EPP5(S)

APPEAL BY ISLAND GAS LTD, PORTSIDE
ELLESMERE PORT

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GEOLOGY

SUMMARY PROOF

by

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EXPERIENCE

I am a senior consultant in geology and the environment. My main client in 2018 has been the United Nation's Development Program (UNDP), a branch of the World Bank Group, advising them on mineral resources in Afghanistan. I hold an Upper Second Class Honours Degree in Geology and Zoology with subsidiary Botany from the University of Manchester, followed by a 3-year postgraduate scholarship at Manchester awarded by the National Environmental Research Council. During tenure, I was awarded a Master's Degree in Geology by research on the buried bedrock topography between Manchester and the Mersey Estuary, in which I gathered and analysed the logs of several thousand boreholes, including many from the Ellesmere Port, Stanlow and Wirral Peninsula. I also discovered and described the freshwater Eccles Mudstone as a unit on top of the Manchester Marl (**EP16)**.

I was Lecturer in Geology at Wigan and District Mining & Technical College and Secretary of the Wigan & District Geological Society. Due to intensive fieldwork I became a leading expert in the regional geology of the Carboniferous sequence of North-West England and North Wales. As a result, I became Senior Consultant with Oldham Associates through which I became Adviser to more than twenty exploration companies engaged in exploration for oil and gas in North-West England and offshore in the East Irish Sea Basin, and the East Midlands Oilfields.

In my career I have been Team Leader of major international projects: in Albania, Mongolia, Kazakhstan, Kyrgyzstan and Afghanistan including developing major coal mines and gold mines in the Gobi Desert, mapping silver, gemstones, jade, talc and lapis lazuli in the Hindu Kush.

This proof of evidence is largely based on geological information I obtained as a result of work I did on behalf of my clients, consisting of more than 20 oil and gas exploration companies who purchased Report 84/4 in 1984: *"Prospects and Plays in North-West England and the East Irish Sea Basin."* This was the leading report guiding oil and gas exploration in the region at that time.

The Nature of the Resource at Ellesmere Port -1

1. Ellesmere Port-1 is implausible as a conventional well and, in my professional judgement, was drilled for unconventional oil and gas. I am concerned that fractured chert is the target.

2. IGas suggests that the Pentre Chert is a conventional target stating that "*This geometry allows for an accumulation of conventionally trapped hydrocarbons within the Pentre Chert in a stratigraphic pinch out".* My reappraisal of the geology shows scant evidence of a pinch-out on 2-D seismic line along the highway past Ellesmere Port-1 by Shell, and the repeat of that line by confidential 3-D seismic would be wholly insufficient to determine if a pinch-out was present.

Seismic Activity

3. There are at least four faults in close vicinity to Ellesmere Port-1 and, if no fault planes were intersected when drilling then that would have been surprising, albeit not impossible.

4. In my opinion, by trying to produce gas from a fault zone in fractured chert, IGas is creating a significant risk of a sudden blowout of inflammable gas, especially if the reservoir is confined to the fractured fault zone. At face value, the seismic activity indicates natural faulting is active in the vicinity of Ellesmere Port-1, and therefore the possibility of triggering movements in the well is significant.

5. Seismic activity is present in remarkably close proximity to the EP-1 well. Therefore prior to operations IGas should have conducted a seismic assessment, and established a small network of local seismic stations throughout and after operations. IGas should, as a matter of course, submit such information to the Inquiry. IGas should put in place a seismic monitoring station several months in advance of any activity at the well, and continue the monitoring for several months after such activity ceases.

Hydrogen Sulphide

6. I note that the Air Quality Impact Assessment submitted with the Planning Statement [CD 2.4 Appendix 11] states that: “The natural gas produced during the DST and EWT is not expected to contain hydrogen sulphide (H_2S).”

7. The risk of encountering a pocket of sour gas with dangerous levels of toxic, explosive, inflammable hydrogen sulphide (H_2S) is also significant. By drilling far deeper than the coal measures IGas entered a completely different hazard regime, including H_2S, by drilling into the older rocks of the Bowland Basin.

Risk to watercourse

8. The British Geological Survey (BGS) has reported the presence of extraordinarily high concentrations of toxic heavy metals at two BGS sample sites of sediment soils deposited in a surface stream in close proximity to Ellesmere Port-1. In view of the proximity of the development to seismically active faults and presence of porous superficial sediments plus exposure of the region’s most important aquifer, then the risk of the development disturbing the sediments containing high concentrations of toxic heavy metals is unusually high. This is a real risk and there is no scientific evidence showing that the risk may not occur, and so a precautionary approach should be taken.

9. I am concerned that one or more of the many faults in the Ellesmere Port area that cuts through the sandstone aquifer may be seismically active and thereby the risk of contaminating the sandstone aquifer by toxic heavy metals from the stream sediments may be significantly increased; again an event that cannot be reversed.

Conclusion

10. There are a number of risks or impacts arising from the geology of the area which are relevant to whether permission should be granted for the IGas application. Each of these risks are real and mean that a precautionary approach should be taken and that the testing should not take place unless IGas can first demonstrate that these risks will not materialise.

Robin Grayson

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