismic activity) are likely to be insignificant

The critical point is that for an assessment of the level of significance of likely environmental impact the only threshold that the MPAs can reasonably apply to hydraulic fracturing operations is the one set out in the statutory definition.

Otherwise the statutory site by site assessment of each pollutant linkage enshrined in the 2011 Regs and the NPPG for the carrying out of EIAs is effectively undermined for the straightforward reason that a likely significant effect on air quality and health is automatically assumed by implication. This assumption will be used in any application of this proposed policy for every frac job regardless of its size, nature or location, thereby imposing an automatic EIA requirement (scoped again automatically by application of the definition to an assessment of the impact of operations on air quality and health impacts) - all contrary to statute and national policy and critically too without any evidential justification whatsoever.

Summary

In summary there is no justification or evidence to introduce a new definition of hydraulic fracturing other than that which already exists for associated hydraulic fracturing under the Inf Act 2015. In addition, there is no evidence or justification for a split between conventional or unconventional in the context of hydraulic fracturing. Finally, in terms of planning considerations the normal considerations of development should apply such as traffic, light and noise, which are already applied through the planning system.

It is clear, that with respect to hydraulic fracturing – it would be ambiguous and confusing to have different definitions being used by different regulators. In land use planning terms, the potential

surface impacts associated with the development of conventional and unconventional geologies are already clearly handled within the current planning framework.

One final practical issue is the determination of whether the rock has been fractured or not – this is certainly not something any local mineral authority is competent to opine on and should be left to the Oil and Gas Authority. UKOOG can foresee many issues with this practical situation.

UKOOG has explained that the industry is committed to treating all hydrocarbon proposals involving "associated hydraulic fracturing" as constituting EIA development. The interaction between the proposed introduction of a 500 metres buffer zone and the "broader" PPG definition of hydraulic fracturing together with the introduction of the additional text (set out below (MM43 86 5.124)) which suggests that exceptions to what is described as "the more restrictive approach set out in Policy M16 part b)" will only be considered in the context of applications involving conventional hydrocarbon development, however, creates, by implication, a policy presumption that all unconventional hydrocarbon development applications involving the use of hydraulic fracturing, which propose to breach the 500 metres buffer zone, will automatically fall to be regarded by the mineral planning authorities as EIA development.

In UKOOG's view this policy approach is in direct conflict with the statutory requirement set out in Regulation 5(4) of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 which provides that, when determining whether a hydrocarbon development is an EIA development, a planning authority must take into account the relevant exclusion thresholds and criteria set out in Schedules 2 and 3. The combined effect of the differentiation between unconventional and conventional development, the introduction of the buffer, the use of the broader definition and the terms of the explanatory supporting text as regards the different approach to assessment, is to remove the discretion and judgement of the planning authority which the law expects a planning authority to apply before it decides whether an unconventional gas proposal involving non associated hydraulic fracturing should be subjected to a formal EIA assessment. If that is not the case, then the obvious question to be answered is what purpose does the introduction of a sensitivity buffer and the use of the broader definition of hydraulic fracturing serve?

The benefit of the use of the statutory definition of associated hydraulic fracturing and the deletion of the proposed differentiation between conventional and unconventional hydrocarbon and the proposed buffer, is that it essentially removes the legal issues surrounding the interpretation and application of Policy M16 in its current form at a stroke. The important point for the MPAs to note is that the application of the approach advocated by UKOOG would not prevent any proposal involving hydraulic fracturing which did not meet the volumetric thresholds from being ultimately categorised as an EIA development. All that would be required was that it was screened for environmental impact in accordance with the requirements of Regulation 5(4), which is precisely what the law expects. The statutory discretion enshrined in the EIA regulations in relation to the assessment and categorisation of individual hydrocarbon developments in terms of their likely environmental impact (whether they target unconventional or unconventional reservoirs) would remain regardless of the volume of fluid involved.

'Where hydraulic fracturing is proposed in association with development of conventional hydrocarbons, the authorities will consider exceptions to the more restrictive approach set out in Policy M16 part b) where it is satisfied that, based on the circumstances of the specific proposal, it would not result in unacceptable impact on the protected area and full compliance with other relevant elements of the Plan can be demonstrated'.

In short it is not possible for a Local Plan to alter the law.