Support to Building the Inter-American Biodiversity Information Network

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Biodiversity Information for Decision Making – International Experiences

APPENDIX 3

CASE STUDY: Experiences in the Use of Internet Accessible Information in the Oil and Gas Industry

(Document 2 - Appendix 3)

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Support to Building the Inter-American Biodiversity Information Network

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This Appendix accompanies the principal document *Biodiversity Information for Decision Making – International Experiences*. The principal author is Derek Johnson, Nippon Koei UK.

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CHAPTER 1 THE OIL AND GAS INDUSTRY

1.1 Nature of the Industry

Global energy demand is predicted to increase between three and four-fold by the year 2050. In the short and medium term, this demand is expected to be met by oil and gas.

The oil and gas industry is probably unique in that its exploration, resource development and product transportation occur both on land and in the oceans. The locations of exploration and resource development activities are restricted to those parts of the world where the underlying geological conditions are conducive to the accumulation of oil and gas deposits. However, transportation of the raw material over long distances by pi2peline and ship extends the potential for environmental impact over much wider areas of the terrestrial and aquatic environments. Ocean currents and winds can also transport pollutants significant distances from the source of the pollution.

As the transition from fossil fuels to renewable energy sources occurs, natural gas is expected to play an important bridging role. The increase in demand for natural gas will inevitably result in an increase in the number of transmission pipelines. Pipelines have been a significant source of controversy in areas of high biodiversity value, because of the potential for long-term habitat fragmentation, hydrological impacts and the interruption of migration routes, in addition to the short-term impacts associated with pipeline construction.

With a greater awareness and understanding of the importance of maintaining biodiversity, and the fragility of a number of habitats, areas that are of potential interest to the oil and gas industry are being recognised and valued for their biodiversity. While, individually, oil and gas industry related activities in an area may not be the greatest threat to biodiversity, they can have a wide range of negative impacts on the ecosystems. When combined with the impacts of other parallel developments, the threat to biodiversity increases.

The prospect development activities carried out by the industry are sequential and of increasing potential for adverse impact. The stages can be simplified as:

- Desk Studies
- Aerial and Ground-based Exploration Surveys (including seismic)
- Exploration Drilling
- Appraisal
- Development and Production
- Decommissioning and Site Rehabilitation

As the project moves through the stages, the number of activities having an impact, the area subject to impact, and the intensity of impacts will all increase. It follows that the amount of detail required in biodiversity information will also increase.

Before the first exploration surveys are carried out, there will have been a significant amount of effort devoted to desk-based studies. It is at this stage that ready access to well-structured information systems can help put forward the business case for biodiversity conservation needs, within the context of demand for product, economics and lifetime of the resource.

As requirements for Environmental Impact Assessments (EIA) have developed over the years, individual activities such as yield appraisal, exploration drilling and site investigation have become the subject of separate environmental assessments.

Over time, driven by internal and external forces, the industry has begun to show a more responsible attitude towards the impacts of its activities on the environment in general, and on local and regional biodiversity in particular. The heightened awareness of the importance of ameliorating effects on biodiversity has been clearly demonstrated in the development of the Energy and Biodiversity Initiative (EBI) - see Chapter 3. The EBI included the establishment of a framework for the incorporation of biodiversity issues into the various stages of the oil and gas project lifecycle.

There is a great variation in the level of biodiversity information needed by the industry. The initial route planning for an international pipeline would need mapped information on, for example, the various categories of national and international protected areas, forest cover, Endemic Bird Areas, Centres of Plant Diversity, WWF Global 200 Priority Ecoregions and CI Biodiversity Hotspots. On the other hand, the EIA for a specific industry development site would need detailed information on the plant and animal species at the site.

Biodiversity information is now used by the oil and gas industry, not only to minimise the adverse effects of new developments, but also to assist in associated biodiversity enhancement initiatives, the rehabilitation process after de-commissioning and in the restoration of historically degraded oil fields.

This document principally relates to biodiversity information requirements during the exploration, production and transport of oil and gas. However, the oil and gas industry also includes a very large ‘downstream’ element producing the refined products, petrochemicals, etc. The siting and operation of refineries and other industrial plant also needs to take biodiversity into consideration. Such matters should be addressed within EIAs, which would not only identify the loss of biodiversity due to landtake, but also determine the impact of effluents and emissions on biodiversity within the ‘area of influence’. This may require

detailed modelling studies, but good information on the distribution, importance and sensitivity of biodiversity is also critical.

CHAPTER 2 EARLY INITIATIVES TOWARDS BIODIVERSITY CONSERVATION

The industry has been increasingly aware of its potential to have adverse impacts on the environment, and as a result, has collaborated with international environmental bodies in the preparation of environmental guidelines applicable to its activities. Some of these guidelines are non-region specific, while others have focussed on particular sensitive ecosystems. The more important guidelines are as follows:

NCC (1986) *Nature Conservation Guidelines for Onshore Oil and Gas Development*. Nature Conservancy Council, Peterborough, UK, with British Petroleum, London, UK.

IUCN (1991) *Oil Exploration in the Tropics: Guidelines for Environmental Protection*. IUCN, Gland, Switzerland and Cambridge, UK,

IUCN (1993) *Oil and Gas Exploration and Production in Mangrove Areas*. IUCN, Gland, Switzerland and Cambridge, UK,

IUCN (1993) *Oil and Gas Exploration and Production in Arctic and Sub-arctic Onshore Regions*. IUCN, Gland, Switzerland and Cambridge, UK, with E&P Forum, London, UK.

E&P Forum/UNEP (1997) *Environmental management in oil and gas exploration and production: An overview of issues and management approaches*. E&P Forum, London, UK, with UNEP, Paris, France.

These documents are useful in so far as they inform the user of the procedures that should be adopted at different stages of resource exploitation or in a particular environment. However, they do not provide the mechanism by which the user can access key legislation and conventions, or obtain information regarding the ecological conditions or biodiversity in a particular region.

Easy access to up-to-date, concise information on protected areas, ecologically sensitive areas, cultural heritage sites and the distribution of disadvantaged social groups, is particularly important for the initial desk studies and subsequent project development process.

Rapid Internet access to free or low-cost quality-controlled biodiversity information encourages a greater consideration of biodiversity during decision-making and the earliest stages of project development. Appropriate sources of such information are discussed in Chapters 3, 4 and 5 below.

CHAPTER 3 THE ENERGY AND BIODIVERSITY INITIATIVE

3.1 Introduction

A major step forward was the Energy and Biodiversity Initiative (EBI) project for 'Integrating Biodiversity Conservation into Oil and Gas Development'.

The objective of the initiative was to bring together leading energy companies and conservation organisations to develop and promote procedures to enable biodiversity conservation to be integrated into all stages of the oil and gas development process. The intention was to develop procedures and materials on biodiversity that would be acceptable to both the energy and conservation communities, particularly during the 'site selection' process.

The nine members of the EBI were:

- BP
- Chevron Texaco
- Shell
- Statoil
- Conservation International
- Fauna & Flora International
- IUCN
- The Nature Conservancy
- Smithsonian Institute

3.2 The Output of the EBI

The output of the EBI, which was published in 2003, consists of a printed report supported by a CD-ROM containing additional guides, discussion papers and resources. These are also available interactively on-line at www.TheEbi.org .

The core of the EBI output is a series of linked flowcharts that take the user through each of the stages within the exploration, development and rehabilitation process. Within each stage, there is an identified procedure which requires the user to carry out a review of biodiversity conservation issues. This review, together with economic, environmental, social, geotechnical and engineering information, will enable the project to team decide whether to proceed to the next stage of the project, and if so, what additional biodiversity information will then be needed.

The resources for carrying out the review of biodiversity are contained within the report, the associated compact disc and hyperlinked web sites. These resources contain links to related topics in other guides, discussion papers and materials.

The total content of the EBI report is as follows:

Guides:

- Integrating Biodiversity into Environmental Management Systems
- Integrating Biodiversity into Environmental and Social Impact Assessment Processes
- Framework for Integrating Biodiversity into Site Selection Process
- Biodiversity Indicators for Monitoring Impacts and Conservation Actions

Discussion papers:

- Negative Secondary Impacts from Oil and Gas Development
- Opportunities for Benefiting Biodiversity Conservation

Resources:

- Good Practice in the Prevention and Mitigation of Primary and Secondary Biodiversity Impacts
- PowerPoint Presentation on Integrating Biodiversity Conservation into Oil and Gas Development
- Online Biodiversity Information Sources
- International Conventions
- Glossary

3.3 Internet Based Resources

The two Internet-based resources are 'International Conventions' and 'On-line Biodiversity Information Sources'.

3.3.1 International Conventions and National Regulations

The International Conventions resource consists of a summary of relevant conventions together with hyperlinks to the sites that contain the details of the conventions. While the text on the compact disc is fixed, the link leads to a site that is subject to a process of updating. The advantage of using the EBI site directly is that the accessible sites are also updated, and hence the user always has access to the most recent information.

Conventions are particularly important during the review of legal and regulatory issues within the 'site selection' framework process; they may also be relevant to

subsequent stages. The focus has been on the international and regional levels, but information on country-specific legislation will also be required in applying the framework.

The need for access to national information will vary according to:

- The level of environmental institutional development in terms of regulatory, legal and political context of the country in question;
- To which relevant international conventions and agreements the country is a signatory; and
- Whether the conventions and agreements have been implemented at the national level.

Therefore, when the framework is being applied, country-specific aspects of legislation must be considered as by the user to supplement the given information.

In addition to the key international conventions, the framework tool kit provides access to regional agreements, and specific habitat and faunal group agreements. What is not available is access to the legislation of individual countries.

3.3.2 Biodiversity Information

A search in February 2004 using the Google search engine using the keyword 'biodiversity' generated 2.2 million hits. The On-line Biodiversity Information Sources resource is based on a refined search and contains a screened sub-set of sites containing information that is relevant and has undergone a critical review. The sites are arranged in groups with similar technical or geographical content.

Within the resource, the sites are grouped in the following categories:

Biodiversity – Global Projects
Biodiversity – Regional Projects
Conventions and National Biodiversity Strategies and Action Plans
Databases
Freshwater Resources
Gateways, Directories and Search Engines
General Information
Indigenous Peoples and Traditional Knowledge
International Conservation NGOs
Marine Resources
Natural History Museums
Protected Areas
Publications
Science, Research and Natural History
Sensitive Environments
Species Related Data

With a little practice and experience it is possible to move between the different databases to draw together information on species within the project area and establish a picture of the nature of the biodiversity.

It is not proposed that the use of the Internet-based resources to gather information replaces site visits by experienced biologists and ecologists. Rather, it enables the key issues to be identified and thereby makes the fieldwork more cost effective.

This resource, **if maintained and kept up to date** will provide the user in the project management team with access to relevant information on the biodiversity status of the proposed prospect at exploration 'block' or project level.

The EBI output is designed to be applicable worldwide, and consequently contains much information that is not relevant to the IABIN region. Within the categories listed above there are some web-sites that are specific to North America but only a few relate to individual Central and South American countries.

3.4 Future Development of EBI

Conservation International (CI), which managed the development of EBI, is actively promoting its application in the industry. CI is working closely with IPIECA (see Chapter 4) and the OGP Biodiversity Working Group to carry out a programme to test the guidelines and associated resources. Feedback from the testing process will be used to refine and further improve the guidelines.

As noted in Section 3.3.1 above, there appears to be no readily accessible common source of information on national legislation relating to the protection of habitats and biodiversity.

3.5 Sources of Information for Use in the EBI Framework

The functionality of the EBI resource tools is entirely dependent on the ability of the user to be able access externally maintained information sources on formally protected areas, sensitive and threatened areas, biodiversity, etc.

Information that is key to the implementation of the EBI framework can be found in the following Internet accessible sites:

3.5.1 World Database on Protected Areas

http://sea.unep-wcmc.org/wdbpa/

A collaborative project between the IUCN World Commission on Protected Areas and UNEP-WCMC that gives access to a searchable database. The key feature of the database is that it is searchable by country or by a specific area name. Information relating to each registered site is presented in a common tabular format. Geographic co-ordinates and area are generally provided, together with status and ownership. The site tables themselves do not provide information about the boundaries of the site, and consequently further searching is necessary to determine proximity or overlap of proposed project sites with protected areas.

Commercial users with access to GIS software are able to download polygon database and "shape" files to display the boundaries of internationally and nationally designated sites on their own base maps. In order to use this extended facility of the Protected Areas Database, it is necessary to obtain a licence from UNEP-WCMC.

3.5.2 Interactive Map Services IMAPS

http://www.unep-wcmc.org/

IMAPS is the map-based counterpart to the text-based Protected Areas Database. It provides a rapid screening tool for use at the early stages of a project, and allows a wide range of land and marine based screening criteria to be examined.

For more detailed information on IMAPS see Chapter 4 below.

CHAPTER 4 INTERNATIONAL PETROLEUM INDUSTRY ENVIRONMENTAL CONSERVATION ASSOCIATION (IPIECA)

4.1 Introduction

IPIECA, the International Petroleum Industry Environmental Conservation Association was established in 1974 (see www.ipieca.org.). It is a voluntary non-profit organization whose membership includes both petroleum companies and associations at the national, regional or international levels. It is IPIECA's mission to develop and promote scientifically sound, cost-effective, practical, socially and economically-acceptable solutions to global environmental issues pertaining to the petroleum industry.

IPIECA has been working on biodiversity issues since 1992, and in 2002 formed a joint industry Biodiversity Working Group (BDWG) with the International Association of Oil and Gas Producers (OGP).

4.2 IMAPS

While IPIECA does not support directly an Internet-based biodiversity information system, it has worked closely for more than seven years with UNEP-WCMC (see www.unep-wcmc.org) in the development of an Interactive Map Service (IMAPS). This provides Internet access to both biodiversity and environmental data through an interactive map format.

IMAPS allows users to select regions of the world and create maps showing local biodiversity, sensitive environments, protected areas and the distributions of some selected flora and fauna genera / species. IPIECA has specifically sponsored IMAPS coverage of the Mediterranean, Black Sea and Caribbean Region, and is currently working, through a dedicated Steering Committee of industry members, to expand this coverage to the Caspian Sea.

The function of IMAPS is to provide a tool to be used by the oil and gas industry in project planning and management, and also in preparing and managing emergency response plans.

More detail is available in Document 4 of this project, *Standards and Practices for Sharing GIS-based Information*, that describes the approach to GIS, map libraries and interactive mapping and uses IMAPS as an example.

At the present stage of development, the publicly accessible area of IMAPS covers the whole world at low resolution, with the Mediterranean, Black Sea and Caribbean area in more detail. The oil and gas industries have access to mapping for the whole world at high resolution.

CHAPTER 5 INTERNATIONAL ASSOCIATION OF OIL AND GAS PRODUCERS (OGP)

5.1 Introduction to OGP

Members of the International Association of Oil & Gas producers (OGP) include most of the world's leading publicly-traded, private and state-owned oil & gas companies, oil & gas associations and major upstream service companies. Between them the members produce more than half of the world's oil and about one third of its gas.

From its headquarters in London, OGP represents the industry in the UN International Maritime Organisation (IMO) and the Commission for Sustainable Development (CSD). OGP also works with the World Bank and with the International Organisation for Standardisation (ISO). From its office in Brussels, OGP, provides an important two-way link between the upstream industry and the European Union (EU).

An important role of OGP is to help its members to achieve continuous improvements in environmental performance in the engineering and operation of upstream ventures.

5.2 The Needs of OGP Members

At the present time the environmental focus of OGP is towards the preparation and dissemination of documents that provide guidance on operational procedures for upstream operations. However, comments from the participants at a June 2003 workshop on biodiversity showed that the members felt a need for access to information on sensitive environments. A number of the 'problems' that the members identified could be solved by having their own in-house staff with experience in identifying and addressing issues of habitat sensitivity and effects on biodiversity.

The three needs most relevant to the development and use of Internet-based information can be summarised as follows:

- Clear definitions of major types of sensitive environments; information on relevant data sources and how to access them; and to identify means to enable companies to share information.
- Valuation of biodiversity and sensitive environments in monetary terms, by using natural resource accounting techniques.

- The ability to incorporate biodiversity considerations effectively into life cycle planning of a project. The EBI (See Chapter 2), which was rolled out later in the year 2003, provides a good starting point in meeting this need.

CHAPTER 6 PARALLEL INITIATIVES IN THE MINERAL EXTRACTING INDUSTRIES

6.1 Introduction

The International Council on Mining and Metals (ICMM) based in London has fifty members representing the mineral and coal mining industries. The basic procedures of exploration, exploitation and rehabilitation that the mining industries follow are similar to those of the oil and gas industries. However there is one major difference between the two industries, the disturbance to the surfaced as a result of mineral extraction can be significantly greater than that caused by oil and gas extraction.

ICCM has committed itself to a dialogue on mining and biodiversity with the conservation community. IUCN is the leading international environmental NGO talking part in the dialogue.

With a view to minimising and managing the impact of their activities on the environment members of ICCM have pledged to operate within a ten-point sustainable development framework which was adopted in May 2003.

6.2 Basis of the Sustainable Development Framework

Three of the principles of the framework that relate to environmental performance are: A commitment to,

Principle 2: Integrate sustainable development considerations within the corporate decision-making process.

Principle 6: Seek continual improvement of environmental performance

Principle 7: Contribute to conservation of biodiversity and integrated approaches to land use planning.

Principle 6 includes the following sub sections:

- Assessment of the positive and negative, the direct and indirect, and the cumulative environmental impacts of new projects – from exploration through closure.
- Rehabilitation of land disturbed or occupied by operations in accordance with appropriate post-mining land uses.

Principle 7 includes the following sub sections relating more directly to biodiversity issues:

- Respect for legally designated protected areas.

- Dissemination of scientific data on and promotion of practices and experiences in biodiversity assessment and management.
- Support for the development and implementation of scientifically sound, inclusive and transparent procedures for integrated approaches to land use planning, biodiversity, conservation and mining.

These principles clearly identify the recognition of the potential for interaction between the practices of the mining industries and the maintenance of biodiversity.

6.3 Linking with Other Members of the Private Sector

In parallel with the internal initiative of the mining and biodiversity dialogue, moves have been made towards developing a clearer interaction with the broader private sector.

These moves on the existing guidelines prepared by the ICMM and take into account recent developments including discussions of the ICMM Council and the outcomes of the World Summit for Sustainable Development. The mining dialogue is a part of the broader dialogue that has been underway for several years now with the extractive industries including the oil and gas industry. The most significant of these being the discussions with the Energy and Biodiversity Initiative (EBI) and the secondment of a staff member to the Shell Group. years.

The working together of what are probably the two largest industries involved in the exploitation of the earth's physical resources is an important step forward in the area of the protection of biodiversity. The ability of these industries to have ready access to information regarding the locations of designated and proposed protected areas and habitats and species under threat is key to their continued endeavours in this area.

CHAPTER 7 POTENTIAL APPLICATION OF INTERNET BASED INFORMATION SYSTEMS

7.1 Introduction

As has been described in the sections above there are existing project planning and operational tools in use by the oil and gas industry which are centred on, or include, access to Internet based information systems.

Examination of the country or region specific databases that are listed in the EBI resources reveals that there is limited information for Central and South American countries. The development of IABIN as a network specifically focussing on the Americas will, it is hoped, provide a more extensive and comprehensive coverage of the region.

7.2 Information Required for Reactive Protection of Ecosystems

For oil spill management and emergency response management IMAPS, in its present form, provides detailed habitat and biodiversity information for the Mediterranean, Black Sea and Caribbean Regions and work is currently underway to provide detailed information for the Caspian Sea. It would be appropriate to expand this coverage even further to include estuaries and coastal area in the vicinity of oil loading and off-loading terminals to assist in emergency response planning within the IABIN geographic area.

7.3 Information Required for Long Term Protection of Ecosystems

Many of the long term needs of the oil and gas industry in terms of biodiversity conservation and protection of sensitive ecosystems are the same as those of other extractive industries and infrastructure developers.

The IABIN programme should endeavour to provide information, for each of the countries within the programme, on the location and boundaries of all existing and planned Protected Areas and non-protected sensitive habitats and species. This will provide the information required at the early stages of project identification and site selection.

Further down the project chain at the EIA stage more detailed sets of information are required. These include detailed information on the cause-effect-mitigation-recovery-rehabilitation chain. Some of the input to this chain will be addressed by the ‘Role and Use of Biodiversity Indicators’ and ‘Pressure and Response Indicators’. Key to the understanding of the processes involved in the loss of biodiversity and recovery will be long term ecological studies. The ability to use

the EBI process to prevent the occurrence of significant negative impacts will rely on access to scientifically robust case studies of impact, effective mitigation and recovery. Only by providing access to such information to the project planners will it be possible to start to include the whole of the ecosystem/biodiversity component into a meaningful project evaluation.

Information that specifically identified by OGP as valuable for the planning process is clear definitions of sensitive environment types and a means of assessing the quality of information.

A second important factor identified by OGP was the measurement of the valuation of biodiversity and sensitive environments in monetary terms. This type of information is particularly important as cost-benefit assessments are carried out. In the early days of the application of environmental economic techniques to projects little was known about the true value of the environment and value was frequently addressed from an anthropocentric point of view. As a greater understanding of the value of biodiversity develops this value need to be translated into terms which can be used in the overall cost benefit model. Access to a common database containing monetary value figures would ensure that projects and options were evaluated using a common set of value data.

ANNEX 1: Key Contacts

EBI **The Energy & Biodiversity Initiative**

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e-mail: info@ipieca.org

IUCN **IUCN - The World Conservation Union** Headquarters

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OGP **International Association of Oil and Gas Producers**

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ICMM **International Council on Mining and Metals**

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ANNEX 2: Acronyms and Abbreviations

BDWG	Biodiversity Working Group
CI	Conservation International
EBI	Energy & Biodiversity Initiative
EIA	Environmental Impact Assessment
EU	European Union
GIS	Geographic Information System
IABIN	Inter-American Biodiversity Information Network
IMO	International Maritime Organisation
IPIECA	International Petroleum Industry Environmental Conservation Association
IUCN	International Union for the Conservation of NatureWorld Conservation Union
NGO	Non- Governmental Organisation
OGP	International Association of Oil and Gas Producers
UN	United Nations
UNEP	United Nations Environmental Programme
WCMC	World Conservation Monitoring Centre
ICMM	International Council on Mining and Metals