



This form will report compliance with your permit as determined by an Environment Agency officer

Site	Kirby Misperton A Wellsite		Permit Ref	402444/DB3002HE	
Operator/ Permit holder	Third Energy U K Gas Limited				
Date	10/10/2017		Time in		Out
What parts of the permit were assessed	PO2 Hydraulic Fracture Plan EPR/DB3002HE				
Assessment	Report/data review	EPR Activity:	Installation	Waste Op	X Water Discharge
Recipient's name/position	Operations Director				
Officer's name	EA Officers		Date issued	10/10/2017	

Section 1 - Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations. A detailed explanation and any action you may need to take are given in the "Detailed Assessment of Compliance" (section 3). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our [Compliance Classification Scheme](#) (CCS). CCS scores can be consolidated or suspended, where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your [local office](#).

Permit Conditions and Compliance Summary			Condition(s) breached
a) Permitted activities	1. Specified by permit	N	
b) Infrastructure	1. Engineering for prevention & control of pollution	N	
	2. Closure & decommissioning	N	
	3. Site drainage engineering (clean & foul)	N	
	4. Containment of stored materials	N	
	5. Plant and equipment	N	
c) General management	1. Staff competency/ training	N	
	2. Management system & operating procedures	A	
	3. Materials acceptance	N	
	4. Storage handling, labelling, segregation	N	
d) Incident management	1. Site security	N	
	2. Accident, emergency & incident planning	N	
e) Emissions	1. Air	N	
	2. Land & Groundwater	N	
	3. Surface water	N	
	4. Sewer	N	
	5. Waste	N	
f) Amenity	1. Odour	N	
	2. Noise	N	
	3. Dust/fibres/particulates & litter	N	
	4. Pests, birds & scavengers	N	
	5. Deposits on road	N	
g) Monitoring and records, maintenance and reporting	1. Monitoring of emissions & environment	A	
	2. Records of activity, site diary, journal & events	N	
	3. Maintenance records	N	
	4. Reporting & notification	A	
h) Resource efficiency	1. Efficient use of raw materials	N	
	2. Energy	N	

KEY: C1, C2, C3, C4 = CCS breach category (* suspended scores are marked with an asterisk), A = Assessed (no evidence of non-compliance), N = Not assessed, NA = Not Applicable, O = Ongoing non-compliance – not scored

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0
------------------------------------	---	---	---

If the Total No Breaches is greater than zero, then please see Section 3 for details of our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- the part(s) of the permit that were assessed (e.g. maintenance, training, combustion plant, etc)
- where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- any non-compliances identified
- any non-compliances with directly applicable legislation
- details of any multiple non-compliances
- information on the compliance score accrued inc. details of suspended or consolidated scores.
- details of advice given
- any other areas of concern
- all actions requested
- any examples of good practice.
- a reference to photos taken

This report should be clear, comprehensive, unambiguous and normally completed within 14 days of an assessment.

We have completed our assessment of the relevant sections of the Hydraulic Fracture Plan (HFP) submitted by Third Energy on 29th June 2017 to satisfy Pre-Operational Condition 2 of the environmental permit DB3002HE. The HFP now forms part of the operator Emissions Monitoring Plan.

A number of revisions have been made throughout the assessment process and the final version was received on 28th September 2017. In the final version dated 28th September 2017, the monitoring strategy has been revised and KM7 will be used for downhole geophones, replacing the proppant tracer and temperature logging techniques in the original plan.

We now consider that the information provided in the final HFP, dated 28th September 2017, satisfies Pre Operational Condition 2 of the environmental permit. The approved HFP is now part of the Emissions Monitoring Plan and becomes an Operating Technique in Table S1.2.

In summary, we consider that the proposals for monitoring are proportionate to the planned operations and adequate measures are in place for the protection of groundwater.

The HFP is also designed to meet the requirements of the Oil and Gas Authority (OGA) and agreement is also required from the OGA.

Please note:

As well as operating according to the HFP, permit conditions remain applicable to the hydraulic fracturing activities and the operator should particularly note condition 3.5.5 regarding calibration and use of monitoring equipment and the requirement to have a management system in place as per 1.1.1. Testing and confirmation of performance of the geophones must also be part of this system.

We note the commitments in sections 6.3 and 6.4 to assess and review the injection rates, pressures and microseismic data to adjust the injection program in the event that the models indicate that the fracs will exceed the permit boundaries.

Summary of Assessment

As part of the assessment we compared the submitted HFP to the requirements in the EA Oil and Gas Sector Guidance. We consulted with external experts with experience in modelling, seismicity and hydraulic fracturing regulation internationally.

During our assessment, a meeting was also held at Third Energy offices in London on 25th July 2017. This reviewed the interpretation of the 3D seismic data, which is summarised in the HFP, as required in the sector guidance.

Questions were subsequently asked in CAR 402444/0289652 to clarify and expand on the information required in the HFP and included some minor clarifications of wording and references. A response was received from the operator on 03/08/17 with a revised Hydraulic Fracture Plan.

We asked questions on the change of proppant to ceramic beads containing a tracer, digadolinium trioxide. The Waste Management Plan was updated as part of this assessment to include the proppant tracer and we asked further questions on the waste route for the proppant. Additional information on the properties of the ceramic proppant was received from Halliburton on 31st July 2017 describing the manufacturing route of the proppant.

The monitoring strategy has now been changed and instead utilises microseismic monitoring in KM7. Ceramic beads containing digadolinium trioxide tracer will no longer be used.

Faulting & Formation Stresses

A summary assessment has been provided in the HFP. Further clarification was sought in CAR 402444/0289652 on the interpretation of the seismic data, resolutions and assumptions, and we are satisfied that Third Energy have carried out a full study on this, made an assessment of the risk and presented this in the HFP.

Local Background Seismicity & Risk of Induced Seismicity

Information is provided in the HFP regarding baseline seismicity and seismic hazard assessment. With the changes requested on CAR 402444/0289652 and now included in the revised HFP regarding the decision tree, notification and additional information on geophones, we consider that the information provides sufficient assurance for the protection of groundwater.

Summary of Planned Operations & Permitted Boundary

The operational phases are described in section 3 of the HFP. Minor clarifications were sought in CAR 402444/0289652 on baseline logging, however with the new monitoring strategy some of these comments are no longer applicable and the operator has removed these from the HFP.

The operator has committed in section 6.2 to adjust injection parameters in the event of a frac model indicating that a frac will propagate outside the permitted boundary to prevent this from occurring.

Additional questions that arose during our assessment were asked on the 24th August by email and are listed below.

- *A review of the information provided in the HFP, with use of some estimated values, results in a wider range of surface pressures exceeding those provided in the plan in Table 3.1. Please could you reconfirm the surface pressure estimates provided from your pressure calculations, to inject the stated volumes.*
- *The maximum treatment rate is also listed as 50 bpm, which does not seem to be achievable in 2 hours for frac stage E. Please could you confirm whether the frac operation for stage E is either likely to exceed 2 hours or if increased rate and injection pressure are proposed.*

We are satisfied that the final submission of the Hydraulic Fracturing Plan addresses these points.

The email also highlighted that 2 items for clarification had not been addressed in the resubmission, these were:

5.3 Please include the full references for the Shapiro (2010) and Hallo et Al. (2014) papers in the reference list.

These references have been removed in the final version of the HFP.

6.5 Please confirm that you will pause injection if monitoring indicates that fractures, as well as fluids, are propagating upwards along a previously undetected fault.

This section has been removed from the final version of the HFP and the undertaking to do this has been made elsewhere in the document.

Monitoring Techniques

The monitoring technique in the HFP describes the use of geophones down an adjacent well, KM7, integrated with the geomechanical modelling. The extent of the monitoring data will depend on the depth, size and seismicity of the fracturing and the information will feed into the calibration of the geomechanical model.

In discussions about the proposed change to the monitoring technique, the following points were summarised by email on 25th September 2017 and sent to the operator.

- *A revised HFP must include any proposed change in monitoring strategy and justification for this.*
- *You confirmed that no other changes are proposed to the HFP apart from those relating to this change.*

- *Clarification should be made around the integration of the geomechanical modelling with the seismic monitoring proposals.*
- *The plan should include how the management systems will incorporate the calibration and maintenance of the proposed monitoring equipment*
- *That the HFP should refer to the extent of fracture propagation in a way consistent with the wording of the 2nd paragraph of the 'Introduction to the Hydraulic Fracture Plan' section in the revised HFP and omit reference to fluid propagation.*
- *The plan should include how you will demonstrate that the monitoring equipment is working effectively and to the required sensitivities, including tests by recording perf shots, or test shots at fracture depth.*
- *A statement of the action that will be taken if signals from the microseismic monitoring system are lost such that it is not providing adequate information.*
- *Responses to the original questions asked by email on 24th August 2017, either by email response or in a revised HFP are needed.*

Please also include a commitment, as discussed previously, that should the techniques used fail to provide the detail expected from the monitoring data at the lower frac stages, the upper frac stages A & B will be reassessed in light of the monitoring data obtained.

The submitted HFP received 28th September 2017 includes sufficient information regarding these points and we are satisfied with this approach.

Mitigation of risk of inducing an earthquake and well integrity

A seismicity mitigation decision tree has been included in Figure 5.3. The revised HFP figure 5.3 meets the requirements of the Environment Agency for assessment of well integrity and notification.

We requested that the operator also revise sections 2.3 and 7 to set out what would be done in the event of a loss of well integrity and that operations would stop in the event of loss of well integrity which resulted in a risk to the environment.

The operator has also included further detail on the operational boundary considerations in section 5.4 of the HFP and the potential of a geomechanical link to events inside the boundary.

We note that In section 2.3 the operator has included the commitment 'If a well integrity issue indicates the risk of emission to the environment, operations will be stopped immediately, and the EA informed.'

Reporting

Section 7 addresses communication and reporting. We are satisfied with the revision, with a morning report during hydraulic fracturing operations on top of the required notifications that have been detailed in section 2.3 and the decision tree. The operator has also committed to supply a comprehensive report at the end of hydraulic fracturing operations following analysis of data.

The submitted HFP fulfils the requirements of PO2 and this is now complete.



This form will report compliance with your permit as determined by an Environment Agency officer

Site	Kirby Misperton A Wellsite	Permit	402444/DB3002HE
Operator/ Permit	Third Energy U K Gas Limited	Date	10/10/2017

Section 3- Enforcement Response **Only one of the boxes below should be ticked**

<p>You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.</p>	
<p>Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further relevant information comes to light or advice isn't followed.</p>	
<p>In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.</p>	
<p>We will now consider what enforcement action is appropriate and notify you, referencing this form.</p>	

Section 4- Action(s)

Where non-compliance has been detected and an enforcement response has been selected above, this section summarises the steps you need to take to return to compliance and also provides timescales for this to be done.

Criteria Ref.	CCS Category	Action Required / Advised	Due Date
See Section 1 above			

Section 5 - Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- advise on corrective actions verbally or in writing
- require you to take specific actions in writing
- issue a notice
- require you to review your procedures or management system
- change some of the conditions of your permit
- decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you.

● We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.

● Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and or suspension or revocation of the permit.

● A civil sanction Enforcement Undertaking (EU) offer may also be available to you as an alternative enforcement response for this/these offence(s).

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- ensure you comply with other legislative provisions which may apply.

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance which could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General Information

Data protection notice

The information on this form will be processed by the Environment Agency to fulfill its regulatory and monitoring functions and to maintain the relevant public register(s). The Environment Agency may also use and/or disclose it in connection with:

- offering/providing you with its literature/services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law and taking any resulting action
- preventing breaches of environmental law
- assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Information Regulations request.

The Environment Agency may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The Environment Agency will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within 28 days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with the officer's line managers. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 03708 506 506 (Mon to Fri 08.00–18.00) and ask for the Customer Contact team or send an email to enquiries@environment-agency.gov.uk. If you are still dissatisfied, you can make a complaint to the Ombudsman. For advice on how to complain to the [Parliamentary and Health Service Ombudsman](#), phone their helpline on 0345 015 4033.