

## Proposed terms of reference

The following is a response to the public request for comments on the proposed **terms of reference** for research on UGEE. It is requested that all the following points be taken into account and included in the final terms of reference.

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References to the draft for consultation, pages 1 to 8 are indicated in *italics*

Draft1

*Page one of eight*

*Title*

Change title to read “ physical environmental impacts” rather than “environmental” in order to emphasise that there are matters of public concern outside the remit of the current proposed research.

*One*

*second line*

word "use" : replace with " entire process of which" and continue on the end of line four “forms a part of a process"

rationale: otherwise the process as described on page 7 may appear to be omitted in favour of simply considering a narrow short-term activity of pressurising fluid into the well.

*Second paragraph*

“Pumping a water rich" replace with "pumping volumes of water rich"

rationale: one major problem arising is a very large volumes of water involved .

*Fifth line*

Replace "water containing released natural gas" with "much of the water containing released natural gas and other acquired substances"

rationale: not all of the water returns by any means. Also many other fluids and materials, sometimes radioactive, can be released along with the gas.

The word 'shale' is used in this paragraph for the first time.

1A

These terms of reference are seriously flawed because they do not contain a section on "scope".

The following paragraphs must be included in order to avoid confusion by tenderers, to make it absolutely clear to the public what is encompassed by the study; and to highlight to those responsible the work that needs to be done elsewhere on the same technology, outside the current proposed study.

INSERT:

"Scope

The scope of this research programme is limited to the environmental impacts, particularly the physical environmental impacts of UGEE. In particular, public health issues not affected by environmental factors; social and economic impacts on different sections of society and industry are not considered by the research"

Rationale: the economics impacts of UGEE, the social impacts and the public health impacts are outside the competence of the Authority; it would not be appropriate to facilitate research in these areas, however desirable such research might be.

INSERT:

Scope: the scope of this research should cover the first "non-desk" actions (seismic surveys, core samples) through alloperations till the decades of the possible arrival of deep water to surface aquifers after 10 or 20 years.

Rationale: "spa" water is often advertised as coming from the depths at which hydraulic fracturing occurs. Furthermore the University of Montpellier in France has identified that it can take 14 years for water to rise from those depths to join surface water. The Environmental Protection Agency and the public need to be aware of these hazards before any commencement of work or licensing so the potential effects, hazards and threats to the public purse in time to come can be anticipated and ameliorated.

2

*First line in the third paragraph:*

"give the holder the first right": replace with "give the holder the first refusal"

Rationale: the license option does not appear to give "rights" to any exploration licence. It is up to the Minister to offer a licence if he chooses; the proposed wording may be a little more accurate.

*Third last line*

"Any operations involving hydraulic fracturing would require an environmental impact assessment"

This statement would appear to be seriously inaccurate. It is understood that a site in the UK, close to Blackpool, was fracked without an environmental impact assessment, the operators having exploited a loophole in the regulations. (This subsequently caused to earthquakes). This text should be corrected; or a footnote put in to refer to the facts in this case.

*Page two of eight*

*Paragraph 3*

This section refers to only one report, seeming to suggest that it is the basic or fundamental report, whereas it is actually a brief overview.

Reference should be made here to the study reports produced for the European Parliament 2011, 2012; to the research reports produced for the German Bundesrat; to the published research report commissioned by Exxon corporation in Germany (4/2012).

Further reference should be made to the reports to be expected from the European Commission, from New York State, et al.

In particular, the report on public health issues by the province of New Brunswick should be referred to explicitly while stating that public health is outside the remit of this research has instanced above.

*Key questions:*

"technology". Suggestion: it must be made clear that "technology" means the entire process; from beginning to the results possibly several decades later (see reference page 7 last line)

"Fully protecting the environment and human health?"

A note must be inserted here to make it completely clear that while the protection of existing industry and existing society is essential, it is not covered by this research.

*Paragraph 4*

*Line 2*

A wide range of responsibilities" after the word "responsibilities", an " \* " or footnote reference must be inserted to indicate that currently the Environmental Protection Agency act confers immunity on the EPA for all their acts and omissions and therefore they ultimately do not carry final responsibility in the eyes of a citizen or a Court for these matters.

*Last line*

with the agreement of DCENR, the words "their impact on the environment" could be supplemented with the text ", public health and other existing and developing industries" in order to assure the public that all aspects of potential new industries are of concern to the Department on behalf of the public.

*Page three of eight*

*second paragraph*

*Last line*

"Required environmental permissions" as noted elsewhere, the required environmental permissions did not prevent fracking from going ahead near Blackpool in such a manner as to cause earthquakes and result in an enormous column of radioactive water which cannot easily be moved, or be left in situ either. A closer examination of what the required permissions are; and what the loopholes are, is needed.

### *Five further research*

#### *Second paragraph*

"Steered by a committee with representatives from"

It is noted that the representatives are those of different agencies with very specific remits. In the worst case, it is possible that they could concentrate on dividing responsibilities between themselves for different sectors. In any event, a widespread overview of general public and civic interest and wider concerns is missing.

In particular, this was noted by the relevant Joint Committee of the Oireachtas and it is understood that they wrote to the Environmental Protection Authority to request that some concerned citizens could also join the Steering Committee to assist it in its work, particularly by contributing to a wider viewpoint and a wider concern.

It is recommended that the text be altered to include expanded representation on the steering committee.

#### *Seventh paragraph*

"Shale" is again mentioned. Please clarify whether this covers coal seam gas, tight sands etc; or merely shale.

*In the same paragraph*, it needs to be made clear that hydrological concerns involve extended timescales; perhaps 1 to 2 decades.

Rationale: studies by the University of Montpellier has shown that water can take up to 14 years to arrive at the surface of from the depths that fracking is to be carried out at. These are similar to the depths from which some "spa" waters are obtained and sold to the public.

#### *Eighth paragraph*

Attention needs to be drawn to the fact that the pressurised water may hit layers or strata that have not been targeted and have different characteristics than the target zone. Layers underneath the target zone must be taken into account.

*Page four of eight*

*Project A1*

*Second bullet point*

It has been said that all gas is natural; this allows operators sometimes to disclaim a connection between fracking and methane gas in drinking water or elsewhere. Any baseline monitoring would have to distinguish between gas that has originated recently from some operator activity and gas which is generated by natural processes close to the surface. If there are existing seepages of gas from deeper levels, the ratios approaching surface should be noted. If there are existing wells, disused, in the specific Irish areas, monitoring should ascertain whether there are additional gases in the region of these old wells in comparison with similar areas that do not have these wells.

*Last bullet point*

*Recycling the flow back*

Emphasis should be placed here on the desirability of very close examination of any data found; it has been noted in academic circles that the reported percentage of recycled in some cases has turned out to be completely inaccurate and misleading.

Furthermore, the eventual disposal of the residual recycled material should be investigated.

At some point in this proposed study, the whole question of treating the huge volumes of various produced water, effluents, radioactive fluids etc must be examined in some detail.

*Task one*

"Legislative requirements" it is proposed that reference should be made both to Irish and European legislation.

*Task three*

*"This should take into consideration existing monitoring infrastructure"*

It is necessary both to the tenderer and the general public to explain what the existing monitoring infrastructure is. The existing monitoring structure should be described in annex to the terms of reference.

This is essential both for this task and for following tasks.

### *Task five*

Add: "and where found wanting elsewhere".

Rationale: "Best practice" may not actually exist in the relevant circumstances. Rather than assume that it does, the additional text allows for identification of gaps in baseline monitoring practice.

### *Task six*

Add: "references should also be made to any time delay that should be considered concerning these hazards".

Rationale: as noted elsewhere, it can take more than a decade of years for water to attain the surface level from the Shale levels. Within this kind of timescale, it is likely that the operators will have left the field and all possible damage will have to be remedied by the citizen and taxpayer .

### *Task seven*

Expand this task to include lakes or rivers and waterways, canals, underground passages (e.g. Shannon pot) and the general water network in the areas examined.

### *Page five of eight*

"Implications of, recycling" replace text with "implications of, and alternatives to, recycling"

rationale: not all flow back can be recycled indefinitely. It also needs to be "cleaned" before being reused. In the case that it is not possible, it is necessary to know what the alternative treatments of flow back and produced fluids might be.

This section of the study must cover all questionable materials: flow back fluids, associated solids, ex-drilling material (spoil), produced fluids and solids and all "non-product" gas.

A thorough picture of all disturbed materials must be obtained and associated with appropriate and acceptable treatments where such treatments exist.

*Project A-2*

*Bullet .1*

add "Canada"

Consider time effects. Will a seismic impact always occur immediately after a fracking event? Or will seismicity also occur after an accumulation of fracking incidents? Will it occur immediately, or after some time? Even some years? Rationale: as this is a relatively new area of study, it should not be restricted by preconceived notions that all earthquakes occur like clockwork following some fracking action. ( See additional bullet point below)

*Add new bullet point 5*

A new bullet point must be added in “ assessment and review of seismic risk to all site installations; particularly including the effects on all varieties of casing at all depths; noting whether they are deformed or damaged and what effect these could have on the ageing process of the casing etc”.

Rationale: considerable concern exists about the escape of methane gas (etc) from depths via drill lines. Often it is claimed that faulty casing is the only cause of such leakage, which seems to occur in about 3% or more of wells. It must be understood what the effect of seismic events could be on such casing, particularly as it could affect older wells in the vicinity of newer workings. The deterioration might not be noticed for some considerable time; when indeed the costs will fall on the citizen and taxpayer.

*Point number 2.*

Add " assessment of possible impacts on existing wells in the area, some of which are up to 30 years old."

Rationale: as stated above, the effect of seismic activity on well case integrity must be assessed. There are old wells in the area of interest which could be affected by past (if any) or future seismic activity, particularly gas instigated by further activity in the same region.

*Page 6 of eight*

*add: bullet point 10*

"examination of global experience with existing or desirable regulations for mitigation purposes; both prior to and after operations"

*Page seven of eight*

*Bullet point 3:*

Replace "life cycle assessment" with " carbon cycle assessment"

Rationale: the assessment described here apparently refers to global warming, as distinct from the many other issues and concerns arising from the full life cycle of the industry in question.

*Bullet point 4*

Replace the word "indications" with the word "suggestions"

Rationale: the suggestions that have been made appear to be highly questionable; applying only to certain activities while excluding others such as drilling; reports of injuries and death; no examples of the practice being available to common knowledge. Specific reports and studies should be available publicly before "indications" could be accepted currently.

*Bullet point .5*

"Identification of best practice in self-regulation"

This bullet point must be re-edited to make two situations clear in the context of the proposed research.

"Identification of best practice"

comment: it must be recognised that "best practice" may not exist as yet.

According to *bullet point 4* above, the technology is still evolving in different places and in different ways; and indeed differs according to the local morphology. In such circumstances, the concept of "best practice" can very easily be overplayed; with each company claiming that it follows " best practice " while in fact no published, recognised, evaluated and peer-reviewed formulations are in fact available. It is highly unlikely that any commercial

company will admit that it follows anything except "best practice". Were such good practices to be well-documented and widely accepted, especially outside the industry itself, it could be a useful guide; however wishing that it existed is no substitute for the necessity of thoroughly safe operations to be carried out in practice.

### "Self-regulation"

The expression "self-regulation" is only sensible were "regulations" actually exist.

This must be compared to the situation in Poland, where (till recently at any rate) the law makes no reference to any operations concerning hydraulic fracturing. The members of the German Bundesrat recently came to understand that their regulatory system did not in any way incorporate hydraulic fracturing. The Irish mining law long preceded hydraulic fracturing.

Various regulations at European level and elsewhere merely happen to cover some of the events relative to hydraulic fracturing; this has been identified by the European commission itself. Britain has suffered two earthquakes because whatever regulations they might have had in place were bypassed.

It is therefore unlikely that a researcher will come across a set of regulations that are available, that are understood, that are practicable and that are commonly in use. If such existed, a researcher could recommend them as a basis for self-regulation.

If such regulations are not available, then we are back to the condition that each company will do what it sees best in whatever way it sees fit and not only refer to this as "best practice" but also as "self-regulation". The public will not have to look so far beyond the banking sector as to see what has happened in gas plays around the world to recognise such "self-regulation" for the dangerous sham that it was.

The research undertaking this tender will have to identify the scope of future necessary regulations that would enable "self-regulation" to have some meaning. As correctly stated, these necessary regulations will cover all phases from the exploratory through operations and finally reinstatement.

## *Project -C*

### *Issue 1*

This item needs to include a serious critique of any gaps in other countries rather than merely listing existing regulatory usages. (See note on regulation above in different countries, particularly the incidental nature of regulation viz-a vis fracking.)

"Health impact assessment" :

this reference should be deleted as public health issues and concerns are to a considerable extent outside the purview of the Environmental Protection Agency and should be undertaken by the appropriate authorities. Such an external consideration of health impact assessment would take into account the newly issued report of the Chief Medical Officer of the Province of New Brunswick in Canada.

### *Issue 2*

"well-head construction"

replace with "well-head and casing construction"

rationale: one of the main aspects of widespread concern is the integrity of the well casing and this omission should be corrected.

*Page eight of eight*

### *Issue 4*

In order to avoid any public confusion; and inappropriate expenditure on the part of researchers, these terms of reference need to explicitly state that certain issues are outside of the terms of reference of the environmental protection agency; specifically: public health, full economic life cycle of a hydraulic fracturing industry is being introduced to an area, economic impact on existing industries.

Rationale:

there are issues in public health, such as increase in voluntary drug abuse, antisocial behaviour and social ill-effects of differential wealth inflows , which are not appropriate for an environmental agency, but must be well studied by some other appropriate agency before the licensing or introduction of any such industry which carries these outcomes.

The total economic life cycle must be completely understood before the citizen and taxpayer is forced to undertake funding or other support for sections of the life cycle which have not been thought through prior to allowing any such industry to commence.

For example, the public health costs related to the items mentioned previously needs to be added to the infrastructural costs for example; roads that are currently built on boggy areas and small bridges will certainly be damaged/need reinforcements/need rebuilding.

Any company will minimise their agreed contribution, leaving the balance to be paid by the taxpayer.

Jobs will be promised, but if these are classified into highly skilled and lowly paid; it may be found that the highly skilled jobs are sourced from elsewhere and provide little economic benefit. The same might even apply to lower paid jobs such as drivers of lorries who do not need to speak the local language to carry out their duties. It might be more convenient to contract them in the short-term from another country (as has been done before in Ireland).

The actual costs of methane emissions in European fines might well be noted in an environmental report, but also must be specified in an economic life cycle study of the industry.

The energy security provided by a supposed delivery of gas and the effect on import prices is again part of an economic life cycle study, but not part of an environmental study. Such an economic life cycle study is essential before a novel industry such as hydraulic fracturing could be considered, but should not be suppressed inside environmental research.

The tourism industry and its potential, as well as the agricultural industry of Ireland could easily be affected by either or both the existence and the accidents of hydraulic fracturing operations. The economic effect on these external industries is not essentially an environmental one, but is one that needs to be taken account in a full economic life cycle study.

These terms of reference must make it clear that there is no attempt to give half answers to some of the above questions as a result of the proposed research. The terms of reference must state that, important as these issues may be, they will not be done with in this research and must be done elsewhere.

(The above paragraphs do not purport to list the entire contents of a full economic life cycle study of hydraulic fracturing)

ENDS