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Environment Agency

Our ref: KT/2013/117025/01-L01
Your ref: KCC/DO/0217/2013

Date: 14 October 2013

Mr Mike Clifton
Kent County Council
Planning Applications Unit
County Hall (Invicta House)
Maidstone
Kent
ME14 1XX

Dear Sir/Madam

TEMPORARY USE OF LAND (FOR UP TO 52 WEEKS) TO ALLOW DRILLING OF AN EXPLORATORY BOREHOLE TO TEST INSITU COAL MEASURES FOR METHANE GAS, INCLUDING PROVISION OF DRILLING RIGS AND ASSOCIATED SITE COMPOUND

FORMER TILMANSTONE COLLIERY, OFF PIKE ROAD, EYTHORNE, KENT, CT15 4ND

Thank you for consulting us on this planning application. We would like to offer the following advice:

Our Position

The applicant has not provided sufficient information with this application. We are therefore unable to advise whether or not the environment (in particular groundwater quality) can be protected from this development. We recommend that planning permission should not be granted on the basis of the information provided and that you seek additional information to address the matters outlined below. We look forward to reviewing this information when it becomes available. If it is not possible for this information to be provided, then we would be minded to object to the application.

For full detail on the further information required, please refer to the Appendix. It should be noted that this application is for exploration, and so our comments relate

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solely to this phase. We understand that any subsequent proposals for longer term testing or for exploitation/ production would require new planning applications. At that stage, we would make additional comments.

Context

This proposal involves drilling, construction and installation of exploration wells through the entire thickness of the chalk aquifer (specifically the Margate member, a principal aquifer). Groundwater in principal aquifers provides significant quantities of water for people and may also sustain rivers and wetlands. The proposals represent a risk to this aquifer by potentially introducing pollutants, creating turbidity (fine particles of chalk) and making preferential pathways for pollutant transport. The applicant therefore must demonstrate how the aquifer will be protected from this development.

Earlier this year, we held a joint meeting with the applicants and the water companies (Affinity Water and Southern Water). During this meeting, we emphasised the importance of addressing the groundwater risks in the application, therefore we are disappointed with the level of information that has been provided.

Site Specific Geology

At this location, the groundwater is abstracted for agricultural use, as well as providing base flow to the down gradient surface waters. Groundwater flow in the chalk is strongly controlled by fissures and flow can be very rapid. This means that any contaminants entering the chalk could reach abstraction boreholes and surface waters very quickly.

There are a number of risks to groundwater quality associated with any activity that causes a physical disturbance within the aquifer. It is therefore essential to protect the aquifer from pollution during the drilling of this borehole.

Please note, Section 8.10 of the Supporting Statement indicates that there are silts, sands and gravels over Triassic/coal measures that contain groundwater and that this is hydraulically connected to the water level in the River Avon. This information is geographically and geologically incorrect and should be amended to reflect the local environmental setting.

Supporting Policy

The following policies support the principle that groundwater quality must be protected from potentially polluting development. This proposal clearly poses risks to the aquifer and further information is needed to show that these risks can be managed.

- The *National Planning Policy Framework* paragraph 109 states that the planning system should contribute to the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable

levels water pollution.

- *Kent Minerals Local Plan: Oil and Gas* Policy OG2 states that proposals for exploratory drilling will normally permitted where, having regard to the geological structure, the planning authority is satisfied that the proposed site has been selected to minimise its environmental and national resource impact.

- Our approach to groundwater protection is set out in *Groundwater Protection: Principles and Practice* (November 2012). We will oppose development proposals that may pollute groundwater especially where the risk of pollution is high and the groundwater asset is of high value. We seek to enable development by ensuring that applicants provide adequate information to demonstrate that the risks posed by development to groundwater can be satisfactorily managed.

- Under the Water Framework Directive, the South East River Basin Management Plan requires the restoration and enhancement of water bodies to prevent deterioration and promote recovery of water bodies. Without further supporting information, the proposal could potentially cause deterioration of groundwater quality and prevent the recovery of a drinking water protected area with the East Kent Stour Chalk Groundwater Body. In the event of the groundwater being polluted there could be a longer-term detrimental impact on the surface water system.

Other Permits and Consents

The supporting statement has not referred to the Environment Agency consents that this development may require. The applicant is aware of our draft document *Onshore oil and gas exploratory operations: Technical Guidance,* which is currently out for consultation until the end of October. This outlines our permitting requirements for all unconventional gas operation including coal bed methane. In summary, the following permits may be required for this operation:

- The applicant must notify the Environment Agency of their intention to drill a borehole(s) in accordance with section 199 (1) Notice etc. of mining operations which may affect water conservation (Water Resources Act 1991)

- Environment Permits for:

    - Groundwater activity – very likely to apply in this case
    - Mining waste activity – this is likely to apply in all circumstances
    - An installation under the Industrial Emissions Directive – when there is an intention to flare more than 10 tonnes of waste gas per day
    - Radioactive substances activity – likely to apply in all circumstances where oil or gas is produced due to Naturally

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Occurring Radioactive Material (NORM) which may be stimulated during operations.
- Water discharge activity – if surface water run-off becomes polluted, for example, due to a spill of diesel or waste fluid contaminated during the process

- Abstraction Licence – in the event that water needs to be sourced from a supply other than a water company and the required volume of water is in excess of 20m^3/day. We note the application states that water will be sourced from a local farm. We recommend the applicant contacts us on ksl_uge@environment-agency.gov.uk to discuss possible licensing requirements at the earliest opportunity.

- Dewatering – The Water Act 2003 defines dewatering activities as a regulated activity. However the Commencement Order, which would bring this into force, has yet to be issued. Defra has published a timetable which indicates when dewatering will become regulated. We strongly recommend the applicant contacts us prior to the test pumping phase to clarify whether or not a permit is required at that time. Please contact us on ksl_uge@environment-agency.gov.uk.

It is likely that the permits will require groundwater quality monitoring before, during and after drilling, therefore additional boreholes may be required and a monitoring plan will be required. Significant additional information will be required to satisfy the permit applications; however we feel that it is important that the key elements (particularly groundwater protection, waste and air quality) are addressed at the planning stage.

Ecology
We recommend that Natural England is consulted to ensure effective mitigation is put in place to protect the adjacent badger sett from noise and vibration during drilling.

Please do not hesitate to contact me if you require clarification on the matters within this letter.

Yours sincerely

Andrew Pearce

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Appendix: Further Information Required

The following section sets out the information we feel is required to enable us to come to an informed position on this application:

Construction and Drilling of the Borehole

Section 8.1 of the Supporting Statement needs to be expanded to provide more detail on how the groundwater will be protected during these operations. Ideally, this should be in the form of a Hydrogeological Risk Assessment, to ensure all of the risks to groundwater are fully identified and that adequate measures can be put in to address all of the issues identified. This should include a detailed method statement covering the following:

- Information on how the different geological strata will be cased, sealed and grouted to protect the aquifers from contamination by the drilling fluids and also to prevent mixing of groundwater from different aquifers.
- Explanation on how pollutants associated with the colliery spoil and other surface activities will be prevented from migrating downwards into the aquifer during drilling.
- The monitoring systems to be used during drilling to ensure that the groundwater environment, local abstractions and springs and streams are adequately protected.
- Explanation of how monitoring water levels in the borehole will indicate that the borehole is sealed. The applicant must set out how the integrity of the borehole will be tested.

Section 8.4 states that there are no mine workings in the immediate area. This may be a reasonable assumption based on the map included in the report; however caution should be applied during drilling process in the event that the maps are inaccurate.

Vibration

Section 8.14 states that the perceived level of risk from vibration is low. This conclusion has been drawn because early stage drilling is through soft overburden and this will absorb any vibrations. However, the Chalk formation is not considered as soft; therefore further discussion on this point may be necessary. The impact of vibration is likely to be a human health concern, therefore within local authority remit rather than ours. However any impacts on the drainage and infrastructure from vibrations could affect the environment.

Testing Phase

The methodology of the testing phase should be provided. We require further awareness and knowledge from the applicant and the coal bed methane industry. We

had understood, from experience at other coal bed methane sites, that water is usually pumped from the exploration borehole to lower the water table in the coal layers and to enable the evaluation of the available gas levels in the ground. The information in the Supporting Statement differs from our general understanding of the process. We require clarification. In the event that water is to be pumped from the borehole the Supporting Statement has not identified the likely resulting need for on-site liquid storage and the considerable tanker movements to remove the water from the site. This water is likely to be highly saline, therefore appropriate storage and disposal is critical to prevent pollution to the groundwater. Appropriate testing and disposal options will need to be put in place.

Site Infrastructure

Further information should be provided in Section 7.4 of the Supporting Statement, in particular regarding the drilling platform. This is to ensure any liquid spills are not able to infiltrate into the ground. We note the applicant proposes a geo-textile membrane and a layer of hard core as the base of the drilling platform. While this is standard practice at oil exploration and production sites, no additional hydrogeological risk assessment has been undertaken and so no additional precautions have been suggested for such a highly vulnerable groundwater area.

Details of how this will be constructed should be provided. There is a risk that the membrane could be punctured by heavy vehicle movement, and thus create a pathway for contaminates to reach the groundwater. We request information on how the membrane will be sealed, protected from puncture and tested. We believe that an assessment should be carried out to determine whether additional layers of protection layer should be provided at this vulnerable location to protect the groundwater and abstractions. At present this has not been adequately researched.

Ground Conditions

Section 7.5 states that a detailed survey will be conducted during the development process. Further information should be provided on what this will consist of. Soil chemistry testing must be carried our prior to works to establish a baseline, as well as testing during the decommissioning phase. Due to the previous use of this site as a colliery, the planning application should be accompanied by a preliminary risk assessment. The use of the land may have left contamination which could impact on the proposed development or on the aquifer.

An assessment into the past uses of the land and any potential risks arising from this should be carried out. Any identified risks should be fully evaluated, if necessary by intrusive investigations and appropriately addressed prior to commencement of development. This information will help establish suitable mitigation measures for the drilling process.

Surface Water Drainage

Clarification of the proposed surface water drainage system is necessary to ensure controlled waters are not polluted. We note that surface water is to be collected in

perimeter cut off ditches. The plan supplied is not clear on the location of the drainage ditches. Construction details should also be provided, including reference to how the ditches will be lined. The design of the interceptor tank should also be provided. The applicant should include rainfall calculations to demonstrate that the drainage system can accommodate storm events. This is relevant because if the drainage system or tanks are inadequate and become surcharged, it could lead to contaminated surface water running off the site.

We understand that the surface water will not be discharged to ground. In the event that a discharge is proposed, further information and an appropriate permit application will be required.

Aquifer Units

Section 7.7 and 8.3 should identify all the aquifer units. This is so that a methodology can be prepared to seal each unit, safeguarding them from cross contamination. A detailed review of local geological information should be carried out to ensure the encountered geology is as expected. We note that although the Chalk aquifer has been identified, other aquifers (for example the Lower Greensand aquifer) have not been identified. These will also need protection.

Drilling Fluid

Soluble substances in the drilling fluid have the potential to pollute the groundwater during the operations. It is not clear from the documentation whether the vulnerable groundwater conditions, and the proximity to the abstraction boreholes, have been taken in to account when assessing the suitability of the proposed drilling fluids. The applicant should be encouraged to carry out a hydrogeological risk assessment to determine the risks to the groundwater and determine the types of drilling fluid that are suitable. We note that “Pure-Bore” is the anticipated drilling fluid used. The applicant should confirm whether the proposed drilling fluid is to be used over the entire length of the well, or whether other substances are to be used or added to the drilling fluid.

Please note that although Pure-Bore has been accredited for use in marine environments, this does not automatically mean that it is suitable in a freshwater chalk aquifer. The information provided suggests Pure Bore is suitable for unconsolidated formations, but it is not clear if it is suitable for use in the fractured groundwater environment such as the Chalk. Safety data sheets should be provided, showing the chemical makeup of each substance to be used, along with justification for their use. Please note, this will also be required in detail at the permitting stage.

Restoration

The restoration proposals outlined in Section 8.18 require additional detail. They do not provide assurance that cross contamination of different aquifers (particularly in the long term) will be prevented. The restoration proposals might work well for a shallow borehole; however as this borehole will pass through different geologies, at great depth, the groundwater conditions may potentially vary greatly. Further

assessment should be carried out to establish suitable decommissioning materials for the entire length of the well and an appropriate methodology. The applicants should be encouraged to submit an “as completed” borehole log. This is a log of the geology of the exploration borehole as drilled, rather than a prediction of the geological layers. It will enable a better design of the restoration phase to protect the groundwater environment. This information may be submitted following well completion, as further geological information will be apparent at that stage. Therefore it should be possible to secure restoration details by condition.

Waste (including Waste Water)

The application has not stated the nature of waste that will be generated on site, or outlined how it will be segregated, stored and disposed. Some of this waste may be hazardous, highly saline, contain heavy metals and naturally occurring radioactive materials. It is therefore crucial that drilling waste (including waste water) is not taken to a conventional disposal facility as this could result in harm to human health or the environment. More information on this should be provided with the application. In particular:

- A description of each waste type (including waste waters) expected to be produced
- An estimate of the quantity of each type of waste expected to be produced
- Precise storage locations on site for each type of waste, including details on their containment/ bunding and pollution prevention measures
- Explanation of how waste will be segregated on site and a description of the methodology and processes for sampling, testing Waste Acceptance Criteria (WAC) analysis and classification/ characterisation of the waste to ensure appropriate disposal.

We note that although it will not be possible to determine the destination of all waste streams until each type has been tested and analysed, potential disposal sites for all contingencies should be identified in advance. Although this information would typically be provided at the permitting stage, the waste management aspects of this proposal are also planning considerations. We therefore recommend that these questions are answered prior to grant of planning permission. To meet permitting requirements, the applicant will need to provide further information on their chosen disposal sites.

Air Emissions and Gas Flaring

It is unclear whether or not there will be gas flaring during the testing phase. In the event that gas is flared further details are likely to be required on air quality monitoring. The requirement for a permit will be determined by the volume of gas produced, and in the event that a permit is required further information will need to be provided. The presence and height of a flare stack would be pertinent to the planning process.

Summary

In summary, the applicant will need to provide the following information for us to properly determine the risks to groundwater from the proposed development:

- Details of the drilling methodology
- Casing design
- Measures to protect groundwater in the chalk aquifer
- Groundwater monitoring strategy, including groundwater quality and turbidity
- Monitoring systems to be used during drilling
- Construction details of the site infrastructure
- Detailed plan and construction details for surface water drainage system
- Preliminary Risk Assessment
- Detailed review of the geological information
- Details of any drilling fluids used, how these will be introduced, how volumes will be monitored and how groundwater will be protected
- Additional details for the restoration proposals
- Quantified risk assessments
- Contingency plans to deal with the risk of turbidity (Chalk fines from drilling process) at abstractors boreholes or in springs or streams
- Contingency plan in the event of any loss of potentially polluting materials (such as drilling muds, process water or flow back water)
- Following borehole completion, an “as finished log of the borehole
- Information on waste (both solid and water) – in particular the quantities, on site storage arrangements, means of treatment and disposal off site
- Clarification of air emissions and need for flaring

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