



SEA 5

**Strategic Environmental
Assessment of parts of the
northern and central North
Sea to the east of the
Scottish mainland, Orkney
and Shetland**

MAY 2004

BACKGROUND INFORMATION

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1 BACKGROUND AND PURPOSE

1.1 Purpose of this document

The purpose of this document is to provide background to stakeholders on the current DTI offshore energy SEA (SEA 5).

1.2 Background to the DTI SEA process

In 1999, the Department of Trade and Industry's (DTI) commenced a Strategic Environmental Assessment (SEA) process for offshore energy with a sequence of sectoral Strategic Environmental Assessments (SEAs) of the implications of further licensing of the UKCS for oil and gas exploration and production. The first of the DTI's offshore Strategic Environmental Assessment (SEA 1) was conducted in 1999/2000 in preparation for the 19th Licensing Round and covered the deep water area along the UK and Faroese boundary. Subsequent SEAs have been SEA 2 which covered the central spine of the North Sea with the majority of existing UK oil and gas fields (2001-2002), SEA 3 which assessed the remaining parts of the southern North Sea (2002-2003) and SEA 4 (2003-2004) which considered offshore areas of the UKCS to the North and West of Shetland and Orkney.

In addition, during 2003, the DTI conducted an SEA covering three strategic regions off the coasts of England and Wales in relation to a second round of offshore wind licensing.

Full details of the SEA process, the steering group (established in early 2001) and documentation can be found at www.offshore-sea.org.uk, a website specially set up to promote transparency and facilitate public consultation in relation to the DTI Offshore Energy SEAs.

The offshore energy SEA process is currently being coordinated for the DTI by a team of independent consultants from Hartley Anderson Limited and Geotek Limited.

1.3 What is SEA?

Strategic Environmental Assessment (SEA) is a means through which environmental protection and sustainable development may be considered, and factored into national and local decisions regarding government (and other) plans and programmes – such as offshore oil and gas or renewable energy licensing rounds.

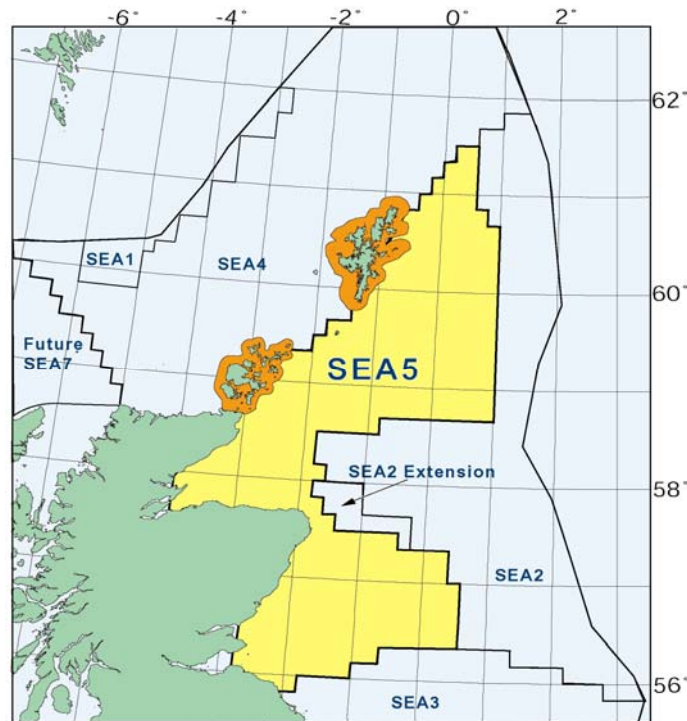
Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (commonly called the SEA Directive) was adopted to provide a

strategic complement to the Council Directives (85/337/EEC and 97/11/EC) which require Environmental Impact Assessments of *specific* developments and activities. Member states are required to implement the SEA Directive by 21 July 2004.

1.4 SEA 5

The main focus SEA 5 is the potential further licensing for oil and gas exploration of offshore areas of the UK Continental Shelf (UKCS) to the east of the Scottish mainland, Orkney and Shetland – see Figure 1.

Figure 1 – The area covered by SEA 5



Note: To allow full consideration, the SEA extends to the shoreline including areas within bay enclosure lines although these areas would not form part of an offshore licensing round.

In addition, as part of SEA 5 an assessment will also be made of the implications of re-offering during the same licensing round, currently unlicensed blocks within the areas covered by the earlier offshore oil and gas SEAs.

New information has been gathered through survey and other studies to underpin the assessment for oil and gas licensing in the SEA 5 area. These studies have been framed to also facilitate future SEA for offshore renewable energy when such plans or programmes are proposed.

Strategic Environmental Assessment involves extensive consultation, seeking information and opinions from the public, environmental groups, industry and others so that these can be considered in the decision making process.

Key elements of the SEA 5 consultation are:

- The SEA website
- Scoping (spring 2003 and on)
- Stakeholder dialogue meeting (summer 2004)
- A 3 month public consultation period following publication of the SEA 5 documents on the website (autumn 2004)
- Post consultation report (winter 2004)

For SEA 5, initial scoping with the environmental authorities and a range of academic and conservation organisations was commenced early in 2003 and focussed on ascertaining seabed survey needs. This is because of the timescale needed to organise, collect and analyse offshore seabed samples. The conclusion was that further survey work was necessary to investigate seabed habitats and biota prior to SEA. Field work was conducted during the summer of 2003.

In keeping with the Government's move towards "less paper" where feasible, scoping and subsequent consultation is conducted electronically using e-mail and the SEA website.

2 OIL AND GAS LICENSING PROCESS

The Petroleum Act 1998 vests all rights to the nation's petroleum resources in the Crown. The Secretary of State for Trade and Industry can grant licences that confer exclusive rights to "search and bore for and get" petroleum. Each of these licences confers such rights over a limited area and for a limited period. Licensing of the UKCS for oil and gas exploration and production commenced in 1964 and has progressed through a series of rounds. The proposed offshore oil and gas licensing round would be the 23rd and would offer Production Licences covering parts of the northern and central North Sea to the east of the Scottish mainland, Orkney and Shetland.

A brief overview of offshore licensing is given below and more detail can be found on the DTI's website at www.og.dti.gov.uk/upstream/licensing/index.htm.

For licensing purposes the UKCS is divided into quadrants of 1° of latitude by 1° of longitude (except where the coastline, "bay closing line" or a boundary line intervenes). Each quadrant is further partitioned into 30 blocks each of 10 x 12 minutes. The average block size is about 250 square km (roughly 100 square miles). Relinquishment requirements on successive licences have created blocks subdivided into as many as six part blocks.

There are two main types of Seaward (offshore) Licences:

- **Exploration Licences** which are non-exclusive, permit the holder to conduct non-intrusive surveys, such as seismic or gravity and magnetic data acquisition, over any part of the UKCS not held under a Production Licence. These licences may be applied for at any time and are granted to applicants who have the technical and financial resources to undertake such work. Production, or any drilling deeper than 350m, is not permitted under an Exploration Licence.
- **Production Licences** grant exclusive rights to holders “to search and bore for, and get, petroleum”, in the area of the licence covering a specified block or blocks. The Traditional Licence is valid for a sequence of periods or “Terms”. These Terms are designed to follow the typical exploration, appraisal, production lifecycle of a field. Each Licence expires automatically at the end of each Term, unless the Licensee has made enough progress to earn the chance to move into the next Term.

Following a consultation exercise conducted during 2002 the DTI introduced a new variant of the Production Licence (the “Promote” Licence) designed to increase the amount of oil and gas activity in the UKCS. “Promote” Licences were offered alongside Traditional Production Licences for the first time during the 21st offshore licensing round.

The Promote Licence initiative is aimed at harnessing the skills, knowledge and energy of the wider geotechnical community. The general concept of the 'Promote' Licence is that Licensees will be given two years after award to attract the technical and financial capacity to complete an agreed Work Programme. In effect, DTI will defer (not waive) its financial, technical and environmental checks until the preset Check Point. Promote Licensees are not allowed to carry out field operations such as seismic or drilling until they have met the full competence criteria.

In recent years, two other variations of the 'Traditional' Production Licence have also been offered. These are the “Frontier” Licence, which is crafted to match the operating challenges in the deepwater areas to the west of Britain, and Licences specially drafted to cover the redevelopment of a decommissioned field such as the Ardmore (formerly the Argyll) field.

3 OVERVIEW OF THE SEA 5 AREA

3.1 Environment

Coastal and nearshore environment

Typical coastal features of the SEA 5 area are the east coast firths and the high, rugged cliffs which stretch along much of the north east coast of Scotland, and the Orkney and Shetland islands. These form an important habitat for large numbers of breeding seabirds which benefit from the rich feeding grounds in adjacent

coastal and shelf waters. There are numerous coastal conservation areas designated for a variety of species and features throughout the SEA 5 area.

The Orkney and Shetland islands host a range of important marine habitats including coastal lagoons, shallow inlets and bays, sea caves and reefs; many are particularly species rich or support species at the northern extent of their biogeographical distribution. The islands also support internationally important populations of otter, and common and grey seal.

The Moray Firth coast supports a range of habitat types including the rocky and high cliffed habitats found at Duncansby Head to Brora, the Tarbat Ness peninsula and from Burghead to Fraserburgh, and extensive sand and shingle beach systems at Loch Fleet, Dornoch Point, Morrich More, Whiteness Head, Culbin Sand, Burghead Bay and Spey Bay with associated maritime vegetation. The Moray Firth itself encompasses a number of estuarine habitats and includes three inner firths (Dornoch, Cromarty and Beaully/Inverness).

The coastline of the region supports important breeding seabird populations, while offshore areas provide foraging and post-breeding moulting areas. The various mudflat and estuarine areas provide important overwintering or temporary feeding areas for migrants. The Moray Firth and its associated inner firths also support marine mammals which forage throughout the area.

The estuarine systems of the Firth of Tay and the Firth of Forth, both support important bird and seal populations. Cliffs stretch from the mouth of the Forth as far as the English border, reaching heights of nearly 200m between Fast Castle Head and St. Abb's Head. These headlands support important seabird breeding colonies.

Offshore environment

In general, offshore areas of SEA 5 have water depths in the range 90-120m with depth increasing to the north and approaching 200m at the northernmost extent of SEA 5. The central North Sea is shallower (50-90m) although there are a number of deep water areas including the Witch Ground (140m) and Devil's Hole (220m).

The chief water mass movements into the SEA 5 area and the North Sea in general are influxes of Atlantic water through the Fair Isle Channel and to the east of Shetland, and a major outflow through the Norwegian Trough. Offshore tidal currents decrease in velocity from south to north and summer stratification of the water column affects much of the SEA 5 area, effectively isolating surface and near bottom waters until autumn gales break down the stratification.

Seabed sediments over the majority of the SEA 5 area are sand or mud, or a mixture of the two. Typically, sandier sediments are found in the south and in coastal waters, with muddy sediments present in the deeper areas of the central

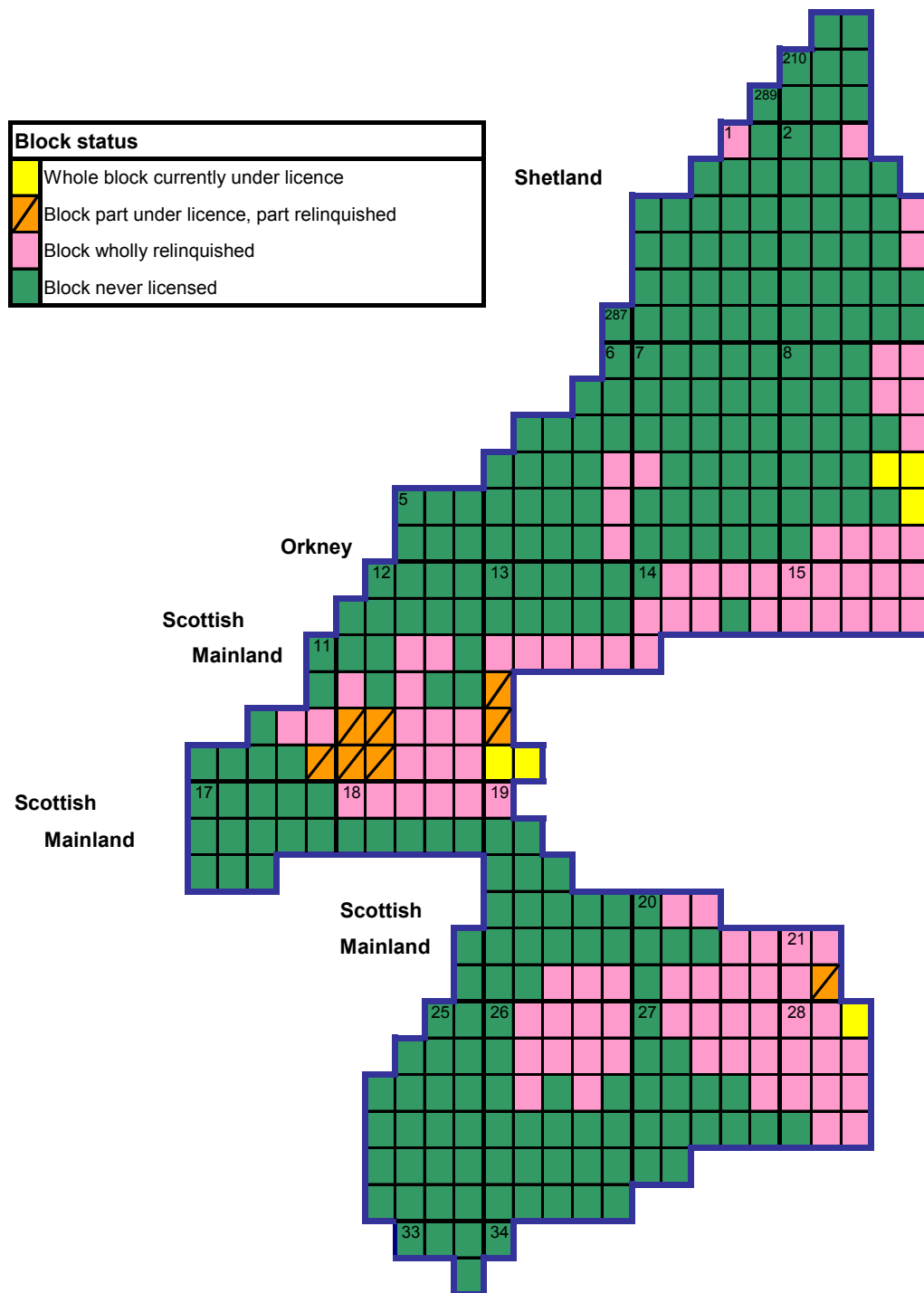
and northern North Sea. Pockmarks (shallow seabed depressions formed from the seepage of gas) are found in muddy areas in particular the Fladen and Witch Grounds. Most pockmarks are relict features but some continue to leak natural gas and may contain carbonate rocks which provide a habitat for encrusting and other surface living seabed animals.

Many different types of fish are found in the North Sea with diversity being higher in the central and northern North Sea and in inshore waters. These support not only important fisheries but also sustain the large number of breeding and wintering seabirds found in the area as well as a wide range of cetaceans and seals.

3.2 History of oil and gas licensing within the SEA 5 area

Blocks within the SEA 5 area were first offered for oil and gas licensing in 1965. The area comprises some 382 blocks of which 6 are currently wholly under licence, 8 are partly licensed and partly relinquished, 101 have been licensed but are now wholly relinquished, and 267 which have not previously been licensed - see Figure 2 overleaf.

Figure 2 – Schematic of blocks within the SEA 5 area, either currently licensed or potentially available for licensing



Note: Information sourced from www.og.dti.gov.uk

3.3 Overview of prospectivity in the SEA 5 area

The SEA 5 area includes components of 25 separate basinal, intrabasinal and platform structural elements, each with its own geological succession, which directly determines the hydrocarbon prospectivity of the area. These features are grouped into broad areas of prospectivity and summarised below:

- The Unst Basin in the north of the SEA 5 area, covers parts of Quadrants 209, 210, 1 and 2, and contains some minor potential for hydrocarbons. Where it lies close to the Shetland Islands, the potential reservoirs are probably too shallow to be prospective.
- To the south of the Unst Basin lie the:
 - East Shetland platform (covering parts of Quadrants 1, 2, 7 and 8)
 - The basins of the East & West Fair Isle (covering parts of Quadrants 5, 6 and 7)
 - The Dutch Bank Basin (covering parts of Quadrants 7 and 8)
 - The Fladen Ground Spur (covering part of Quadrant 8)

All these areas (with a few exceptions) are thought to be no more than marginally prospective as only a relatively thin cover of younger rocks lies on an old basement over most of this area. This is also the case very close to Orkney. The potentially more prospective area lies immediately to the west of the Emerald Field in Quadrant 2, and the narrow strip running south of this which borders the North Viking Graben on the very east of the SEA 5 area. The southerly portion of the Dutch Bank Basin shows greater prospectivity, as does the Fladen Ground Spur in the south east of Quadrant 8. Some of these areas are already licensed.

- South of latitude 59°N in the Outer Moray Firth, the prospectivity increases. Although the area is characterized by dry holes from an earlier exploration phase, it is now considered that many of the wells were poorly located to find hydrocarbons.
- There are areas of greater prospectivity in the Inner Moray Firth. The Sutherland and Caithness coast runs coincident with the “Great Glen Fault Zone” and seaward of this, prospectivity has been proven close to the coast in Block 11/24. South along the Moray Firth coast of Ross and Cromarty, Nairnshire and Moray the potential reservoirs are shallow and not very prospective. However, there is some prospectivity in the top of Quadrant 17 in the “Great Glen Sub Basin”. Along the rest of the Moray, Banffshire and Aberdeenshire coasts, the prospectivity lies to the north of the “Banff Fault Zone”. Close to this coast, the potential reservoirs are shallow and prospectivity decreases.

- Southwards, to the west of Buzzard Field and then over the Peterhead Ridge and into the southern end of Quadrants 19, 25, 26 & 28 prospectivity decreases except in the Forth Approaches Basin which covers south of Quadrant 19 and the north of Quadrants 25 and 26. Greater prospectivity is seen in the south of Quadrants 20 and 21 and Quadrants 27 and 28 with the exception of the Devils Hole Horst.

4 POTENTIAL 23RD ROUND LICENSING IN THE SEA 5 AREA

4.1 Expected take up of Blocks in the SEA 5 area

It should be noted that much of the SEA 5 area has limited potential for commercial oil and gas reserves and consequently uptake of the 382 Blocks offered is expected to be less than 15%, with around 75% of these being Promote Licences and 25% Traditional Licences.

4.2 Estimates of potential activity in the SEA 5 area from 23rd round licensing

Both exploration and development activity levels and timing would depend on a range of factors including the number of blocks licensed, work programme commitments made by licensees, exploration success, economic and commercial factors and Government approval of development plans.

The DTI Licensing and Consents Unit have provided projections of the scale of potential exploration and production activity which could follow licensing of the SEA 5 area. The projections are best estimates on the basis of current understanding and thus indicative.

Seismic surveys

In the north of the SEA 5 area, very few seismic surveys are anticipated with the exception of the Unst Basin and a fringe along the margins of the North Viking Graben where some 2D surveys are predicted. The majority of the anticipated 2D and 3D activity is expected in Quadrants 11 to 18, in line with the hydrocarbon prospectivity narrative above. South of this, in Quadrants 19 to 28 little activity is expected except along the fringes of the SEA 2 & and SEA 5 areas where there may be some exploration. The following seismic survey effort is envisaged:

- In the year of award – 2 x 2D seismic surveys
- In the year following award – 4 x 2D seismic and 3 x 3D seismic surveys
- In the year 2 years after award – 2 x 2D seismic and 3 x 3D seismic surveys
- In the year 3 years after award – 2 x 3D seismic surveys
- In the year 4 years after award – no seismic envisaged

Exploration and appraisal wells

Expected exploration drilling activity follows the seismic acquisition and it is anticipated to show a similar spatial pattern. The following exploration drilling is envisaged:

- In the year of award - no exploration or appraisal wells
- In the year following award - 3 exploration wells and 1 appraisal well
- In the year 2 years after award - 3 exploration wells and 2 appraisal wells
- In the year 3 years after award – 3 exploration wells and 2 appraisal wells
- In the year 4 years after award - 3 exploration wells and 3 appraisal wells

Developments

Depending on the success of the Exploration and Appraisal drilling, some three new standalone developments are anticipated, with potentially one new pipeline to shore and the remaining developments tying into existing export infrastructure.

An overview of the types of oil and gas exploration and production activities which could follow licensing is provided on the SEA website (www.offshore-sea.org.uk/sea/dev/html_file/pdf2.cgi/SD_002_W.pdf).

4.3 Alternatives

SEA 5 will address all the Blocks within the area in terms of the implications of licensing for oil and gas exploration and development. Depending on the outcome of the SEA process and other Government considerations, all or a proportion of the unlicensed Blocks within the SEA 5 area may be offered for licensing in the 23rd round. In addition, the SEA 5 assessment will also consider the implications of re-offering during the same licensing round, currently unlicensed blocks within the areas covered by the earlier offshore oil and gas SEAs.

Alternatives proposed for the development of oil and gas resources within the proposed 23rd Round area have been identified as:

1. Not to offer any blocks for Production Licence award
2. To proceed with the licensing programme as proposed
3. To restrict the area licensed temporally or spatially

5 HOW TO INPUT TO SCOPING

Consultation is key to the SEA process and the DTI wishes ensure that, prior to completing the assessment for SEA 5, it:

1. Is aware of and has access to all relevant environmental information
2. Has identified stakeholder issues and concerns which should be considered in the SEA

The scoping for SEA 5 will conclude immediately after the Stakeholder Dialogue meeting scheduled for 29th of June 2004. Should you wish to make input at this stage there are a number of routes open to you

- by e-mail to SEA@hartleyanderson.com
- by post to Pat Lawson at Hartley Anderson Limited, Regent House Regent Quay, Aberdeen, AB11 5BE
- by fax to Pat Lawson at Hartley Anderson Limited on 01224 587276
- or via the SEA website at www.offshore-sea.org.uk using the comments facility on the How Do You Get Involved page (to insert text from a Word document use copy and right mouse click for paste).

In all cases, please indicate that your input relates to “SEA 5 – Scoping” and whether you would be happy for your input to be made public via the SEA website.