

Proposed Terms of Reference for EPA/DCENR/NIEA Research Programme on Environmental Impacts of Unconventional Gas Exploration & Extraction (UGEE)

SUMMARY

1. Background - Unconventional Gas Exploration & Extraction

Unconventional Gas Exploration & Extraction (UGEE) refers to the use of high volume hydraulic fracturing (fracking) of previously impermeable rock to permit the extraction of natural gas on a commercial scale from unconventional sources such as shale gas deposits, coal seams and tight sandstones.

2. Unconventional Gas Exploration & Extraction on the Island of Ireland

In the Republic of Ireland, Onshore Petroleum Licensing Options granted to:

- (i) Tamboran Resources PTY Ltd over 986 sq km in the Northwest Carboniferous Basin.
- (ii) Lough Allen Natural Gas Company Ltd over 467 sq km in the Northwest Carboniferous Basin.
- (iii) Enegi Oil Plc over 495 sq km in the Clare Basin

The three options expire in February 2013, by which time the licence holders will have to decide whether to apply for a licence or relinquish the acreage.

In Northern Ireland, Tamboran has secured an Exploration Licence from the Department of Enterprise, Trade and Investment (DETI).

3. Previous Research on Unconventional Gas Exploration & Extraction

In May 2012, preliminary study “Hydraulic Fracturing or ‘Fracking’: A Short Summary of Current Knowledge and Potential Environmental Impacts” published. Conducted for the EPA by University of Aberdeen. Included a review of regulatory approaches used in other countries and areas for further investigation and research.

The **key questions** this (further) research needs to answer are:

1) **Can this technology be used whilst also fully protecting the environment and human health?**

If the answer is **yes**, then:

2) **What is best environmental practice in using the technology?**

4. Funding Organisations

(i) EPA - independent statutory body. Funds research programme ‘STRIVE’ through the Department of Environment, Community and Local Government (DECLG).

(ii) Department of Communications, Energy and Natural Resources (DCENR). The Petroleum Affairs Division and the Geological Survey of Ireland (GSI) are within DCENR.

(iii) Department of the Environment of Northern Ireland (DOENI). DOENI will regulate fracking in Northern Ireland through the relevant planning permissions and/or the required environmental permissions informed by this research.

5. Further Research

This programme of research is being administered by the EPA STRIVE Programme. Steering committee includes representatives from DCENR, DECLG, the Commission for Energy Regulation (CER), An Bord Pleanála (ABP), GSI, the Northern Ireland Environment Agency (NIEA) and the Geological Survey of Northern Ireland (GSNI).

RESEARCH AREAS:

PROJECT-A: BASELINE CHARACTERISATION. Timescale 20 months

Hydraulic fracturing inherently involves geo-mechanical risks. Given that there are advanced license applications in three areas (Co. Clare, Co. Leitrim & Co. Fermanagh), these areas shall be used as 'case studies areas', through which the methodologies can be developed, applied and evaluated.

Project A-1 (groundwater, surface water and associated ecosystems):

Potential impacts on groundwater, surface water and associated ecosystems.

- Development of sub-regional geological/hydrogeological characterisation and conceptual model based on all of the available existing data for the case study areas.
- Baseline groundwater monitoring undertaken for a minimum period of 12 months.
- Assessment of the vulnerability of groundwater resources from both surface and subsurface UGEE¹ activity related (including fracking) potential hazards and pathways.
- An assessment of the direct (e.g. abstraction) and indirect impacts (e.g. drinking water) of using of local water sources for UGEE and specifically, fracking.
- Implications of recycling the flowback water for reuse in further fracturing operations.

Project A-2 (Seismic Impacts)

Review of seismic risk control regimes and make recommendations for systems applicable to Ireland, with particular reference to case study areas.

- Seismic monitoring shall be undertaken for a minimum period of 12 months, with provision for the on-going operation and maintenance of the network.

PROJECT-B: FRACKING OPERATIONS, IMPACTS & MITIGATION MEASURES. Timescale 9 months

- Water Impacts and Mitigation Measures: Potential environmental impacts of UGEE on groundwater and other water bodies, including methane and chemical and other contaminant migration, both from surface as well as subsurface potential sources.

Mitigation measures to address these potential impacts should be critically reviewed and presented.

- Other Potential Impacts and Mitigation Measures: Impacts from UGEE operations on other areas, which shall include, but not be limited to human beings, flora & fauna, air, – both local and global (i.e. CO₂) impacts, climatic factors, landscape, material assets and cultural heritage. Mitigation measures to address these potential impacts should be critically reviewed and presented.
- Life-Cycle Assessment: Assessment of cumulative environmental impact of unconventional exploration gas (?) and compared with similar published assessment of other energy sources.
- Chemicals: Ascertain current and emerging practices in the context of avoidance of the use of additives that have the potential to harm the environment.
- Identify best practice for monitoring both physical and environmental (impacts). Identification of best practice in self-regulation during all phases.

PROJECT-C: REGULATORY FRAMEWORK FOR ENVIRONMENTAL PROTECTION. Timescale 9 months

Identify all regulatory requirements and best operational practices associated with the establishment and operation of a “UGEE development” in an Irish context.

- Regulatory approaches of other countries that have extensive experience with this activity. Potential role of Health Impact Assessment in regulation of UGEE. Minimum of five countries to be examined including at least one country where a moratorium on unconventional gas exploration has been introduced.
- Best practice for UGEE operations: Best practice in relation to UGEE operations including: water resources management, risk management/minimisation and treatment, avoidance or mitigation of detrimental seismic events, use of chemicals, well-head construction, residuals management and air emissions management.
- Public engagement: Examine a minimum of five case studies of public engagement in UGEE projects. Recommend the most appropriate strategy in the Ireland / Northern Ireland context.

6. Contractor Experience and Conflict of Interest Issues

Applicants shall be required to demonstrate in-depth knowledge of a range of legal, environmental, socioeconomic and technical issues including knowledge of mineral and fossil fuels (preferably unconventional gas) extraction practices and technologies.

7. Indicative Timeframe:

- Jan – March 2013 Public Consultation on UGEE research programme
- April 2013 Announcement of research funding opportunity via e-Tenders
- May 2013 Deadline for submission of Tenders

- May/June 2013 Evaluation and Negotiation Process
- June 2013 Award of Successful Tenders