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24th October 2016

Roy Beggs MLA
Northern Ireland Assembly
Parliament Buildings
Ballymiscaw
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Belfast
BT4 3XX

Dear Roy Beggs MLA,

You asked in a recently an AQW 4016/16-21, which asked (i) to outline the business case and risk assessment that took place prior to the Board of Northern Ireland Water permitting oil exploratory drilling to occur within the water catchment area of Woodburn dams; and; (ii) whether he would provide a copy of any such assessment.

Infrastrata employed RPS consultants to produce a document to inform Northern Ireland Water's decision making. I have place a copy of this in the Assembly Questions redacted to protect personal details.

CHRIS HAZZARD MLA
Minister for Infrastructure



South East Antrim Exploration Information to inform NI Water Business Case

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1 INTRODUCTION

In March 2011, the Department of Enterprise, Trade and Investment (DETI) awarded a petroleum exploration licence (licence number PL1/10) to InfraStrata plc (InfraStrata) and its partners (Brigantes Energy, Cairn Energy and Terrain Energy) for a 663 square kilometre area covering the south eastern portion of County Antrim (Figure 1.1).

The licence grants the Operator (InfraStrata) exclusive rights during the licence term to undertake exploratory work to determine whether there are any potential commercially extractable oil or gas deposits present in the subsurface geology of the licence area.

The term length of the licence awarded to InfraStrata is 5 years.

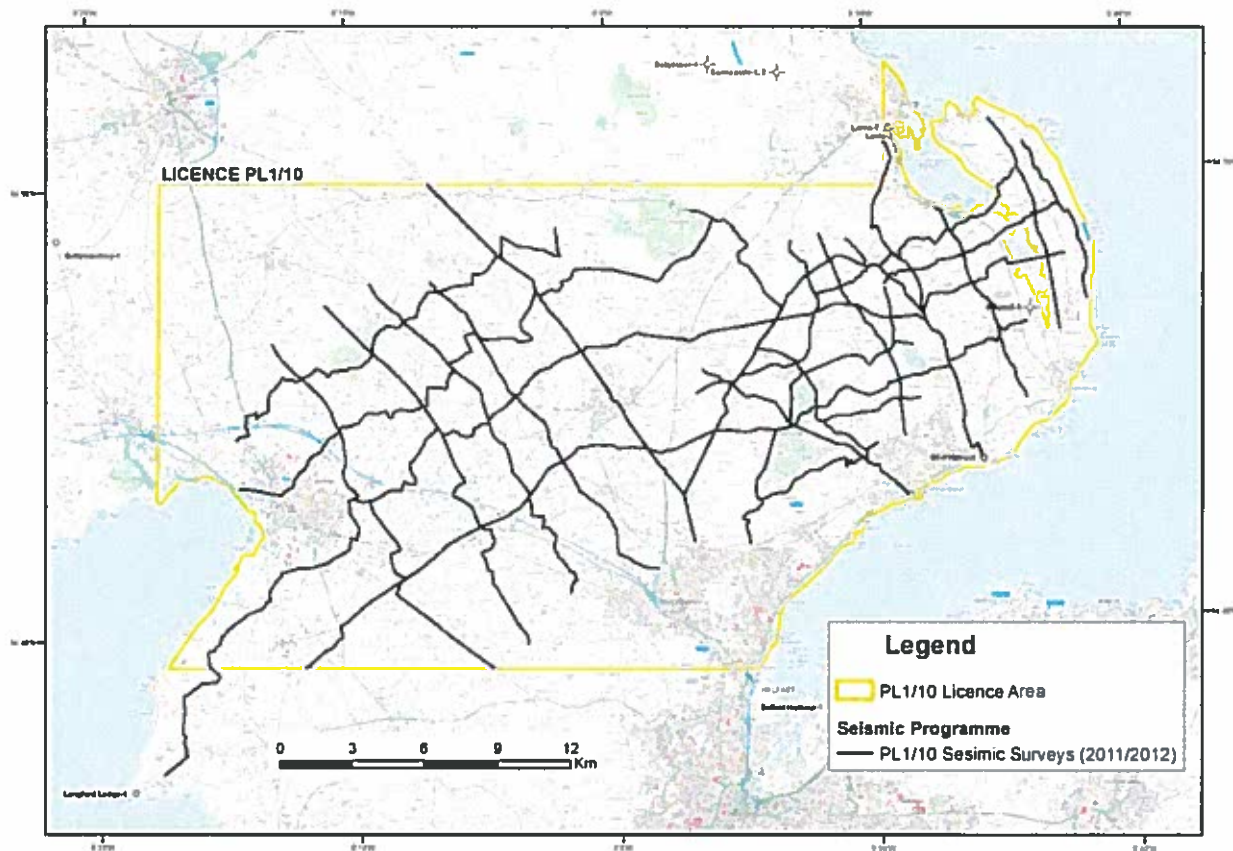


Figure 1.1: PL1/10 Petroleum Licence Area showing seismic surveys

In comparison with the rest of the UK, relatively little deep geological exploration work has taken place in this part of Northern Ireland and therefore the licence presents an exciting opportunity to find out more about the deep geology of the area.

In order to be granted an exploration licence, an Operator and its joint venture partners must demonstrate to DETI that they possess the technical capacity and financial backing to undertake the exploration safely. They must also demonstrate an adequate level of awareness and competence in relation to environmental protection. DETI have been fully satisfied that the InfraStrata led joint venture fits these criteria.

InfraStrata has had a presence in Northern Ireland since 2006. InfraStrata is also a partner with Belfast-based Mutual Energy, and BP, in the Islandmagee Gas Storage Project, a £400 million project to create an underground gas storage facility by means of forming caverns within a Permian salt layer, approximately one mile beneath Larne Lough. This project, following completion of a comprehensive Environmental Impact Assessment, received planning permission for its above ground facilities in October 2012. The Islandmagee Gas Storage Project is currently preparing to drill a 1,700 metres deep well on its site in Islandmagee to confirm the suitability of the Permian salt for gas storage purposes, with civil works to construct the wellsite site having commenced in May 2013. This drilling activity is being managed by the InfraStrata team on behalf of the Islandmagee Gas Storage Project.

2 SUMMARY OF WORK UNDERTAKEN TO DATE

To better understand the subsurface geology of the licence area and identify the areas where there is potential for oil or gas deposits to have accumulated, InfraStrata commissioned two 2D seismic exploration surveys, which were undertaken in summer 2011 and summer 2012. The extents of the surveys, which covered a distance of more than 400 linear kilometres, are also shown in Figure 1.1.

The seismic surveys were undertaken as part of permitted development rights, under the terms of the licence, however extensive consultation was held with the relevant statutory agencies, including NIEA, DRD Roads Service, the local Councils, DARD, DCAL and Rivers Agency, along with the various landowners along the survey route, to ensure that all potential environmental impacts were satisfactorily addressed and mitigated. This included the preparation of a Habitats Regulations Assessment Screening Report to ensure that potential impacts on one Special Area of Conservation (SAC) and five Special Protection Areas (SPAs) close to the survey areas were avoided.

Under the terms of the exploration licence, the Operator is required to make a decision to “*drill* [an exploratory well] *or drop* [the licence]” within 3 years of the licence having been awarded.

Interpretation of the data acquired during the seismic survey has resulted in the identification of a number of areas within the licence area where there are geological structures present which have the potential to hold accumulated oil or gas deposits.

It should be noted that the exploration activities are for the exploration and recovery of conventionally extractable hydrocarbons. There are no plans for any shale gas exploration or hydraulic fracturing (“fracking”) operations.

3 PROPOSED DEVELOPMENT

In accordance with the licence terms, InfraStrata and partners have made the decision to drill an exploration well into one of these geological structures and has chosen a site within Woodburn Forest, owned by NI Water, as its preferred location from which to drill the exploration well (see Section 5.1 below).

The exploration well will require an upgrading of the access lane to the site to make it suitable for accommodating site traffic and the construction of a wellsite.

A wellsite typically covers an area of up to 3 acres, comprising an flat area of hardcore in its centre, upon which the exploration drilling rig and its supporting infrastructure (e.g. storage tanks, drilling equipment, generators, fuel, site offices, lighting units, pumps, etc.) will be sited. Encased within the wellsite platform, below surface level, is a concrete wellhead cellar and the conductor tube through which the drilling string will pass into the subsurface.

It is anticipated that the civil engineering works to prepare the wellsite would take approximately 10 weeks and the drilling operation would take approximately one month.

It is a condition of the DETI petroleum exploration licence and the "permitted development" rights that, in the event of the well proving to be unsuccessful in discovering hydrocarbons in exploitable quantities, the well must be safely plugged in accordance with current legislative guidelines (described in more detail below) and the development site must be fully reinstated to its former land use.

It is anticipated that the reinstatement works, if required, would be completed within one month.

If hydrocarbon 'shows' during drilling and from log evaluation and other evaluation methods are considered to be discouraging (i.e. absent or not present in commercially extractable quantities), then the decision will likely be made by InfraStrata and partners to permanently plug and abandon the well, after first gaining consent to do so from the DETI. Well abandonment takes into consideration methodologies presented in the '*Guidelines for the suspension and abandonment of wells, Issue 4, July 2012*' and the '*Guidelines on qualification of materials for the suspension and abandonment of wells, Issue 1, July 2012*', both as issued by Oil & Gas UK which are designed to prevent adverse impacts to the environment following well abandonment. On the surface, the wellsite would be removed with all materials taken off site and the area would be fully reinstated to its former land use.

If the testing undertaken during the exploration drilling shows encouraging results, there may be a requirement for further longer-term testing operations to be carried out. Ongoing testing would be subject to a renewed set of consents from DETI and further environmental controls.

Should the site be subsequently found in testing to hold commercially extractable quantities of hydrocarbons, the well would be temporarily plugged and suspended (in accordance with the abovementioned guidelines) to allow long term development options on the well to be considered. The development of a commercial extraction facility would be subject to planning consent and, dependent on the size of the facility, may also require a formal EIA and full Environmental Statement to accompany the planning application as well as a number of other statutory consents.

4 STATUTORY CONSENTS FOR EXPLORATION BOREHOLE

Petroleum exploration boreholes in Northern Ireland are eligible to be granted 'permitted development' rights, in which case they do not require full planning permission - provided they fall within set criteria outlined by Planning Service. These criteria relate primarily to the environmental sensitivity of the receiving area and also restrict the exploration activity (i.e. drilling operations) to a maximum of four months duration.

Upon confirmation of a proposed site for the exploration well, InfraStrata will be consulting with Planning Service to confirm that the exploration well satisfies the criteria for permitted development. In the unlikely event that Planning Service determines that the proposed exploration well does not fit the criteria for permitted development, a formal planning application would be lodged by InfraStrata instead.

Under the terms of the DETI petroleum exploration licence, a project being advanced under 'permitted development' rights is required to prepare an environmental impact assessment report which must be agreed and 'signed off' by the relevant statutory agencies before being approved by DETI ahead of any site works commencing, thus ensuring that any potential impacts are fully addressed.

The agencies that must be consulted with and which must give assent for the exploration well are the same consultees that would be approached by Planning Service and which must give their consent to a project proceeding during the conventional planning process. The consultees include (but are not limited to):

- DARD Quality Assurance Branch, Forest Service, Veterinary Service
- DCAL Inland Fisheries
- DRD Roads Service
- HSENI
- Local Councils
- NIEA: Built Heritage
- NIEA: Natural Heritage, Conservation Designation and Protection
- NI Water
- Planning Service Minerals Unit
- Rivers Agency
- RSPB

InfraStrata have engaged local consultants RPS, based in Belfast, and who have worked with InfraStrata on the Islandmagee Gas Storage Project since 2007, to aid in undertaking the necessary environmental studies and securing the permissions from the various consultees. All site operations including site construction, the drilling of the well, the contingent testing and site reinstatement, will be undertaken in compliance with the various controlling health and safety and environmental legislation which includes:

1. the '*Borehole Sites and Operations Regulations (Northern Ireland) 1995*'
2. the '*Management of Health and Safety at Work Regulations (Northern Ireland) 2000*'
3. the '*Construction (Design & Management) Regulations (Northern Ireland) 2007* and
4. the '*Offshore Installations & Wells (Design & Construction etc). Regulations (Northern Ireland) 1996*'

5 ENVIRONMENTAL CONSIDERATIONS

5.1 SITE DESCRIPTION

The proposed well will be drilled to an approximate depth of 2,000 metres below the surface, with the first target reservoir in Triassic sandstones at a depth of approximately 650 metres below the surface. Deeper targets are within Permian and Carboniferous sandstones.

The proposed site from which InfraStrata is seeking permission to drill the exploration well is located approximately 350 metres east of Woodburn North Reservoir at its nearest boundary, in an area of Woodburn Forest currently owned by NI Water and leased to Forest Service (Figure 5.1). As can be seen on the figure below, the site has in recent years been felled and replanted and the trees on the site are not mature. There is an existing access lane to the site which links it to the Paisley Road.

The site is ideally suited to the project as it is secluded from nearby dwellings by the local topography and forestry, whilst being easily accessible from a main road.

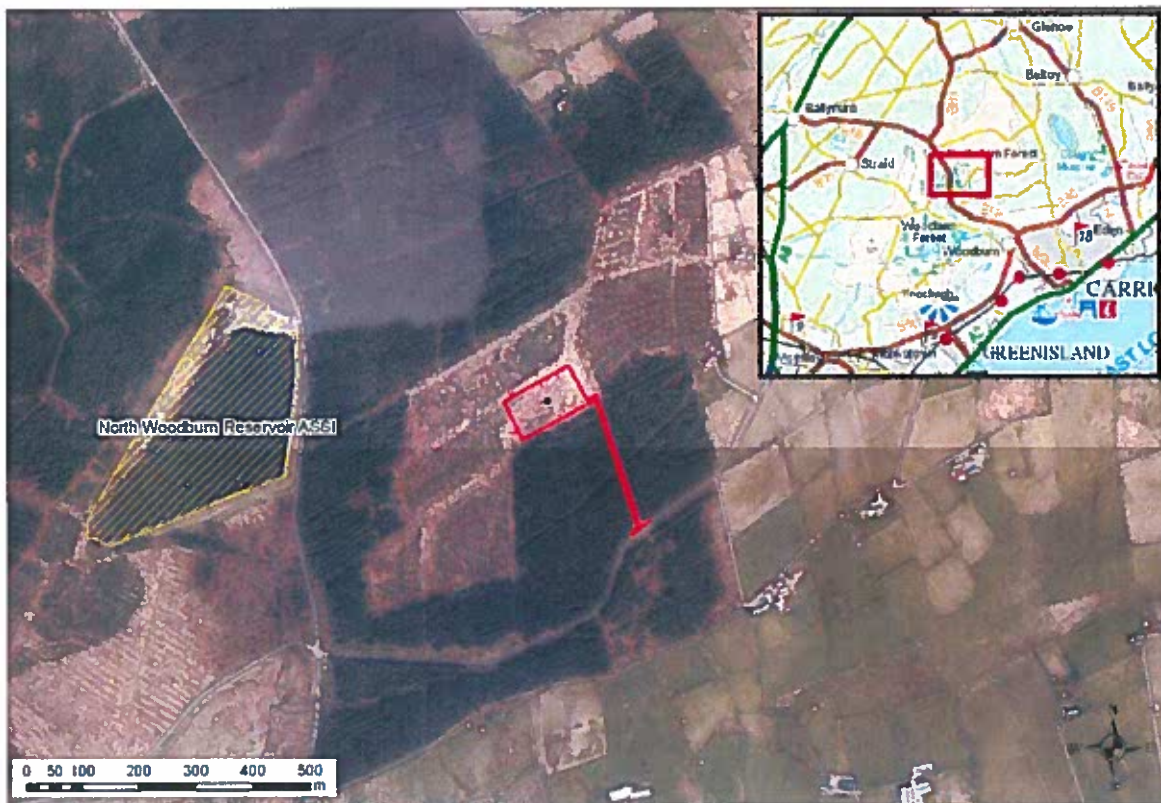


Figure 5.1: Proposed Site of Exploration Wellsite and Access.

5.2 POTENTIAL ENVIRONMENTAL IMPACTS

InfraStrata and RPS have previously met on two separate occasions with NI Water representatives from Lands Management (), Water Supply Management (), Water Quality Management (), Procurement (W. Scott), local Donsland Plant Manager () as well as the local Scientific Officer for the area ().

InfraStrata is fully cognisant of NI Water's primary concern, which is to ensure that the proposed construction and operation of the exploration well would not cause any adverse impacts on the water quality within the nearby North Woodburn Reservoir or any part of its catchment area. InfraStrata also recognises the importance of the reservoir's ASSI designation.

In order to address NI Water's concerns regarding the safeguarding of water quality InfraStrata and its wellsite design and civil engineering consultants R. Elliott Associates prepared an outline wellsite design which was presented to , , and on 9th January 2013. The key points of the design are summarised below:

5.3 WELL DESIGN KEY POINTS

The design and construction of the wellsite and of the well itself takes into account the need to protect the fresh water aquifer and surface water catchment in the immediate vicinity of the well.

The design of all oil and gas exploration drilling sites are based on the premise that all fluids on the site are retained within the site, and then removed by a licensed contractor using sealed tankers to a suitable disposal point remote from the site, in accordance with Control of Pollution legislation. The site is therefore constructed as a sealed entity and zero discharge occurs from it.

The site is sealed by placing a bentonite mat, sandwiched between sand and geotextile layers to minimise the risk of damage, beneath the entire footprint of the site. In the event of small punctures, the bentonite matting is self-healing and is able to re-seal itself.

The membrane runs under the entire drilling platform and continues into the perimeter ditches so that there is complete continuity of the membrane. Bunds are created around the site and bentonite mat is placed up and over them to provide a minimum bund height of 600mm.

During a meeting with NI Water representatives on 26th April 2013 it was noted by NI Water that the site design should take into consideration flooding due to a heavy rain event and accordingly a Flood Risk Assessment will be performed to ensure that the bund heights within the design are confirmed as providing full protection against an extreme rain event.

The wellhead is contained within a concrete chamber called a cellar and the bentonite membrane is cast into the in situ surround to prevent leaks.

The entire well is lined with steel casings which are sealed in place with cement, thereby isolating and protecting the near surface formations that constitute or could be in communication with the regional or local fresh water aquifer, prior to drilling deeper.

The Environment Agency in GB have accepted this design as appropriate for high-risk areas such as water catchment areas, or water abstraction zones.

This system has been used in a number of highly sensitive locations such as a site at Hurstbourne Tarrant in Hampshire, where the site was located on chalk about 400m from a Southern Water abstraction borehole and springs that feed into the River Test – a renowned trout fishing stream. No leakage was reported from this or any other sites, and when restored to agriculture the site needed no remedial works. Sites have also been developed on the edge of a Flood Risk Zone 3, where the substrata is a permeable sand that has a tidal water table.

The proposed wellsite for the well for the Islandmagee Gas Storage Project is currently being built to a similar standard as is proposed for Woodburn Forest, and is located immediately adjacent to a highly sensitive water body, Larne Lough, which holds environmental designations of National, European and International importance. InfraStrata would welcome NI Water visiting the Islandmagee wellsite following its construction to view the pollution prevention measures in situ.

5.4 OTHER ENVIRONMENTAL CONSIDERATIONS

The environmental impact assessment for the proposed exploration well will also examine and address the potential impacts of the civil engineering works to create the wellsite and the subsequent drilling operation:

- Impacts on natural environment
 - *Ecology (habitats - flora & fauna)*
- Impacts on local residents
 - *Noise*
 - *Air Quality*
 - *Traffic*
- Landscape and Visual Impact
- Safety
- Cultural Heritage (Archaeology)
- Impacts on local Geology and Hydrogeology

During the previous meetings with NI Water, the scientific and water quality management staff have indicated that, provided all the wellsite design mitigation measures outlined by InfraStrata and R. Elliott Associates are implemented, they are satisfied that the proposed exploration well should not pose any impact to the water quality .

6 PROPOSED COMMERCIAL TERMS WITH NI WATER

There are approximately 45 onshore producing oil and gas field developments in the UK. Many of these developments have multiple wells drilled from individual wellsites and many of the larger accumulations comprise several wellsites. However over the past 30 years there have been approximately 600 wellsites constructed in the UK for oil and gas exploration, with the majority being only temporary as no oil or gas was encountered. InfraStrata's civil engineering consultant Richard Elliott, of R. Elliott Associates, has been involved in the construction of approximately a quarter of these wellsites.

The land required for an oil and gas exploration wellsite in the UK is normally leased from the landowner. Given that exploration wells commonly do not encounter hydrocarbons, and are plugged and the site reinstated immediately, it is common to have a short initial lease or licence for up to 3 years, with an option to extend the lease, or if it is a licence to convert it to a lease, with extensions possible for life of development or up to 40 or 50 years. A wellsite for the initial exploration well typically requires a land area of up to 3 acres. It would be normal to agree at the outset an additional option area that might be required for a development should the well be successful (possibly for additional wells from the site or production facilities).

Land lease values for wellsites vary around the UK but the "industry standard" is to pay approximately the value of the land area (typically £4,000-£10,000 per acre) each year for the initial period for up to 3 years while the well is drilled and the data analysed. Should a long-term lease then be entered into if the well is successful, it would be normal to pay an uplift of between 20-30% on the initial annual rent. It is also normal for the oil and gas company to pay the reasonable legal costs of the landowner in connection with the negotiation and completion of the agreement. The lease payments would also be periodically reviewed by reference to increases in RPI or CPI.

InfraStrata has recently entered into an agreement for an exploration wellsite in Dorset, England for £[REDACTED] per annum for up to 3 years for a site of 3 acres, with an uplift of [REDACTED] if InfraStrata enters into a long-term lease for 25 years, with a right to increase for up to a further 25 years. InfraStrata also agreed an option over an additional area of approximately 10 acres. If following the drilling of this exploration well (expected early in 2014), InfraStrata requires additional land for a development the rent will be increased pro-rata for increased area.

For the Dorset project InfraStrata at first entered into a Heads of Terms (HOT) with the landowner. This set out the approximate area required and the possible additional land option area, together with the broad commercial terms. With this agreement InfraStrata was then able to consult with the local planning authority and their environmental team. Following this consultation the site outline was modified and a full agreement was subsequently completed. The relevant consents for the project are currently being sought. A non-refundable Early Signature Payment of £[REDACTED] was paid to the landowner which will be deducted from the first year payments once the licence is triggered by entry onto the land.

InfraStrata would like to propose to NI Water that a similar process and basis for agreeing commercial terms is followed as the above example. Agreeing an initial HOT, or Memorandum of Understanding, with NI Water would enable InfraStrata to seek confirmation from the Planning Service that the well could be drilled under permitted rights and undertake consultation with the statutory consultees such as the NIEA. These initial consultations would help inform the final position of the wellsite prior to a full agreement being negotiated with NI Water. The assent of all the various agencies to the drilling location would also provide

comfort to the Board of Directors of NI Water before the main agreement is signed and completed.

Should terms be agreed with NI Water on a similar basis to other UK exploration wellsites and the project was to proceed to a development the monetary value to NI Water for leasing land to InfraStrata for a development project would likely be in the region of £ [REDACTED] per annum for the lifetime of the project, depending upon the rental per acre agreed and the land required for development, with regular rent increases to reflect inflation.