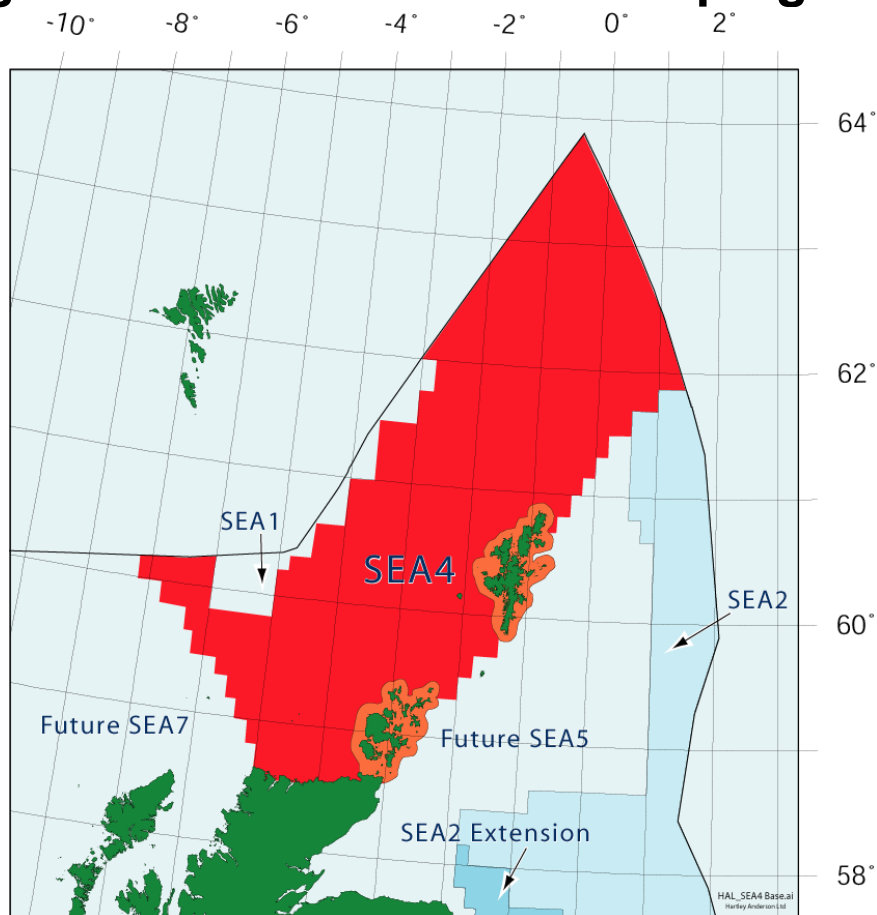


# Strategic Environmental Assessment of the area North and West of Shetland and Orkney SEA 4

## Background Information and Scoping Request



April 2003

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# 1 BACKGROUND AND PURPOSE

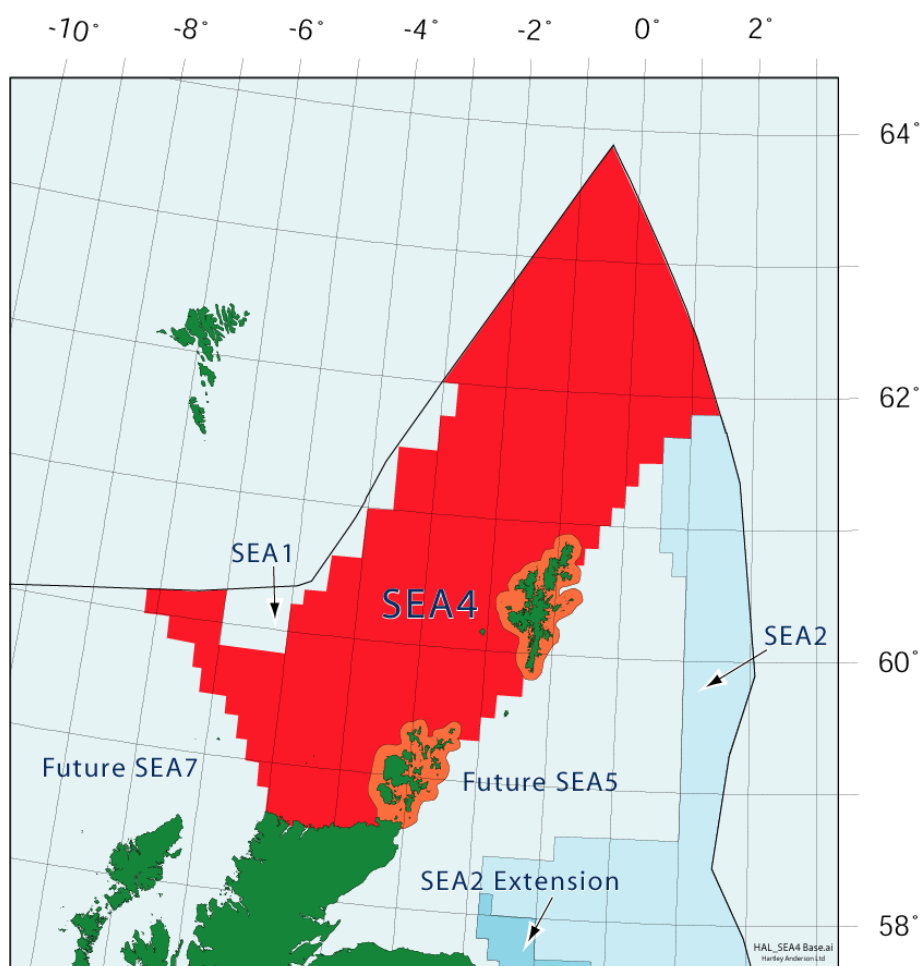
## 1.1 Introduction

Strategic Environmental Assessment (SEA) is the process of appraisal 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 oil and gas licensing rounds.

The UK Department of Trade and Industry (DTI) is the principal regulator of the offshore oil and gas industry and has taken a proactive stance on the use of SEA as a means of striking a balance between promoting economic development of the UK's offshore oil and gas resources and effective environmental protection.

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

*Figure 1 – The area to be covered by the DTI's 4th SEA (SEA 4)*



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

## 1.2 Background to the DTI SEA process

In 1999, the DTI began a sequence of sectoral SEAs of the implications of further licensing of the UK Continental Shelf (UKCS) for oil and gas exploration and production. The first UK offshore Strategic Environmental Assessment (SEA 1) was conducted in 1999/2000 in preparation for the 19<sup>th</sup> 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) and SEA 3 which assessed the remaining parts of the southern North Sea (2002-2003).

In addition, an extension of SEA 2 to consider 14 blocks in the central North Sea adjacent to the Buzzard field discovery was conducted alongside SEA 3 in 2002.

Full details of the SEA process, the steering group (established in early 2001) and documentation can be found at [www.offshore-sea.org.uk](http://www.offshore-sea.org.uk) (formerly [www.habitats-directive.org](http://www.habitats-directive.org)), a website specially set up to promote transparency and facilitate public consultation.

In 1996, a European Directive was proposed on the assessment of the effects of certain plans and programmes on the environment (Com (96)511), to provide a *strategic* complement to the Council Directives which require Environmental Impact Assessments of *specific* developments and activities (85/337/EEC and 97/11/EC). The Strategic Environmental Assessment Directive was adopted in June 2001 (Directive 2001/42/EC). Although the Directive does not require to be implemented in the UK until 2004, the DTI SEAs are being carried out in accordance with its requirements.

## 1.3 Purpose and structure of this document

The purpose of this document is to provide background to and request input from a wide range of stakeholders as part of scoping of the fourth SEA (SEA 4). SEA 4 is considering a proposed 22<sup>nd</sup> offshore licensing round which would cover the area to the north and west of Orkney and Shetland - see Figure 1. The objective of scoping is to identify questions, concerns, information gaps and potentially useful information sources so that these may be considered through the SEA process.

In particular at this stage, the DTI wishes to ensure that for SEA 4 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

To facilitate this, the document gives an overview of the:

1. SEA consultation process
2. Proposed licensing
3. Potential activity
4. Strategic Environmental Assessment process
5. Draft contents list for the public consultation assessment document
6. SEA 4 environment and key information sources
7. Further consultation to be conducted as part of the SEA process

## 1.4 Information sources available on the SEA website

The SEA website ([www.offshore-sea.org.uk](http://www.offshore-sea.org.uk)) includes a range of downloadable documentation relating to the SEA process and to the first three SEAs. A number of these documents are modular for use in more than one SEA.

Documents available on the DTI SEA website which provide useful background for this scoping are:

1. Strategic Environmental Assessment of the Former White Zone (SEA 1)
2. Strategic Environmental Assessment of the Mature Areas of the Offshore North Sea (SEA 2)
3. Strategic Environmental Assessment of Parts of the Central & Southern North Sea (SEA 3)
4. Extension to 2<sup>nd</sup> Strategic Environmental Assessment of the Mature Areas of the Offshore North Sea
5. An Overview of Offshore Oil and Gas Exploration and Production Activities (SD\_001)
6. Pockmarks in the UK Sector of the North Sea (TR\_001)
7. Biological aspects of pockmarks in the UK Sector of the North Sea (TR\_002)
8. Contaminant Status of the North Sea (TR\_003)
9. North Sea Fish and Fisheries (TR\_004)
10. Overview of plankton ecology in the North Sea (TR\_005)
11. Marine mammals in the North Sea (TR\_006)
12. Background information on marine mammals relevant to SEA 2 and 3 (TR\_006\_Rev1)
13. Human activities in the North Sea (TR\_007)
14. North Sea Geology (TR\_008)
15. Overview of Cephalopods relevant to the SEA 2 Area (TR\_009)
16. The Potential Socio-Economic Implications of Licensing the SEA 2 Area (TR\_010)
17. The scope of Strategic Environmental Assessment of North Sea areas SEA 3 and SEA 2 in regard to prehistoric archaeological remains (TR\_014)

## 2 PLANNED CONSULTATION

### 2.1 SEA 4 consultation process

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

Key elements of the SEA 4 consultation are:

- SEA website
- Scoping (early 2002 and spring 2003)
- Stakeholder dialogue meeting at the draft assessment stage (summer 2003)
- A 3 month public consultation period following publication of the SEA 4 documents on the website (autumn 2003)
- Post consultation report (winter 2003)

For SEA 4, initial scoping with a range of academics and conservation organisations was carried out early in 2002 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 fauna prior to SEA.

In keeping with the Government's move towards "less paper" where feasible, scoping and subsequent consultation will be conducted electronically using e-mail and the SEA website. Details of the scoping feedback mechanisms are given in Section 5.

## 2.2 Changes following previous SEA consultation

The practice of SEA is developing over time and following experience on SEA 3 and consultation feedback received, a number of changes to the DTI SEA process are planned for SEA 4. These include:

- SEA document figures and graphics on the website to have enhanced resolution to facilitate legibility
- Involving various stakeholders in a workshop on the initial assessment of potential effects of licensing (together with the SEA steering group, authors of underpinning studies and SEA team)
- Inclusion of a review of the SEA 1 predicted versus actual (or committed) levels of activity
- Improved transparency on the decision making process on which blocks to offer for licensing

## 3 LICENSING PROPOSALS

### 3.1 Licensing process

Licensing of the UK Continental Shelf (UKCS) for oil and gas exploration and production commenced in 1964 and has progressed through a series of rounds. The proposed licensing round would be the 22<sup>nd</sup> and would offer Production Licences covering parts of the shelf and deep waters to the north and west of Shetland and Orkney - see Figure 1.

A brief overview of offshore licensing is given below and more detail can be found on the DTI's website at <http://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, a "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).

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. Relinquishment requirements on successive licences have created blocks subdivided into as many as six part blocks. An overview of oil and gas exploration and production activities which could follow licensing is provided on the SEA website (Report SD\_001). Following a consultation exercise conducted during 2002 the DTI introduced a new type of production licence (the "promote" licence) designed to increase the amount of oil and gas activity in the UKCS. "Promote"

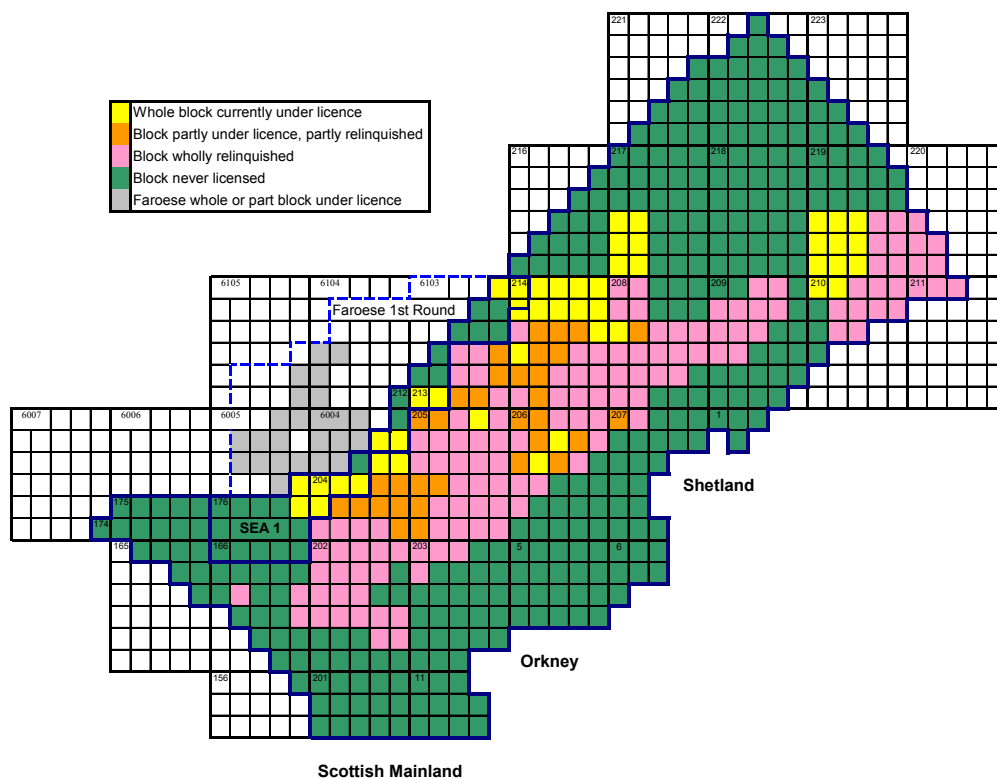
licences were offered alongside Traditional production licences for the first time during the 21st offshore licensing round.

The Traditional licence has an initial term of 4 years for exploration and requires that the Operator has in place the necessary finances, operating, technical and environmental competencies to carry out the agreed work programme before a licence is given. The Promote licence initiative is aimed at harnessing the skills, knowledge and energy of the wider geo-technical community and provides a period of time during which licensees are able to work up potential prospects - primarily using existing data. The Promote licences are offered at a reduced rental fee for this initial period giving smaller companies the opportunity to find oil and gas before 'promoting' their asset to investors to finance the cost of drilling and undertaking a commitment to do further work. The DTI will defer (not abandon) its financial, operating technical and environmental checks until a preset Interim Deadline (two years in most cases). A report must be submitted at the end of this Interim Period or the licence will automatically expire. The full competence criteria will be assessed before any consent is granted for Promote licensees to undertake seismic, drilling and other field operations.

### 3.2 Location of potential 22<sup>nd</sup> round licensing

Blocks within the SEA 4 area were first offered for licensing in 1965. The area comprises some 508.5 blocks of which 33.5 are currently wholly under licence, 33 are partly licensed and partly relinquished, 130 have been licensed but are now wholly relinquished, and 312 have not previously been licensed – see schematic representation below.

*Figure 2 – Schematic of blocks within the SEA 4 area, either currently licensed or potentially available for licensing*



*Note: The SEA 1 area and the blocks licensed during the Faroese 1st licensing round are also highlighted. The Faroese First licensing round was launched on the 17<sup>th</sup> February 2000 and covered approximately 14,000 km<sup>2</sup>, divided into 56 whole blocks and 26 part-blocks. Seven licences were awarded on 17<sup>th</sup> August 2000.*

### 3.3 Alternatives

SEA 4 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 4 area may be offered for licensing in the 22<sup>nd</sup> round.

Alternatives proposed for the development of oil and gas resources within the proposed 22<sup>nd</sup> Round area have been identified as:

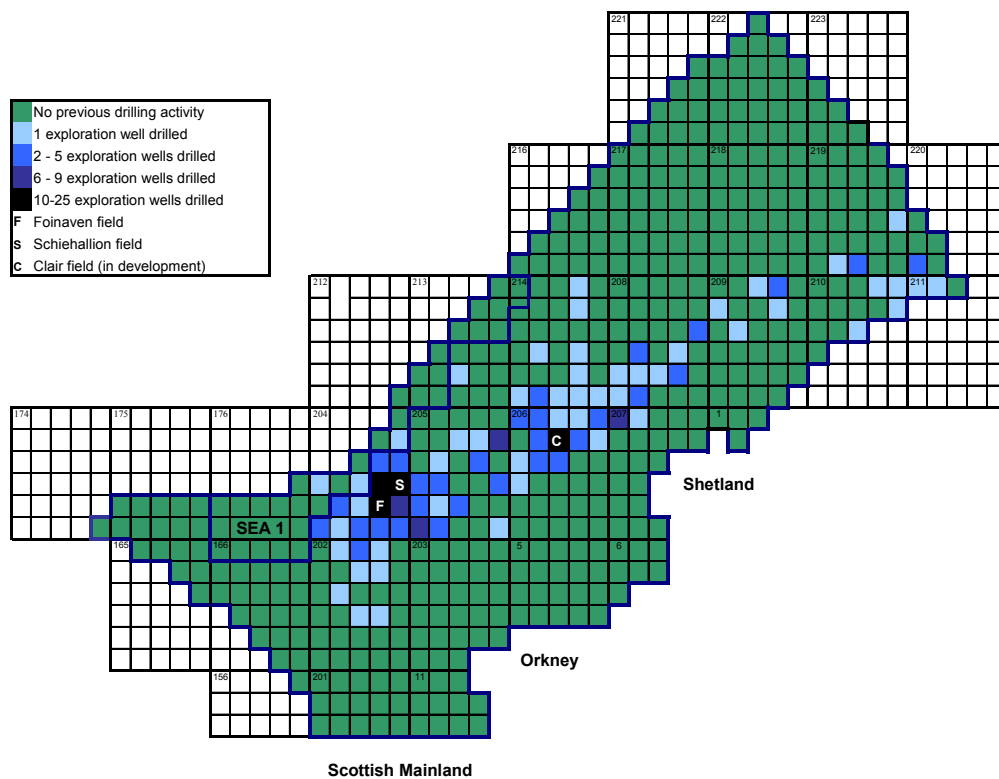
1. Not to offer any blocks for Production Licence award
2. To proceed with the licensing programme as proposed
3. To restrict the area licensed temporally or spatially

## 4 POTENTIAL ACTIVITY IN SEA 4

### 4.1 Location and scale of previous activity in SEA 4 area

Previous licensing of the SEA 4 area has led to the drilling of a number of exploration wells and subsequent developments. The extent and location of these, as well as information relating to the adjacent SEA 1 area are highlighted in Figure 3.

Figure 3 – Schematic of SEA 4 exploration and development activity



Notes:

1. Information sourced from [www.oq.dti.gov.uk](http://www.oq.dti.gov.uk)
2. SEA 1 area is also highlighted



By way of context, 44 whole and part blocks in the SEA 1 area were offered in the 19<sup>th</sup> Licensing Round. As a result of the Licensing Round production licences covering 12 whole and part blocks were awarded. For the SEA 1 area, the operator work commitments agreed at licence award and published included 7 firm wells, 6 contingent wells, and 3 drill or drop wells. All the licences awarded during the 19th Round had existing 3D seismic data, therefore the majority of the work programmes offered reprocessing existing 3D surveys as apposed to collection of new data. Only some blocks had commitments to acquire new 2D and 3D seismic surveys. To date 3 wells have been drilled (204/18-1, 204/16-1 and 204/10-1) and as a whole the results remain confidential. A new 2002 3D seismic survey has been acquired covering blocks 204/16 and 204/21. Approximately 1,250 kilometres of long offset 2D seismic data has been acquired over block 204/18 and adjacent areas.

*Note: A Firm well is a commitment to drill, which is not contingent upon any further evaluation. No waivers will be considered for Firm wells. A Contingent well is a commitment to drill, contingent upon additional evaluation. These are not firm wells although, the Operator must make a technical case to the DTI for a waiver of the commitment if the Operator no longer feels the drilling of the Contingent well is justified on technical, geological or other grounds. A Drill or Drop well is a commitment to drill or relinquish the licence within a specified time frame – again these wells may not be drilled unless geological evaluations prove to be favourable.*

## 4.2 Estimates of potential activity from 22<sup>nd</sup> round licensing

The SEA 4 area can be divided into 3 sub-areas based on geological characteristics and potential for finding oil and gas:

**Area 1** - The area of existing and previously licensed acreage where hydrocarbons (both oil and gas) have been encountered at almost all levels of the geologic column from Devonian to Eocene

**Area 2** - The area beyond about 100km north of Shetland which has never been licensed, and because of lack of information, the potential for hydrocarbons is relatively unknown

**Area 3** - The shallow water coastal areas which are underlain by igneous rocks and viewed as having limited hydrocarbon potential

Projections of the scale of potential exploration and production activity which could follow licensing of the SEA 4 area have been provided by the DTI Licensing and Consents Unit. The projections are best estimates on the basis of current understanding and thus indicative.

### Area 1

**Seismic** - two 2D seismic surveys (500 – 1000km length of 2D seismic lines) and two to five 3D seismic surveys (500 - 2500 km<sup>2</sup> of 3D coverage)

**Exploration wells** – three to five firm/contingent wells

**Developments** - one to two subsea developments tied back to existing infrastructure, one to two Floating Production Storage and Offtake vessels (FPSO) involving some eight to twelve development wells

### Area 2

**Seismic** – two to five 2D seismic surveys (1000 - 4000 km length of 2D seismic lines), two to five 3D seismic surveys (500 - 2500 km<sup>2</sup> of 3D coverage)

**Exploration wells** – one to three firm/contingent wells

Note: For area 2 there is only sparse 2D seismic coverage, and there is a strong likelihood that a number of blocks will be applied for on a drill or drop/contingent well basis. An estimate of up to 10 drill or drop/contingent wells could be expected.

**Area 3** - No activity expected

It should be noted that since much of the area (notably the coastal areas) has limited potential for commercial oil and gas reserves and uptake of the Blocks offered is expected to be low at less than 10%.

## 5 THE ASSESSMENT

### 5.1 Proposed draft contents for SEA 4 Consultation Document

#### Non-Technical Summary

##### 1 Introduction and Background

- 1.1 Introduction
- 1.2 Licensing context and SEA sequence
- 1.3 Scope and purpose of the SEA
- 1.4 Organisation of the consultation document
- 1.5 Supporting studies and documents

##### 2 Strategic Environmental Assessment Process

- 2.1 Introduction
- 2.2 Overview of the SEA process
- 2.3 Scoping the SEA
- 2.4 Stakeholder dialogue session
- 2.5 Studies
- 2.6 Further consultation process

##### 3 Regulatory Context

- 3.1 SEA Directive
- 3.2 Licensing
- 3.3 Control of operations

##### 4 Activities

- 4.1 Introduction
- 4.2 Alternatives
- 4.3 Scenarios
- 4.4 Stages of activity

##### 5 Physical and Chemical Environment

- 5.1 Overview
- 5.2 Geology, substrates and shoreline types
- 5.3 Climate and meteorology
- 5.4 Oceanography and hydrography
- 5.5 Contamination of water and sediments

##### 6 Ecology

- 6.1 Overview
- 6.2 Plankton
- 6.3 Benthos
- 6.4 Cephalopods
- 6.5 Fish
- 6.6 Marine reptiles
- 6.7 Birds
- 6.8 Marine mammals
- 6.9 Coastal habitats

##### 7 Coastal and Offshore Conservation Sites

- 7.1 Overview
- 7.2 Existing coastal conservation sites within the SEA 4 area
- 7.3 Potential for coastal and offshore sites within the SEA 4 area
- 7.4 Marine and coastal archaeological resources and sites

##### 8 Users of the SEA 4 Marine and Coastal Environment

- 8.1 Introduction
- 8.2 Oil and gas
- 8.3 Fisheries
- 8.4 Shipping
- 8.5 Aggregate extraction
- 8.6 Recreational uses
- 8.7 Cables
- 8.8 Renewable energy
- 8.9 Aquaculture
- 8.10 Other uses of the coastal environment
- 8.11 Other uses of the offshore marine environment

##### 9 European Resources of Potential Relevance to the SEA 4 Area

- 9.1 Introduction
- 9.2 Faroes, Norway
- 9.3 Listing of protected sites

##### 10 Consideration of the Effects of Licensing

- 10.1 Introduction
- 10.2 Approach
- 10.3 Evaluation of minor effects
- 10.4 Consideration of effects
- 10.5 Cumulative and synergistic effects
- 10.6 Transboundary effects
- 10.7 Socio-economic effects

##### 11 Conclusions

- 11.1 Conclusions
- 11.2 Gaps in understanding
- 11.3 Recommendations
- 11.4 Overall conclusion

##### 12 References

- Appendix 1:** Glossary and Abbreviations
- Appendix 2:** Identification of Environmental Interactions
- Appendix 3:** Summary of Expert Assessment Workshop
- Appendix 4:** Further detail on some components of the natural environment

## 6 SEA 4 AREA - OVERVIEW

### 6.1 Coastal and shelf waters

The predominant coastal features of SEA 4 are the high, rugged cliffs which stretch along much of the north coast of Scotland, and the Orkney and Shetland Isles. These form an important habitat for large numbers of breeding seabirds which benefit from the rich feeding grounds in adjacent coastal and shelf waters.

The islands of Orkney and Shetland 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.

Small dolphins and whales are generally present in inshore waters of SEA 4 with harbour porpoises and white beaked dolphins, the most commonly recorded. Minke whale, bottlenose dolphin, killer whale and long-finned pilot whale are distributed over the shelf and in deeper offshore waters.

Important fish species include mackerel, herring, cod and haddock, many undertaking large scale spawning and feeding migrations along the shelf edge. An area of enhanced productivity, the shelf edge represents an important feeding ground for fish, oceanic seabirds and cetaceans.

The range and variation of water temperatures within SEA 4 is marked; the relatively warm north-eastwards flowing water of the North Atlantic Drift bathing the continental shelf and upper slope contrasting with the very cold water flowing south-west at depth from the Arctic Ocean and Norwegian Sea. The area also encompasses the full range of sea floor types - from bedrock, sands and gravel to mud.

### 6.2 Continental slope and deep water

The deep water province is dominated by a number of significant topographical features. To the north, the gently sloping North Sea Fan reaches depths of 2,400m in the north, rising to 900m in the south, where it joins the Faroe Shetland Channel. The southern end of the channel meets the Faroe Bank Channel and dividing this from the Rockall Trough, the Wyville Thomson Ridge rises to within 400m of the surface.

The ridge provides richer feeding grounds than the surrounding deeper water and also supports a range of benthic organisms including sponges and cold water corals. The 'Darwin Mounds' were first discovered during the 1998 AFEN survey, with a second area found nearby during the 1999 DTI survey. Many of these seabed mounds were found to harbour the coral *Lophelia pertusa* and the area has been proposed as an offshore conservation site.

The fish of the upper 500-600m of the continental slope include commercial species such as cod, haddock and monkfish. A limited number of commercially important fish species, including the Greenland halibut, roughhead grenadier, Arctic skate and redfish are found in the cold water deeper down the continental slope.

The waters of the continental slope and Faroe-Shetland Channel are within the foraging range of northern fulmar, northern gannet and Atlantic puffin although, in general, the deep waters to the north of Shetland are too distant from colonies to be used during the breeding season. However, non-breeding birds and migrants may be present.

There are records of blue, fin, humpback and other whales in the region and long-finned pilot whales are concentrated along the continental slope north of Scotland, particularly in the Faroe Shetland Channel and the Faroe Bank Channel. Atlantic white-sided dolphin and common dolphin are also distributed in deep water although there may be inshore movements associated with calving periods. Hooded seals regularly feed in the deep water areas far to the north of Shetland.

### 6.3 Key information sources on the environment

The SEA 1 Consultation Document contains an extensive bibliography to the natural environment of the North-eastern Atlantic region. Information sources relating to the North Sea environment and the effects of oil and gas operations are contained within SEA 2 and SEA 3 Consultation and Underpinning Documents (see Section 1.4). Key information sources for the SEA 4 area not referenced in these earlier documents and new publications of broad application include:

Atlantic Margin Environmental Surveys of the Seafloor 1996 and 1998. CD Atlantic Frontier Environmental Network and UKOOA

Collins M and Sternberg RW (2001). The Marine Environment of the north east Atlantic Margin. Continental Shelf Research, Volume 21 Nos. 8-10

Taylor SJ and Reid JB (2001). The distribution of seabirds and cetaceans around the Faroe Islands. JNCC Report ISBN 1 86107 532 4. 68pp.

AFEN (2001)The UK Atlantic Margin Environment Towards a better understanding. Published by the Atlantic Frontier Environmental Network ISBN 0 9541648 0 6

Swift RJ, Hastie GD, BartonTR, Clark CW, Tasker ML and Thompson PM (2002). Studying the distribution and behaviour of cetaceans in the northeast Atlantic using passive acoustic techniques. A report to AFEN 87pp.

These, together with the references and data sources therein, form the starting point for understanding the regional environment as a basis for the SEA assessment.

Through scoping we wish to identify such additional information as may be relevant to the conduct of a Strategic Environmental Assessment.

### 6.4 Studies underway

In addition to those relevant studies completed during SEA 2 and 3 (listed in Section 1.4), a number of data compilations/syntheses were recognised from scoping to date as necessary to support the SEA 4 assessment. The subject areas addressed by these studies are:

- Seafloor and subsurface sediments and geology
- Users of the SEA 4 area
- Fish and fisheries
- Coastal and deep water seabed biota
- Plankton
- Cephalopods
- Marine mammals
- Coastal and offshore conservation sites
- Prehistoric marine archaeological remains
- Socio-economic Implications of SEA 4 licensing

## 7 YOUR INPUT TO SCOPING

The DTI would appreciate your input as part of the offshore oil and gas SEA process and would be grateful if you would provide your input under the following headings:

**1. Additional information**

Any additional information that you believe should be taken into account for SEA 4, giving references where appropriate

**2. Issues or concerns**

Identify issues or concerns that you may have with regard to the proposed licensing, both general and specific

**3. Other**

Any other input you feel relevant

Please send your input marked “SEA 4 Scoping Input” by preferably e-mail to [SEA@hartleyanderson.com](mailto:SEA@hartleyanderson.com).

Alternatively feedback can be sent by post to Christine Weare, Department of Trade and Industry, Atholl House, 86-88 Guild Street, Aberdeen, AB11 6AR or via the SEA website at [www.offshore-sea.org.uk](http://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). Please indicate that your input relates to “SEA 4 – Scoping”

We would be grateful for your response to SEA 4 scoping by 11<sup>th</sup> May 2003 or earlier if possible. In all cases, please specify whether you would be happy for your input to be made public via the SEA website.

The outcome of this scoping exercise will be presented at the Stakeholder Dialogue Meeting proposed for Summer 2003.