INTRODUCTION

1.1 PURPOSE OF REPORT

Tullow Ghana Limited (Tullow) and its joint venture partners Kosmos Ghana HC (Kosmos), Anadarko WCTP Company, Sabre Oil and Gas, the EO Group, and the Ghana National Petroleum Corporation (GNPC), known as the Jubilee Joint Venture, are pursuing development of hydrocarbon resources within the Jubilee Field, located in deep water approximately 60 km offshore Ghana.

The proposed Jubilee Field Phase 1 development would be the first major deepwater offshore oil production project in Ghana and for projects of this type there is a legislative requirement to undertake an Environmental Impact Assessment (EIA). This Environmental Impact Statement (EIS) reports the findings of the EIA and has been submitted for public comment and review by the Ghana Environmental Protection Agency (EPA) and other government regulators.

An EIA is a systematic process that predicts and evaluates the potential impacts a proposed project may have on aspects of the physical, biological, socio-economic and human environment. Mitigation measures are then developed and incorporated into the project to eliminate, minimise or reduce adverse impacts and, where practicable, to enhance benefits.

This introductory chapter presents an overview of the project, provides details of the EIA team and outlines the approach taken to undertake the EIA. In addition the structure of the remainder of the report is outlined.

1.2 OVERVIEW OF PROJECT

1.2.1 Hydrocarbon Exploration in Ghana

Hydrocarbon exploration in Ghana started as early as 1896 with wells being drilled in the vicinity of Half-Asini as a result of oil seeps found in the onshore Tano basin in the western region of Ghana(1). The Saltpond field was discovered in 1970 by a Signal Amoco well approximately 100 km west of Accra. Between 1978 and 1985 a total of about 3.47 million barrels of oil (MMBo) was produced from the field and 14 billion cubic feet (Bcf) of gas were flared. A platform, Mr. Louie, used for the production is still in place. Operations resumed in 2000 and the field is currently producing about 600 barrels of oil per day. There is currently no other active commercial oil and gas production in Ghana.

Over the past eight years, exploration for commercial hydrocarbons in Ghana has intensified with activities undertaken by Tullow, Kosmos, Hess Corporation, Hunt Oil, Afren and Norsk Hydro Oil and Gas amongst others. Of the greater than 50 exploration wells drilled in Ghana, approximately 75% showed indications of hydrocarbons and ten discoveries have been made. More than 50 appraisal and development wells have now also been drilled in Ghana.

1.2.2 Jubilee Field Discovery

In June 2007, the Jubilee oil and gas field was discovered offshore Ghana when the Mahogany-1 exploration well in the West Cape Three Points Block was drilled by Kosmos. The Hyedua-1 appraisal well was immediately drilled afterwards in August 2007 by Tullow in the neighbouring Deepwater Tano Block and this confirmed a continuous hydrocarbon accumulation between the two concession areas. Follow-up appraisal wells were drilled in 2008-2009 to evaluate the nature of the oil and gas reserve, with the Mahogany-2 well drilled in May 2008 followed by the Hyedua-2 and Mahogany-3 wells at the end of 2008 into early 2009. The well results, combined with high quality seismic survey data obtained in the fourth quarter of 2007, has identified a large accumulation of hydrocarbons that underlies portions of the Deepwater Tano and West Cape Three Points concession blocks (see Figure 1.1 for location). The two concession blocks are operated by Tullow Ghana Ltd (Tullow) and Kosmos Energy (Kosmos), respectively.

The field is approximately 60 km from the nearest coast and lies in deep water (1,100 to 1,700m). The field was named Jubilee in 2008 by the Government of Ghana in recognition of the country’s golden jubilee anniversary of independence in 2007. Because the field straddles the two concession blocks, Tullow and its joint venture partners are developing the Jubilee field most efficiently under an unitisation arrangement (Unit Agreement) requested and enforced by the Minister of Energy (MoE) as per the Petroleum Agreements applicable to both concession blocks. Under the terms of the agreement Tullow has been designated as Unit Operator of the Jubilee field Unit on behalf of the Jubilee Joint Venture parties. The management of the facilities project design and execution to be deployed in field is being lead by Kosmos Energy as Technical Operator, with a project team composed of personnel from all of the joint venture parties. The Jubilee Unit is approximately 110 km² in area. Figure 1.2 shows the Jubilee Unit and the location and type of the wells as described in the Jubilee Field Phase 1 Plan of Development (PoD) submission.
Figure 1.1  Location of the Jubilee Field Unit Area

![Location of the Jubilee Field Unit Area](image)

Figure 1.2  Jubilee Unit Showing Location and Type of Wells

![Jubilee Unit Showing Location and Type of Wells](image)
The Jubilee Joint Venture is planning a multi-phase development of the Jubilee Field. Phase 1 of the development, which is the subject of this EIA, will consist of production wells, water injection wells and gas injection wells. Oil and gas produced from the underground reservoirs will be gathered through a network of subsea wells, valves, manifolds and pipelines and sent to a Floating Production Storage and Offloading vessel (FPSO) which will be moored in the Jubilee Field. The FPSO is a ship-shaped hydrocarbon processing facility which separates the crude oil and natural gas from the water that may be produced from the reservoirs. The crude oil is processed and stored in the facility’s storage tanks in the hull and offloaded to ocean going oil tanker vessels. The gas will be re-injected to the reservoir and/or exported for sales which will greatly reduce the need for any gas flaring. Any produced water is treated to reduce the concentration of oil in the water to meet permit standards and then discharged to sea. Subsea equipment and FPSO installation is planned for late 2009 to mid 2010 and the target for first oil production is between September to December 2010; with a most-likely first oil date is October 2010. The field development work will continue until early 2011 with further drilling and tie-in of new wells until the plan is completed. It is expected that the field will be decommissioned after 20 years of operation i.e after 2031, although subsequent appraisal and development of the reservoirs may extend this period significantly. A full description of the project is provided in Chapter 3.

1.2.3 Need for Project

The Ministry of Energy (MoE) oversees the development of oil and gas extraction from Ghana’s natural reserves. Under the Ghana National Petroleum Act, 1983, MoE is charged with the responsibility to:

“(a) promote the exploration and the orderly and planned development of the petroleum resources of the Republic; and (b) ensure that the Republic obtains the greatest possible benefits from the development of its petroleum resources.”

MoE grants oil exploration, appraisal and production licenses with the goal to develop and exploit these resources for commercial purposes. The project is being developed in compliance with the PoD agreed with the government of Ghana.

In 2006 Ghana formulated its second edition medium-term national development strategy known as the Growth and Poverty Reduction Strategy (GPRS II), 2006 to 2009. The strategy places emphasis on economic growth as a means of reducing poverty. The strategy identified five priority areas:

- infrastructure development;
- agricultural modernisation;
- good governance;
- private sector development; and
- social services enhancement.
The strategy, policies and practices of the MoE are aligned with GPRS II with the emphasis on two of the priority areas: infrastructure development and private sector development. To that end, the MoE has been engaging in activities intended to reduce the cost of imported oil through facilitating private sector investment in the domestic oil and gas sector.

Another purpose of the project is to generate income. This would occur by selling the oil extracted from the reserves. This income would benefit the project’s shareholders which include Government of Ghana (through participation of the GNPC) as well as commercial entities. The Government of Ghana would generate additional income through royalties and taxes. The income would be used by the Government of Ghana to the benefit of the people of Ghana.

1.2.4 Project Benefits

The purpose of the project is to develop Ghana’s natural resources that lie within the Jubilee Field to the benefit of the people of Ghana and the project stakeholders. The project will need to do so in a safe, environmentally sound and commercially viable manner. The project will contribute to the Ghanaian economy and will have a positive impact in reducing the Ghana balance of payments with respect to energy. Income to the government from the project will facilitate economic development and growth, further benefiting Ghana directly from the project and indirectly through development of supporting and related enterprises. The Jubilee project will generate employment and training opportunities directly in the offshore oil and gas industry. The project will also generate opportunities indirectly through service, supply and support industries. Further details regarding the expected benefits of the project are presented in Chapter 5.

1.3 THE PROJECT TEAM

1.3.1 The EIA Team

Environmental Resources Management (ERM) and ESL Consulting (ESL), jointly referred to as the EIA team, were appointed by Tullow in November 2008 to undertake an EIA for the Phase I Development project. The team comprises independent environmental and social specialists with a combination of experience in undertaking EIAs for FPSO projects in other countries and EIA experience in Ghana. In addition, a series of studies have been undertaken by specialist consultancies to address specific issues. The core team members from ERM, ESL and the specialist consultancies that have contributed to this report are listed in Table 1.1.
### Table 1.1 The EIA Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Role</th>
<th>Qualifications and Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry Camp</td>
<td>ERM</td>
<td>Project Director</td>
<td>BA, 25 years</td>
</tr>
<tr>
<td>Mark Irvine</td>
<td>ERM</td>
<td>Project Manager</td>
<td>BSc, MSc, 21 years</td>
</tr>
<tr>
<td>Albert de Jong</td>
<td>ERM</td>
<td>Project Coordinator</td>
<td>BSc, 6 years</td>
</tr>
<tr>
<td>Ayaa K Armah</td>
<td>ESL</td>
<td>ERM Project Director</td>
<td>BSc, MPhil, MSc, 29 years</td>
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<tr>
<td>Dr Adam Payne</td>
<td>ERM</td>
<td>Fish and fisheries</td>
<td>BSc, MSc, PhD, 10 years</td>
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<tr>
<td>Rob Steer</td>
<td>ERM</td>
<td>Risk Assessment</td>
<td>BSc, MSc, 17 years</td>
</tr>
<tr>
<td>Paul Fletcher</td>
<td>ERM</td>
<td>Waste Management</td>
<td>BSc, MSc, 19 years</td>
</tr>
<tr>
<td>Peter Braithwaite</td>
<td>ERM</td>
<td>Waste Management</td>
<td>BSc, MSc, 10 years</td>
</tr>
<tr>
<td>David Newby</td>
<td>ERM</td>
<td>Waste Management</td>
<td>BSc, 25 years</td>
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<tr>
<td>Kerryn McKune</td>
<td>ERM</td>
<td>Health and social</td>
<td>BA, MA, 5 years</td>
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<tr>
<td>Selorm Ababio</td>
<td>ESL</td>
<td>Marine science</td>
<td>BSc, MPhil, 8 years</td>
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<tr>
<td>Louis Atsiartome</td>
<td>ESL</td>
<td>Socio-economics</td>
<td>BEd, MEd, 18 years</td>
</tr>
<tr>
<td>Emanuel Lamptey</td>
<td>ESL</td>
<td>Fish and fisheries</td>
<td>BSc, MPhil, 9 years</td>
</tr>
<tr>
<td>Dr James Brooks</td>
<td>TDI Brooks</td>
<td>Marine baseline survey</td>
<td>BSc, MS, PhD, 39 years</td>
</tr>
<tr>
<td>Dr Koen van Waerebeek</td>
<td>CEPEC</td>
<td>Marine mammals</td>
<td>PhD, 25 years</td>
</tr>
<tr>
<td>Dr Martin Dyer</td>
<td>Unicomarine Ltd</td>
<td>Marine biologist</td>
<td>BSc, PhD, 35 years</td>
</tr>
<tr>
<td>Tim Worsfold</td>
<td>Unicomarine Ltd</td>
<td>Marine biologist</td>
<td>BSc, 19 years</td>
</tr>
<tr>
<td>Eoin Howlett</td>
<td>ASA</td>
<td>Oil spill modelling</td>
<td>BSc, MBA, 15 years</td>
</tr>
<tr>
<td>Dr Eric Comerma</td>
<td>ASA</td>
<td>Drill cuttings modelling</td>
<td>MS (Civ Eng), PhD, 9 years</td>
</tr>
</tbody>
</table>

### EIA SPECIALISTS

**EIA PROJECT MANAGEMENT TEAM**

- Henry Camp: ERM Project Director (BA, 25 years)
- Mark Irvine: ERM Project Manager (BSc, MSc, 21 years)
- Albert de Jong: ERM Project Coordinator (BSc, 6 years)
- Ayaa K Armah: ESL ERM Project Director (BSc, MPhil, MSc, 29 years)

**EIA SPECIALISTS**

- Dr Adam Payne, ERM Fish and fisheries (BSc, MSc, PhD, 10 years)
- Rob Steer, ERM Risk Assessment (BSc, MSc, 17 years)
- Paul Fletcher, ERM Waste Management (BSc, MSc, 19 years)
- Peter Braithwaite, ERM Waste Management (BSc, MSc, 10 years)
- David Newby, ERM Waste Management (BSc, 25 years)
- Kerryn McKune, ERM Health and social (BA, MA, 5 years)
- Selorm Ababio, ESL Marine science (BSc, MPhil, 8 years)
- Louis Atsiartome, ESL Socio-economics (BEd, MEd, 18 years)
- Emanuel Lamptey, ESL Fish and fisheries (BSc, MPhil, 9 years)

**SPECIAL TOPIC EXPERTS**

- Dr James Brooks, TDI Brooks Marine baseline survey (BSc, MS, PhD, 39 years)
- Dr Koen van Waerebeek, CEPEC Marine mammals (PhD, 25 years)
- Dr Martin Dyer, Unicomarine Ltd Marine biologist (BSc, PhD, 35 years)
- Tim Worsfold, Unicomarine Ltd Marine biologist (BSc, 19 years)
- Eoin Howlett, ASA Oil spill modelling (BSc, MBA, 15 years)
- Dr Eric Comerma, ASA Drill cuttings modelling (MS (Civ Eng), PhD, 9 years)

### 1.3.2 Jubilee Joint Venture Team

The EIA was carried out with input from specialists from the Jubilee Joint Venture team. Input included providing details on the project’s technical aspects as well as with the development of mitigation measures and environmental management plans. Key contributors from the Jubilee Joint Venture team include the following:

- Tullow Ghana Ltd HSE and CSR team: Kofi Esson, Cesar Molina, Rex Quick, Okyeame Ampadu-Agyei, Jamie White, Emmanuel Arthur and Emmanuel Appiah.
- Tullow Oil Plc team: Stuart Wheaton, Graham Brunton, Keith Mutimer, Graham Guy, Brian Teggart, Nigel Hill.
- Anadarko WCTP Company: Steve Freemyer and Rob Abbott.

### 1.3.3 Acknowledgements

Acknowledgements go to the Ghana Environmental Protection Agency (EPA) for providing guidance on the EIA process and to those consultees listed in
Annex A that provided information for the EIA, raised issues and made comments on the project.

In addition, project description and baseline information from previous studies undertaken by Continental Science Associates (CSA) International on behalf of Kosmos has been used in this EIA and is gratefully acknowledged.

1.4 PURPOSE OF EIA

Under the Ghanaian Environmental Assessment Regulations (1999), oil and gas field development is an undertaking for which an EIA is mandatory. Guidance on how to undertake the EIA is provided in the Environmental Assessment in Ghana Guidelines (1995). The undertaking also requires registration and authorisation by the Ghana EPA.

The purpose of the EIA is to provide information to regulators, the public and other stakeholders to aid the decision making process. The main objectives of the EIA are therefore as follows.

- To define the scope of the project and the potential interactions of project activities with the natural and social (including socio-economics and health) environment that should be defined and assessed during the EIA.

- To review national and international legislation, standards and guidelines, to ensure that all stages of the proposed project through its complete lifecycle take into consideration the requirement of Ghanaian legislation, internationally accepted environmental management practices and guidelines, and project-related Environmental Health and Safety (EHS) policies and standards.

- To provide a description of the proposed project activities and the existing physical, chemical, biological, socio-economic and human environment that these activities may interact with.

- To assess the potential environmental and social impacts resulting from the project activities and identify viable mitigation measures and management actions that are designed to avoid, reduce, remedy or compensate for any significant adverse environmental and social impacts and, where practicable, to maximise potential positive impacts and opportunities that may arise due to the project.

- To provide the means by which the mitigation measures will be implemented and residual impacts managed, through the provision of an outline Environmental Management Plan (EMP). This will also require the development of monitoring plans for various environmental and social impacts and a mechanism for audit, review and corrective action.
1.5 EIA METHODOLOGY

1.5.1 Overview

The overall EIA process is shown schematically in Figure 1.3 and the following key steps are described in the subsequent sections.

- Screening and Registration
- Scoping
- Baseline Data Collection
- Project Planning and Design
- Stakeholder Engagement
- Impact Assessment
- Management and Mitigation Plans
- Reporting and Disclosure

Figure 1.3 Overview of the Impact Assessment Process

1.5.2 Screening and Registration

Every development that may have an impact on the environment is required to be registered with the EPA. Schedule 2 of the Environmental Assessment Regulations (1999) lists a number of activities for which an EIA must be undertaken. Oil and gas field development is listed under Item 12 and the EPA therefore determined that an EIA is required for the Phase 1 Jubilee Field development. The proposed project was registered on 4 July 2008 with registration number 3687.
1.5.3 **Scoping**

The aim of scoping is to identify environmental and social sensitivities and those project activities with the potential to contribute to, or cause, impacts to environmental resources and social receptors. The term ‘resources’ is used to describe features of the environment such as water resources, habitats and species which are valued by society for their intrinsic worth and/or their social or economic contribution. The term ‘receptors’ is used to define individuals and communities that may be affected by the project.

At the scoping stage it is necessary to identify and understand the key issues to a level that allows the remainder of the impact assessment to be planned. An important part of this process is identifying and consulting with a range of stakeholders including government bodies and community representatives to identify key issues and sources of information.

For the purposes of the EIA the project is defined as ‘all activities which are a necessary part of the Phase 1 development’ and have been included in the Jubilee Field Phase 1 PoD submitted to the Government of Ghana. These include well completions, subsea infrastructure and FPSO installation, commissioning and operation (including production, hydrocarbon processing, crude oil offloading, and support and maintenance activities) and decommissioning at the end of the commercial life of the field. The links between this EIA and the previous permitted drilling activities is addressed in Section 1.6. The area of influence of these activities will vary depending on the type of impact being considered. The main areas of influence include the Jubilee Unit Area (seabed footprint and exclusion zone), support vessel and helicopter routes and the onshore supply base. For some potential impacts the area of influence may extend beyond the area directly affected by the project, eg socio-economic impacts or pollution event impacts.

A Scoping Report presenting an overview of the project and outlining the key issues to be addressed in the EIA was produced and submitted to the EPA in December 2008. It was approved by the EPA on 3 February 2009, advertised in the press, placed in a number of locations in Accra and in the Western Region of Ghana, distributed to a number of stakeholders during consultation meetings and made available on a project website. Details of the consultation process and distribution of the Scoping Report are included in Annex A. The EPA advised their requirements of the EIA in their reply to the Scoping Report submission, and these requirements have been incorporated into this EIS.

1.5.4 **Baseline Data Collection**

The EIS provides a description of the existing environmental and socio-economic conditions as a basis against which the impacts of the project can be assessed. The baseline includes information on receptors and resources that were identified during scoping as having the potential to be significantly affected by the proposed project. It also includes technical information, such
as hydrographic conditions, that has been used in the assessment and for modelling studies.

The description of the baseline has the following main objectives.

- To identify the key environmental and socio-economic resources and conditions in areas potentially affected by the project and highlight those that may be vulnerable to aspects of the project.
- To describe, and where possible quantify, their characteristics ie their nature, condition, quality and extent.
- To provide data to aid the prediction and evaluation of possible impacts.
- To inform judgements about the importance, value and sensitivity or vulnerability of resources and receptors.

For this EIA, baseline data collection was obtained from the following sources.

- Collection of available data from existing sources including:
  - Jubilee Field project team reports (eg hydrographic conditions);
  - stakeholders consulted during the project including government agencies, fishermen’s organisations and NGOs;
  - local experts and research and academic organisations; and
  - published sources.

- A marine Environmental Baseline Survey (EBS) was conducted in October 2008 to characterise relevant parameters of the offshore environment within the defined Jubilee Field Development survey area. Further details are provided in Chapter 4 and a copy is included on a CD accompanying this report.

A number of additional detailed studies were undertaken by the EIA team and the Unit Operator following stakeholder consultations, scoping and the development of the project design. These have included studies related to drill cuttings treatment and disposal, produced water dispersal and potential oil spill modelling and contingency planning.

1.5.5 Project Planning and Design

The project description in Chapter 3 provides details of the various activities that would occur during the installation, commissioning and operational phases of the project to a level that allows those activities with the potential to cause environmental and social impacts to be identified (eg physical presence, emissions, wastes and discharges). The project decommissioning phase is described separately in Chapter 8.
Project planning, decision making and refinement of the project description continued throughout the assessment process as a result of the development of the project and in response to the identified potential impacts. A key step in the EIA process is the incorporation of agreed mitigation measures to project design, operation, monitoring and decommissioning. The *Environmental Assessment Regulations (1999)* require that alternatives to the undertaking are considered in the EIA. Further details are provided in *Chapter 3*, including an explanation of the reasons why the proposed options were selected.

1.5.6 **Stakeholder Engagement**

Stakeholder consultation starts at the scoping stage of the project, runs throughout the EIA and then continues through the operational phase of the project. The objective of this engagement is to ensure that sources of existing information and expertise are identified, legislative requirements are met and that stakeholder concerns and expectations are addressed.

A Public Consultation and Disclosure Plan (PCDP) for the EIA phase of the project was developed at an early stage in the project to ensure that engagement was undertaken in a systematic and inclusive manner and provided important input to the EIA process.

A series of consultation meetings with national and local government stakeholders and other parties such as fishermen’s organisations and Non-Government Organisations (NGOs) were undertaken during the EIA (between November 2008 and November 2009) to provide project information, collect baseline data and understand key stakeholder concerns. The PCDP for the EIA, including a list of stakeholders who were consulted, minutes of meetings and a register of issues raised is provided in *Annex A*.

1.5.7 **Impact Assessment**

Impact assessment and development of mitigation measures is an ongoing process that commences during the scoping stage and continues throughout the EIA process. The key objectives of this process are as follows.

- To analyse how the project may interact with the baseline in order to define, predict and evaluate the likely extent and significance of environmental and social impacts that may be caused by the project.

- To develop and describe acceptable and cost effective mitigation measures that avoid, reduce, control, remedy or compensate for negative impacts and enhance positive benefits.

- To evaluate the predicted positive and negative residual impacts of the project.
To develop a system whereby mitigation measures will be integrated with the project and will be taken forward as commitments. This is achieved through the development of a provisional Environmental Management Plan (EMP).

The impact assessment process is illustrated in Figure 1.4 and has the following four main steps.

1. Prediction of what will happen as a consequence of project activities.
2. Evaluation of the importance and significance of the impact.
3. Development of mitigation measures to manage significant impacts where practicable.
4. Evaluation of the significance of the residual impact.

Where significant residual impacts remain, further options for mitigation may be considered and impacts re-assessed until they are reduced to as low as reasonably practicable (ALARP) levels. This approach takes into account the technical and financial feasibility of mitigation measures.

In addition to predicted impacts from planned activities, those impacts that could result from an accident or unplanned event within the project (e.g., pollution event from a fuel or oil spill) are taken into account. In these cases the likelihood (probability) of the event occurring is considered. The impact of non-routine events is therefore assessed in terms of the risk, i.e., taking into account both the consequence of the event and the probability of occurrence.
Dealing with Uncertainty

Even with a detailed and fixed project design and an unchanging environment, predictions are by definition uncertain. In this EIS, predictions have been made using methods ranging from qualitative assessment and expert judgement to quantitative modelling. The accuracy of predictions will depend on the methods used and the quality of the input data on the project and the environment. Where assumptions have been made, the nature of any uncertainties which stem from these are presented.

Uncertainty can also arise as a result of the stage reached in the design process at the time of preparation of an EIS. Where details of the project description are not fully defined at the EIA stage assumptions are required to be made. These are based on the expertise and previous project experience of the project and EIA teams. Where uncertainty may affect the assessment of impacts this is acknowledged and a conservative (ie reasonable worst case) approach to assessing the likely residual impacts is adopted with mitigation measures developed accordingly.

1.5.8 Management Plans

The range of different measures to mitigate impacts identified through the EIA process is reported in the EIS within the project description and assessment chapters. In accordance with the requirements of the Environmental Assessment Regulations (1999), these have been brought together in a provisional Environmental Management Plan (EMP) for the project (Chapter 9).

The provisional EMP consists of the set of management, mitigation, and monitoring measures to be taken during implementation of the project to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan details the specific actions that are required to implement the controls and mitigation measures that have been agreed through the EIA process. Other key related plans (eg Oil Spill Response Plan, Waste Management Plan, and Emergency Response Plan) are already in place for the offshore drilling operations and will be updated and implemented by Tullow and its contractors prior to the start of construction activities.

1.5.9 Reporting and Disclosure

The outputs of the above tasks are drawn together into the draft EIS and submitted to the EPA for review. In accordance with Ghana EIA requirements, the draft EIS is required to be advertised and made available for public review and comment for a period of 21 days. Comments received on the draft EIS from the EPA’s technical review, stakeholders written comments, and the outcome of any public hearings that are held, are addressed in the final EIS which is submitted to the EPA.
1.6 LINKS WITH OTHER EIA STUDIES AND PERMITS

This EIS covers the Jubilee Field Phase 1 Development. An assessment of the impacts associated with the development drilling programme was undertaken separately and prior to the start of this EIA and reported in three separate EISs\(^{(1)}\) and development drilling was subsequently permitted by the EPA. Drilling is currently underway and is expected to be completed by mid 2011. As the drilling EISs are linked to the Phase 1 Development EIS, a summary of the findings of the drilling EISs and a discussion on drill cuttings disposal options are included in Annex B. Where relevant, information from the previous EISs and supporting documentation is included in this EIS, for example, in the mitigation and monitoring sections.

The Phase 1 EIA addresses the planned 17 wells, however, the project has been designed with flexibility to add additional wells in the future, eg there are 32 well slots within the well centres to be established on the seabed. Impacts associated with potential subsequent development, such as further drilling, additional field development, or export of gas to shore would be the subject to separate permitting processes with the EPA that may include separate project specific EIAs\(^{(2)}\).

1.7 STRUCTURE OF THIS REPORT

The structure of the EIS follows that provided by Ghana EPA and clarified in their approval of the Scoping Report in February 2008. The contents are summarised in Table 1.2.

A CD is attached to this EIS with an electronic copy of this report, a copy of the Marine Environmental Baseline Survey report and information on personnel Health and Safety Procedures.

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\(^{(1)}\) See Annex B for further details
\(^{(2)}\) Gas export and commercial use of the gas would be evaluated separately in future EIAs if such activities are proposed. This project only includes gas utilisation for energy needs on the FPSO, gas re-injection for reservoir pressure maintenance and enhanced oil recovery.
## Table 1.2   EIS Report Structure

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<th>Title</th>
<th>Contents</th>
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<td>Non Technical Executive Summary</td>
<td>Summary of the EIS written in non-technical language</td>
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<td></td>
<td>Introduction</td>
<td>Introduction to the project; purpose and need for project; EIA team and introduction to impact assessment methodology</td>
</tr>
<tr>
<td>2</td>
<td>Legal and Policy Framework</td>
<td>An overview of relevant national and international legislation, and industry standards and guidelines</td>
</tr>
<tr>
<td>3</td>
<td>Project Description</td>
<td>Technical description of the project; alternatives considered; applicable legislation and standards</td>
</tr>
<tr>
<td>4</td>
<td>Environmental Baseline Description</td>
<td>Description of the relevant environmental, social and health existing conditions</td>
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<tr>
<td>5</td>
<td>Impact Identification and Assessment</td>
<td>Evaluation of potential impacts; proposed mitigation measures and identification of residual impacts</td>
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<tr>
<td>6</td>
<td>Mitigation Measures</td>
<td>Summary of mitigation measures including those built into the design and identified through the EIA process</td>
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<tr>
<td>7</td>
<td>Monitoring Plan</td>
<td>Summary of the monitoring that will be carried out to verify environmental and social performance</td>
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<td>8</td>
<td>Decommissioning Plan</td>
<td>Description of the approach for decommissioning of the facilities at the end of the field’s life</td>
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<td>Provisional Environmental Management Plan</td>
<td>Outline of the Environmental Management Plan taking into account identified impacts and planned mitigation measures and monitoring requirements</td>
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<td>10</td>
<td>Conclusions</td>
<td>Summary of the conclusions from the EIA</td>
</tr>
<tr>
<td>References</td>
<td>References</td>
<td>A list of references and websites cited in the text</td>
</tr>
<tr>
<td>Annex A</td>
<td>Consultation Report</td>
<td>A summary of the consultations undertaken during the EIA process as well as a list of stakeholders, meeting minutes, attendance records and photos</td>
</tr>
<tr>
<td>Annex B</td>
<td>Drilling Report</td>
<td>Summaries of previous drilling EIAs and an assessment of drill cuttings disposal options</td>
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<td>Annex C</td>
<td>Oil Spill Risk Frequency Report</td>
<td>Outputs from accidental events frequency analysis undertaken as part of the project Safety Case</td>
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<td>Annex D</td>
<td>Discharge Modelling Report</td>
<td>Report by ASA on drill cuttings, produced water and oil spill modelling</td>
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<tr>
<td>Annex E</td>
<td>Emissions Inventory</td>
<td>Emission calculations for combustion and major fugitive sources based on conversion factors</td>
</tr>
<tr>
<td>Annex F</td>
<td>Waste Management</td>
<td>Report on waste management requirements, plans and facilities</td>
</tr>
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