1 INTRODUCTION

1.1 General

This introduction to the Tilenga feeder pipeline environmental impact statement (EIS) describes the following:

- project purpose and need
- project overview:
  - Tilenga Project
  - Tilenga feeder pipeline
  - EACOP System
- developer contact information
- EIS overview
- EIS structure.

1.2 Purpose and Need for Project

Commercial accumulations of oil were first discovered in Uganda in 2006 within the Albertine Graben. The current estimate of the country's petroleum oil in place is 6.5 billion stock tank oil-initially-in-place (STOIIP) barrels of oil (bbl), of which 1 billion bbl is estimated as recoverable.

The Government of Uganda (GoU) has plans for the phased development of a refinery and export of crude oil to international markets by pipeline via Tanzania.

The purpose and the need for the Tilenga feeder pipeline is to deliver crude oil to the planned refinery and the East African Crude Oil Pipeline (EACOP).

1.3 Project Overview

1.3.1 Tilenga Project

Total E&P Uganda B.V. (TEP Uganda), Tullow Uganda Operations Pty Limited (TUOP) and CNOOC Uganda Limited (CNOOC), referred to as the Joint Venture Partners (JVPs), plan to develop the discovered oil fields in the Lake Albert region of Western Uganda.

Each of the three partners, TEP Uganda, TUOP and CNOOC, currently hold a 33.33% interest in each area: CA-1, LA-2, EA-1A and the Kingfisher Development Area (KFDA). The GoU at award of the Ngiri, Jobi Rii and Gunya Production Licences in EA-1 as well as the Kasemene Wahrindi, Kigogole Ngara, Mputa Nzizi and Waraga, Ngege and Nsoga Production Licences in EA-2 elected to participate in these Joint Ventures at a 15% interest through its nominee, Uganda National Oil Company (UNOC). When negotiations for a Joint Venture Agreement between the JVPs and UNOC are complete and the Joint Venture Agreement is executed, the JVPs' interest will be split as follows:

- TEP Uganda, 28.3%
- TUOP, 28.3%
- CNOOC, 28.3%
- UNOC, 15%.

Discussions are underway among the JVPs and the GoU to finalise the transfer of equity of about 22% of TUOP's interest equally to TEP Uganda and CNOOC, leading to TEP Uganda and CNOOC owning 37.5%, TUOP 10% and UNOC 15%.

The overall objective of the Tilenga Project is to establish production of the oil fields within CA-1, LA-2 North and EA-1A in an economically prudent manner using sound reservoir management principles and best industry practice, and to deliver crude oil to the market. This includes ensuring the safety of workers and the public and limiting as far as practicable, environmental and social impacts of the project activities, enhancing the beneficial impacts, and seeking to achieve a net gain in biodiversity and ecosystem services as relevant in compliance with applicable laws and International Finance Corporation (IFC) standards.

The petroleum development operations, which include transport of crude oil to the Delivery Point, are governed by Production Sharing Agreements (PSAs). The parties to the PSAs are the Government of the Republic of Uganda (GoU) and the JVPs. The PSA details the specific obligations and requirements of the parties to the Agreement. These include work programmes, financial obligations, and health, safety and environment (HSE) requirements with other data and reporting obligations.

1.3.2 Tilenga Feeder Pipeline

The Tilenga feeder pipeline comprises the following permanent facilities:

- 95 km of insulated, electrical heat-traced, buried 24-in. pipeline
- aboveground installations:
  - main line block valve stations
  - electric substations.

Pipeline development will also include a construction main camp and pipe yard and will require access roads for the construction phase.

The GoU has also committed to support development of oil and gas operations within the Lake Albert Development Area through providing the required infrastructures and appropriately resourced reviews for approval of applications. The Government will provide infrastructure, which will include upgrades to existing infrastructure and development of new infrastructure including roads, bridges and power transmission lines. These are being developed by various government ministries and agencies, and are subject to separate EIS reports.

Information on project components, including maps, is provided in Section 2. Project Description.

1.3.3 EACOP System

The crude oil produced from production areas in Lake Albert region (CA-1, LA-2 and KFDA) will be stabilised at their respective central production facilities (CPFs)

and transported via Kingfisher Oil Project and Tilenga Project feeder pipelines to the Delivery Point. The Delivery Point, EACOP pumping station (PS1) and a refinery will be located in the Kabaale Oil and Gas Industrial Park, in Hoima district.

Figure 1.3-1 is a map showing the location of the upstream areas, the CPFs, their respective feeder lines and the refinery, as part of the Lake Albert Development Area.

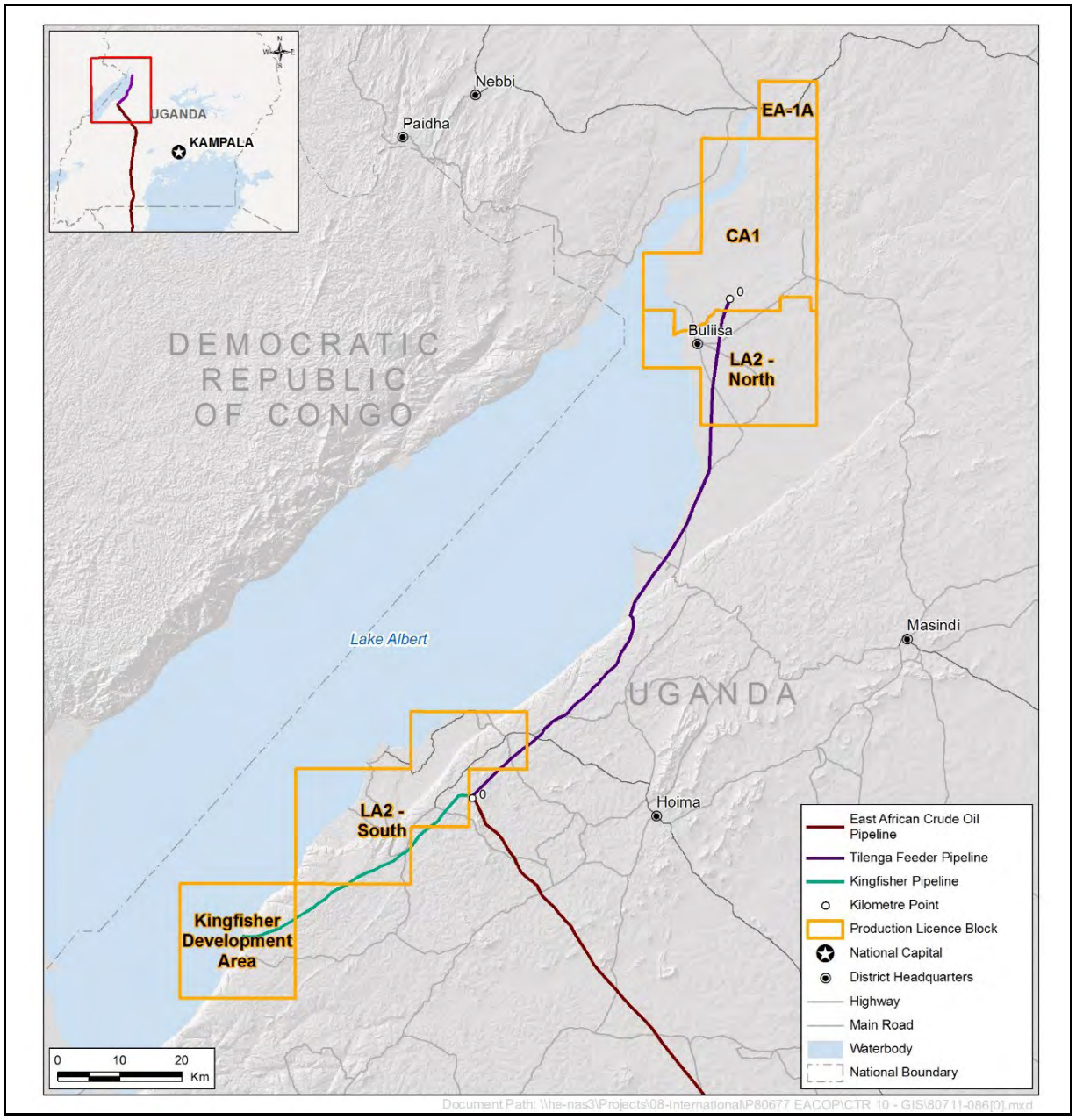


Figure 1.3-1 Lake Albert Development Area

1.3.4 Developer Contact Information

The Tilenga feeder pipeline is being developed by TEP Uganda and TUOP.

1.3.4.1 Tullow Uganda Operation Pty Ltd

Tullow is a leading independent oil and gas, exploration and production group, quoted on the London, Irish and Ghanaian stock exchanges (symbol: TLW). The Group has interests in over 80 exploration and production licences across 16 countries, which are managed as three delivery teams: West Africa, East Africa and New Ventures. In Uganda, TUOP is currently the operator of LA-2. For further information, please refer to www.tullowoil.com.

Tullow entered into three Ugandan exploration licences in 2004 (as Tullow Uganda Limited) following the acquisition of Energy Africa. The Tullow Group added further equity and operatorship to the licences in the Lake Albert Rift Basin when it acquired Hardman Resources in 2007 (as Tullow Uganda Operations Pty Ltd).

A series of transactions took place in 2010–2012 whereby Tullow acquired 100% of the three licences after acquiring the commercial interests of Heritage Oil and Gas before sharing a third of the equity to both CNOOC and Total in 2012. TUOP expects to further reduce its shareholding in the project, as highlighted in Section 1.3.1.

1.3.4.2 Total E&P Uganda BV

Total SA is a French multinational integrated oil and gas company operating in more than 130 countries in the world. Total Uganda Ltd has been operating in Uganda in the downstream/retail market since 1955 and has a market share of more than 25%. In February 2012, TEP Uganda joined the upstream oil and gas industry in Uganda by announcing the acquisition of a one-third interest in the four Ugandan licences held by an affiliate of Tullow Oil plc.

In 2017, TEP Uganda announced a further interest to increase the company stake that it had acquired in the PSA. More information about Total Group in Uganda can be found on www.ug.total.com.

Table 1.3-1 provides the contact information of the project developers.

Table 1.3-1 Contact Information

Name of Developer	Address	Named Key Contact
Total E&P, Uganda BV (TEPU)	Course View Towers, Plot 21 Yusuf Lule Road, Kampala, Uganda	General Manager Total E&P Uganda B.V. Pierre Jessua
Tullow Uganda Operations Pty Ltd (TUOP)	2nd Floor, Lotis Towers, Plot 16 Mackinnon Road Nakasero, Kampala, Uganda	The General Manager & Director Tullow Uganda Operations Pty Limited Jimmy D. Mugerwa

1.4 Environmental Impact Statement Overview

1.4.1 Purpose

This EIS is a report of the environmental and social impact assessment conducted to identify, describe and assess the likely interactions of the Tilenga feeder pipeline

in Uganda with environmental and socio-economic receptors, termed as the "valued environmental and social components" (VECs). The phrase, environmental and social impact assessment (ESIA), will be used interchangeably for both EIS and environmental impact assessment in this report.

The objective of the ESIA is to document the:

- potential impacts of the project on the physical, biological and human environment
- project benefits to the environment and the people of Uganda
- identified mitigation measures, where necessary, to avoid or minimise impacts through early recognition and incorporation to engineering, construction and operation
- significance of the impacts.

This ESIA has been prepared pursuant to:

- the National Environment Act, Cap 153, 1995
- the National Environment (Environmental Impact Assessment Regulations), SI 153-1 1998
- the Guidelines for Environmental Impact Assessment in Uganda, 1997
- the Environmental Impact Assessment Guidelines for the Energy Sector in Uganda, 2004 and the Environmental and Social Impact Assessment Guidelines for the Energy Sector in Uganda, 2014.[1]

The impact assessment also concords with international guidance including:

- the International Finance Corporation's (IFC) environmental and social performance standards
- Equator Principles
- other relevant international standards and guidelines (see Section 4).

The ESIA has been conducted in accordance with the Scoping Report and terms of reference (ToR) approved by NEMA by way of correspondence dated 19 September 2017. The approval contained comments and recommendations, which have been addressed in this ESIA. A concordance table has been included in Appendix K.

1.4.2 Environmental and Social Impact Assessment Team

An experienced ESIA team with extensive pipeline engineering, environmental and social impact assessment knowledge was formed to prepare this ESIA, which included Ugandan partners experienced in ESIA development in the Ugandan oil and gas sector. The interdisciplinary team comprised:

- registered independent environmental and social experts working for Eco & Partner Consult Partnership and RSK Environment Limited

[1] The Environmental Impact Assessment Guidelines for the Energy Sector (NEMA 2004) encompass all types of energy projects, including oil pipelines, whereas the 2014 guidelines refer to oil only in the context of thermal generation. Nonetheless, the 2014 guidelines include text from both the 2004 guidelines and refinements, such as additional information on scoping report and ESIA format content, and hence are considered current best practice.

- ESIA and HSE management teams from TEAM and some of the project developers mentioned in Section 1.3
- an international engineering consultancy, Gulf Interstate Engineering (GIE). GIE has performed front-end engineering and design for the project working closely with the rest of the ESIA team.

The registered and contributing environmental and socio-economic expert members of the ESIA team are listed in Table 1.4-1.

Table 1.4-1 Registered and Key Contributing Members of Environmental and Social Impact Assessment Team

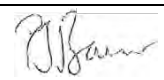
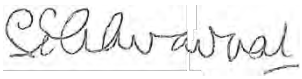
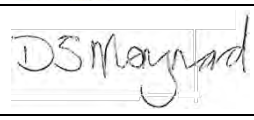
Name	Qualifications	Role	Signature
Registered EIA Practitioners			
David Taylor	BSc (Hons) Geology; MSc (by research) Marine Geology and Geophysics	ESIA oversight and coordination/ team leader	
Nicola O'Donnell	BSc (Hons) Environmental Biology with a Modern Language; MSc Environmental Science	Biodiversity lead	
Peter Baur	MSc Engineering Hydrology; BSc (Hons) Geography	Hydrology lead	
Srinivas Srimath Tirumala Gudimella	BEng Civil Engineering; MEng Environmental Engineering; PhD in Air Quality Modelling and Monitoring	Climate and air quality lead	
Eddie Luyima	MSc in Environment Management; BA in Environmental Management; Dip in Env Mgt, IEMA CC/EIA/026/18	In-country ESIA team leader	
Amos Mafigiri	BA in Environmental Management; Cert ISO 14001	ESIA quality control	
Diana Nakalanzi	MSc in Environmental Science – Limnology and Wetland Management, BSc in Environmental Science	Water quality specialist	
Daniel Clare	BSc (Hons) Environmental Science; IOA Diploma in Acoustics and Noise Control	Environmental acoustics lead	
Francis Lugemwa	MA Sociology (Candidate); MA Land-use Planning and Regional Development; BA in Geography; Dip in EIA; IEMA	Socio-economic and stakeholder engagement in-country lead	
Eng Daka Michael	MSc Engineering; BSc Civil Engineering	Road engineer and traffic surveyor	
David Maynard	Certificate in Practical Archaeology (credit); BA Prehistory and Archaeology	Cultural heritage specialist	

Table 1.4 1 Registered and Key Contributing Members of Environmental and Social Impact Assessment Team

Contributing Specialists		
Name	**Qualification**	**Role**
Lodewijk Werre	PhD Anthropology; Executive Education for Sustainability Leadership Program	Project manager
Hilde Van Vlaenderen	Licentiate in the Psychological and Pedagogical Sciences; PhD Psychology	Stakeholder engagement and social specialist
Tom Smith	PDip Ecology and Environmental Management; BSc (Hons) Applied Ecology	Ornithology expert
Simon Boulter	BSc (Hons) Zoology; MSc Primate Conservation	Fauna expert
Joanne Nightingale	DPhil Ecology and Conservation; BSc (Hons) Environmental Biology	Botany expert
Will Hawthorne	BA (Hons) Botany; PhD Botany	Botany expert
Steven Heathcote	BA (Hons) Natural Sciences; DPhil Botany	Botany
Dr Peter Walker	BSc (Hons) Marine and Freshwater Biology; MRes Applied Fish Biology; PhD Fish Parasitology	Aquatic biodiversity expert
Mark Olokutum	MSc Limnology and Wetland Management; MSc Zoology; BSc Fisheries & Aquaculture	Aquatic ecologist
Dr Perpetra Akite	PhD Plant Pathology; MSc in Environment and Natural Resources; BSc Botany	Invertebrate ecologist
Erin Parham	BSc Biodiversity and Conservation; BA Geographic Information Systems	Critical habitat assessment expert
Pippa Howard	BSc Marine Biology and Environmental Sciences	Critical habitat assessment expert
John Cornell	MA Geography; BSc (Hons) Ecology & Conservation	Critical habitat assessment expert
Dr Robert Kityo	PhD in Zoology; MSc and BSc in Vertebrate Ecology	Mammal specialist
Dr James Kalema	PhD in Botany; MSc Botany; BSc Botany & Zoology	Botany specialist
Prof. Derek Pomeroy	PhD in Animal Ecology; Natural Sciences Tripos (Cambridge)	Avifauna specialist
Dr Timothy Twongo	PhD in Zoology; MSc Biology; BSc Zoology & Botany	Aquatic biology expert
Dr Mathias Behangana	PhD Environment and Natural Resources; MSc Zoology; BSc Zoology	Herpetofauna specialist
Tim Newton	BSc (Hons) Zoology; MA Environmental Impact Assessment and Management	Soils and geology lead

Table 1.4 1 Registered and Key Contributing Members of Environmental and Social Impact Assessment Team

Contributing Specialists		
Name	**Qualification**	**Role**
Julius Opio	MSc Physical Land Resources – Soil Science; BSc (Hons)	Soil expert
Syliver Wadamba	MSc in Tropical Hydrogeology; MSc in Watershed Management; BSc (Hons), Diploma in Groundwater Exploration, Exploitation & Management	Hydrology expert
Hamdi Mohamed Riad El-Ghonemy	BSc Geology; MSc and PhD Hydrogeology	Hydrogeology lead
Robert Naguyo	MSc in Water Resources Surveys, Groundwater; BSc Geography/Chemistry	Hydrogeology, soils and geology
Daniel Leaver	Bachelor in Landscape Design; BSc (Hons) Zoological Science	Landscape lead
Richard Appleyard	BEng (Hons) Environmental Engineering with Resource Management	Climate, air quality and best available techniques expert
Deo Okure	MSc in Energy and Environmental Management; BSc Mechanical Engineering (Hons)	Climate and air quality
Abraham Ochola	BA in Environmental Management, Cert in Oil & Gas, Cert in GIS	Noise expert
Kate Blacklock	Master's in Education and Development	
Dr Dauda Batega	PhD in Sociology; MA (Sociology); BA in Social Sciences (Hons)	Sociology expert
Birungi Judith	MA in Social Sector Planning (Candidate); BA in Social Sciences (Sociology and Gender Studies)	Sociologist
Opesen Chris Columbus	PhD (Candidate) Social Anthropology; MSc in Development Management; BA in Social Sciences	Sociologist
Glorius Kasande	MA in Rural Development; BA in Social Sciences (Sociology and Gender Studies)	Gender issues specialist
Dr Mark Divall	Bachelor of Medicine and Bachelor of Surgery; postgraduate diplomas in Anaesthesia, Occupational Medicine and Health, Tropical Medicine and Health, Health Impact Assessment	Health lead
Izak Olivier	Bachelor of Medicine and Bachelor of Surgery; Advanced University Diploma in Occupational Health	Health expert
Dr Alex Mukasa	MSc in Livestock Development Planning and Management, Veterinary Medicine	Livestock specialist
Ian Wickett	HNC Civil Engineering	Lead traffic specialist

Table 1.4 1 Registered and Key Contributing Members of Environmental and Social Impact Assessment Team

Contributing Specialists		
Name	**Qualification**	**Role**
Gerry Wait	MA Anthropology and Archaeology; DPhil European Prehistory Registered Consultant (Heritage) for UNESCO	Lead intangible cultural heritage
Sarah Musalizi	MSc Palaeontology for Lacustrine; Postgraduate Diploma in Museum and Heritage Studies; BA Tourism and Geography	Lead archaeologist

1.5 Environmental Impact Statement Structure

The EIS comprises 11 sections and 12 appendices (A–M) as outlined in Table 1.5-1.

Table 1.5-1 Environmental Impact Statement Structure

Section	Description of Section
Executive Summary	Nontechnical summary of the key findings of the ESIA
Table of Contents	Table of contents
Glossary	Definition of terms, acronyms and abbreviations used
Section 1 Introduction	Introduction to the ESIA report, including: • project purpose • project overview • EIS overview o purpose o team and list of authors and contributors to the ESIA • EIS structure
Section 2 Project Description	Description of: • project components and associated facilities including functions, locations and layouts • pre-construction, construction, commissioning, operation and decommissioning activities
Section 3 Alternatives	Review of the alternatives considered during the design of the project
Section 4 Legislative, Policy and Administrative Framework	Overview of the project applicable legal, policy and administrative frameworks
Section 5 ESIA Process and Methodology	Description of the ESIA process and methodology for identifying and assessing and determining the significance of potential impacts

Table 1.5-1 Environmental Impact Statement Structure

Section	Description of Section
Section 6 Environmental and Social Baseline Conditions	Description of the baseline conditions in the project area of influence (AOI), including existing (pre-project) trends in the condition of VECs. This section will be based on the data collected during the scoping and the ESIA stages.
Section 7 Stakeholder Engagement	Description of the stakeholder engagement process
Section 8 Impact Identification and Evaluation – Normal Construction and Operations	Identification and assessment of predicted potential impacts during normal construction, commissioning, operation and decommissioning activities
Section 9 Potential Impact Identification and Evaluation – Abnormal Operations and Unplanned Events	Identification and assessment of predicted potential impacts that may occur in the event of abnormal operation or unplanned events (e.g., fire or breakage of the pipeline)
Section 10 Environmental and Social Management Plan	A consolidated description of the management plans developed to prevent or reduce potential impacts, and proposed monitoring
Section 11 Summary and Recommendations	Summary of the key ESIA findings and recommendations of the ESIA
References	A list of the published and unpublished reports and other sources of data consulted
Environmental and Social Management Plan	Stand-alone volume containing a copy of Section 10 and the environmental and social management plan matrices
Appendices	
Appendix A Baseline Reports	Compilation of the baseline field survey reports
Appendix B Critical Habitat Assessment	Summary of the CHA undertaken for the Tilenga Project
Appendix C Stakeholder Engagement	• List of the project's stakeholders identified during the ESIA process • Summary of stakeholder concerns • Records of stakeholder engagement
Appendix D Magnitude and Sensitivity Ranking Tables	Tables defining the VEC-specific criteria for assigning magnitude and sensitivity rankings
Appendix E Impact Assessment Tables	Registers of all expected impacts and mitigation measures • E1: Aspects and Activities Register • E2: Generic Impacts Register • E3: Location-specific Impacts Register • E4: Commitments Register

Table 1.5-1 Environmental Impact Statement Structure

Section	Description of Section
Appendix F Project Environmental Standards	Project environmental standards proposed for air, water, noise and soil
Appendix G Impacts Assessments	A description of modelling and data analysis undertaken in support of the impact assessments: • Erosion Risk Assessment • Acoustic Impact Assessment • Emissions Calculations – Construction
Appendix H Cumulative Impact Assessment	Supporting information for the cumulative impact assessments: • Sources of Cumulative Impact • Location of Screened-in Developments • Cumulative Impacts Matrix • Screened-out Sources of Cumulative Impacts
Appendix I Oil Spill Modelling	An assessment of the environmental risk posed by an oil spill and modelling of oil spill dispersion
Appendix J Land Acquisition and Resettlement Framework	A framework of the land acquisition resettlement process
Appendix K Concordance Table	Table showing how NEMA comments made to the Scoping Report have been addressed in the ESIA
Appendix L Acknowledgements	Acknowledgements of contributions made to the production of the ESIA
Appendix M Company Certificate of Registration	Company registration certificate