National Oceanography Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

# *Environmental Risks of Fracking*


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## About us:

[5] The National Oceanography Centre (www.noc.ac.uk) is part of the Natural Environment Research Council (NERC) and is the UK national focus for Oceanography. It undertakes large-scale, long-term oceanographic research from coast to Deep Ocean. It provides national capability in oceanographic sciences

## Declaration of interests:

[6] NOC welcomes the opportunity to respond to the Commons Select Committee inquiry into the Environmental Impacts of Fracking. The National Oceanography Centre (NOC) is a focal point for UK Marine Science and many of its programmes are funded through public money, accessed via NERC and ESPRC as well as other government departments such as DEFRA.

## Submission Date:

[7] 19th December 2014

## Consultation Questions:

### What are the risks from fracking operations in the UK, including potential risks to water supplies and water quality, emissions, habitats and biodiversity, and geological integrity?

[8] Fracking can occur both onshore and offshore. It is currently unknown exactly what the scale of the offshore unconventional hydrocarbon resources accessible by fracking is. Nevertheless it is likely that there is great potential in the offshore resources (Economic Affairs Committee – 3rd Report - The Economic Impact on UK Energy Policy of Shale Gas and Oil). If sustainably managed in compliance with existing (and potential future) legislation then that exploitation unconventional hydrocarbons through fracking activities could contribute significantly to the Blue Growth of the UK economy.

[9] The cost of offshore extraction is thought to be an order of magnitude larger than onshore (www.publications.parliament.uk/pa/ld201314/ldselect/ldeconaf/172/17207.htm). Therefore offshore fracking has not been undertaken at scales large enough to support commercialisation of unconventional hydrocarbons extraction. Despite this in February 2014 DECC awarded licences for exploration in the Irish Sea (www.independent.ie/business/irish/uks-nebula-gets-licence-to-explore-irish-sea-fracking-30012998.html) and there have been plans proposed for exploration of Swansea Bay (www.bbc.co.uk/news/uk-wales-16567883).

[10] Offshore fracking carries environmental implications. The fracking process uses a mixture of water and chemicals to displace the oil and gas in the rocks (fracfocus.org/chemical-use/what-chemicals-are-used). These chemicals may have unforeseen environmental impacts, especially if they are able to leak out into

the marine environment. Therefore sustained environmental monitoring of the offshore fracking area is needed, as well as high quality geophysical surveys of the substrata, before, during and after, to understand the geological implications of the fracking process.

[11] Any activity that disturbs the seabed, e.g. drilling and installing platforms, may impact habitats and organisms that live there. Furthermore the noise generated (as yet un-quantified) from the fracking process, may cause unforeseen effects to a wide range of organisms, especially those that are highly sensitive to sound (e.g. wales and dolphins). Furthermore, this disturbance from underwater noise will likely have impacts on organisms that are not localised to the fracking site because of the naturally greater propagation of sound in water.

### What are the necessary environmental safeguards, including through the planning/permitting system?

[12] Any activities, (including placing any structures on and taking matter from the seabed) being undertaken in English and Welsh EEZ waters must be licenced and as such regulated by the Marine Maritime Organisation (MMO; www.gov.uk/government/organisations/marine-management-organisation). In Scotland, Marine Scotland is responsible for the offshore regulation of activities rather than the MMO and as such for Scottish EEZ waters MMO should be read as Marine Scotland in this response.

[13] Currently the MMO is developing marine plans (www.gov.uk/government/policies/protecting-and-sustainably-using-the-marine-environment) around the coast of the UK to regulate the competing demands on the marine environment and ensure that it is sustainably used. Therefore, any fracking activities would have to be compliant with this marine spatial planning process and report to the MMO.

[14] The marine plans being implemented by MMO and Marine Scotland are required by the Marine and Coastal Access Act 2009 (www.legislation.gov.uk/ukpga/2009/23/contents) for England and Wales and the Marine Scotland Act 2010 (www.scotland.gov.uk/Topics/marine/seamanagement/marineact) for Scotland. As such these acts should also be considered were future fracking activities to be undertaken offshore.

[15] Further directives and policies governing both UK and European waters to ensure protection of the marine environment, minimise environmental impacts and ensure sustainable exploitation of resources. Include the Marine Strategy Framework Directive, the Water Framework Directive and the Habitats Directive.

[16] The Marine Strategy Framework Directive (MSFD; ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm) is a European Directive, coordinated nationally by the Scottish Government, Defra, the Northern Ireland Executive and the Welsh Government, ensuring that European Seas are Clean, Safe and Biologically Diverse and achieve Good Environmental Status by 2020. Of particular relevance to the offshore fracking industry are the following descriptors which each (will) have targets and standard to be met in UK waters:

- Descriptor 6 – Seafloor integrity ensures functioning of the ecosystem
- Descriptor 8 – Concentrations of contaminant gives no effects
- Descriptor 11 – Introduction of energy (including underwater noise) does not adversely affect the ecosystem (noise energy and its impacts on the marine environment are not currently well understood or documented).

[17] The Water Framework Directive (WFD; ec.europa.eu/environment/water/water-framework/), is another European policy, implemented nationally, which ensures the good quality of the land based water resources out to the very edge of the coastal environment (up to 1 nautical mile offshore), would need to

be complied with particularly if fracking for offshore resources was undertaken through horizontal drilling techniques onshore. In particular the WFD looks to ensure the quality of its waters through ensuring chemical quality standards in waters.

[18] The Habitats Directive (ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm) aims to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. The directive covers offshore waters (in this UK this is 12 nautical miles from the coast out to 200nm or to the limit of the Continental Shelf Designated Area). The Habitats Directive is transposed into UK law by the Offshore Marine Conservation Regulations 2007.

[19] For a summary of all the legislation and policies, governing and protecting the marine environment in the UK please refer to the following publications:

- Boyes, S.J. & Elliott, M. (2014) Marine Legislation – the ultimate 'horrendogram': International Law, European Directives & National Implementation. Marine Pollution Bulletin, 86, pp. 39-47.
- Boyes, S.J. & Elliott, M. (2015) The excessive complexity of national marine governance systems - has this decreased in England since the introduction of the Marine and Coastal Access Act 2009? Marine Policy, 51, pp57-65.

[20] Working with platforms in the UK such as the Marine Science Coordination Committee (www.gov.uk/government/groups/marine-science-co-ordination-committee; e.g. the Marine Industry Liaison Group will help to ensure that the fracking industry understands the environmental implications of the exploitation in the marine environment and vice versa. Furthermore, groups such as the MSCC's Underwater Sound Forum enable contentious and unresolved issues such as the impact of noise in the marine environment to be openly discussed and further investigated by both the academic and industrial communities. UK learned societies and professional bodies (www.imarest.org and www.sut.org) also have active working groups, which could also offer advice on offshore fracking activities.

[21] Furthermore, if fracking were to occur in the offshore environment there would need to be appropriate long-term monitoring programmes in place in order to ensure that any chemicals were not able to leak into the marine environment. The technology (www.noc.ac.uk/research-at-sea/nmfss/mars) being developed at NOC is well placed to work alongside the fracking industry, using autonomous robotic systems with in built sensors to monitor the water quality, cheaply and efficiently around fracking sites. Work is already underway at NOC to develop its robotics fleet for monitoring of the integrity of CCS sites (www.noc.ac.uk/news/noc's-vital-expertise-£1m-industry-project)

[22] If, in the future, offshore fracking for unconventional hydrocarbons were to take place, the knowledge and expertise of the National Oceanography Centre could help to deliver sustainable management practices of any activities, from advice on existing legislation to be aware of through to scientific monitoring and specialist data collection from and around offshore sites (including geophysical data, benthic habitat imaging and autonomous robotic system monitoring).

### What are the implications for our carbon emissions reduction obligations?

[23] No comment.