REPORT – VOLUME 2, PART 1

November 2019

CNOOC UGANDA LIMITED

Environmental and Social Impact Assessment for Kingfisher Field Development Area, Uganda

Construction Phase Environmental and Social Management Plan (C-ESMP) for the CPF, Wells and Ancillary Infrastructure

Submitted to:
The Executive National Environmental Management Authority
NEMA House, Plot 17/19/21 Jinja Road
P.O. Box 22255 Kampala, Uganda

Report Number: 1776816-321497-10

Table of Contents

TABLES

FIGURES

APPENDICES

List of Acronyms and Abbreviations

Acronym	Description
3LPP	3 Layer Polypropylene
BAT	Best Available Technology
BLPD	Barrels of Liquid per Day
BOP	Blowout Preventer
BOPD	Barrels of Oil per Day
BS&W	Basic sediment and water content of crude oil. Part of quality specifications.
BVS	Block Valve Station
BWPD	Barrels of Water per Day
CCO	Customary Certificate of Ownership
CCR	Central Control Room
CCTV	Closed Circuit Television
CDP	Community Development Plan
C-ESMP	Construction Environmental and Social Management Plan
CFC	Chloro Floro Carbons
CFP	Chance Find Procedure
CFR	Central Forest Reserve
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLF	Community Liaison Forum
CLOs	Community Liaison Officers
CNOOC	China National Offshore Oil Corporation
CO_2	Carbon Dioxide
CPF	Central Processing Facility
CR	Critically Endangered
CUL	CNOOC Uganda Limited
CV	Curriculum Vitae
DEO	The District Environment Officer
DRC	Democratic Republic of Congo
DWRM	Directorate of Water Resources Management
EA	Exploration Areas
EACOP	East African Crude Oil Pipeline
EBRD	European Bank for Reconstruction and Development
EBS	Environmental Baseline Study
EC	Environmental Coordinator
ECC	Emergency command Centre
EFOs	Environmental Field Officers
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan

Acronym	Description
EMS	Environmental Management System
EP	Export Pipeline
EPC	Engineering, Procurement and Construction
FP C-ESMP	Construction Environmental and Social Management Plan
ES	Ecosystem Services
ESD	Enterprise and Supplier Development
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental and Social Management Plan
ESO	Environmental Site Officer
ESP	Electric Submersible Pump
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GPS	Global Positioning System
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ICSS	Integrated Control and Safety Systems
IFC	International Finance Corporation
IMP	Influx Management Plan
IPIECA	International Petroleum Industry Environment and Conservation Association
IT	Information Technology
IUCN	International Union for Conservation of Nature
KF	Kingfisher
KFDA	Kingfisher Field Development Area
kW	Kilowatt
LC	Least Concern
LC	Local Council
LOCSA	Liaison Officer-Community and Stakeholder Affairs
LP	Liquefied Petroleum
LPG	Liquefied Petroleum Gas
LSA	Local Study Area
mbgl	metres below ground level
MEMD	Ministry of Energy and Mineral Development
MGLSD	Department of Occupational Safety and Health, Ministry of Gender Labour and Social Development
MMS	Machine Monitoring System
MPFM	Multiphase Flow Meter
MSDS	Material Safety Data Sheets
MTWH	Department of Museums and Monuments, Ministry of Tourism, Wildlife and Heritage
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGO	Non-governmental Organisations
NOx	Oxides of Nitrogen

Acronym	Description
NPSH	Net Positive Suction Head
NSRs	Noise Sensitive Receptors
OGP	International Association of Oil and Gas Producers
PCB	Poly Chlorinated Biphenyls
PEPD	Petroleum Exploration and Production Department
PLA	Project Labour Agreement
PLDS	Pipeline Leak detection System
PLMS	Pipeline Leak Monitoring System
PM	Particulate Matter
POB	Personnel on Board
PPE	Personal Protective Equipment
PS	Performance Standards
PSAs	Production Sharing Agreements
Ptb	Pounds per Thousand Barrel
RAP	Resettlement Action Plan
RoW	Right of Way
RSA	Regional Study Area
RTU	Remote Terminal Unit
RVP	Reid vapour pressure (RVP) is a common measure of the volatility of gasoline.
SCADA	Supervisory Control and Data Acquisition
SEHT	Skin-Effect Heat Tracing System
SO_2	Sulphur Dioxide
SoCs	Species of Conservation Status
SOW	Scope of Work
SPT	Sewage Treatment Plant
STI	Sexually Transmitted Infections
TLB	Tractor Loader Back-Actors
UCPs	Unit Control Panels
UNRA	Uganda National Roads Authority
UWA	Uganda Wildlife Authority
VOC	Volatile Organic Compounds
VOIP	Voice over Internet Protocol
WAT	Wax Appearance Temperature
WHCP	Hydraulic Wellhead Control Panel
WHO	World Health Organisation
WMD	Wetlands Management Department
WRMD	Water Resource Management Directorate

1.0 INTRODUCTION

This Construction Environmental and Social Management Plan (C-ESMP) guides the environmental and social management of China National Offshore Oil Corporation's (CNOOC's) development of the Kingfisher Development Area (KFDA) pertaining to the construction phase of the Central Processing Facility (CPF), wells, and ancillary infrastructure only (hereafter referred to as the Project). Environmental and social management of the design and operational phase and export pipeline is addressed separately from this C-ESMP. The C-ESMP aims to mitigate and enhance potential negative and positive impacts respectively. Responsibilities for implementing mitigation measures are allocated and appropriate monitoring actions are described.

The C-ESMP has been informed by the 2018 ESIA (and associated specialist studies) conducted by Independent Consultants who were appointed by CNOOC, and as such must be read in conjunction with the ESIA executive summary. Key objectives of the C-ESMP are to:

- Facilitate compliance with applicable acts, regulations and guidelines;
- Avoid and/or minimise negative social and environmental impacts of the Project and maximise positive impacts;
- Recognise that social responsibility and environmental management are among the highest corporate priorities;
- Assign clear accountability and responsibility for environmental protection and socio-economic enhancement to management members and employees;
- Facilitate environmental and social planning throughout the Project life cycle;
- Provide a process for achieving targeted performance levels;
- Provide appropriate and sufficient resources, including training, to achieve targeted environmental performance levels on an on-going basis; and
- Evaluate environmental performance and social responsibility against CNOOC's environmental and social policies, objectives and targets and seek improvement where appropriate.

The C-ESMP is a "living document" and information contained in this version will be reviewed and updated as and when necessary. Evaluating the findings and recommendations flowing from environmental and social monitoring assessments (annually or more frequently) by internal / external auditors will form the basis of updates to the C-ESMP, as required.

CNOOC will develop and implement an Environmental and Social Management System (ESMS) in accordance with their environmental policies to ensure that environmental impacts caused by the Project are continually monitored and to provide a basis for the development of improved impact management measures. The ESMS will be in place prior to construction starting and will accommodate the stipulations contained in the relevant environmental laws and regulations of Uganda.

1.1 What is included?

The C-ESMP stipulates management measures for the impacts of CNOOC's civil construction activities directly related to the CPF, wells, and ancillary infrastructure (i.e. the Project) within the KFDA on the Buhuka Flats, along the south-eastern side of Lake Albert. The C-ESMP:

- Defines a set of rules for managing the construction of the Project in the license area. These rules are based on detailed work done for the approved KFDA ESIA (2017), and have social and environmental components which all construction activities must comply with; and
- Covers the construction of the CPF, wells, and ancillary infrastructure, their use during construction and their post-construction maintenance and monitoring, has been established. All necessary enviro-social monitoring and management activities are detailed in the Construction ESMP (C-ESMP).

Environmental Impact Management Measures

An environmental impact is defined as any change to the environment, whether adverse or beneficial, resulting from a project activity. Listed below are some typical environmental impacts that could adversely affect the environment:

- Pollution of surface and groundwater resources by contaminated runoff;
- Emission of harmful gases and/or particulates into the atmosphere;
- Seepage of contaminants from hazardous materials into soil or water;
- Generation of harmful or nuisance noise;
- Death or injury to animals;
- Destruction of natural habitat, leading to reduced biodiversity;
- Reduction of local residents' ability to produce food and make traditional use of the ecological resources of the area;
- Damage to cultural and heritage resources; and
- Degradation of visual aesthetics.

The Project will go through a life cycle consisting of three phases, namely construction (site clearing, excavation and construction of CPF, wells, and ancillary infrastructure) and operation (processing), and decommissioning (closure). The activities, their impacts and the management actions required to implement the recommended mitigation measures are dealt with in the sub-sections below.

1.2 What is excluded?

The C-ESMP does not include the management of impacts associated with the Feeder Pipeline. The reader is referred to the Feeder Pipeline (FP) Construction ESMP (FP C-ESMP, 2018).

Issues related to compensation and resettlement are not addressed in this FP C-ESMP either and the reader is referred to the CNOOC resettlement and compensation process and associated documentation.

The C-ESMP also excludes specifications regarding occupational health, hygiene or safety requirements. CNOOC and Contractor obligations in this regard are determined by legislation and CNOOC's requirements are specified in the Main Contract documents.

1.3 Report Structure

The C-ESMP is structured as follows:

- Chapter 2 describes CNOOC's environmental and social policies and commitments in Uganda;
- Chapter 3 describes the construction activities covered by this C-ESMP that are directly associated with the CPF, wells, and ancillary infrastructure;
- Chapter 4 describes the environmental management structure, including the approach to the C-ESMP and the organisational structure and responsibilities relevant to the Project;
- Chapter 5 sets out the detailed specifications, including management of impacts associated with the construction phase;
- Chapter 6 describes requirements for performance assessment, corrective action, management review and auditing;
- Chapter 7 sets out requirements for competency training and awareness creation;
- Chapter 8 outlines requirements for dealing with emergencies; and

- Chapter 9 specifies requirements for document control.

The content of the report is set out according to an internationally recognised framework, which includes the following:

- Avoidance/mitigation/management measures required during the construction phase of the project;
- A description of the activities necessary to achieve the mitigation measures;
- Programming and scheduling requirements;
- Definition of responsibilities, resources, communication and reporting structures;
- Specification of performance evaluation requirements;
- Identification of training requirements;
- Identification of monitoring requirements; and
- Identification of audit requirements.

1.4 Key point of contact

The key point of contact for the Kingfisher Field Development is indicated in Table 1-1.

Table 1-1: Details of the developer, CNOOC

Title	CNOOC Uganda Limited (CNOOC)
Organisation	CNOOC Uganda Limited (CNOOC)
Postal address	CNOOC Uganda Limited Simba Towers, Plot 22 Acacia Avenue, P.O BOX 7862, Kololo, KAMPALA, UGANDA
Contact Name	Andrew OTUBA
Telephone	+256 204 500223
Cellular phone	+256 772 798111
E-mail	Andrew.OTUBA@cnoocuganda.com

2.0 CNOOC POLICIES AND COMMITMENTS IN UGANDA

2.1 Development philosophy

CNOOC's development philosophies are listed in Table 2-1, while environmental, health and safety specifications are listed in APPENDIX A with relevant Project design codes and standards. All documents form part of the C-ESMP and must be complied with.

Table 2-1: CNOOC development philosophies

Reference	Philosophy
KF-FS2-RPT-CPF-SA-0002	Environmental Philosophy
KF-FS2-RPT-CPF-SA-0003	Noise Control Philosophy
KF-FS2-RPT-CPF-SA-0004	Waste Management Philosophy
KF-FS2-RPT-CPF-SA-0007	Design HSE Philosophy
KF-FS2-RPT-CPF-SA-0008	Oil Spill Contingency philosophy
KF-FS2-RPT-CPF-SA-0009	Emergency Response Philosophy

Reference	Philosophy
KF-FS2-RPT-CPF-C0-0001	Telecommunication Philosophy
KF-FS2-RPT-CPF-EL-0001	Electrical Power System Philosophy
KF-FS2-RPT-CPF-PR-0006 REV0	Restart & Displacement Philosophy
KF-FS2-RPT-CPF-IN-0001 REV0	Control & Instrument Philosophy

2.2 Leadership and Commitment

CNOOC commits itself to deliver sustainable energy to society by promoting clean, healthy, and green energy development models with their partners along the industry chain. The development of existing natural resources must be undertaken in a safe, efficient, and environment-friendly manner and provide society with clean, reliable, and stable energy that will meet people's reasonable energy demands.

2.3 Corporate Social Responsibilities

During project implementation, CNOOC must communicate their strategy towards social investment in Uganda, particularly in regions and local communities potentially affected by the project. This strategy should emphasise the distinction between social investment offered as philanthropic good-will to support community needs and "mitigation" required to reduce negative impacts. This distinction should be combined with efforts to align ongoing communication processes between the community liaison officers and the local communities. CNOOC currently engages in activities that benefit society and is involved in the following ventures in Uganda:

- Support to Education Best Performers' Award;
- Basic Skills Training;
- Buhuka School Donation;
- Promotion of Culture and Talent;
- Support to Health Sector and Medicine for the District Health Centers; and
- Disaster Relief Donation.

2.4 Compliance with Legislation and Industry Best Standards

CNOOC is committed to comply with all Ugandan environmental legislation. A legal register in this regard is maintained and regularly updated. CNOOC will also comply with industry best practice worldwide and, to this end, uses the IFC and World Bank Performance Standards, Safeguard Polices and the Equator Principles as a guide to its actions.

The following international principles and standards have been incorporated into the C-ESMP:

- Equator Principles;
- IFC Documents, including:
  - IFC Performance Standards on Social & Environmental Sustainability, including:
    - Performance Standard 1: Social & Environmental Assessment & Management System;
    - Performance Standard 2: Labour and Working Conditions;
    - Performance Standard 3: Pollution Prevention and Abatement;
    - Performance Standard 4: Community Health, Safety and Security;
    - Performance Standard 5: Land Acquisition and Involuntary Resettlement;

- Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management;
- Performance Standard 7: Indigenous People; and
- Performance Standard 8: Cultural Heritage.

- Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual, International Finance Corporation 1998;
- General IFC Environmental, Health and Safety (EHS) Guidelines, including Environmental, Occupational Health and Safety, Community Health and Safety, Construction and Decommissioning (e.g. Air Emissions and Ambient Air Quality, Noise); and
- Workers' accommodation: processes and standards: A guidance note by IFC and the EBRD.

2.5 Mitigation hierarchy

The priority of environmental management is always to minimise adverse impacts and enhance the desirable impacts, thereafter management measures with other objectives are considered. Environmental management measures can be varied and the measures themselves can have a variety of objectives. World Bank guidelines for a best practice approach to the management of environmental and social impacts are presented in Table 2-2.

Table 2-2: Primary objectives of mitigation measures for adverse environmental impacts (listed in decreasing order of priority)

Objective	Description
Avoidance	■ Avoiding activities that could result in adverse impacts; and ■ Avoiding resources or areas considered as sensitive.
Prevention	■ Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence from having negative environmental impacts.
Preservation	■ Preventing any future actions that might adversely affect an environmental resource. Typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
Minimisation	■ Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, or redesigning elements of a project.
Rehabilitation	■ Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.
Restoration	■ Restoring affected resources to an earlier (and possibly more stable and productive) state, typically 'background/pristine' condition.
Offset	■ Creation, enhancement or protection of the same type of resource at another suitable and acceptable location, offsetting for lost resources.

Ref: The World Bank. Environment Department. January 1999. Environmental Management Plans. Environmental Sourcebook Update. Number 25

3.0 PROJECT DESCRIPTION

The C-ESMP applies to the Kingfisher Development Area (KFDA, Figure 1) along the eastern border of Lake Albert and is ~15 km long by 3 km wide with an area of 32.3 km^2. While the C-ESMP relates solely to the construction phase of the CPF, wells and ancillary infrastructure, a Feeder Pipeline is related to the Project. These components are addressed separately from this C-ESMP but are briefly outlined for reference.

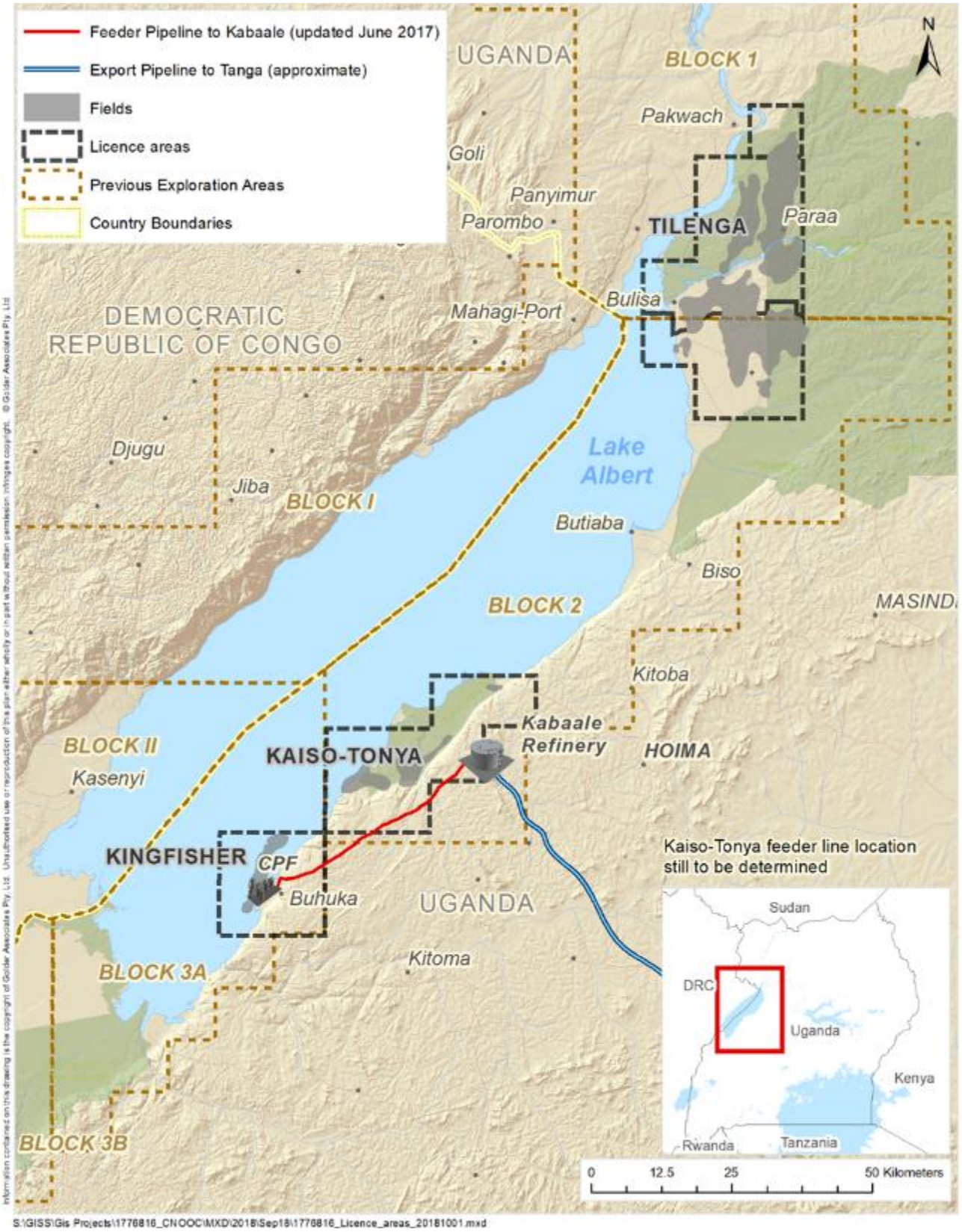


Figure 1: The Kingfisher Development Area (KFDA), Kaiso-Tonya License Area and the Tilega License Area

3.1 Feeder Pipeline

The Feeder Pipeline runs from the CPF storage tanks to a delivery point near Kabaale (Figure 1). It leaves the battery limits of the CPF on the east side of the plant, turning northward to the base of the escarpment, where it turns directly east up the escarpment. The average gradient in this section of the route is 1:3 (Vertical: Horizontal), rising from roughly 650 to 1 040 mamsl within a horizontal distance of 740 m. From this point, the pipeline is routed north-eastward in gently undulating terrain, extensively cultivated and interspersed with rural settlements. The route passes south-east of Hohwa and Kaseeta villages and passes immediately north of the planned Kabaale Airport, turning eastward to the delivery point at the proposed Kabaale Refinery. The total length of the pipeline is approximately 46 km. At Kabaale, the Government of Uganda is planning an industrial park which, among other facilities, will include a refinery, associated petrochemical processing factories and airport and related supporting infrastructure. At the delivery point, there will be metering of the crude oil, which will be piped either to the industrial park to feed the refinery and associated petrochemical industry or exported through the East African Crude Oil Pipeline (EACOP), planned from Kabaale to Tanga sea port in Tanzania. The EACOP will be a public - private partnership between the governments of Uganda, Tanzania and oil company(s).

The Feeder Pipeline ends at the delivery point in Kabaale. The industrial park and the EACOP are independent projects that will be planned and developed by other parties and as such will independently follow a separate permitting process from the KFDA ESIA permitting process. Apart from their inclusion in the Cumulative Impact Assessment of oil industry activities, they are outside of the scope of the present C-ESMP.

3.2 Project Activities

Project components relevant to the C-ESMP are illustrated in Figure 2. The C-ESMP specifically addresses the construction of the:

- Production wells and associated infrastructure;
- Flowlines; and
- Central processing facility (CPF).

The operational and decommissioning phases of these components, as well as the Feeder Pipeline (all phases) are addressed separately from this C-ESMP.

3.2.1 Production wells and associated infrastructure

During the civil works and drilling, all existing exploration pads (Pads 1-3) will be upgraded to accommodate multiple production wells on a single pad and expanded to their full extent at the start of the construction phase. Well pad 4A is still to be cleared and all pads (Pads1-4A) will cover an area >7.36 ha. Facilities on the well pad associated with drilling will include the drilling rig, drainage pits for well control emergency and temporary waste storage (covered to prevent rain ingress), fuel tank storage area, drilling fluids preparation area and mud tank, flare pits for emergency use, storage facilities for chemical additives, diesel generators to drive the rig and ancillary power requirements, and offices, as well as other infrastructure for drilling contractor and CNOOC staff. Accommodation on the well pads will only be for security and critical drilling personnel relevantly working on a particular work shift.

Directional drilling and drilling rig specifications

The development wells will be drilled from the well pads down to the kick-off point (~2 700 m) and then directed towards the oil field (~3 800 m), over a typical period of 2 - 4 months. Only one well will be drilled at a time. Conversion from development to production wells will involve: preparation of the drill-hole bottom to required specifications, as well as perforation of the well casing to allow connection with the reservoir and well stimulation to restore and/or enhance the productivity of a well, as required. Drilling rig specifications are outlined in Table 3-1.

.

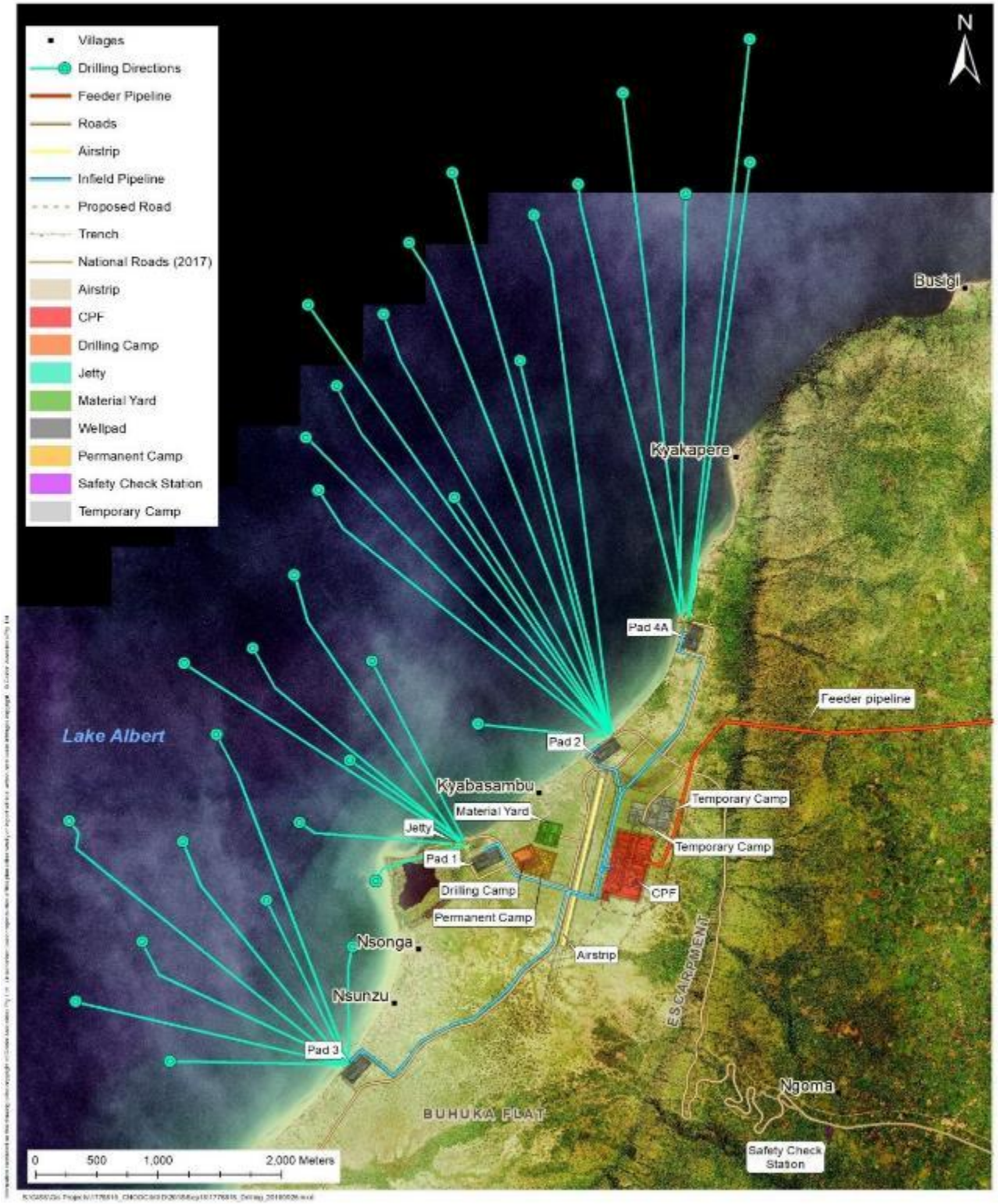


Figure 2: Approximate extent of horizontal wells drilled from each pad

Table 3-1: Drilling Rig Specifications

Aspect	Specification	Description
Mast	45 m	Structure used to support the crown block and the drill string.
Draw works	2 000 HP, mechanical and electrical breaking systems with regenerative breaking	The machine on the drilling rig consisting of a large-diameter steel spool, brakes, a power source and assorted auxiliary devices. The primary function of the draw works is to reel out and reel in the drilling line, a large diameter wire rope, in a controlled fashion. The reeling out of the drilling line is powered by gravity and reeling in by an electric motor or diesel engine.
Top Drive	69 kNm 120 rpm	Device that turns the drill string. The Top Drive is suspended from the hook, so the rotary mechanism is free to travel up and down the derrick.
Mud Pumps	3 x 1,600 HP 7 500 psi	Pumps that circulate drilling muds through the drill bit and back up the casing into the mud conditioning pits for make-up and recycling. Power will be supplied by diesel generators on the well pad.
Tank System	Active mud: 600 m^3, Kill-weight mud (as per drilling program)	The tank system stores the mud which is pumped down the drill string.
Pressure Control	Minimum 5,000 psi BOP with 5,000 psi annular, mud gas separator	The BOP (blowout preventer) is a large valve at the top of a well that may be closed if the drilling crew loses control of formation fluids. Typically, two or more BOPs are used in a stack.
Power Plant	Diesel generators: 6,000 KW	An assembly of components and controls necessary to provide a hydraulic power supply. The diesel engine is used to power generators, providing an independent power supply that is harnessed to the necessary hydraulic pump and control systems.

3.2.2 Flowlines

Construction RoW and Community Access

The construction right of way (RoW) will be 20 m wide and pedestrian access across the trench during construction will be provided where there is pedestrian traffic and where the section of open trench is too long to walk around.

Method of Pipe laying

Flowline trenches will typically be excavated using tractor loader back-actors (TLBs). Trench construction is typically undertaken by stripping the topsoil and placing it in a windrow along the side of the trench opposite to construction vehicles. Trench spoil is then removed and windrowed on the same side of the trench. The pipe is brought onto site by low loaders and is lifted by mobile cranes and placed on blocks, in rows, next to the trench. The pipe ends are then reamed, butted together and welded. Welding is done by highly skilled certified welders. The integrity of each weld is checked using X-ray methods, which can detect very fine faults. The shrink wrap sleeve is then applied and heated to seal the welded joint. The pipe coating is checked for defects (i.e. pinhole-sized flaws) and marked and repaired as needed. The pipe is then lifted into the trench by side booms using slings, typically in 100 m welded sections. A thermal installation system (SEHT) is then installed around the pipe and graded material is placed around the pipe and covered with the excavated material. Backfill is not compacted and is left mounded over the trench to allow settlement. The Cathodic Protection System is connected to the pipeline and the trench is closed.

Reinstatement and Rehabilitation of the Right of Way

Once the trench is filled in, topsoil is recovered from the windrowed stockpile and replaced over the trench surface. Rehabilitation may be from the natural seed beds in the soil and by colonisation from the surrounding area, or by re-seeding using locally indigenous grasses.

3.2.3 Central Processing Facility (CPF)

General

The construction phase of the CPF and supporting infrastructure (Figure 3) will involve the following general activities:

- Clearing, levelling and terracing;
- Foundations and civil construction works;
- Installation of Equipment;
- Electrical and other tie ins; and
- Commissioning and testing of plant and equipment.

Construction sites will involve a multitude of activities, employing up to 2000 personnel (including day workers) at peak times. Cranes, excavators, bulldozers, heavy vehicles, vibrating rollers, and a wide range of other mechanical and hand-operated equipment will be used. Most of the activity will be restricted within defined work areas, the principal of these being the CPF and permanent camp, as well as ancillary work areas which will include construction of remaining roads and supporting infrastructure, including the water intake station and other minor ancillary infrastructure.

Construction Personnel

Employment will be over 34 months and CNOOC will contract the entirety of the construction work to contractor(s) who will employ as many as possible of the unskilled labour from the local area in alignment with the local labour laws.

Temporary Camp

The temporary (construction) camp will be supplied with potable water, treated to meet the Ugandan potable water standard (refer to APPENDIX A for Project Standards). The temporary construction camp will include:

- Air-conditioned accommodation of varying grades with ablution facilities;
- Staff canteen facility (with food and drink storage facilities);
- Laundry facilities;
- Sick bay and first aid medical facility;
- Recreational & sports facilities (indoors and outdoors);
- Communication facilities;
- Area flood lighting;
- Camp office warehouse and maintenance facility;
- Diesel generator for electrical generation;
- Electrical transformer, switchgear, and distribution system;
- Stand-by emergency diesel powered electrical generation;
- Potable water production and storage facilities;
- Sewage treatment plant;

- Security gatehouse and fencing;
- Internal access roads, footpaths and parking areas;
- Fuel station;
- Vehicle maintenance workshop and wash bay;
- Fire station, fire detection and fire-fighting system;
- Waste storage and packing area;
- Emergency alarm system and PA system;
- Smoking area;
- Training room; and
- Personnel on Board (POB) and accommodation management system and access control system.

Supporting Facilities and Infrastructure

Facilities and infrastructure in support of the CPF include in-field access roads, a jetty, Safety check station, a helipad, airstrip and a materials yard (supply base).

Access roads will connect with the tarred escarpment road and an access road to well pad 4A planned to be built by the year 2023 contigent on the finalization of investiment decision for the project. The jetty will be used for limited transport requirements. The airstrip will be used during the construction phase however it shall be converted to a material storage area after construction. Other available space within the CPF footprint will also be used as material lay down areas.

The reader is referred to the environmental and social impact assessment (ESIA) conducted for the Kingfisher development in 2018 for a more detailed description of the supporting facilities and infrastructure.

Figure 3: CPF and supporting infrastructure

The camp will be supplied with potable water, treated to meet the Ugandan potable water standard. Raw sewage will be delivered to a sewage treatment plant at the permanent camp. Plant capacity will be ~300 m^3/day and sized to meet peak construction demands for up to 2000 personnel. The plant will be designed to comply with the effluent discharge requirements of the Ugandan Government and IFC. The EPC contractor must comply with Ugandan Waste Regulations and IFC waste management guidelines, which encompass the principles of the waste hierarchy. Waste generation and waste disposed to landfill will be minimised. All re-usable and recyclable waste will be separated at source from waste destined for disposal to landfill. Waste will be labelled and stored in covered temporary storage areas, for collection by a third-party contractor.

Electricity will be supplied by a diesel generator located in the camp. This will be used as the backup generator once power is supplied from the CPF during the operational phase.

4.0 ENVIRONMENTAL CONTEXT

The project area is sensitive. A detailed environmental baseline has been conducted and is described in the ESIA. Key components contributing to the Environmental and social sensitivity of the area are listed below for context:

- The project is located on the shores of Lake Albert on a land terrace known as the Buhuka Flats. This area is bounded on the east by the escarpment which rises over 400 m above the floor of the Flats and is bounded in the west by Lake Albert;
- There are five villages on the Buhuka Flats. These villages follow largely a traditional lifestyle comprising agriculture and fishing. The project is consequently being developed in very close proximity to people. There are established villages in proximity to all components of the project on the Buhuka Flats and certain infrastructure will be constructed immediately adjacent to established housing;
- Given the presence of people in close proximity to the project there are many sites of religious, cultural and archaeological importance in the local area; and
- Similarly, the waters of the lake, biota within the lake, lakeshore, escarpment and River systems training from the escarpment to the lake are sensitive from an ecological perspective. A number of red list species have been recorded, or are known to use, components of the ecosystem in proximity to the project. Several well-developed wetland systems across the Flats.

The overarching environmental sensitivities within the project area are indicated in a sensitivity map that accompanies this EMP. Detailed maps in relation to specific components of the project, the receiving environment and identified areas of sensitivity are contained within the EIA report which should be read in support of the EMP.

5.0 ENVIRONMENTAL MANAGEMENT FRAMEWORK

5.1 Obligations and responsibilities of CNOOC

CNOOC has the overall responsibility for ensuring that the project is undertaken in accordance with the recommendations of this C-ESMP. CNOOC is also responsible for updating the C-ESMP, as and when necessary, during the life cycle of the Project and must ensure that its contractors adhere to the stipulations of the C-ESMP.

CNOOC undertakes to manage all Project activities in a manner that minimises adverse effects on the environment and the public, maximises socio-economic benefits for the project area and protects the health and safety of employees, contractors, visitors and the general public. To this end, CNOOC will:

1) The C-ESMP shall available to all contractors and a print copy retained in the CNOOC site office. Ensure that the contractors are familiar with the C-ESMP which forms an integral part of the contract documents entered into with the consulting engineers and all contractors;

2) Educate its personnel, contractors and visitors regarding the safety, health and environmental (SHE) requirements applicable in general to the project;

3) Provide professional staff to give effect to its safety, health and environmental management commitments;

4) Appoint a competent Project Manager to oversee all aspects of the project;

5) Appoint a competent CNOOC Environmental Coordinator (EC) prior to the commencement of construction. The EC will perform regular inspections to monitor compliance with the C-ESMP, provide the appropriate level of management within CNOOC with monthly reports on environmental compliance and performance and provide guidance on the remediation of any unplanned environmental impacts. The EC will also motivate and draft any updates to the C-ESMP as and when they become necessary;

6) Ensure that internal C-ESMP compliance inspections and audits are undertaken by the EC. These inspections and audits will include all activities associated with the CNOOC project site in its entirety, including activities undertaken by CNOOC's contractors and agents;

7) Monitor, evaluate and report performance with regard to safety, health and environmental protection to the relevant management level within CNOOC; and

8) CNOOC and its contractors will be responsible for implementation of the C-ESMP during the project.

5.2 Obligations and responsibilities of contractors

Obligations and responsibilities of contractors are outlined below. Contractors shall:

1) Ensure that they are familiar with the C-ESMP and adhere to the requirements of this C-ESMP and the environmental guidelines and standards contained therein which form part of the contractual commitment with CNOOC and develop appropriate work method statements;

2) Familiarise themselves with the undertakings and requirements relevant to the project activities contained in this C-ESMP, educate their personnel accordingly and ensure that such undertakings and requirements are adhered to;

3) Prepare method statements describing the methods through which compliance with environmental standards will be achieved and submit them to CNOOC for approval. Although CNOOC may comment on any inadequacies in these statements, the contractor will be solely and exclusively responsible in case of non-compliance with the standards contained in this document;

4) Employ techniques, practices and methods that will ensure the fulfilment of these requirements, with specific reference to the control of waste and pollution, the prevention of loss or damage to natural resources and the minimisation of adverse effects on users and holders of neighbouring land and the public in general;

5) Take cognisance of the basic information provided in this C-ESMP, but shall also verify the accuracy of any information provided, report any inaccuracies or omissions to CNOOC's Management and Field Environmental Manager and, irrespective of any inaccuracies or omissions, comply with the intentions of the requirements stated in this C-ESMP;

6) Undertake any remedial measures within a reasonable period following the receipt of a written instruction from CNOOC to do so;

7) Take all reasonable and prudent measures to prevent the occurrence of accidents that may compromise the integrity of the environment and/or the health and safety of all persons on site, of all persons on neighbouring land and of the public;

8) Report to CNOOC or its representative all incidents including, but not limited to, environmental damage, injuries and/or loss of or damage to CNOOC's physical assets or corporate image;

9) In the event of an incident as described in point 8 (above) occurring, present a detailed plan to:

   a) Restore the environmental conditions, in so far as it is possible to do so, to a state similar to that existing before the incident;

   b) Address any injuries caused in a manner satisfactory to the injured party or parties and CNOOC; and

   c) Prevent the future occurrence of similar incidents.

10) Comply with CNOOC's internal environmental and social policies and standards;

11) Cooperate in periodic C-ESMP compliance audits by CNOOC, its external auditors and/or relevant government bodies and provide the necessary information to this effect; and

12) Should government authorities believe any activities executed by the contractor cause unacceptable environmental damage, or are inadequate to mitigate environmental damage, the contractor shall immediately consult the competent government authorities and CNOOC and reach an agreement about the remedial measures to be implemented. The measures agreed upon shall be implemented to avoid the occurrence of further damage and to repair any damage that may have occurred. The contractor will be responsible for all relevant costs related to the environmental damage.

5.3 Organisational Structure and Roles

The overall organisational structure for the environmental management of the construction of the CPF, wells, and ancillary infrastructure is set out in Table 5-1 in conjunction with specific roles and responsibilities.

Table 5-1: Organisational Structure and Responsibility

Role	Responsibility
CNOOC Project Manager	CNOOC management is responsible for oversight of project construction. Where a Construction Contractor is appointed for an activity, the CNOOC project manager will liaise with them. ■ CNOOC representative, responsible for engineering, procurement, and construction management of the project, including all social and environmental management; ■ In accordance with accepted standards of the international petroleum industry, CNOOC must ensure that the Construction Contractor employs up to date techniques, practices, and methods of construction that comply with the appropriate standard; ■ In general, CNOOC must minimise environmental damage, control waste, avoid pollution, prevent loss or damage to natural resources, and minimise effects on surrounding landowners, occupants and the public; and ■ CLO.
Site Engineer (Engineer)	■ The Site Engineer is CNOOC's representative on site; and ■ The Community Liaison Officer (CLO) and Environmental Site Officer (ESO) must report directly to the Site Engineer.
Construction Contractor (including all sub-contractors)	■ The Construction Contractor is responsible for all construction activities related to the CPF, wells, and ancillary infrastructure; ■ Ensure that they are familiar with the C-ESMP and adhere to the requirements of this C-ESMP and the environmental guidelines and standards contained therein which form part of the contractual commitment with CNOOC; ■ The Construction Contractor must regularly keep the CNOOC Environmental Coordinator (EC) informed about any non-conformance in respect of this C-ESMP and must advise the EC of actions that will be taken to rectify non-conformance; ■ The Construction Contractor (or 'Contractor') must be responsible for the actions and performance of all sub-contractors; and ■ The Contractor shall be responsible for ensuring compliance with relevant Ugandan legislation applicable to environmental management. ■ The Contractor must take proactive steps to ensure that the requirements in the C-ESMP are met, including, but not limited to: ▪ Employment of competent and dedicated staff to ensure implementation of the C-ESMP. All staff responsible for environmental management of the contract must be approved by CNOOC;

Role	Responsibility
	▪ Active participation of environmental management staff in the planning, construction, and re-instatement of works; and ▪ Regular interaction with CNOOC's environmental staff. ■ Staff must be instructed about the relevant environmental sensitivities and the specific measures that each employee must implement to meet the environmental protection and management standards defined by the C-ESMP.
CNOOC Environmental Coordinator (EC)	■ The EC must be a senior CNOOC employee with extensive environmental work experience; ■ The EC must liaise with consultants or specialists as needed and monitor environmental performance on the project, as well as review monthly non-conformance reports. The EC must communicate with the CNOOC site Engineer regarding any significant non-compliance by the Construction Contractor and agree on the steps to rectify the non-compliance; ■ The EC must support the ESOs and CLOs and approve the ESO/CLO monthly reports; ■ The EC can propose C-ESMP updates to NEMA and make necessary changes to the C-ESMP if approved by NEMA; ■ The EC must oversee the re-instatement of the site and provide final sign-off following acceptable re-instatement; and ■ The EC, in conjunction with the CNOOC Liaison Officer – Community and Stakeholder Affairs (LOCSA), must coordinate and manage all necessary communication with the Government (local, provincial, and national).
CNOOC Liaison Officer – Community and Stakeholder Affairs (LOCSA)	■ The LOCSA is a permanent CNOOC officer responsible for all ongoing communications with communities and stakeholders affected by the project; ■ The LOCSA must guide the CLO(s) appointed under the management contractor's staff, where necessary, and must support interaction between the CLO(s) and relevant community leaders; ■ The LOCSA must review the ESO/CLO monthly reports and must work with the EC on matters of common interest, including review of non-conformances in the reports; and ■ Together with the EC, the LOCSA must initiate, coordinate, and manage all necessary communication with the Government (local, provincial and national).
CNOOC Local Procurement Officer	The CNOOC local procurement officer must implement enterprise and supplier development strategies and tactical plans (including necessary supporting business and governance processes, procedures, systems, and tools) in order to enable CNOOC to meet its preferential procurement and Enterprise and Supplier Development (ESD) targets. The officer must also: ■ Identify, nurture, grow, and leverage internal and external partnerships necessary to successfully execute the local content strategy (particularly as it relates to ESD and local procurement; and

Role	Responsibility
	■ Oversee the management of the delivery of business and technical support activities provided to CNOOC's ESD beneficiaries.
Community Liaison Officer (CLO)	Community Liaison Officers (CLOs) must be employed full time under the CNOOC's staff as the principal interface between communities and the Construction Contractor. They must guide and advise the Construction Contractor on communication and local community issues through ongoing liaison and monitoring of relations with communities, identification of problem areas, and conflict resolution. The CLO(s) must report directly to the Site Engineer. Where advice about community issues is required, the CLO shall notify and request assistance from the LOCSA. The CLO must comply with all requirements for ongoing communication with affected communities. The CLO(s) hired must: ■ Be trained by CNOOC and LOCSA on all relevant aspects of the project; ■ Have experience in communication with communities and local and district authorities; ■ Be fluent in the local Ugandan languages; and ■ Be able to evaluate the effectiveness of specified social management measures and provide solutions to problems in respect of the implementation of the C-ESMP. Responsibilities of the CLO shall be set by CNOOC and may include the following: ■ Informing communities of upcoming activities and progress with construction; ■ Organisation of occasional visits to site for District Government and community leaders; ■ Educating communities about traffic safety where they are near or on project access routes; ■ Implementation of support on labour agreements (among others) through communication with government, village leaders, and community members; ■ Liaising between CNOOC, communities and NGOs/ service providers implementing community projects; ■ Communication and management of the Compliments and Complaints Register; ■ Reporting of transgressions of foreign workers in the communities to the Site Engineer and the EC; and ■ Preparation of monthly reports with the ESO.
Environmental Site Officer (ESO)	The Environmental Site Officer (ESO) must be appointed under CNOOC's staff and must be employed on a full-time basis. The ESO must perform all tasks necessary to monitor the performance of the contractor with respect to the environmental specifications in the C-ESMP. Specific responsibilities of the ESO include: ■ Ensure the protection of the environment; ■ Perform all of the day-to-day tasks necessary to monitor the performance of the Contractor(s) with regard to the requirements of the C-ESMP; ■ Liaise with the Site Engineer and the EC in the case of incidents, non-conformance, or any matter where the course of action is unclear;

Role	Responsibility
	■ Verify the accuracy of the information contained in the C-ESMP and bring any errors, omissions, or oversights to the attention of the CNOOC and EC; ■ In consultation with the EC, guide all aspects of the re-instatement process as applicable; and ■ Prepare monthly reports with the CLO(s). The ESO must be fully briefed about the project, and receive any necessary training from CNOOC and the EC. Through the Site Engineer, the ESO shall guide and advise the Contractor regarding compliance with the C-ESMP on environmental issues. This will be achieved by ongoing internal coordination meetings, inspections/ monitoring of the project, identification of problem areas, and provision of actions plans to avoid environmental damage. The ESO must liaise frequently with the CLO(s) and with the Contractor's environmental staff (ECO). The ESO must have experience in environmental management and be capable of evaluating the effectiveness of specified management measures and be familiar with environmental management techniques. The ESO must be capable of proposing solutions to problems identified in respect of the implementation of the C-ESMP.

5.4 Communication with Government, Communities and Stakeholders

Communication with the Ugandan Government regarding environmental management matters will be via CNOOC's Environmental Coordinator and Liaison Officer – Community and Stakeholder Affairs (LOCSA). Communication with local structures shall be undertaken by the Community Liaison Officer(s) (CLOs) appointed for the construction period, with assistance, where necessary, from the LOCSA.

Communication regarding resettlement and compensation will be undertaken by CNOOC's Manager Stakeholder Relations (MSR) or their appointed representatives. Close liaison shall be maintained between MSR and the CLOs in the field. Where necessary, concerns or issues raised by communities and gathered by the CLOs shall be passed on to the MSR team for action.

5.5 Permits and licenses

National laws and regulations require many permits, licences and approvals that could apply to the project or specific activities.

■ All applicable approvals, permits, consents, and licenses relating to the environment must be in place prior to any construction activities and must be stored in a location which is easily accessible to appropriate staff on site.

A non-exhaustive guide to permits, licenses, and approvals is provided in APPENDIX B and it is responsibility of CNOOC and contractors to ensure all relevant permits, licenses, and approvals are acquired and complied with.

6.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

The C-ESMP has been structured into Standard Controls and specific Management Plans. The standard controls relate general management actions required in project administration, procurement and stakeholder controls. These are exclusive to Table 6.1 - 6.5 and respectively include:

a) the general Project planning (Table 6-1),
b) General admininstrative and liaison (Table 6-2),
c) Community stakeholder and Government engagement (Table 6-3),
d) procurement of local goods and services (6-4) and
e) labour working conditions and employment(6-5).

The subsequent tables are Specific management plans (that form part of an Environmental Management System (EMS). The Specific management plans relate specifically to construction activities of the CPF, wells, and ancillary infrastructure. CNOOC will implement, maintain and update the following plans in accordance with the provisions of the C-ESMP:

1) Air Quality management plan;
2) Noise and vibration management plan;
3) Biodiversity management plan;
4) Water management plan;
5) Marine works management plan;
6) Traffic management plan;
7) Community health, safety and security management plan;
8) Waste management plan;
9) Cultural heritage management plan;
10) Labour working conditions and employment management plan;
11) Pollution prevention and response management plan;
12) Emergency management plan;
13) Influx management plan;

14) Ecosystem services management plan;

15) Visual impact management plan;

16) Soil erosion and siltation management plan;

17) Greenhouse gas management plan; and

18) Health management plan.

6.1 Pre-construction planning requirements

Table 6-1: Standard Controls during Project planning

Aspect / Activity	Objective	Standard Contol / Action	Responsibility	Frequency of / monitoring Schedule	Performance indicator(s)
Establishment of buffers around sensitive environmental and social resources	Minimize the project impact on sensitive ecological and social resources that can potentially arise from project enchroachment on sensitive localities that are outside the defined project footprint	No infrastructure to be developed outside approved areas. Most requirements are spatially defined in the ESIA. If undefined, compliance with the requirement shall be verified in the field when the activity is proposed. No encroachment within sensitive areas without prior approval of CNOOC ECO.	• Specialist Environmental Consultant CNOOC EC	Pre-construction- as a basis for licensing of the activity	Independent verification of suitability of project infrastructure location and NEMA approval
Preparation of C-ESMP appendices for additional projects	Facilitate complete environmental and social planning of the entire project	Any new activity for which authorisation has been granted by NEMA shall be recorded as an Appendix to this C-ESMP. The Appendix shall include details of boundary coordinates of all infrastructure, in tabular form, and a map layer, illustrating the location of project elements. Where specific management measures or monitoring	• Specialist Environmental Consultant • CNOOC EC	Pre-construction - as a basis for licensing of the activity	Availability of C-ESMP appendices for all new activities authorized by NEMA and didn't

Aspect / Activity	Objective	Standard Contol / Action	Responsibility	Frequency of / monitoring Schedule	Performance indicator(s)
	construction phase	requirements have been recommended for the project, (over and above the general requirements in this document) they shall be set out in the Appendix.			form part of this C-ESMP
Avoidance of obstruction to surface water flow	Minimize project impact on the surface hydrology and avoid ecological disturbances of aquatic habitats and social inconviniences from disrupted surface water flow	All project infrastructure shall be designed to minimise impacts on the natural flow of water. For linear infrastructure, this shall include appropriately sized and positioned drains, culverts etc. Other infrastructure (well pads, borrow pits) shall be located to avoid impact on seasonal and permanent watercourses and on storm water drainage in general. Where linear infrastructure must cross seasonal or permanent drainage lines, the appropriate location shall be verified in the activity-specific Appendix to this report, together with any specific impact control measures that are required.	CNOOC Construction Contractor	Pre-construction	• No damming of water courses or obstructions to water flow • Continued existence of aquatic local habitats • Limited or no surface water complaints from the community arising from project impacts
Project activities in areas with Cultural resources	Optimization of the the chance finds procedure and broadened cultural baseline data resource	Additional cultural heritage assessment to document finds of high importance must be concluded prior to commencement of construction, as defined within the cultural heritage specialist study. Recovered artefacts to be housed in the National Museum, or as otherwise authorised by the museum's authority.	CNOOC Project Management Team (PMT) LOCSA	Preconstruction	Proof of completion of artefact recovery

6.2 General Administration and Liaison

6.2.1 Administration and General Issues

Table 6-2: Standard Contols for Administration and general issues

Ref.	Aspect / Activity	Objective	Standard Control / Management Action	Responsibility	Indicator/Performance Criteria[1]	Monitoring Frequency / Schedule	Additional Reference
1.	Release of contracts	• Compliance with C-ESMP	✓This C-ESMP shall be available to all contractors and a print copy retained in the CNOOC site office.	CNOOC PMT	■ C-ESMP available in CNOOC site office; and ■ Inclusion of C-ESMP as part of all contracts and orders.	Project tendering	
2.	Compliance with relevant legislation	• Compliance with relevant legislation	✓In all cases, the requirements of Ugandan legislation shall be met). Should this not be possible for any reason, CNOOC shall be immediately notified of any breach in the legislation or pending breach. This notification shall be accompanied by full details of the contravention or pending contravention and shall be accompanied by a corrective action plan.	• Construction Contractor • CNOOC PMT	■ Project records; ■ Absence of legal warnings/ prosecutions; and ■ ESO/CLO monthly reports with reference to legal non-compliances.	At all times	
3.	Hiring of Sub-contractors	• Compliance with C-ESMP	✓The main contractor shall be responsible for ensuring the compliance of sub-contractors with all aspects of this C-ESMP (all references to the Construction Contractor refer to the main contractor and all sub-contractors).	• Construction Contractor • CNOOC PMT	■ Evidence of C-ESMP knowledge of the contractor and physical possision of the same by all contractors ■ Evidence of compliance by all sub-contractors.	At all times	
4.	Regulating of working period and work hours	• Noise Nuisance avoidance	✓All noisy construction work shall be restricted to between the hours of 06h00 and 18h00 unless otherwise approved by CNOOC following consultation with affected communities and approval from NEMA. Any approved night work shall not create a nuisance in surrounding communities.This excludes drilling operations which are conducted 24 hours per day.	• Construction ContractorCNOOC PMT	■ ESO/CLO monthly reports; ■ Absence of complaints; and ■ Contractor's reports on weekly hours worked by personnel. ■ Availability of Permits from NEMA for generation of noise beyond permissible levels	At all times	
5.	Personnel HSE management	• Adequate HSE controls ensuring a safe work environment	✓A site and project-specific HSE induction shall be drafted prior to commencement of construction and be presented to all employees before they start work on the Project. The EC shall approve the content of the induction. A register shall be kept by the Contractor of all personnel who attend the induction.	• Construction Contractor • Environmental Coordinator (CNOOC)	■ Inclusion in training/induction programme(s); and ■ Register of attendance of induction.	Prior to employment	
6.	Personnel management	• Safe work environment and no unauthorised fires	✓Smoking is only permitted in designated areas and where there is no risk of starting bush fires (subject to normal safety precautions regarding flammable materials).	• Construction ContractorCNOOC PMT	■ Inclusion of smoking areas; and ■ in training/induction programme(s).	At all times	
7.	Work site employment	• Employment of appropriate personnel • Discouragement of population influx in the project area by job seekers	✓Workers shall not be employed at the gate of any work site. ✓The recruitment procedure will be cleared communicated to the community through sensitization programs	• Construction ContractorCNOOC HR	■ No soliciting of work by workers observed at the campsites or work locations.	At all times	
8.	House-keeping	• Safe work environment • No unnecessary pollution	✓Working areas shall be kept tidy and free of litter at all times.	• Construction Contractor • CNOOC PMT	■ Inclusion in training/induction programme(s); and ■ Absence of litter on site.	At all times	

[1] Performance indicators are only specified where there may be additional requirements to the verification that the requirement / specification have been met. Additional monitoring requirements are specified under Section 7.0. Note that number of incidents, audit findings etc. shall also be used as indicators of performance.

Ref.	Aspect / Activity	Objective	Standard Control / Management Action	Responsibility	Indicator/Performance Criteria[1]	Monitoring Frequency / Schedule	Additional Reference
9.	Implementation of disciplinary procedures	Appropriate correction of non-compliance with C-ESMP	✓ Appropriate disciplinary procedures shall be taken against offenders by the contractor's management in the event of deliberate non-compliance with any of the specifications in this C-EMP and notification shall be given to the Site Engineer of the actions taken.	• Construction ContractorCNOOC PMT	■ Evidence of disciplinary actions where deliberate non-compliance is encountered.	At all times	
10.	Alcohol and drug use	Safe work environment	✓ No alcohol or narcotic substances shall be permitted on site; ✓ No employee may enter into a construction area within 8 hours of consuming alcohol; ✓ Develop a programme to address education about and management of non-communicable diseases related to use of drugs and alcohol issues; ✓ Implement the CUL policy of prohibiting the possession and use of drugs and alcohol at all of its camps and construction worksites and those of its contractors and the associated routine search of vehicles and bags to ensure that unauthorised substances are not taken into the camps facilities; and ✓ Ensure that there is sufficient provision for worker recreation in order minimise the lure of substance abuse and use of external sexual services and facilities. While it is understood that it is extremely difficult to ensure prevention, it will be necessary for CNOOC to put very specific measures in place to address such issues.	• Construction Contractor • CNOOC Project Management Team (PMT)	■ Records of disciplinary procedures.	At all times	

6.2.2 Community, Stakeholder and Government engagement

A key management principle during the construction phase of the project shall be that of ensuring that the rights of the inhabitants are not infringed and that all operations are conducted in a manner that is respectful of the local residents and the land and resources that belong to them. Most people are tolerant of short-term construction impacts if treated courteously and this shall be a guiding principle of all CNOOC's contractors' activities and relationships with communities.

The project area is characterised by the following socio-economic conditions, which shall always be taken into consideration:

- Subsistence living;
- poverty;
- Strong dependence on local natural resources;
- Lack of health and education facilities, access roads; and
- Very limited employment opportunities.
- Cross border commerce and influx of migrants from DR Congo

Note that this section does not contain standard controls for liaison in respect of compensation, which is covered under CNOOC's Compensation and Resettlement Action Plan).

Table 6-3: Standard Controls for Community, Stakeholder and Government engagement

Ref.	Aspect / Activity	Objective	Standard Control / Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Management of community expectations	Understand and manage community expectations	Community leaders and residents may have expectations that CNOOC will play a supporting and developmental role within the area and that the project will have other positive economic benefits. To avoid unrealistic expectations, close communication shall be maintained between local communities and the Community Liaison	LOCSA CLO	■ Number and nature of communication initiatives; ■ Minutes of meetings and correspondence indicating the	At all times	

Ref.	Aspect / Activity	Objective	Standard Control / Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
			team (the CNOOC LOCSA and the Community Liaison Officer/s appointed for the construction period) with the objective of clarifying the limitations to CNOOC's involvement in development initiative in project-affected communities. Support work to develop comprehensive land policies. This includes support for Government capacity to do strategic, long-term land use planning that protects small holder farmers and helps balance multiple uses of land, including for oil and gas extraction.		activity of the CLOs and LOCSA; ■ Regular analysis of comments made, issues raised, and complaints registered to improve CNOOC's understanding of community expectations and attitudes towards CNOOC; and ■ Check understanding by discussions with community leaders and residents.		
2.	Communication with local leaders	Open and transparent communication with community leaders and residents	Access to land, the integrity of fences, control of bush fires, littering, harassment of domestic and wild animals, sedimentation and contamination of ground and surface waters, damage to landscape and vegetation, nuisance (noise and dust) and all such environmental matters, shall be controlled in the best interests of the local inhabitants and shall, where necessary, be the subject of open communication between the parties.	• Construction Contractor • CNOOC Project Manager Team (PMT)	■ Record of compliments/ complaints; ■ Number of complaints registered and resolved; ■ Nature of corrective actions taken; and ■ Trends in complaints.	At all times	
3.	Development of a communication plan	Formalise a communication plan	Prior to implementation of each activity, the CNOOC public affairs coordinator, in consultation with the LOCSA, shall prepare a Communications Method Statement, based on established principles and procedures, including: ■ Details of stakeholders; ■ Methods of communication at the various levels of Government and among local stakeholders; ■ Responsibilities for communication prior to the start of construction and during the construction phase itself; and ■ Details of the messages that are to be communicated to the different interest groups Any local areas where there may be sensitivities due to proximity to construction activities shall be highlighted and specific additional measures for liaison with the affected people shall be determined.	Public Affairs Coordinator LOCSA	■ CNOOC-approved Communications Plan; and ■ Records of communication according to the requirements of the plan.	Pre-construction	
4.	Community consultation	communication with communities	Ongoing communication with communities during the construction contract shall be the responsibility of the CLO(s). Where construction teams are active, the frequency of communication with local communities shall be increased. Records of all communication shall be kept and regularly updated.	CLO	■ Records of ongoing communication / sensitization programs; and ■ Compliments and Complaints Register and necessary follow up actions.	All the time	
5.	Communication with local communities	Communication through formal forums	Where CNOOC already has existing communication forums or can re-establish these where they have ceased to function, they shall be considered for use before establishing new forums. Contractors are obligated to source labour via the Community Liaison Forums (CLF) in consultation with CLO(s) and CNOOC.	Public Affairs Coordinator CNOOC PMT	■ Availability of forums ■ Record of forum activity in respect to project sensitization ■	All the time	
6.	Development of Complaints Register	Documentation of compliments and complaints	Each project affected community shall be provided with a Compliments and Complaints Register and by the CLOs about how to use it. Information about its use shall also be included in the	CNOOC PMT	■ Compliments and Complaints register in each affected community; and	Register to be provided to local	CUL-QHSE-L2-005 Communication

Ref.	Aspect / Activity	Objective	Standard Control / Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
			register itself. Marginally literate and illiterate people are to be encouraged to obtain assistance to use the register or to contact the CLO by phone or meet with the CLO on days when the register is checked. The Register in each community shall be inspected weekly by the CLO as a part of ongoing communication and any complaints are to be resolved within a week. The Register be structured in accordance with the requirements set out in the CNOOC Communications Procedure.		■ Record of the follow up action and resolution register for Compliments and Complaints .	communities prior to the commencement of any construction activity. Weekly check of register by the CLO	Management Procedure. CUL-QHSE-L3(GE)-006 Stakeholder Engagement Specification.
7.	Communication with stakeholders	Structured communication of project information to responsible parties	The Contractor shall not deal directly with surrounding communities about construction-related issues. CNOOC shall bring to the Construction Contractors' attention any issues that are raised by the community that require action. The Construction Contractor's ECO shall stay in regular daily contact with the CLO. When requested to do so by the CLO, the Construction Contractor shall attend community meetings with the Community Liaison Team in order to resolve any issues that have arisen.	CNOOC Construction Contractor CNOOC PMT	■ Records of communication with communities and resolution of issues; and ■ Meeting and discussion records in the monthly ESO/CLO reports.	All the time	CUL-QHSE-L2-005 Communication Management Procedure. CUL-QHSE-L3(GE)-006 Stakeholder Engagement Specification.
8.	Prohibition of access / trespass of project personnel into community homesteads and private property	Avoid public nuisance arising from trespass of project personnel into community private property	Access by all project personnel to homesteads and associated lands outside of the project footprint shall be prohibited.	Construction Contractor CNOOC PMT	Absence of complaints.	At all times	

6.3 Standard controls for Procurement of Local Goods and Services

CNOOC aligns its project planning to support Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and will promote competitiveness of Ugandan labour and enterprises in the oil and gas industry and the overall economy. The following table provides the standard controls for procurement of local goods and services

Table 6-4: Procurement of Local Goods and Services

Ref.	Aspect / Activity	Objective	Standard control / Management Action	Responsibility	Indicator / Performance Criteria	Monotoring Frequency /Schedule	Additional Reference
1.	Procurement of local goods and services	Promotion for procurement of local goods and services	CNOOC must comply with Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and will as far as possible: ■ Build the capabilities of Uganda's human resources to effectively participate in the oil and gas subsector; ■ Promote employment of Ugandans in the oil and gas industry; ■ Develop the competitiveness of Ugandan enterprises as suppliers and joint venture partners; ■ Increase the use of locally produced or available goods and services by the oil and gas industry; and ■ Promote research and development and technology transfer. The above will be achieved through the following: ■ All available positions will be publicly advertised;	• Construction Contractor • CNOOC PMT	■ Local suppliers in service provider list; and ■ Register and percentage of procurement in communities, the District and Province, and nationally. ■ Number of trainings aimed at capacity building of local suppliers	All the time	Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017). Labour working conditions and employment management plan (Table 6-5).

Ref.	Aspect / Activity	Objective	Standard control / Management Action	Responsibility	Indicator / Performance Criteria	Monotoring Frequency /Schedule	Additional Reference
			■ Recruitment and training will be prioritised for Ugandans; ■ Establish operational bases in Uganda; ■ Procurement and contracting procedures will be put in place to benefit Ugandan enterprises and locally available goods and services will be exclusively procured from Ugandan enterprises ; and ■ Development and implementation of plans for the transfer of technology and know-how to Ugandan institutions.				
2.	Procurement of local goods and services	Promotion of local procurement of goods and services and Optimization project benefit to the local community	■ The Construction Contractor shall prepare and submit a Local Content Plan to CNOOC for approval, in compliance with Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and CNOOC's procedures and guidelines for procurement in Uganda, as described above. The Construction Contractor will comply with this plan and use a specific template as a part of reporting requirements to CNOOC. Detailed records of procurement shall be kept for submission to the Petroleum Authority of Uganda; ■ The plan will focus on stimulating economic growth throughout the value chain and creating opportunities for local suppliers. Local content, which covers a range of categories, from highly specialised to the commoditised, must be an integral part of tender evaluation criteria in all procurement; ■ Maximise local procurement of goods and services, wherever reasonably possible. CNOOC has committed to this principle, which is expected to apply to the construction contractors responsible for the feeder pipeline as well; ■ Create a detailed and specific local procurement policy (LPP) that will provide benefits to the local community by prioritising sustainable business opportunities with local enterprises, particularly SMEs. The LPP should set out the steps that will be taken to work with and build the capacity of local suppliers to become more competitive and profitable. This may include the provision of external training and support, aimed at improving their operational, safety, environmental and technical standards to a standard that allows them to compete effectively for contract opportunities. From an internal perspective, the LPP should integrate real measures to identify local procurement opportunities, to communicate the business case to all relevant stakeholders and to put incentives and opportunities in place that will incentivise a supply chain process committed to ethical local procurement; ■ Support educational and vocational training reform that will develop the range of skills necessary for Uganda to benefit more fully from the sector, including support of science, technology, engineering, and mathematics (STEM) at schools and technical and vocational education and training;	• Construction Contractor • CNOOC PMT	■ Prepared and implemented Local Content Plan; and ■ Records of percentage of procurement from local communities, the district, province and nationally. ■ Number of trainings aimed at capacity building of local suppliers	Monthly Pre-construction. Periodic reporting	Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017). Labour working conditions and employment management plan (Table 6-5).

Ref.	Aspect / Activity	Objective	Standard control / Management Action	Responsibility	Indicator / Performance Criteria	Monotoring Frequency /Schedule	Additional Reference
			■ Contribute to economic development and infrastructure improvement in the project area, in partnership with central, and local government; ■ Develop a transparent community development and contribution policy; and ■ Develop programmes to minimize influx into the project area and support vulnerable groups as required (elderly, the disabled, single mothers or child headed households).				
3.	Employment/ recruitment of works	Equality	Uganda's Gender policy (2017) will be complied with and gender equality principles will be included in corporate policies to broaden corporate social responsibility and interventions that promote gender equality.	• Construction Contractor • CNOOC PMT	■ Implementation of policies to facilitate gender equality.	Monthly Pre-construction. Periodic reporting	Uganda Gender Policy (2007). Labour working conditions and employment management plan (Table 6-5).
4.	Human Capital Development	Promotion of local human resource and skill development	■ Identify unskilled construction workers who demonstrate the necessary experience and aptitude for potentially becoming part of a valued workforce, and introduce a directed in-service mentoring and capacity building support programme; ■ Support STEM at school level and encouraging the development of science laboratories at schools, strengthening education in maths and science at schools and the development of well-stocked school libraries as a specific focus of CNOOC Corporate Social Responsibility (CSR); ■ Consider offering bursaries or internships to promising students (refer to discussion on the community development impacts) to build a sustainable and educated future workforce; ■ Collaborate with the Petroleum Authority of Uganda (PAU), which is tasked with establishing, maintaining and operating a national talent register for the petroleum sector to ensure that CNOOC contributions in the form of bursaries and scholarships support the development of an appropriately skilled labour force; ■ Support initiatives that will promote and strengthen the levels of competence of master artisans and crafts persons within the Technical Vocational Education and Training (TVET) system, and design mechanisms that will support the entrance of female scholars into TVET institutions; ■ Develop and implement training and skills development programmes for the construction workforce to expand the human capital available within the local economy; and ■ Create opportunities for supporting and up-skilling suitable candidates from the temporary unskilled construction workforce so that their experience and competence is built in a manner that aligns their competencies with workforce skills needs.	• Construction Contractor • CNOOC PMT	■ Implementation of human capital development policy. ■ Number of scholarships / bursaries given to the local community ■ Infrastructural support and technical assistance given to education institutions to foster STEM and / or vocational training	Quarterly Pre-construction. Periodic reporting	

6.4 Labour, working conditions, and employment management plan

The labour working conditions and employment management plan for the construction of the CPF is presented in Table 6-5.

Table 6-5: Labour working conditions and employment management plan

Ref.	Aspect / Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
1.	Recruitment of local labour	• Establish and foster observance of a LFMP in consultation with relevant stakeholders • Compliance of the local labour force laws during construction the project construction phase	CNOOC shall develop a Labour Force Management Plan (LFMP) to guide recruitment processes and the workforce wellbeing in line with the Ugandan labour laws / regulations and IFC PSs Implement the actions set out in the ESIPPS (2015) Labour Force Management Plan (LFMP). Ensure that all contractors employed during the construction phase of the project are aware of and comply with the management framework for casual labour set out in this document. Ensure that the framework is fully applicable to CNOOCs full time construction staff.	CNOOC PMT	■ Signed LFMP; and ■ Records of disputes.	Quarterly In advance of the construction contract	
2.	Management of labour force	Compliance with LFMP and Ugandan labour law	Employment shall be undertaken and managed by the Construction contractor according to Ugandan labour law and the approved Project Labour Agreement (provided to the Construction contractor by CNOOC). The following should be addressed in the LFMP and implemented by the Construction contractor: ■ The maximum use of local labour during construction on activities where construction machinery could be dispensed with. Where skilled labour use is practical, it shall be complemented by applicable skills training; ■ All unskilled temporary construction jobs should be for the project-affected communities, subject to availability of sufficient workers from these communities who meet with project requirements for employment; ■ Recruitment methods for the project shall be agreed with the local authority and community leaders but shall under no circumstances be *ad hoc* recruitment at the construction sites or personnel camps; ■ No fees shall be levied for recruitment or preferred status for employment opportunities; ■ Preferentially hire local people, in accordance with CNOOC policies and agreements with Government. Advertise employment opportunities within the local fishing villages (local labour market) so that as many people as possible are employed who can continue to live with their families as they offer their services to the project. Directly project-affected people should be given priority to win construction phase jobs, subject to their meeting the necessary employment requirements; ■ Ensure that permanent employment is done via CULs Kampala head office in order to discourage job seekers at the gate of the production facility. Widely advertise the employment process for the construction phase so as to ensure local understanding of employment criteria and processes; and ■ Develop and implement training and skills development programmes in the construction workforce where feasible, to	• Construction contractor • CNOOC PMT	■ Signed LFMP; ■ Number of locally recruited workers for the available non skilled jobs ; ■ Records of CLF, showing unskilled employment from project-affected communities; and ■ Absence of justifiable complaints in the Compliments and Complaints Register.	Quarterly before and during construction	

Ref.	Aspect / Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
			expand the human capital available within the local economy.				
3.	Recruitment of unskilled workers	■ Transparency and equitability in recruitment of unskilled workers	Selection for unskilled employment shall further be based on the procedures developed and agreed by the Community Liaison Forum (CLF), which is intended as a mechanism for identifying and selecting unskilled workers from local communities in a fair and transparent manner.	Construction contractor CNOOC PMT	■ Compliance with LFMP; and ■ Records from Community Liaison Forum.	Bi-monthly prior to construction and all the time during construction	
4.	Recruitment of unskilled workers	Communication of requirements for employment opportunities	In order to maintain a transparent labour recruitment process, the information concerning procedures and eligibility requirements shall be communicated through channels used by local authorities and grass roots community organisations. Details of communication channels shall be included in the Communications Plan.	CNOOC PMT	■ Number and nature of communication initiatives; and ■ Records of communication.	Bi-Monthly prior to construction and all the time during construction	
5.	Management of grievances	Amicable Management of all grievances in the shortest possible time	▪ The LFMP shall include a formal Employee Grievance Procedure which provides employees with a mechanism for raising issues with the company without fear of victimisation. ▪ Contractors shall ensure that the induction of employees includes instruction on how to use the grievance procedure.	• CNOOC PMT • Construction contractor	■ Grievance Procedure; ■ Induction regarding; Grievance Procedure; and ■ Records of grievances and how they were resolved.	Quarterly prior to construction and monthly during construction	
6.	Semi-skilled and skilled employment	Localise employment as far as possible	▪ Where positions are available for semi-skilled and skilled jobs, the Construction contractor shall coordinate with local authorities and the education sector to identify appropriate local candidates. ▪ The Construction contractor shall follow the 'spiral' principle in seeking qualified candidates (i.e. start in local communities, and move outwards to the closest town, province, and finally nationally.	• CNOOC PMT • Construction contractor	■ Percentage of semi-skilled and skilled employees from local communities, Districts ; and ■ Evidence of use of the 'spiral principle'.	Quarterly prior to construction and monthly during construction \	
7.	Employment of women, and other disadvantaged people	Prioritise previously disadvantaged / project affected people for employment opportunities	▪ Uganda's Gender policy (2017) will be complied with and gender equality principles will be included in corporate policies to broaden corporate social responsibility and interventions that promote gender equality. ▪ The Construction contractor shall weight the award of specific unskilled jobs in favour of women, and other disadvantaged people in the recruitment policy .	• Construction contractor • CNOOC PMT	■ Percentage of women, and other disadvantaged people employed.	Quarterly prior to construction and monthly during construction	
8.	Management of workers	Alignment of employee agreements with the LFMP	The Contractor shall ensure that agreements with employees (including disciplinary criteria, working conditions, payment of over-time etc.) are in line with the PLA and are properly understood by all employees.	• Construction contractorCNOOC PMT	■ Records of employee briefings and induction. ■ Evidence of contracts for all employees on the project	Quarterly	
9.	Employment of temporary workers	• Management of job tenure expectation for employees • Foster financial literacy for employees to cope with life after expiry of the job tenure	■ The Contractor shall ensure that contract employees fully understand the temporary nature of their employment contracts; ■ Train the elected office bearers (LC1's) to ensure that they understand and communicate appropriate information to their communities about the temporary nature of construction employment; and ■ Involve civil society in disseminating information about conditions of temporary employment.	Construction contractor CNOOC PMT	■ Employment Contract and records of employee briefings and induction. ■ Record of financial literacy to employees whose contract tenure is more than 4 months	Quarterly	

Ref.	Aspect / Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
10.	Employee supervision	Adequate supervision	Construction contractors shall ensure proper supervision of employees at all times, including after-hours where employees are resident on site.	Construction contractor CNOOC PMT	■ Compliance with LFMP and FP C-ESMP requirements.	At all times	
11.	Management of workers	Enhance skills of local workers	■ Align the CNOOC Education and Training related support initiatives as well as in-house training and competency development of Ugandan nationals with the critical and scarce skills requirements of the Oil and Gas sector; ■ Consider promoting a process of Recognition of Prior Experience (RPE) and Recognition of Prior Learning (RPL) in collaboration with tertiary technical training institutions that will allow the accrual of credit for informal and non-formal skills development into the formal skills development sector for unskilled but experienced construction workforce; ■ Provide basic financial literacy training to construction workforce who are employed for longer than 4 months; and ■ Provide all necessary SHE training to construction workforce.	• CNOOC PMT • Construction contractor	■ Compliance with LFMP and FP C-ESMP requirements; and ■ Records of employee training.	Quarterly	
12.	Safeyty of workers	Provision of Adequate and accommodation meeting the requirements of the local labor laws and IFC standards	■ Ensure that construction workforce accommodation meets the local labor laws and IFC PS 2 requirements, including the putting in place and implementing policies related to quality and management of the accommodation and provision of basic services; ■ Ensure that construction worker rights to freedom of movement or of association are balanced with the need to prevent detrimental construction workforce related impacts on the general well-being and health, safety and security of settlements in proximity to the workforce accommodation services. The current CNOOC practice of sequestering workers who reside in the camp to the camp site from 19:00 at night assists in minimising the potential interaction between workers and villagers; ■ Ensure that the contractor provides adequate on-site catering for all personnel (including day workers); ■ Ensure provision is made for sufficient housing to avoid overcrowding at the EPC and Drilling contractors' temporary camps; and ■ Refer to recommendations for recreational health under alcohol and drug abuse.	• CNOOC PMT • Construction contractor	■ Prepared and implemented Local Content Plan; and ■ Local suppliers in service provider list.	Quarterly prior to construction and and monthly during construction	

6.5 Air Quality Management Plan

The air quality management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in Table 6-6.

Table 6-6: Air quality management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Dust generation from construction vehicular traffic earth works (excavations, cutting and filling etc)	• Health disorders like respiratory related illness to the exposed community and project personnel • surface water quality •	• Minimise dust generation and comply to relevant legislation and guidelines • Minimize the associated dust impacts to the health (Respiratory) and livelihood of the community	Dust caused by construction activities shall be controlled to ensure no detrimental effect on landowners, occupants, employees or the public. The contractor shall comply with the Ugandan legal requirements and IFC/ World Bank air quality guidelines for suspended particulates. Construction Contractor and the CNOOC , shall insititute a dust monitoring proram to check dust generation during construction and demonstrate deliberate suppression measures to ensure that generated dust meets local and IFC acceptable standard The dust suppression measures shall include but not limited to: a) Regular wetting of surfaces b) Use wet suppression and wet misting during materials handling activities c) screening of construction areas d) limiting vehicular movement of the construction transportation trucks to defined accesses and avoidance of off tracking e) Covering of material stockpiles and loads during transportation f) Progressively rehabilitate and re-vegetate disturbed areas Train all personnel who operate heavy equipment to be aware of and minimise dust generation; g) Driving off road or on unauthorised roads must be prohibited without prior approval from the site supervisor; and h) Inform local communities of project activities, including use of vehicles on the road network. i) Furthermore, the ESIA has recommended that the road between the Buhuka Flats and Hoima (P1) is tarred before construction begins, which is the responsibility of the Government of Uganda. As such, the Developer must engage with Government and pursue a decision on the tarring of the road. Should Government not wish to proceed with tarring of the road, this management plan should be revisited to ensure its adequacy. j) The CLO(s) and ESO shall communicate regularly with households and other receptors living close to construction activities where dust is potentially affecting them. Most people are tolerant of short term nuisance when treated courteously and when efforts are made to minimise their issues of concern.	• Construction Contractor • CNOOC PMT	■ Evidence of dust monitoring records ■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timely corrective action to resolve complaints; ■ Records of observations in ESO / CLO monthly reports (Need for use of formal monitoring equipment to be determined by CLOs and ESO, based on circumstances on site); and ■ No adverse impacts to human health and the environment. ■ Suspended Particulates (Ugandan daily standard): 200 µg/m^3; ■ PM_{10} (IFC daily standard): ≤50 µg /m^3; ■ PM_{10} (IFC annual standard): ≤20 µg/m^3; ■ Respirable particulate matter (<10 µg/m^3) (Ugandan daily standard <100 µg/m^3); and ■ Dust fall 600 mg/m^2/day determined in accordance with ASTM D1739 methodology.	■ Daily inspection and monthly monitoring during construction .	CUL-QHSE-L3(GE)-023 Land Transportation Specification

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
2.	Dust from Batching plant	• Health disorders like respiratory related illness to the exposed community and project personnel • Surface water pollution	• Minimise dust generation • Minimize the associated dust impacts to the health (Respiratory) and livelihood of the community	▪ Dust generation from batching plants shall be minimised so as not to create nuisance in surrounding communities. ▪ Control measures that may be required include sprays, division panels, and direct feed from silo to mixer or dust screens. ▪ The CLO(s) and ESO shall communicate regularly with households and other receptors living close to construction activities where dust is potentially affecting them. Most people are tolerant of short term nuisance when treated courteously and when efforts are made to minimise their issues of concern.	• Construction Contractor • CNOOC PMT	■ Evidence of Monitoring of dust levels in environment; ■ Evidence of corrective action to resolve non - compliance with dust standards ; ■ Complaints recorded in Compliments and Complaints Register; and ■ No adverse impacts to human health and the environment. ■ Records of regular community liaison and discussion about nuisance issues.	Daily inspection and monthly monitoring During Construction	
4.	Dust generation in camp	Health disorder (respiratory illness) to project personnel in camp	Minimise dust in camp.	■ Locate machinery, fuel and chemical storage and dust generating activities at a safe adistance away from site boundaries and sensitive receptors ; ■ , materials should be delivered to site pre-fabricated (constructed) to reduce cutting, grinding and sawing (etc.) within the project area; ■ Use of dust extraction techniques in fabrication areas; ■ Secure cover for all skips, ; ■ Work areas must be swept and dampened as needed to prevent the build-up of fine waste dust material.	Construction Contractor CNOOC PMT	■ Photographs showing appropriate management actions; ■ Complaints registered by communities or employees in the Complaints Register; and ■ Evidence of corrective actions to ensure Compliance with dust standards	Monthly	
8.	Emission of dust and trace gases to the atmosphere	• Air pollution	• Compliance with local air quality standards • Compliance with company and industry best practice • Minimise the degeneration of the ambient air quality	■ CNOOC must operate and maintain a site-specific ambient air quality monitoring network for the construction phase. This network should be installed at the start of the construction phase and continued through the operational phase however the network will require optimisation for the operational phase; ■ During construction, dust fall monitoring is to be undertaken with the ASTM D1739 methodology and fine PM_{10} particulate monitoring via active monitoring methodologies ■ Monitoring of gaseous trace gas pollutants (i.e. SO_2, NO_2, O_3 etc) with passive diffusion tubes should be undertaken biannually (twice a year during construction); ■ Audit and optimise the air quality monitoring network annually audit to ensure that it is maintained in accordance with best practice and is relevant to the key emission sources on the ground; ■ The emissions inventory and model should feed into future updates of the air quality management plan; and	Construction contractor CNOOC PMT	■ Monthly air quality monitoring reports ■ Suspended Particulates (Ugandan daily standard): 200 µg/m³; ■ PM_{10} (IFC daily standard): ≤50 µg /m³; ■ PM_{10} (IFC annual standard): ≤20 µg/m³; ■ Respirable particulate matter (<10 µg/m³) (Ugandan daily standard <100 µg/m³); and ■ Dust fall 600 mg/m²/day determined in accordance with ASTM D1739 methodology..	Monthly	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				■ Responsibility for the monitoring network can be allocated by CNOOC to the Construction Contractor and/or future operators through contractual agreements.				

6.5.1 Hydrocarbon emissions

Table 6-7: Hydrocarbon emissions

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
1.	Point source air emissions	• Air pollution • Surface water pollution	Comply with WHO ambient air quality guidelines	Point source emissions are distinct, immobile, and identifiable sources of air pollutants (e.g. flaring and venting of hydrocarbons). Emissions from point sources must be minimised and controlled according to CNOOC's Air Quality Management Specification (includes control technologies, as well as stack height and emission guidelines) and Good International Industry Practice (GIIP)[2]. The contractor shall comply with the Ugandan legal requirements and the following IFC/ World Bank air quality guidelines: ■ Sulphur Dioxide (IFC daily standard): 20 µg/m^3; ■ Nitrogen dioxide (IFC annual/hour standard): 40 µg/m^3 and 200 µg/m^3; ■ Ozone (IFC 8-hour daily standard): 100 µg/m^3; and ■ Particulate Matter $PM_{2.5}$ (IFC annual/ daily standard): 10 µg/m^3 and 25 µg/m^3. The height of stacks must be at least 5 m higher than other structures located within a radius of 200 m from the stack.	■ CNOOC PMT ■ Contractor.	■ Point source emissions inventory; ■ Documented evidence of regular air quality monitoring; ■ Evidence of corrective actions to ensure compliance with air quality guidelines; ■ Record of resolution of air quality complaints in a timely manner; ■ Record of regular review and updates of monitoring data, including resolution of information gaps; ■ Monitoring location represent at point source; ■ Monitoring time representing maximum point source emission period; ■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timelycorrective action to resolve complaints; ■ Records in ESO monthly reports.; and ■ No adverse impacts to human health and the environment.	Daily or as specified by relevant authority.	■ CUL-QHSE-L3(GE)-055 Air Quality Management Specification; ■ CUL-QHSE-L3(GE)-062 Greenhouse Gas Management Specification; ■ Integrated Emission Standard of Air Pollutants (GB16297-1996); and ■ IFC Guidelines (Air Emissions and Ambient Air Quality).

[2] IFC Guidelines: Air Emissions and Ambient Air Quality (2007) - http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
2.	Use of fuel	Air pollution arising from gaseous emissions	Reduce air emissions	Energy efficiency must be optimized to minimize air emissions . Furthermore the following should be implemented: ■ Maintain and service all vehicles and diesel generators regularly to ensure that exhaust particulate and trace gas emissions are kept to a minimum with post-combustion control measures; and ■ , Preferencially use low sulphur fuels to minimise SO_2 emissions.	• CNOOC PMT • Contractor	■ Monitoring records to achieve optimized energy efficiency ■ Servicing records for project equipment ■	Monthly	CUL-QHSE-L3(GE)-063 Energy Management Specification.
3.	Fugitive emissions	Air pollution due to emissions	Minimise and control fugitive emissions	Fugitive source emissions are unconfined air emissions distributed over a wide area (i.e. not confined to a specific release point). CNOOC's air Quality Management Specification must be complied with and the following must be done to minimise and control these emissions: ■ Open burning of waste material must be prohibited; ■ develop a specific procedure for monitoring of fugitive emissions from infrastructure (e.g. pipes, valves, seals, tanks) and other components with vapour detection equipment, and with subsequent maintenance or replacement of components as needed. The procedure should specify the monitoring frequency and locations, as well as the trigger levels for repairs; ■ Collection of vapours through air extractors and subsequent treatment by removing VOCs with control devices such as condensers or activated carbon absorption; and ■ Ozone depleting substances[3] must be minimised as far as possible. ■ Selection of appropriate technology and infrastructure to minimise emissions	CNOOC PMT QHSE Department	■ Evidence of a functional procedure in place for fugitive emission monitoring ■ Implementation of methods to control and reduce fugitive emissions in design, operation, and facilities maintenance records; ■ ; ■ Evidence of Implementation of adequate leak detection and repair programmes; and ■ No adverse impacts to human health and the environment.	Monthly	
4.	Enissions from mobile sources such as vehicles	Air pollution due to gaseous emissions	Minimise and control emissions from mobile sources	Emissions from vehicles include CO, NOx, SO_2, PM and VOCs . General Measures to minimize and control emissions from mobile sources include: ■ Vehicles must be maintained according to manufacturer's recommended maintenance programs; ■ Drivers must be instructed on the benefits of driving practices that reduce both the risk of accidents and fuel consumption; ■ Where feasible, aging vehicles must be replaced by newer more fuel-efficient alternatives. All vehicles must use clean fuels (i.e. low-sulphur fuels or biofuels) ; and , emissions control devices (e.g. catalytic converters) must be installed and maintained in vehicles and mobile machinery if their emissions exceed acceptably recognised standards.	• CNOOC PMT • Contractor	: ■ Maintenance record as per manufacture's requirements; ■ Visual evidence of emissions or exhaust residue; ■ Air Quality complaint; ■ Availability of functional Journey management plans.	Inspections before use and monthly during construction	■ CUL-QHSE-L3(GE)-055 Air Quality Management Specification; and ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification.

[3] Examples provided by IFC (2007) include: chlorofluorocarbons (CFCs); halons; 1,1,1-trichloroethane (methyl chloroform); carbon tetrachloride; hydrochlorofluorocarbons (HCFCs); hydrobromofluorocarbons (HBFCs); and methyl bromide. They are currently used in a variety of applications including: domestic, commercial, and process refrigeration (CFCs and HCFCs); domestic, commercial, and motor vehicle air conditioning (CFCs and HCFCs); for manufacturing foam products (CFCs); for solvent cleaning applications (CFCs, HCFCs, methyl chloroform, and carbon tetrachloride); as aerosol propellants (CFCs); in fire protection systems (halons and HBFCs); and as crop fumigants (methyl bromide)

6.6 Noise and Vibration Management Plan

The noise and vibration management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in Table 6-8.

Table 6-8: Noise and vibration management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Noise from operation of Vehicles and machinery	• Noise pollution causing a Nuisance to the exposed community / homesteads •	• Minimise and control noise from construction vehicles and equipment • Minimize the impact of project noise to the health and livelihood of the community	■ Installation of vibration isolation for mechanical equipment, where practical; ■ Train drivers and equipment operators to minimise unnecessary generation of noise; ■ Train all personnel to be aware of noise nuisance and to minimise their noise footprint in the surrounding community; ■ , Reanable Re-location of noise sources to less sensitive areas to take advantage of distance and shielding to reduce noise impacts; ■ Comprehensive inventory of sensitive noise receptors within influence areas (e.g. wildlife areas, protected species, and residents etc.) and deliberate avoidance strategies should be reasonably encouraged; ■ ■ Limiting traffic routing through community areas wherever feasible; ■ Development of a functional journey management plan ■ All vehicles and equipment shall be fitted with appropriate noise suppression devices / mufflers, , and operated and maintained as per manufacturer's schedule and specifications, ; ■ Noise producing equipment such as generators, air compressors, etc. should be enclosed in acoustic enclosures (such as enhanced mufflers and engine compartment sound insulation). Mufflers, bafflers must also be used ; and ■ All noisy construction work shall be restricted to between the hours of 06h00 and 18h00 unless otherwise approved by CNOOC following consultation with affected communities and approval from NEMA. Any approved night work shall not create a nuisance in surrounding communities. This excludes drilling operations which are conducted 24 hours per day The noise emission profile (i.e. anticipated noise output) of heavy fleet vehicles, machines, and equipment must be used as a key reason for its selection. Items with high noise emission profiles must not be selected in favour of quieter options. Machines and transport equipment must not be allowed to idle, i, and must be shut- or throttled down to their minimum operating levels .	• Construction contractor CNOOC PMT	■ Maintenace record as per manufacturer's schedule and specifications, instructions, ■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timely corrective action to resolve complaints; ■ Records of monitoring in ESO weekly and monthly reports; ■ Compliance evidence with CNOOC's noise management specification provided in the company EMS; and ■ Registers of training (including type of training, date and name). ■ Permit to generate noise beyond permissible limits	Monthly	■ CUL-QHSE-L3(GE)-056 Noise Management Specification; ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
2.	Drilling activities	• Noise pollution causing a nuisance to the exposed community /homesteads	• Minimise and control noise from drilling operations • Minimize the impact of project noise to the health and livelihood of the community	The following mitigation in addition to the above must be implemented with respect to noise generated during drilling activities: ■ Comprehensive inventory of sensitive noise receptors within influence areas (e.g. wildlife areas, protected species, and residents etc.) and deliberate avoidance strategies should be reasonably encouraged ■ Erect acoustic barriers (noise 'curtains') around the drilling rig, screening to above the drilling platform, and 5 m high screens above ground level around the perimeter of the site; and ■ Separate the top drive and the blower fans and install the fans at ground level. Screens could be made from a variety of materials of which the most practical may be stacked shipping containers.	• Drilling Team contractor • LOCSA • CLO • CNOOC PMT	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records of monitoring in ESO weekly and monthly reports; ■ ; and ■ Evidence of Compliance with CNOOC's noise management specification. ■ Permit to generate noise beyond permissible limits	Weekly	■ CUL-QHSE-L3(GE)-056 Noise Management Specification; ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.
3.	Generation of noise at sensitive receptors such as schools	Elevated noise levels	• Compliance with relevant local legislation and international guidelines • Motivate continuous improvement in noise abatement	The *Noise and Vibration Criteria Impact Assessment Criteria and Methodology*[4] produced by Rio Tinto was used to determine the threshold limits in the ESIA. For long term construction noise (>6 months), the target values are 55 dBA (daytime) and 45 dBA (night time). Based on the management actions stipulated above, the number of affected households can be limited to: ■ High significance (>55 dBA): 5 people (1 building structure); and ■ Low Medium significance (50 - 55 dBA): 189 people (42 building structures). In cases where there is evidence of noise nuisance based on field observations, or based on complaints received, measurements must be taken to verify noise levels being generated by construction work and necessary corrective action must be undertaken as soon as possible. Noise monitoring must be designed and conducted by trained specialists. Monitoring periods must be sufficient for statistical analysis (e.g. over 48 hours with the use of noise monitors capable of logging data continuously). Monitors should be located approximately 1.5 m above the ground and no closer than 3 m to any reflecting surface (e.g. wall). Should it become evident that there are more households/people affected than what was predicted, the Developer must re-evaluate the Noise management plan and update are required.	Construction contractor CNOOC PMT	■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records in ESO monthly reports; ■ Monitoring results, when required by the ESO/CLO; ■ Evidence of Compliance with CNOOC's noise management Specification; and ■	Weekly	■ CUL-QHSE-L3(GE)-056 Noise Management Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.

[4] Rio Tinto (undated)

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				Noise monitoring must be done at schools within 100 m - 200 m of noisy activities. If necessary, take measures to minimise the effect of the noisiest activities by timing them to avoid critical periods in the school day. ■ Comprehensive inventory of sensitive noise receptors within influence areas (e.g. wildlife areas, protected species, and residents etc.) and focus a deliberate monitoring regime around these receptors ; ■ Use of a Type 1 or 2 sound level meter that complies with all appropriate and current IEC standards[5].				

6.7 Biodiversity Management Plan

The biodiversity management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in Table 6-9.

Table 6-9: General Biodiversity Requirements

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Construction activities within previously undiscovered biodiversity hotspots	• Disturbance of critical habitats and endangered species	• Broaden the biodiversity baseline data • Ensure complete Avoidance of biodiversity hotspots	▪ A biodiversity expert should be available during site clearing to undertake a site reconnaissance to observe potential biodiversity hotspots that could have been missed the the ESIA ▪ Where small areas of high biodiversity are encountered during surveying or bush clearing for roads or other infrastructure, that were not identified in pre-construction studies, consideration must be given to slight re-alignment of the infrastructure to avoid these areas.	• Construction contractor • CNOOC PMT • Environmental Coordinator	■ Records of EC training to identify hotspots; ■ Records of biodiversity expert and EC undertaking site reconnaissance and accompanying surveyors and dozer operators during bush clearing; and ■ Records of biodiversity hotspots and avoidance measures taken.	During surveying or bush clearing	

[5] International Electrotechnical Commission (IEC) standards are used to obtain accurate and repeatable noise measurements.

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
2.	Collecting or harvesting fruits, vegetables, grains and any other plant material	Over explotation of locally available food resources Distortion of the social economic balance and distabilization of the community livelihood	Avoid impact to Local produce industry and livelihood of communities from food gatherings.	The harvesting or collection of fruits, vegetables, grains and other plant material by CNOOC employees or the Contractor for use or sale shall be prohibited.	• Construction contractor • CNOOC PMT	■ Evidence Inclusion of prohibition in training / induction programme(s) and contractor tool box talks; ■ Absence of evidence of plant harvesting by employees; and ■ Evidence of disciplinary procedures in the event of non-compliance.	At all times.	
3.	Hunting or harassing wild animals – including fishing	• Over exploitation of the locally available food resource • Distortion of the the social economic balance and distabilization of the community livelihood	Avoid impact to Local meat industry and livelihood of communities from hunting and fishing	Hunting, fishing, harassing, or capturing of wild animals for sale as pets or food shall not allowed. The purchase of wild animals for food by CNOOC employees and Contactors shall not allowed.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Inclusion of prohibition in training / induction programme(s) and contractor tool box talks; and ■ Absence of evidence of hunting or animal harassment by employees.	At all times.	
4.	Vehicle movement around the project area	• Road kills as a result of project vehicular traffic	• Minimise animal injury or mortality • Minimize accidents to personnel resulting from vehicular collision with fauna	The following should be implemented to reduce animal injury, mortality and vehicular accidents from traffic collision with fauna : ■ Limit vehicle speeds on the escarpment road; ■ Include appropriate signage showing speed limits and enforce the speed limits; ■ Prohibit night driving to or from the construction site except in emergencies; ■ Educate personnel and suppliers about wildlife impacts caused by road traffic; and ■ Monitor road kills in the escarpment section of the route. Report all relevant wildlife and livestock incidents so that proper monitoring of the effectiveness of mitigations can occur and necessary improvements implemented. fence surrounding the CPF and well pads must be erected to prevent the entry of fauna and must be regularly inspected to check integrity, overall condition, and to remove any climbing vegetation that could attract fauna. Any fauna within the CPF and well pads must be removed immediately by the designated personnel.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Observation Record of fauna within the CPF and well pads; ■ Ecidence of Compliance with journey management plans; ■ Results of inspections by EC; ■ Correspondence records with relevant authorities in regards to wildlife management; ■ Evidence of disciplinary procedures in the event of non-compliance; and ■ Record of awareness training with specific reference to avoidance of animal injury/mortality.	At all times.	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				An education programme must be implemented with appropriate awareness communication to all relevant personnel. Ensure no spillage of waste food on or near sites and ensure food waste is stored in wildlife proof bins/pits fitted with appropriate covers.				
5.	Changes to approved alignments	• Extension of project footprint into wetlands and sensitive habitats • Reduced land available for community use	• Minimise / limit the project footprint to approved project acquired land • Minimize further project landtake and avoid escalated deprivation of land for community utilization • Minimize nuisance of arising from trespass of project activities on communal property and / or homesteads	If an approved route needs to be changed, CNOOC must be notified in advance. The notification shall include a motivation for the proposed route change. No changes shall be agreed to that, in the opinion of CNOOC, result in an unacceptable environmental or social impact. Any change shall be certified by the EC. An agreement must be reached between CNOOC and the communual land committee prior to the change being adopted	• Construction contractor • CNOOC PMT • Environmental Coordinator	■ Documented record of notification, agreements and any approval(s); ■ No observable unauthorized offtracking footpring by the project areas identified and marked on the ground; ■ Amount of vegetation cleared must be kept to absolute minimum; ■ Clearing of vegetation to occur at the edges of contiguous vegetation patches first to allow disturbed fauna to move away; and ■ Minimise area of bare ground exposed at any one time.	Prior to alignment changes and monthly inspections	
6.	Alien vegetation	Distortion of the vegetation structure and distabilization of ecosystem functionality	Minimise introduction and colinization of disturbed areas by alien vegetation	■ CNOOC shall prepare a booklet of common existing alien plants, annotated with photographs, as a basis for identification and control by the Construction contractor (prior to construction). ■ The booklet shall be available on site at the Managing Contractor's and Construction contractors' site offices and shall be provided to the ECO/ESOs. ■ If alien vegetation establishes itself, it shall be selectively removed ■ All machinery and vehicles entering the site should be certified clear of weed propagules. ■ Alien species monitoring and control shall be handed over to the SPT monitoring team after the contractor has demobilised.	• Environmental Coordinator • CNOOC PMT	■ Booklet must include all alien plants that have been identified in the relevant area and it must be up to date; and ■ Availability of copies of booklet at construction sites. ■ Records of alien plant removal. ■ Record of Pre check inspection of equipment before mobilization to site	Prior to establishment on site.	
10.	Project activities in sensitive habitats	Distabilization / destruction of sensitive habitats and distortion of ecosystem functionality	Minimise disturbance to sensitive habitats	■ Sensitive habitat areas (including protected areas) must be clearly identified through signage and avoided on reason during all phases of the project;	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Regular inspections and monitoring plans for flora and fauna management as part of the site and activity	Monthly	■ CUL-QHSE-L3(GE)-057 Biodiversity Management Specification;

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Establishment of a relationship and close coordination with external monitoring agencies and entities; ■ Natural drainage patterns must be avoided unless its inevitably impossible to avoid practical; ■ Appropriate buffers must be established and maintained between project activities along water courses and bodies that comply with Ugandan national regulations and GIIP; ■ Noisy construction activities must only occur during designated times; and ■ High frequency noise emitters must be minimised or replaced with quieter options .		specific management systems and plans; ■ Observable signage and availability of sensitive habitat area mapping; ■ Correspondences with external monitoring agencies; ■ Documented training and compliance of personnel; ■ Personnel awareness of sensitive areas and their importance; and ■ Documented compliance with Noise Management Plan.		■ CUL-QHSE-L3(GE)-058 Aquatic and Terrestrial Habitat Management Specification; and ■ Noise Management Plan.
11.	Project induced Influx	• Increased pressure on natural resources • Habitat destruction resulting from over exploitation of existing natural resources	Facilitate management controls to influx Minimize the impact associated with influx of immigrants into the project area to public health, community livelihood and pressure on the limited resources	■ Discourage influx of job seekers to the project area and those seeking to take advantage of Project related economic opportunities through strict offsite recruitment approach ; ■ Ensure that the recruitment of un skilled workers is strictly reserved to the local community and the candidates are vetted by local the ledership before enrolment ■ Avoid or reduce influx of opportunity seekers through preferential sorcing of local goods and services from local suppliers thus discouraging immigrants that will not contribute to development and upliftment of local communities; ■ Proactively supporting programes that attract skilled people such as teachers, health workers, and experienced traders and entrepreneurs; ■ Manage such undesired influx as cannot be avoided through support to existing Government and donor initiatives for planning and development of the Kikuube District, and the protection of habitats and ecosystem integrity and species of conservation concern; and ■ Implement the Influx Management Plan. ■ Support the local and central government to strengthen controls to immigrant influx into the project area	• Construction contractor • Environmental Coordinator • CNOOC PMT • Local and central government	■ Monitoring records. ■ Demographic records at district and national levels ■ Records of origin of recruited unskilled laborforce	Quarterly	

6.7.1 Habitats and Ecosystem integrity

Table 6-10: Near-Shore Environment of Lake Albert

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Project activities extending to surface water sources	• Aquatic habitat pollution and destruction	• Ensure aquatic habitat integrity • Minimise the risks of spillages	The following impact mitigation measures are recommended to minimise the risks of spillages affecting lake biota: ■ Make provision for the designs of well pads to be checked by pollution control experts to ensure that the risks of spillage/overflow associated with drilling pollution management systems are minimised; ■ Establish a pollution management system, to be fully defined in the Contractor's contractual commitments, covering personnel, training, lines of responsibility, immediate action requirements, on-site spill kits, and all other factors necessary to ensure there is a provision for effective preventative and corrective action during all stages of construction and drilling; ■ Inspect all machinery and vehicles prior to entering the construction site for weed propagules. Issue clearance certificates for each piece of machinery and equipment; ■ Develop a culture of zero tolerance for pollution during the construction phase of the project; ■ Provide a high level of competent environmental oversight during drilling of wells and construction of the CPF; ■ Provide for thorough induction training of all construction personnel regarding pollution management, and ongoing refresher training throughout the construction/drilling contracts; ■ Provide specific training to staff responsible for the oversight of pollution control systems; and ■ Ensure structured, daily, monitoring of pollution control systems on the well pads and at the CPF to minimise the risk of inadvertent spills and to respond quickly and effectively to any spills that occur. Emphasis must be on preventative measures.	Construction contractor Environmental Coordinator CNOOC PMT	■ Report on designs of well pads; ■ Documented pollution management system; ■ Environmental auditing records; ■ Records of machinery and vehicle inspections; and ■ Relevant training records.	■ Prior to commencement of construction; and ■ Monthly during construction.	
2.	Construction of water intake station	Distablization / Destruction of the shoreline habitat	Avoid altering sedimentation patterns and fuels / oil spills from the water pump station to the lake	The following is recommended to minimise the risks of the construction of the new water intake station affecting sediment drift patterns on the near-shore habitats of Lake Albert: ■ Construction of the water intake station on wooden or concrete piles, rather than extending a rock foundation-type structure (similar to the existing jetty) from the lake shore to the intake point, to minimise effects on lakeshore currents and long-shore drift of sediments; and ■ Sediment build-up on the wave-ward side of the water-intake station structure should be removed and	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ As-built drawings and photographs of water intake station; and ■ Records of sediment removal. ■ Maintenance record of the water pump	During construction and monthly inspection after construction	Table 6-21

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				redistributed to any eroded areas down-drift of the intake structure, as well as at the existing jetty structure. ■ Make provision for the designs of the water intake station to be checked by pollution control experts to ensure that the risks of spillage/overflow associated with spill pollution management is iminimized ■ Ensure routine maintenance of the water abstruction pump in consistence with the manufacturer's maintenance schedule and specification				

Table 6-11: Bugoma Central Forest Reserve (Bugoma CFR)

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Access road through the Bugoma forest	Increased illegal activity (hunting, enchroachment and illegal logging) facilitated by the improved access to the forest	Avoid Bugoma CFR	The Bugoma Central Forest Reserve (Bugoma CFR) is widely recognised as a biodiversity hotspot and constitutes a network and corridor for critical biodiversity sites in Uganda. The R5 must be de-listed from the proposed oil road upgrades and CNOOC must use the P1 as the major haul road during the construction phase and, if upgraded in time, the R7. CNOOC should continue to engage with UNRA to make certain that R5 upgrade is not indeed not taken forward under the oil roads upgrade programs	• Construction contractor • Environmental Coordinator • UNRA	■ Verified record for use of P1 and R7 instead of R5. ■ Evidence of correspondence with UNRA to delist R5 from the national oil road upgrade program	.quarterly before construction and monthly during construction	
2.	Construction traffic along the roads within the forest section	• Road kills of wildlife from construction traffic • Disturbance of the wildlife resulting from traffic noise and increased human presence along the road section within the forest	Mimize animals road kills and accidents arising from vehicular collision with animals	■ Limit vehicle speeds to 40 km/h along the P1 road in the section from Mpanga to Nsozi; ■ Monitor vehicle speeds and enforce disciplinary action to drivers who do not comply with the speed limit; ■ Prohibit transport of construction materials near the forest at night; and ■ Ensure that all EPC contract transporters are fully aware of the risks to wildlife in the Bugoma Forest. ■ The road section along the forest should be installed with wildlife crossing signage to remind and warn drivers of potential wildlife in the area ■ The road along the forest section should also be constructed with humps to discourage over speeding traffic	• Construction contractor • Environmental Coordinator • CNOOC PMT • UNRA	■ Tachograph records; and ■ Records of training and standing instructions. ■ Visual record of road kills	Monthly	
3.	Project induced Influx	• Increased pressure on the forest resources leading to potential over exploitation • Increased illegal activity (illegal logging, poaching and	Minimize the impact of influx on Bugoma forest habitat such as illegal logging, enchroachment and poaching	■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is discussed in further detail in Chapter 17 of the ESIA; and ■ Implement the Influx Management Plan. ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and enchroachers	• Construction contractor • Environmental Coordinator • CNOOC PMT • NFA	■ Monitoring records. ■ GIS records of the forest cover ■ NFA records of illegal activity in the forest	Quarterly prior to construction and monthly during construdtion	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
		enchroachment on forest land) in the Bugoma central forest reserve						

Table 6-12: Vegetation clearing

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Construction footprint on sensitive habitat	• Habitat destruction resulting from vegetation clearing • Distortion of the vegetation structure • Colonization of invasive species in the disturbed areas	Minimise impact of project footprint and extended project land-take beyond the project acquired land	■ Pre-construction surveys for critical species of concern including bats, chimpanzees and potential bat roosts; ■ Rehabilitation of vegetation communities, where feasible, following completion of construction; ■ Amount of vegetation cleared must be kept to absolute minimum; ■ Clearing of vegetation to occur at the edges of contiguous vegetation patches first to allow disturbed fauna to move away; ■ Minimise area of bare ground exposed at any one time ■ Monitor bush clearing to ensure that clearing for the construction right of way does not exceed the specified width of 20m for flow lines; ■ Avoid small areas of sensitive habitat (such as large indigenous trees) by micro-adjustments to infrastructure placement where feasible. Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Limit vehicle access to the construction right of way and other existing road networks, wherever feasible; ■ ■ Compile a photographic georeferenced pre-construction, construction and post-construction record of the entire alignment.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Clean environmental audit reports; ■ No visual evidence of off tracking by construction traffic ■ a ■ . ■ Additional land take records and agreements ■ Restoration records of disburbed areas	At all times during surveying, bush clearing, construction and rehabilitation	■ Influx Management Plan.
2.	Construction traffic	Road accidents leading to inury / fatality of exposed community and project personnel Damage of project and private property as a result of traffic accidents	Minimise road accidents by project vehicles	■ Enforce strict vehicle speed limits on roads not exceeding 40km in buhuka flats and 60km in the the less populated outskirts ; ■ Develop and enforce a functional journey management plan for the construction traffic ■ Use buses to transport workers to reduce the number of passenger vehicles during construction, ; ■ Restrict construction traffic to daylight hours to reduce the risk of animal mortality; ■ Install under road crossing structures (for example, culverts) suitable for amphibians and small reptiles,	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Tachograph records; ■ Police reports, and ■ Record of safety inspection of vehicles. ■ Maintenance record of project vehicles	Daily inspections and monthly audits	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				along the construction access road to reduce road mortalities and improve habitat connectivity; and ■ Minimise the length of open trench. Inspect open trenches daily (in the early morning) and remove animals trapped in the trench. ■ Ensure proper maintenance of project vehicles in line with manufacturer's schedule and specification ■ All project drivers should be trained in defensive driving				
5.	Installations of lights	Disturbance of human and animal behavioural patterns	Minimise impact of glare on humans and animals Minimize the change in behavioural patterns of animals aring from glare / light intrusion	■ Limit night time work to drilling and concrete casting civil works ; ■ Use the minimum number and focus lights to the required spots. ■ Warm lighting (yellow or orange) should be preferentially be used as opposed to bright white lighting ■ Use of motion sensor lighting on boundary lighting rather than continuous lighting is recommended; and ■ Use narrow spectrum bulbs to minimise the range of species affected by lighting (for example, longer wave length red or yellow bulbs rather than "natural" or white light).	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ complaints register from local residents. ■ Monitoring records	Monthly	
6.	Rehabilitation of disturbed areas	Alien species establishment in the disturbed area	Quicken regeneration and facilitate restoration of disturbed areas	■ Strip topsoil to a depth as determined by a Soil scientist along the construction right of way and at the personnel camp and any laydown areas unless otherwise instructed by the ESO. Train dozer operators to strip topsoil to the specified depth and separately stockpile it from subsoil. Monitor topsoil stripping depth to ensure compliance with the specification; ■ Remove and destroy any invasive alien vegetation encountered within construction areas and areas under control of CNOOC; ■ In the event that rock is excavated, which cannot be utilised as fill, identify a suitable rock spoil area that minimizes damage to natural habitats for disposal of such material; ■ Ensure slight mounding over flow line trenches with backfill and topsoil to allow for settlement over time and to avoid channelling of storm water along the pipeline trench; ■ De-compact the construction right of way and reinstate topsoil from the stockpiles after construction is complete. Implement sequential topsoil restoration as quickly as possible after the pipe is laid in order to minimize erosion risk and to encourage rapid rehabilitation from the natural seed beds in the soil;	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Restoration report ■ Visual evidence of no introduced alien plant species t	Quarterly .	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Remove all foundations and other buried and surface infrastructure from the construction camp and laydown areas. Remediate any contaminated soils. De-compact subsoils and replace topsoil; ■ Decontaminate any hydrocarbon-contaminated soils using bioremediation; ■ Prepare a method statement for active rehabilitation measures in any areas where slope or other factors may prevent recovery of a stable vegetation cover from the natural seed beds in the soil. This may include seeding with locally indigenous grasses and various forms of slope protection; ■ Monitor rehabilitation in areas where cultivation is not re-established. Develop a programme for management and removal of any alien invasive weeds; and ■ Establish (prior to construction) an environment fund specifically intended for continued restoration of the area after the warranty period of the EPC contractor has expired.				
7.	Dust generation from construction activities	Reduced productivity of plants and animals (herbivores) Invasion of dust resistant plants in the dust exposed areas	Minimise impact of dust on animals and plants	■ Develop and adhere to airborne pollutant critical load benchmarks for terrestrial and/or aquatic system impacts for the Project; ■ Apply dust suppression on Buhuka Flats unpaved roads using water or a suitable dust palliative to achieve 50% control efficiency or better; ■ Reduce unnecessary traffic; ■ Control vehicle speeds and institute traffic calming measures to reduce vehicle dust entrainment; ■ Train all personnel who operate heavy equipment to be aware of and minimise dust generation; ■ Driving off road or on unauthorised roads must be prohibited without prior approval from the site supervisor; and ■ Inform local communities of project activities, including use of vehicles on the road network. ■ Furthermore, the ESIA has recommended that the road between the Buhuka Flats and Hoima (P1) is tarred before construction begins, which is the responsibility of the Government of Uganda. As such, the Developer must engage with Government and pursue a decision on the tarring of the road. Should Government not wish to proceed with tarring of the road, this management plan should be revisited to ensure its adequacy. and ■	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Visual evidence of dust coated and dying plants near construction site due to dust ■ Dust monitoring reports ■	Monthly	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
8.	Waste generation	• Habitat destruction • Pollution of water (surface and ground water) and soil • Reduced soil productivity • Destruction of ecosystem fumctionality • Reduced aesthetic value	Minimise impact of waste on habitats and ecosystems	■ Control garbage through provision of adequate refuse collection bins. These should be covered wherever possible and contents removed regularly. ■ Rubble and spoil soils should be handled in organized heaps on site and appropriately disposed in certified land fills ■ Enforce the waste management hierarchy in handling all construction waste from the site ■ the project should have operational contracts with certified waste transporters and disposal entities for routine collection and management of waste	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ No litter; ■ Existing operational contracts with waste handlers ■ Waste manifest records ■	Daily.	

6.7.2 Wetlands and drainage lines

Table 6-13: Wetlands and drainage lines

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Project activities in sensitive riparian habitats	• Destruction of riparian habitats • Distabilization of wetland ecosystem and loss of wetland ecosystem functionality	Minimize project impact on sensitive riparian habitat	■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is discussed in further detail in Chapter 17 of the ESIA; and ■ Implement the Influx Management Plan. ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and enchroachers ■ Follow the principle of avoidance of locally sensitive riparian habitat (such as large indigenous trees) by micro-adjustments to construction footprints. Decisions in this regard should be informed by a competent ecologist ■ Pre-construction surveys to clearly map the wetlands and riparian habitats ■ Undertake investigative baseline survey in near shore habitat to qualify presence or absence of mud snails in the near shore wetland habitats ■ Rehabilitation of vegetation communities disturbed during construction activities after completion of construction; ■ Amount of riparian vegetation cleared must be kept to absolute minimum;	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Monitoring reports ■ Restoration records ■ Visual evidence of continued existence of wetlands	Monthly.	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Clearing of vegetation to occur at the edges of contiguous vegetation patches first to allow disturbed fauna to move away; ■ Monitor bush clearing to ensure that clearing for the construction right of way does not exceed the specified width of 20m for flow lines; ■ Avoid small areas of sensitive habitat by micro-adjustments to infrastructure placement where feasible. Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Limit vehicle access to the construction right of way and other existing road networks, wherever feasible; ■ Construct silt traps to drainages around construction sites to minimize silt deposition intp wetlands ■ CNOOC should Support NEMA and the Wetlands department in enforcement programs to protect wetlads from enchroachment and				
2.	Project activities in sensitive riparian habitats	Distablization / Destruction of species of concern	Protect to conserve species of concern	■ Undertake investigative surveys to verify occurrence of species of concern within sites the project footpring prior to site clearing / disturbance ■ If practical, consider relocation of species of concern from the proposed site of construction prior to construction ■ Rehabilitation of habitats disturbed during construction activities after completion of construction; ■ Monitor bush clearing to ensure that clearing for the construction right of way does not exceed the specified width of 20m for flow lines; ■ Avoid small areas of sensitive habitat by micro-adjustments to infrastructure placement where feasible. Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Limit vehicle access to the construction right of way and other existing road networks, wherever feasible; ■ Construct silt traps to drainages around construction sites to minimize silt deposition intp wetlands CNOOC should Support NEMA and the Wetlands department in enforcement programs to protect wetlads from enchroachment and			Monthly.	Species of concern.
6.	Project activities in sensitive	Destruction of stream banks	Prevent temporary water bodies	Compile a photographic record of stream bank conditions; and avoid creation of temporary waterbodies that could increase water-related diseases.			At all times.	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
	riparian habitats							
7.	Wetland crossing	Wetland destruction Distabilization of wetland ecosystem and distortion of the wetland ecosystem functionality	Minimise impact on wetlands and drainage lines	■ Cross rivers and wetlands, wherever possible, in the dry season. Minimise the handling of wetland soils with heavy tracked equipment to the greatest extent possible; ■ Minimise wetland vegetation cleared to the smallest possible footprint; ■ Demarcate the construction right of way across wetlands to prevent inadvertent damage outside of this footprint; ■ Develop a detailed method statement for the flowline wetland crossing of the Kamansinig River to well Pad 3; defining the requirements to contain construction equipment within the construction footprint, to minimise compaction of wetland soils, to reinstate any clay layers and replace soils in the correct order and to return the wetland to the same profile that existed before construction; and ■ In upgrading the existing access road to Well pad 3, install additional culverts under the access road to reinstate flow across the full width of the wetland area (currently a single culvert with wetland crossing width of approximately 100 m).			At all times.	
8.	Establishment of Buffer areas around wetlands	Wetland destruction resulting from material deposition intpo wetlands	Provide for Buffer zones around wetlands and riparian zones	Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands and riparian zones.			Prior to route change	
9.	Hazardous material storage	Wetland destruction due to pollution from material spillage into wetlands	Minimize the risk of contamination	■ Prohibit the storage of oils, fuel or other hazardous materials within 100 m of delineated wetlands and riparian zones; ■ Prohibit any refuelling of equipment within 100 m of a wetland, with the exception of within the contained areas of Well pads in relation specifically to equipment in use at the well pads; ■ Ensure that all vehicles and machinery are in sound mechanical order, do not have any oil leaks; ■ Ensure that any pumps, generators or other equipment containing oil used to manage water at the wetland crossing are located on impervious plastic sheeting or drip trays; and ■ Manage all hazardous products and wastes to minimise the risk of escaped outside of controlled areas (management according to Waste Management Plan).			Prior to establishment on site	
11.	Earth works	• Wetland destruction • Distabilization of the wetland ecosystem functionality	No erosion	Install erosion prevention measures prior to the commencement of construction activities at wetland/riparian zone crossings. Measures may include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, and re-vegetation of disturbed areas as soon as possible.			End of Construction contractor warranty period	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
12.	Reclaiming of wetlands with fill material	• Wetland destruction • Distabilization of the wetland ecosystem functionality	Absence of fill material following construction	Where fill material is introduced into the wetlands and drainage lines to provide footing for construction vehicles, ensure that it is all removed after construction.			Upon completion of construction in the relevant area	
13.	Work within wetlands	• Wetland destruction • Distabilization of the wetland ecosystem functionality	Minimize the disturbance of wetland habitats dueing construction construction methods	Prepare a method statement covering all aspects of construction in the wetlands and drainage lines. This is to include: ■ Access requirements and approach; ■ Proposed drainage requirements in the event that stream flow is encountered; ■ ■ Provision for sediment barriers in the form of berms and/or indigenous silt fences made from geotextiles and/or indigenous grasses; ■ Measures to reinstate soils, subsurface material and natural ground contours. If impermeable layers are penetrated by excavation of the trench, these must be reinstated; ■ Measures to ensure the continued full reinstatement of the hydrological functioning of the wetland system during after construction; ■ Measures to ensure that vehicles equipment working in the wetlands (such as pumps) are operated on drip trays or plastic liners; and ■ Provision to minimise the risk of hydrocarbon spills.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Monitoring reports ■	Prior to commencement of construction activities in wetland areas and monthly during construction	
14.	Effluent discharge	Wetland destruction due to pollution (Eutrophication, siltation)	Minimize the the impact of effluent discharge into the wetland habitats	Adjust the final design of the canals channelling stormwater and treated sewage effluent from the CPF to remain outside of the seasonally wet areas associated with River 1 as far west as possible, crossing the river channel just upstream of the road culvert. From the culvert onward, it may be necessary to canalise the flow to the lake. Use open cross section swales for this purpose (not concrete canalisation), reinforced if necessary and grassed. Finalise the canal design and the alignment of the stormwater drains with the assistance of a wetland ecologist.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ environmental audit report.	At the commencement of construction activities and monthly during construction	

6.7.3 Species of concern

Environmental management of the Grey Crowned Crane, Mud Snail (*Gabbiella candida*), are addressed below.

Table 6-14: Grey Crowned Crane

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Project activities in sensitive habitats	Disturbance to the ecosystem resources vital for the grey crowned crane survival and continued existence	■ Conserve habitat to ensure minimum disturbances to the ecosystem resources vital for grey crowned crane survival and continued existence	■ Limit construction to identified acquired areas. ■ Avoid encroachment into adjacent areas of natural habitat; and ■ Hunting of the cranes by construction personnel for rituals, food or anyother purpose should be prohibited ■ Implement measures for wetland and riparian areas to ensure protection of such habitat. Documented surveys showing extent as well as presence/ albescence of Grey Crane in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation.	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Monitoring reports ■ Pre- construction survey reports ■ Audit reports indicating evidence of the crane post project survival and existence	Prior to bush clearing and monthly during construction.	
2.		Disturbance to the ecosystem resources vital for the grey crowned crane survival and continued existence	Enhance Survival of Grey Crowned Crane	Implement measures to minimise impacts on Grey Crowned Crane reproduction and survival in the CHAA. Measures should include: ■ Prohibit CNOOC staff and construction subcontractors from entering areas beyond the construction right of way and approved access roads; ■ Develop contractor education programmes regarding the Grey Crowned Crane to prevent the occurrence of incidents involving harassment or hunting of the birds or capture and sale of chicks if found during construction activities. These programmes should be applicable to all staff at induction and to working teams (as tool box talks) during the course of construction; ■ CNOOC to develop and disseminate community education programmes on Grey Crowned Crane habitat conservation, prevention of illegal trade in wild birds and chicks, and prevention of incidences of poisoning; ■ , Erect/plant screens between construction activities and wetland habitats in order to reduce the likelihood of disturbance of the Grey Crowned Crane via human presence and minimise noise disturbance; ■ CNOOC to develop and implement a long-term research and monitoring programme to improve understanding of the	• Construction contractor • Environmental Coordinator • CNOOC PMT	■ Clean environmental audit report.	Daily sensitization and monthly audits.	

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				behaviour and status of Grey Crowned Crane in the CHAA (this recommendation is developed further in Chapter 17 of the ESIA, Cumulative Impacts); and ■ Develop measures to discourage and monitor human migration into the area. This recommendation shall involve the Government and CNOOC (and possibly other oil industry players, as a part of an overall cumulative impact management strategy - see Section 5.16 of this ESMP).				

Table 6-15: Mud Snail (*Gabbiella candida*)

Ref.	Aspect / activity	Potential Impacts	Objective	Management Action	• Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
1.	Surveys	Un informed disturbance to the ecosystem resources vital for the mud snail survival and continued existence	Determine extent and presence/ absence	CNOOC should undertake documented surveys showing extent as well as presence/ albescence of *G. candida* in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, within the CHAA; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and No avoidable habitat degradation. ▪ Undertake final targeted, once off, specialist surveys for the Mud Snail (*G. candida)* before construction starts at the sites where construction disturbance will occur in Lake Albert (jetty expansion and water intake). The surveys should determine the presence/absence of the Mud snail (*G. candida)* in the near-shore habitats of Lake Albert within the Critical Habitat Area of Analysis (CHAA). In case of occurrence of mud snails in the near shore habitat, it will necessitate micro re alligment of the facilities to reasonably avoid the impact of the project on the habitat in which mud snails occur	• CNOOC PMT	■ Monitoring reports Pre project investigation survey for mud snail occurrence	Prior to construction and quarterly during construction.	Pre-construction planning requirements
2.	Project activities in sensitive habitats	Disturbance to the ecosystem resources vital for the mud snail survival and continued existence	Avoid habitat destruction	The Mud Snail (*G. candida)* triggers Tier 1 Critical Habitat and if it is found to be present, work in near-shore habitats should be postponed until appropriate solutions for the conservation and management of the snail are devised by suitably experienced molluscan specialists and approved by NEMA. If found to be present, CNOOC will need to demonstrate that the proposed construction activities	• CNOOC PMT • Construction contractor • Environmental Coordinator	Documented evidence to postpone construction activity if *G. candida* is found within construction areas. Documented studies (and habitat surveys)	During surveying or bush clearing and quarterly during construction.	Pre-construction planning requirements

Ref.	Aspect / activity	Potential Impacts	Objective	Management Action	• Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
				will affect less than 10% of the known global population of the species. A comprehensive survey of habitats with potential to support the Mud Snail on the shores of Lake Albert will be required to support this demonstration. Thereafter, if less than 10% of the known population would be affected, a Species-Specific Action Plan as part of the overall Biodiversity Action Plan (BAP) must be developed to achieve net gain for the affected species. Minimise disturbance of shoreline sediment during construction of the water intake station and the jetty rehabilitation.		showing that construction activities will affect less than 10% of the known global population of the species. Appropriate Species-Specific Action Plan as part of the overall Biodiversity Action Plan (BAP) that achieves net gains for *G. candida*.		
3.		Disturbance to the ecosystem resources vital for the mud snail survival and continued existence	Avoid habitat degradation	The construction phase mitigation measures for near-shore aquatic habitats set out in Table 6-13 should be implemented and strictly adhered to in order to minimise potential loss, fragmentation or degradation of the Mud Snail's habitat.	Construction contractor Environmental Coordinator	Evidence of No avoidable habitatdegradation. Documented studies (and habitat surveys) showing that construction activities will affect less than 10% of the known global population of the species. Appropriate Species-Specific Action Plan as part of the overall Biodiversity Action Plan (BAP) that achieves net gains for *G. candida*.	During surveying or bush clearing.	Pre-construction planning requirements.

Table 6-16: Nahan's Francolin

Ref.	Aspect/ Activity	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Project activities in areas close to sensitive habitats	Disturbance to the ecosystem resources vital for the Nahan's Flancolin survival and continued existence	Support habitat conservation to promote survival and continued	■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is discussed in further detail in Chapter 17 of the ESIA; ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and enchroachers ■ Pre-construction surveys for Nahan's Francolin; ■ Avoid small areas of sensitive habitat (such as large indigenous trees) where Nahan's Francolin potentially nest through micro-adjustments to infrastructure placement where feasible.	• CNOOC PMT • Construction contractor • Environmental Coordinator	■ Monitoring reports ■ Pre- construction survey reports ■ Audit reports indicating evidence of Nahan's Francolin post project survival and existence ■ Correspondence with NFA and other conservation partners relating to Nahan's Francolin conservation	Weekly, before clearing activities and during surveying or bush clearing and monthly during construction	Pre-construction planning requirements

Ref.	Aspect/ Activity	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Documented surveys showing extent as well as presence/albescence of Nahan's Francolin in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation.				
2.	Project activities in areas close to sensitive habitats	Disturbance to the ecosystem resources vital for the Nahan's Flancolin survival and continued existence	Minimise disturbance through appropriate schedules	• Implement measures to minimise impacts on Nahan's Francolin abundance and distribution, and reproduction and survival in the CHAA, particularly those arising from sensory disturbance caused by human presence and mechanical noise generated during construction should construction approach BCFR • Plan and schedule construction during seasons that are reasonably less ecologically prime for species reproduction and survival • Develop and implement a long-term research and monitoring programme to improve understanding of the behaviour and status of Nahan's Francolin in Bugoma Forest (this recommendation is developed further in Chapter 17 of the ESIA, Cumulative Impacts). • Support the government (NFA) in enforcement of existing government forestry policies in Uganda.	• CNOOC PMT • Construction contractor • Environmental Coordinator	. ■ Monitoring reports ■ Pre project investigation survey of Nahan's Francolin habitat and ecology ■ Documented research and monitoring programme.	During surveying or bush clearing and quarterly during construction	

Table 6-17: Eastern Chimpanzee

Ref.	Aspect / Activity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Project activities in areas close to	Disturbance to the ecosystem resources vital for the Eastern Chimpanzee's	Support habitat conservation to promote survival and	■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is	• CNOOC PMT • Construction contractor	■ ■ Monitoring reports ■ Pre- construction survey reports	Weekly, before any clearing activities and during surveying or bush clearing and	

Ref.	Aspect / Activity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
	sensitive habitats	survival and continued existence	continued existence of Eastern Chimpanzee	discussed in further detail in Chapter 17 of the ESIA; ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and enchroachers ■ Pre-construction surveys for Eastern chimpanzee to better understand their behavioural pattern and ecology; ■ Avoid small areas of sensitive habitat (such as large indigenous trees) where chimapnzee potentially nest. Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Documented surveys showing extent as well as presence/albescence of Eastern chimpanzee in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation. Implement the mitigation set out for the Bugoma CFR to reduce further loss, fragmentation and degradation of habitat.	• Environmental Coordinator • NFA	■ Audit reports indicating evidence of Eastern chimpanzee post project survival and existence ■ Correspondence records with NFA and other conservation partners relating to Eastern chimpanzee conservation	quarterly durind construction	
2.	Project activities in areas close to sensitive habitats	Disturbance to the ecosystem resources vital for the Eastern Chimpanzee's survival and continued existence	Minimise disturbance through appropriate schedules	Implement measures to minimise impacts on Eastern Chimpanzee abundance and distribution, and reproduction and survival in the CHAA, particularly those arising from sensory disturbance caused by human presence and mechanical noise generated during construction should construction approach the BCFR • Plan and schedule construction during seasons that are reasonably less ecologically prime for species reproduction and survival • Develop and disseminate community education programmes on Eastern Chimpanzee habitat conservation, and prevention of illegal trade in wild	• CNOOC PMT • Construction contractor • Environmental Coordinator	• Monitoring reports • Pre project investigation survey of Eastern Chimpanzee habitat and ecology • Clean environmental audit report. • Documented research and monitoring programme. • Clean environmental audit report.	Quarterly .	.

Ref.	Aspect / Activity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				animals for live trade and bushmeat, in liaison with existing Eastern Chimpanzee conservation programmes (e.g. Jane Goodall Institute Uganda's environmental education programme). • Develop and implement a long-term research and monitoring programme to improve understanding of the behaviour and status of Eastern Chimpanzee in Bugoma Forest (this recommendation is developed further in Chapter 17 of the ESIA, Cumulative Impacts). • Support the government in enforcement of existing government forestry policies in Uganda.				

6.8 Water Management Plan

The water management plan is presented below and details the management of water use and discharge.

6.8.1 General

Table 6-18: General

Ref.	Aspect / Acticity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	General Water use	• Over explotation of the water resource • Polllution to the surface and ground water resources	Compliance with local legislation and GIIP.	▪ CNOOC's water management specification must be enforced and water use and waste water discharge must comply with local legislation (e.g. National Environment Standards for Discharge of Effluent into Water or on Land Regulations, S.I. No 5/1999, Water (Waste Discharge) Regulations, 1998), as well as the latest IFC wastewater and ambient water quality guidelines where practical.[6] & 7	• Construction contractor • CNOOC PMT	No exceedances of relevant water quality guidelines.	At all times	■ CUL-QHSE-L3(GE)-054 Water Management Specification; and ■ IFC General EHS Guidelines: Environmental Wastewater and Ambient Water Quality (2007).
2.	Water abstraction	Over explotation of the water resource	Appropriate management	▪ Appropriate water abstraction permits must be obtained before using ground or surface water. All requirements in the permit must be complied with and a water flow meter must be installed at the point of water abstraction to record daily water usage.	• Construction contractor • CNOOC PMT	■ All required permits in place; and ■ Compliance with domestic wastewater specification.	Monthly	
3.	Water flow	Distortion of the water fow resulting into destruction of the ecosystem habitat functionality	No obstruction of water flow	▪ Impediments to natural water flow shall be avoided, or, if unavoidable, be allowed for in the design by means of appropriately sized and positioned drains and culverts.	CNOOC PMT; and Contractor	No damming of water or obstructions to water flow (natural or during storm events).	Daily inspection during contruction .	

[6] IFC General EHS Guidelines: Wastewater and Ambient Water Quality (2007).

[7] IFC Onshore oil and gas development: Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development (2007).

Ref.	Aspect / Acticity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
4.	Effluent management	Water Pollution (eutrophication, siltation) of the surface and ground water resources	No surface water pollution by effluent management	▪ Appropriate use of soak-ways and seepage fields must be put in place to prevent contamination of surface water.	CNOOC PMT; and Contractor	■ Runoff water quality (records); and ■ Identification of areas where activities could cause contamination and evidence of measures taken to avoid these.	Monthly	
5.	Flooding	Distortion of the water fow resulting into destruction of the ecosystem habitat functionality	Avoid obstruction to storm water	▪ Obstruction to storm water flows must be avoided using culverts, drains and other means to maintain natural flow volumes and directions as far as possible.	CNOOC PMT; and Contractor	Visual evidence that details of measures implemented in designs.	Prior to construction activities	
6.	Dust Suppression	Water pollution (eutrophication, siltation) of the surface and ground water resources	Minimise dust in surface waters	▪ Biodegradable chemical suppression or the use of water sprayers is required to keep the dust levels low and avoid sedimentation in the local surface waters.	CNOOC PMT; and Contractor	No sedimentation of the water courses.	At all times.	Air Quality Management plan in Section 0.
7.	Sewage water management	Water pollution (eutrophication, siltation) of the surface and ground water resources	Achieve appropriate treatment prior to discharge	▪ Any discharge from sewage works should meet the Ugandan water discharge standards and IFC Environmental, Health and Safety (EHS) Guidelines for treated sanitary sewage discharge quality (**Error! Reference source not found.**), whichever is the more stringent. ▪ Appropriate sewage treatment technology which is suited to operation in remote locations and which is capable of achieving the project standard (**Error! Reference source not found.**) should be used, such as activated sludge treatment plants. ▪ The sewerage treatment plant should be built as soon as possible in the construction phase before personnel numbers ramp up. ▪ Make provision for a modular plant which allows for maintenance without complete shutdown. ▪ Plant selection should also take into consideration buffering capacity, redundancy in terms of structures and mechanical equipment and options for automation. ▪ Irrigation in lawns and around the buffer areas for greening should preferentially be used over point discharge in the lake or lagoon ▪ If point discharge is undertaken, an automated module should be installed within the system to automatically shut down discharge if discharge doesn't meet national permissible standard	CNOOC PMT; and Contractor	Discharge quality analysis on treated water.	Monthly	
8.	Process Water Management	Pollution (eutrophication, oil contamination) of the surface and ground water resources	No spillages	▪ Management of process water to prevent spillages into the environment	CNOOC PMT; and Contractor	▪ Spill volumes.	Continuously	
9.	Accelerated erosion	Pollution (eutrophication,	Minimise erosion	▪ Accelerated erosion during storm events shall be minimised during all stages of construction.	Construction contractor	■ Visual evidence of Minimised alteration of natural flows;	Monthly	

Ref.	Aspect / Acticity	Potentential Impacts	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
		siltation) of the surface and ground water resources		Should this be unavoidable, specific erosion control measures shall be implemented for the duration of the storms (e.g. packing of sandbags to control storm drainage, diversion berms, temporary culverts etc.) to minimise erosion.	CNOOC PMT	■ Details of measures implemented to control storm water; and ■ Absence of material erosion on site.		
10.	Hydrotesting	Pollution (eutrophication, metal flakes, rust and chemical contamination) of the surface and ground water resources	Minimise water pollution and chemical use during hydrotest	■ If feasible, the same water should be used for multiple tests; ■ The need for chemicals must be minimised by reducing the time that test water remains in equipment and the pipeline; ■ Chemical additives must be carefully selected in terms of dose concentration, toxicity, biodegradability, bioavailability and bioaccumulation potential; and ■ If the discharge of hydrotest waters to the lake is the only feasible alternative for disposal, a hydrotest water disposal plan should be prepared that considers points of discharge, rate of discharge, chemical use and dispersion, environmental risk, and monitoring. Hydrotest water disposal into shallow shoreline and waters and sensitive ecosystems should be avoided. ■ In principle, the discharge of hydrotest water into the lake should only be considered is the hydro test water has been tested and found to meet the national discharge standards otherwise it should be treated as wastewater should the test show exceedance to permissible discharge standard	Construction contractor and; CNOOC PMT	Clean environmental audit report.	When hydrotesting is being undertaken	

6.8.2 Waste water

Table 6-19: Waste water

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency /Schedule	Additional Reference
1.	Potentially oil-contaminated (POC) wastewater	Pollution (eutrophication, siltation and oil contamination) of the surface and ground water resources	Minimise wastewater pollution	▪ Small quantities of POC wastewater may result from washdown of spillages in the POC work areas at the Base Camp. These include bunded areas for petroleum storage, the bunded generator platform and areas designated for vehicle servicing and repair. ▪ All wastewater generated from these activities must be managed in accordance with the CNOOC Waste Management Plan and meet produced water and hydrotest water requirements outlined in **Error! Reference source not found.**.	Construction contractor CNOOC PMT	POC-contaminated areas contained and drainage routed through mechanical oil traps.	Daily	
2.	Domestic wastewater	Pollution (eutrophication, siltation) of the surface and ground water resources	Minimise impact of domestic wastewater	▪ All domestic wastewater shall be disposed of in accordance with the CNOOC Waste Management Plan and in line with sewage water discharge requirements outlined in **Error! Reference source not found.**.	Construction contractor CNOOC PMT	Compliance with domestic wastewater specification.	Daily	
3.	Sewage treatment	Pollution (eutrophication, siltation) of the surface and ground water resources	Appropriate management	▪ Sewage effluent must be drained to a brick or concrete-lined sump and treated in a package sewage plant. The sewage plant must be sized to cater for the maximum forecast loads over the period it is in use. Regular compliance monitoring of effluent quality shall be undertaken to ensure sewage effluent meets the standards outlined in **Error! Reference source not found.**. ▪ Monitor treated sewage effluent discharges daily, using automated monitoring instruments for pH, TSS (as turbidity), , nitrogen and phosphorous. BOD is to be monitored weekly via the collection of effluent discharge samples and analysis an appropriate laboratory. ▪ While automated monitoring instruments provide results that are not as accurate as laboratory tests, the information is immediately available which is essential for managing a sewage treatment works in a remote area. Field measurements can be supported by monthly lab tests which serve as quality assurance. ▪ Consider installation of an agricultural irrigation system to discharge treated sewage effluent over defined areas around the work sites. This will maximise uptake of nutrients by terrestrial plants, adding value to pasture grasses while reducing risks of seepage to groundwater. Figure 7-4 in the ESIA shows areas near the camp sewage works that could be considered for irrigation. ▪ Furthermore, during the construction phase, prior to the establishment of the sewerage treatment plant, portable toilets will be used on site and the following should be implemented:	Construction contractor CNOOC PMT	■ Operation and maintenance records of plant as per manufacture's schedule and requirements; ■ Evidence of Compliance with sewage effluent wastewater standard; and ■ Records of treated sewage effluent monitoring and trends in ESO monthly reports.	■ Daily inspection During camp construction; and ■ Monthly Monitoring .	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency /Schedule	Additional Reference
				■ Install ventilated chemical toilets at the well pads, along the flowline construction sites, at the safety check station construction site and at other work areas where the camp toilets are inaccessible to the work force. Portable toilets should be within easy walking distance of any work site; ■ Ensure that there are sufficient toilets for the workforce at the work site; ■ Keep toilets in a clean and sanitary condition at all times; ■ Add disinfectant to toilets to minimise *E.coli*; ■ Train construction personnel to use the toilets (training to be ongoing, starting at induction and continuing by means of tool box talks); and ■ Monitor the use of site toilets throughout the construction contracts.				
4.	Storm water	Pollution (eutrophication, siltation) of the surface and ground water resources	Appropriate management	Any storm water that has been potentially contaminated by oil, grease or other chemicals from site activities must to be treated to the discharge standards listed in **Error! Reference source not found.** before it can be released to the environment. Key principles that must be applied during construction include: ■ Plan heavy duty construction activities to avoid sensitive times of the year, like heavy rain seasons; ■ Minimize areas to be cleared, and use hand cutting tools where possible to avoid unnecessary increases in erosion in the area and sedimentation in the surface waters; ■ Avoid construction of facilities in a floodplain and within a distance of 100 m of the normal high-water mark of bodies of water used for drinking and domestic purposes; ■ Consider the use of existing roads for access to reduce the impacts of erosion, sedimentation and obstruction to the natural surface water flow. Try to construct pipelines along existing infrastructure and roads; ■ Install temporary erosion, sediment control measures, and slope stabilization measures at all times, where necessary; ■ Peak discharge rate must be reduced in areas of development to reduce the potential erosion of the flow paths and sedimentation of downstream surface waters; ■ Storm water must be kept separate from other process and sanitation wastewater streams to reduce the volume of wastewater to be treated; ■ Runoff from process areas must be kept separate from less contaminated (or sediment heavy) runoff	Construction contractor CNOOC PMT	Clean environmental audit report.	Quarterly Prior to constructuction and monthly during construction	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency /Schedule	Additional Reference
				areas to prevent further water contamination. Storm water from process areas needs to be treated to the discharge standards listed in **Error! Reference source not found.**. before being released to the environment; ■ Oil/ water separators and grease traps must be installed and maintained at refuelling areas, workshops, parking areas and fuel storage areas; ■ Runoff from areas with potential sources of contamination and sediment loading should be minimized where possible; and ■ Reuse of storm water and contaminated runoff should be done as much as possible. Storm water should be managed as a resource.				
5.	Process water	Pollution (eutrophication, siltation) of the surface and ground water resources	Appropriate management	In the construction phase, the only process water should be that of hydrostatic testing which is done on the pipelines to detect leaks and verify the integrity of the pipeline and the equipment. There are often chemical additives in the hydrostatic testing water like corrosion inhibitors, oxygen scavengers and dyes. Due to these chemical additives, it is important that this water does not adversely affect the natural surface water in the area. The following principles should be considered when dealing with hydrostatic testing water: ■ Test manifolds installed into sections of newly constructed pipeline should be located outside of riparian zones and wetlands; ■ The source of water used for hydrostatic testing purposes should not negatively impact the water levels or flow rates of the natural water body, and the volume (or rate) of withdrawal should not exceed 10% of the stream volume (or flow); ■ Erosion control measures and fish screens should be in place when withdrawal from the water source is carried out; ■ Disposal alternatives for the hydrostatic testing water include injection into disposal well or discharge to surface water or land; ■ If disposal to the surface water or land is chosen, the use of chemicals should be minimized by reducing the time that the water spends in the pipeline. The chemicals used should be selected carefully so as to reduce the concentration of the additive, reduce the toxicity and increase the biodegradability and bioavailability; ■ Recycle the hydrostatic testing water in the various sections of the pipe to minimize the quatinty of water used in the process	Construction contractor Environmental Coordinator CNOOC PMT	Clean environmental audit report.	At all times	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency /Schedule	Additional Reference
				■ When discharging this water, water quality needs meet the local discharge standard and compare with IFC EHS guidelines as set out in **Error! Reference source not found.**; and ■ Break tanks or energy dissipaters and sediment controls should be used when discharging the water to the environment to avoid erosion and sedimentation in the downstream water bodies. If discharged to a water body, the discharge point should be selected carefully so that the quality of discharge does not negatively impact the water body. If discharge is onto the land, then the discharge site should avoid cultivated land, sensitive land or sites that might be prone to flooding or erosion. ■ If surface discharge of hydrotest water back into the lake is considered, a filter system like sand bed filters should be considered to screen metal flakes that may potentially be contained in the water following hydrotesting hydrotest process				

6.8.3 Water supply

Table 6-20: Water supply

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
1.	Permits for water use	Over exploitation of the water resource	Compliance with relevant permits	The contractor shall obtain all necessary permits for the use of surface water and groundwater	Construction contractor	Compliance with relevant Permits.	Prior to water use	Uganda Bureau of Standards (US 201) Specification for Drinking (Potable Water; 1994)
2.	Groundwater use	Over explotation of the ground water resource Deprivation of water supply to the host community	No impact on community boreholes	Water abstraction for the project shall be from r the lake . The project shall have no detrimental impact on water volumes available to existing users in the area. If any borehole is closer than 1 000 m to the nearest community borehole, specific provision shall be made to monitor the effect of construction on community water supply and to supplement this supply, if necessary. The following must be done if boreholes are significantly affected: ■ Drill new borehole outside of the construction right of way or slightly re-align the pipeline to place the borehole outside of the right of way; and ■ Inform communities of the impact and planned mitigation well in advance of construction.	Construction contractor CNOOC PMT	■ Records of proximity of project water supply to community boreholes; ■ Monitoring of community boreholes, if required; ■ Record of action taken if community borehole temporarily affected; ■ Records of communication with community; and	■ Pre-planning of facility location; and ■ Monitoring if closer than 1 000 m from a community borehole.	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
						■ Photographic evidence of damaged boreholes and corrective action.		
3.	Ground water quality	Pollution (eutrophication, siltation) of the ground water resources	Minimise impact on groundwater supply and quality	■ Monitor water quality in selected boreholes along the route before and after construction as a means of verifying the absence of impact; and ■ Ensure that treated sewage effluent consistently meets the national effluent discharge standard. If treated water exceeds standard , it must be appropriately treated to meet specifications before being released.		Records showing monitoring of water quality in selected boreholes before and after construction as a means of verifying the absence of impact.	Monthly	

6.9 Lakeshore works management plan

The Lakeshore works management plan for the construction of the CPF is presented in Table 6-21. The plan outlines environmental and social management relevant to the jetty and water intake, as well as water related facilities.

Table 6-21: Lakeshore works management plan

Ref.	Aspect / Actity	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
1.	Shoreline	Disturbance of the shoreline habitat Loss of the shoreline habitat ecosystem functionality	Minimise disturbance	Induced erosion often occurs where shorelines are disturbed through vegetation removal and shoreline exposure to the erosive energy of waves and currents with potential changes in shoreline processes and sediment transport. Vegetation along the lake's edge must be preserved and maintained as far as possible through the following measures: ■ Vegetated (e.g. grass) buffer strips must be maintained along the shoreline to aid stabilization and provide filtration of potentially polluted runoff; ■ The Jetty/Materials Offloading Facility must extend inland above the highwater mark to avoid foot/ equipment traffic causing erosion; and ■ Activity must be restricted to the Jetty/Materials Offloading Facility, water intake station and no activity must occur on the shoreline adjacent to the facility.	Construction contractor Environmental Coordinator CNOOC PMT	■ Photographic evidence of Jetty/Materials vegetated buffer strips and Offloading Facility in relation to shoreline zone (including low and high-water mark); and ■ Clean environmental audit report.	Ongoing	Species of concern
2.	Suspended sediments and sedimentation	Pollution (eutrophication, siltation) of the surface and ground water resources	Minimise sediment release in the lakeshore area	Lakeshore works will result an increase in suspended sediments and sedimentation in the lakeshore area. Implement measures to minimise sediment release during construction may include the following: ■ Silt curtains and/or other industry good practice management controls must be used to restrict the spread of sediment released during construction; ■ Shoreline disturbance and clearing must be limited to the facilities footprint. Works must not exceed the design disturbance width, and	Construction contractor Environmental Coordinator CNOOC PMT	■ Photographic evidence of materials used, geotextile lining installation, silt curtains and boundary markers; ■ Appropriate dredging equipment; ■ Records of runoff discharges to lake;	■ Prior to and during construction; and ■ After every significant rainfall event.	Commonwealth of Australia: National Assessment Guidelines (2009)[8].

[8] http://www.environment.gov.au/system/files/resources/8776675b-4d5b-4ce7-b81e-1959649203a6/files/guidelines09.pdf

Ref.	Aspect / Actity	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
				boundaries must be visually enforced using markers or tape, and employee environmental awareness training; and Construct diversion berms up-gradient of works site to divert clean rainfall runoff past the site and into the lake.		■ No discharge of runoff that does not meet water quality criteria to lake; and ■ Clean environmental audit report.		
3.	Water intake	Disturbance of the shoreline habitat Loss of the shoreline habitat ecosystem functionality	Avoid trapping and damage of aquatic plants and animals	Appropriate screens must be fitted to the water intake, if safe and practical, to avoid entrainment and impingement of aquatic plants and animals.	Construction contractor CNOOC PMT	No aquatic flora or fauna in water abstracted and pumped to lakeshore works site	Monthly	

6.10 Traffic Management

The traffic management plan for the construction of the CPF and associated facilities is presented in Table 6-22 and Table 6-23 and outlines journey management of project related vehicles.

6.10.1 General

Table 6-22: General Traffic

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
	General	Traffic accidents resulting into injury, fatalities and loss of property	Appropriate traffic management	CNOOC's Land Transportation Specification must be implemented.	Construction contractor CNOOC PMT	Evidence of Compliance with CNOOC's Land Transportation Specification	At all times	CUL-QHSE-L3(GE)-023 Land Transportation Specification
	Road traffic incidents or accidents	Injury, fatalities of humans and animals Property damage and loss	Avoid creating new roads	■ Drivers to adhere to CNOOC's Land Transportation Specification; ■ All off-road driving prohibited without prior approval from CNOOC; and ■ Use of road marshals to control traffic at designated points such as crossings for animals and people, corners and black spot areas.	Construction contractor CNOOC PMT/QHSE	■ Visual evidence of no or limited off-tracking footprint; and ■ Written authorisation from CNOOC where new access roads if necessary.	At all times	CUL-QHSE-L3(GE)-023 Land Transportation Specification
	Speed limits	Traffic accidents resulting into injury, fatalities and loss of property	Community safety	Safe travelling speeds for each section of the route along the right of way shall be determined and enforced. Enforcement may include, but not be limited to, the monitoring of vehicle speeds, the erection of speed limit signs and the installation of speed humps.	Construction contractor CNOOC PMT/QHSE CLO	■ Speed testing, speed limit signage; ■ Absence of community complaints; and ■ Accident records.	Ongoing	CUL-QHSE-L3(GE)-023 Land Transportation Specification
	Driver training	Traffic accidents resulting into injury, fatalities and loss of property	Community safety	All vehicle operators shall have received appropriate driver training (defensive driving), aimed at promoting improved driver safety performance. Daily Tool box talks to drivers should be a routine prior to daily operations	Construction contractor CNOOC PMT/QHSE	■ Records of appropriate driver training; and ■ Accident records and trends.	At beginning of driver's employment contract and daily tool box talks	CUL-QHSE-L3(GE)-023 Land Transportation Specification
	Community traffic awareness	Traffic accidents resulting into injury, fatalities and loss of property	Improve public traffic awareness to host Community	CNOOC shall conduct regular traffic safety awareness campaign during the construction period, particularly in communities where construction vehicles will be most active. The	Contractor CNOOC PMT/QHSE	Records of traffic awareness campaigns.	Every 3 months.	CUL-QHSE-L3(GE)-023 Land Transportation Specification

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				awareness training shall be repeated in villages as construction moves into their areas.				
	Injuries to community members	Loss Time on project Cost on project in compensation	Facilitate emergency response to accidents involving host Community	In the event of an accident in which a community member is injured, CNOOC (or the Construction contractor) shall take responsibility for transporting the injured person to an appropriate health facility capable of dealing with the injuries.	CNOOC PMT/QHSE Construction contractor	■ Number of near misses; and ■ Number and nature of accidents involving community members (minor to serious).	In the event of an accident.	CUL-QHSE-L3(GE)-023 Land Transportation Specification
	Vehicle nuisance	Disturbance of public quiet	Minimise public disturbance	■ Except for emergencies, hooting must be prohibited to avoid unnecessary noise; ■ Vehicles must not be allowed to idle to avoid unnecessary noise and air pollution; and	Construction contractor CNOOC PMT/QHSE	■ Complaints registered by communities or employees in the Complaints Register; and ■ Itemised inventory registers showing that nothing has been lost from vehicle.	At all times	CUL-QHSE-L3(GE)-023 Land Transportation Specification

6.10.2 Traffic Safety

Table 6-23: Traffic safety

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Transport safety	Traffic accidents resulting into injury, fatalities and loss of property	Promote Appropriate safety practices	CNOOC's land transportation specification must be implemented and transport safety practices must include: ■ Promotion of safety aspects among drivers; ■ Continuous improvement of driving skills and appropriate licensing of drivers; ■ Incorporating limits for trip duration and arranging driver rosters to avoid overtiredness; ■ Avoiding dangerous routes and times of day to reduce the risk of accidents; and ■ Use of speed control devices (governors) on vehicles, and remote monitoring of driver actions. Ensure the adoption and implementation of the CNOOC driving and vehicle management plan during initial activities which will be adopted for the construction phase. Based on this, CNOOC must adopt the best transport safety practices with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public, as well as creating awareness among the local people and villages about road safety. Other mitigation should include: ■ Emphasizing safety aspects among project drivers, specifically ensuring that drivers respect speed limits through busy and built up areas; ■ Ensuring the roster and shifts structure for the project allows employees plenty of opportunity	CNOOC PMT/QHSE Construction contractor	■ Evidence of Compliance with CNOOC's land transportation specification; ■ Documented training; ■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; and ■ Records in ESO monthly reports.	Quarterly Prior to and daily during construction	CUL-QHSE-L3(GE)-023 Land Transportation Specification

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				for sleep and rest between shifts and on their days off; ■ Adopting a proactive approach to managing driver fatigue, based on adequate hours of rest to avoid overtiredness; ■ Avoiding dangerous routes and times of day to reduce the risk of accidents; ■ Positioning traffic guides at children crossings to control driver speeds and seeking cooperation with local educational facilities (school teachers) for road safety campaigns; ■ Implementing safe traffic control measures, including road signs and flag persons to warn of dangerous conditions and children crossings; ■ Provision of alternative transport (bus) for the construction workforce; ■ Ensuring contractors regularly maintain vehicles to minimize potentially serious accidents such as those caused by brake failure commonly associated with loaded construction vehicles; ■ Ensuring contractors compile a list of service schedules of all equipment deployed on site; ■ Minimising interaction of pedestrians with construction vehicles through collaboration with local communities and responsible authorities (e.g. police) to improve signage, visibility and overall safety of roads particularly along stretches located near schools or through busy areas; ■ Construction of pedestrian walkways, parallel to project roads on the Flats, to minimise risks to pedestrians and stock on the roads in and around the construction sites at the production facility and well pads; ■ Considering additional warning tape at accident-prone stretches and sensitive locations (schools & hospitals) if identified as required; and ■ Collaborating with local communities about education about traffic and pedestrian safety (e.g. one road safety campaign at a nearby location once a month).				
2.	Vehicle maintenance	Traffic accidents resulting into injury, fatalities and loss of property	Avoid accidents arising from poor vehicle maintenance and premature equipment malfunction	Vehicles must undergo regular daily safety inspection and routine maintenance and repair using manufacturer approved schedule and specifications.	CNOOC PMT/QHSE Construction contractor	■ Compliance with CNOOC's land transportation specification; ■ No accident record arising from vehicle malfunction ■ Documented maintenance records; and	Pre-construction and ongoing	CUL-QHSE-L3(GE)-023 Land Transportation Specification

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
						■ Complaints registered by communities or employees in the Complaints Register.		
3.	Traffic	Traffic accidents resulting into injury, fatalities and loss of property	Minimise Vehicular traffic	■ Pedestrian interaction with project vehicles must be limited as far as possible; ■ Local communities and responsible authorities must be engaged and educated on visibility, signage, and overall safety of roads (especially where children may be); ■ Coordination with emergency responders to ensure that appropriate first aid is provided in the event of accidents; ■ Using locally sourced materials, whenever possible, to minimize transport distances; and ■ Locating associated facilities such as worker camps close to project sites and arranging worker bus transport to minimizing external traffic.	CNOOC PMT/QHSE Construction contractor	■ Evidence of Compliance with CNOOC's land transportation specification; ■ Documented awareness campaigns including photographic evidence of engagement; ■ Correspondence and coordination records with relevant stakeholders; ■ Documents indicating preference for locally sourced materials; and ■ Complaints registered by communities or employees in the Complaints Register.	At all times	CUL-QHSE-L3(GE)-023 Land Transportation Specification CNOOC Grievance Mechanism Specification
4.	Hazardous material	Traffic accidents resulting into injury, fatalities and loss of property	Appropriate transport procedures	CNOOC's hazardous chemical management specification must be complied with and procedures must be in place to ensure compliance with local laws and international requirements applicable to the transport of hazardous materials. Transport of hazardous materials must include: ■ Appropriately trained personnel; ■ Proper labelling on containers (i.e. quantity, identification, and relevant MSDS); ■ Chain of custody documents; ■ Appropriate packaging; ■ Application of special provisions, as appropriate; ■ Vehicle specifications relevant to transported material; and ■ A 24 hour/day emergency response system.	CNOOC PMT/QHSE Construction contractor	■ Appropriate documentation; ■ Evidence that Investigations are prompt and conducted properly ; ■ Reporting of investigations including findings and recommendations; ■ Report findings and recommendations are addressed promptly; and ■ Evidence that relevant personnel have reviewed documents.	At all times	■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-045 Hazardous Chemicals Management Specification.
5.	Transport Emergency response	Injury, fatalities arising from impromptu emergency resposne	Minimise escalation emergency severity	CNOOC's emergency response plan and emergency preparedness and response procedure must be implemented and must address: ■ Co-ordination with the public and emergency response agencies; ■ First aid and medical treatment; ■ Appropriate response actions; ■ Review and updating to reflect change and the notification of employees of such change; ■ Appropriate emergency equipment (use, inspection, and maintenance); and ■ Appropriate training.	CNOOC PMT/QHSE Construction contractor	■ Appropriate documentation; ■ Investigations are initiated promptly; ■ Reporting of investigations including findings and recommendations; ■ Report findings and recommendations are addressed promptly; and ■ Evidence that relevant personnel have reviewed documents.	At all times	■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; ■ CUL-QHSE-L2-010 Emergency Preparedness and Response Procedure; and ■ CUL-QHSE - ERP Emergency Response Plan.

6.11 Community health, safety and security

The community health, safety and security management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in table below. Traffic in relation to the community health, safety and security is outlined above in section 6.10.

6.11.1 Nuisance

Table 6-24: Nuisance

Ref.	Aspect / Activities	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	**General**	• **accidents resulting into injury, fatalities and loss of property**	• Minimize the project impact to the health, safety and security of the host community arising from population influx of job seekers and intergration of project workers from outside of the community • safeguard the safety of project workers from potential work hazards at the construction camp and respective workplace • Promote a health and safety work culture during the execution of the project •	■ The Community Health, Safety and Security Plan and an Emergency Response Plan should be updated and amended as required to meet the requirements of IFC performance standard 4; ■ Develop an induction programme, including a Code of Conduct, for all workers directly related to the project. A copy of the Code of Conduct is to be presented to all workers and signed by each person. The Code of Conduct must address the following aspects: ▪ respect for local residents and customs; ▪ zero tolerance of bribery or corruption; ▪ zero tolerance of illegal activities by construction personnel including prostitution, illegal sale or purchase of alcohol, sale, purchase or consumption of drugs, illegal gambling or fighting; ▪ zero tolerance policy of drunkenness on the ROW and no alcohol and drugs policy during working time or at times that will affect ability to work or within accommodation camps or acquired from outside the camp whilst accommodated in the camp; ▪ a programme for drug and alcohol abuse prevention and random testing that is equivalent in scope and objectives to the policies prescribed in the Code of Conduct; and ▪ description of disciplinary measures for infringement of the Code and company rules. If workers are found to be in contravention of the Code of Conduct, which they signed at the commencement of their contract, they must face proportionate disciplinary procedures. ■ Publicise the Code of Conduct in settlements potentially affected by the construction camps, as part of the community relations plan. This will help ensure that the local residents are aware of the expected behaviour of construction staff. Posters with the Camp Rules should also be posted in neighbouring	Contractor CNOOC PMT/QHSE	■ Monitoring reports ■ Evidence of incident investigation and accident reports ■ Record of safety induction, training and safety drills ■ Total Recorded Incident Rate (TRIR) ■	**Monthly**	

Ref.	Aspect / Activities	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				settlements or lodged with the LC1 of each village; ■ Provide entertainment facilities for workers at the construction accommodation camp and establish clear rules for conduct during leisure time as well as the need to remain within the camp boundaries during leisure time; and ■ Implement a grievance procedure that is easily accessible to the local community, through which complaints related to CNOOC contractor or employee behaviour that infringes on the health, safety or security of community members can be lodged and responded to. CNOOC must respond to such complaints in a considered manner, including: ▪ Circulation of contact details of community liaison officers or, if separate, of 'grievance officers' or other key contact; ▪ Circulation of details of the Witness NGO as well as the mechanisms to access the NGO; ▪ Raising of awareness amongst the local community regarding the grievance procedure and how it will work; and ▪ Establishment of a grievance register that is continuously updated and maintained by CNOOC. Provision of a mechanism to provide feedback to individuals, groups and village councillors regarding actions that have been taken in response to complaints lodged.				
2.	Construction working hours	Accidents resulting into injury, fatalities and loss of property	Provide an operating framework that regulates the time of construction work Minimize and / or avoid construction activities that are associated with noise generation and light intrusion	▪ Reasonably avoid night execution of construction activities associated with noise generation and light intrusion to minimize the nuisance to the community. ▪ Should such work be technically un avaidable to require activity continuation throught day and night time such as during concrete casting of massive structures, the contractor will inform CNOOC in not less than a week's time in advance to enable ample time for community sensitization and engagement of the affected homesteads.	Construction contractor CNOOCPMT/QHSE	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records of observations in ESO/CLO monthly reports; and ■ (Need for use of formal monitoring equipment to be determined by CLOs and ESO, based on circumstances on site).	Daily inspection and monthly monitoring .	■ CUL-QHSE-L2-005 Communication Management Procedure; and ■ CUL-QHSE-L3(GE)-006 Stakeholder Engagement Specification.

9.	Disruption of Social Networks and Fragmentation	Distortion of the social fabrique	Minimize project disruption of social fabrique and networks	■ Set up an accessible and local “one-stop shop” in the community for all issues concerning the construction process to handle aspects such as the provision of basic information, a contact point for emergencies and grievances (whether the concern is related to CNOOC, its contractors or sub-contractors) about work on the project. As part of this process, provide a resource person (potentially a community liaison officer) who is able to provide on-site information to communities on the RAP and associated processes, property and land issues during construction, to monitor and assist the construction contractor’s pre-entry agreement procedure and final re-instatement sign-off with owners and users and for resolving outstanding issues; ■ Provide comprehensive dispute resolution mechanism linked into a coherent two-way communication system (either as part of the ‘one-stop shop” or aligned with it, with associated feedback mechanisms that will be readily accessible and available to the host community especially PAPs).; ■ Ensure that consideration of conflict issues - latent, existing and potential – is built into all phases and aspects of the construction phase; ■ Monitor and track responses to risks and impacts, involving workers and communities; ■ Continue to implement the Community Relations Strategy (CRS) and establish a formalised communication forum. The forum should be open to representatives from community (including but beyond the formalised governance system provided by LC1s), CSOs, NGOs, FBOs as well as traditional clan chiefs (or representatives) and other stakeholders as identified. Ensure regular meetings at local level, hosted by CNOOC, aimed at: ▪ communicating with stakeholders to build understanding and demonstrate transparency and accountability; ▪ strengthening channels for the provision of further information that may be needed; ▪ promoting mechanisms for understanding real issues and concerns related to the project and impacts being experienced from direct (unmitigated), indirect and cumulative impacts; and ▪ publicly and transparently debating options for sharing out benefits at local level that will take account of the negative impacts experienced locally, including the costs and	CNOOC PMT/QHSE	■ Records of timeous corrective action to resolve complaints; and ■ Records of observations in ESO/CLO monthly reports. ■ Complaints register.	Monthly	

				benefits of different options, their management implications and their role in supporting wider economic development. ■ Develop - in consultation with all relevant stakeholders - a Community Development Action Plan (aligned with the Kikuubw District and Kyangwali Sub-county Development Plans) for implementation of activities aimed at: ▪ promoting strategic Corporate Social Responsibility (CSR) projects which will not require CNOOC to usurp the government's role or act as substitute government agent in fulfilling human rights related delivery; ▪ planning and implementing projects, in partnership with government, that will serve to alleviate existing challenges to the survival, livelihood and dignity of the people of the Buhuka Flats in a sustainable manner. This could include engaging NEMA as well as relevant authorities in implementation of effective solid waste management and associated recycling programmes; ▪ planning and establishing adequate sports facilities for schools as well as for youth, in partnership with government and the Banyoro Kitari Kingdom; ▪ planning and achieving critical objectives set out in the project Livelihoods Restoration Plans; ▪ planning and implementing immediate measures that will assist in earning and maintaining CNOOC's social license to operate; and ▪ taking collective action where appropriate to address environmental, social and human rights issues. ■ Facilitate and financially support the establishment of a district/area-wide Development Organisation, with a formalised legal structure (such as a Foundation or a Community Development Agency). Such an organisation or agency would: ▪ address issues related to human security, as an approach that brings together development, human rights, and peace and security (as defined by the United Nations General Assembly, 2012); ▪ allow the identification and redress of widespread challenges to the survival, livelihood and dignity of villagers on the Buhuka Flats and beyond in a sustainable manner;				

Ref.	Aspect / Activities	Potential impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				▪ draw together the financial and human resources of the private and public sectors, the traditional leadership and other stakeholder bodies as well as donor and aid organisations; and ▪ develop issue-based action plans, including business plans for donor funding in respect of various focus areas of need that will address identified human security issues and concerns. ■ Allow CNOOC to use its own budget to leverage significant additional budget from other role-players (including international 'GoFundMe' initiatives) and aid organisations with a specific mandate (e.g. the distribution of mosquito nets) to address specific problems encountered at village level.				

6.11.2 Population influx and Social Pathologies

Table 6-25: Population Influx and Social Pathologies

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Influx of job / opportunity seekers in the the project area	Increased pressure on available resources Over exploitation of available resources Enchroachment and destruction of natural habitats Increased disease prevalence and crime Distortion of the social economic fabrique	Minimize influx of immigrant job seekers into the project area Minimize the Health, safety and security impact (disease prevalence, reduced sanitation, crime, prostitution etc) arising from influx to the host community Minimize influx related pressure on local resources (water, food, shelter, infrastrure etc) that would undermine the health and	The Communication Plan shall be updated, including national coverage and community communication campaigns, starting prior to establishment on site Implementation of the following recruitment strategies that discourage influx of job seekers into the project area: ■ Ensure that the recruitment of un skilled workers is strictly reserved to the local community and the candidates are vetted by the local ledership before enrolment ■ Avoid or reduce influx of opportunity seekers through preferential sorcing of local goods and services from local suppliers thus discouraging immigrants that will not contribute to development and upliftment of local communities; ■ Avoid procurement of casual goods and services at the gate or around the project fence ■ Proactively supporting programes that attract skilled people such as teachers, health workers, and experienced traders and entrepreneurs; ■ Manage such undesired influx as cannot be avoided through support to existing	Contractor CNOOC Local (Kikuube district) and central government	■ Monitoring records. ■ Demographic records at district and national levels ■ Records of origin of recruited unskilled laborforce	Quarterly	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
			livelihood of the host community	Government and donor initiatives for planning and development of the kikuube District, and ■ Implement the Influx Management Plan ■ Support the local and central government to strengthen controls to immigrant influx into the project area				
2.	Community sensitization and public engagement	Community mistrust and reduced confidence	Foster community engagement through regular information sharing with the host community and hgeneral public	▪ A stakeholder enegement plan shall be developed by CNOOC and will have a stakeholder mapping, frequency and mode of engagement of the respective stakeholders. ▪ Sensitization meetings shall be regularly held with all stakeholders including Government, development partners, host community and the general public to , provide project information and also receive community feedback to issues of interest. ▪	Public Affairs Coordinator LOCSA	■ Record of stakeholder engagement meetings ■ Minutes of stakeholder meetings ■ Evidence of the stakeholder engagement plan in place ■ Evidence of compliance with the stakeholder engagement plan ■	Quarterly - prior to construction and monthly during construction	
5.	Housing and Land Loss	Loss of livelihood and reduced standard of living for the project affected persons	Minimize the pressure on housing resulting from influx and project landtake	■ Ensure that there is a process to identify the rightful owners of any land to be acquired by the project. While this will mean engaging the individual(s) who indicates to they be the rightful land owner(s), the identification process should consider information from a broad consultations. ■ Secondary PAPs, who may not have been immediately identified, but who have utilised the land in some way for a period of up to 12 years and longer. This includes the loss of dwellings of secondary PAPs, loss of crops and assets such as mango trees and resultant loss of income; ■ Undertake a full investigation of the allegations that PAPs have been forced to sign documentation and if any allegations are valid, address them comprehensively; ■ Ensure that the RAP comprehensively addresses all aspects of physical and economic displacement experienced by impacted communities, in accordance with the IFC performance standard 5 which addresses the involuntary resettlement and compensation impacts in the project-affected communities; ■ Provide compensation for lost agricultural productivity (lost grazing and cultivation) during the construction period. Although there has been extremely limited agricultural activity on the Buhuka Flats, adequate notice of the production facility construction schedule must be provided to PAPs so that they don't	CNOOC PMT/CA/L&C	Resettlement action plan.	Quarterly prior to construction and monthly during construction	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				unnecessarily lose crops. Cash compensation must be provided based on the cost of planting, labour and fertiliser inputs required to bring the tree or vine to maturity, plus the cost of the lost production for the period it will take a sapling to reach the production level of the tree/vine at the time it is lost to the project; ■ Ensure that the Livelihoods Restoration Plan, as well as the Community Development Plan, provide practical mechanisms and mitigation strategies for the loss of grazing land on the Buhuka Flats as a buffer against out-migration as well as in respect of cultivated land. The extent of household reliance on subsistence food sources should be taken into consideration in this process; ■ Ensure that land temporarily used during the construction phase is reinstated to at least the condition it was in prior to construction. This would include all agricultural land, except that needed permanently for the ROW. Agricultural land must be left graded and tilled ready for re-planting. Where land must be re-planted in order to prevent erosion, the regime must be agreed with the landowner; ■ Implement a precautionary approach to offering cash compensation as an alternative to payment in kind for housing, infrastructure and land ware of the vulnerabilities that could be caused by cash compensation and has instituted a number preconditions prior to moving forward with the payment of compensation. These have included (i) the requirement that men are not able to negotiate cash settlements without their spouses being present during the negotiation and being in voluntary agreement (ii) payment of the compensation into a bank account (where the amount is sufficiently large to warrant this) and where the account has been opened in the name of the husband as well as the wife and where withdrawals require the permission and signature of both spouses; ■ While this mechanism is a responsive approach to the problems of cash payments, a side effect has been an increase in household violence. In particular, this can led to incidents of assault by husbands where their wives have been reluctant to give approval for intended spending.				

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ ; ■ To cater for inadvertent damages outside of the defined project land , reach agreement with community representatives as to how this should be handled; ■ Identify key fixed photographic reference points for the Buhuka Flats and prepare seasonal (wet and dry season) reference photographs before the construction contractor establishes on site. Use these photographs to assist in resolving disputes in the event of disagreements about damages; ■ Monitor construction activity daily as a means of rapidly identifying and acting upon any inadvertent damages. To achieve this, competent CLOs will need to be on site from the start of construction establishment; ■ Ensure that all contract personnel are trained, both during induction and subsequent follow-up training, to minimise their impact on surrounding communities and to remain within the designated construction areas; ■ Ensure that CNOOC construction staff who reside outside the LSA are required to return to their place of residence during periods of leave to avoid potential use of rental property in the area; and ■ Provide accommodation for all personnel who do not reside in the LSA and are not brought in on a BIBO or FIFO basis.				

6.11.3 Communicable Diseases

Table 6-26: Communicable Diseases

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Schedule	Additional Reference
1.	Sexually transmitted infections	Loss time, injury and fatality due sexually transmitted diseases Distortion of the moral fafrique of the society through increased prostitution	Minimize the the risk of of sexually transmitted infections (STIs) Minimize the	The Construction contractor shall prepare and implement an STI Management Plan designed to minimise the spread of HIV infection and other STIs. The plan shall be prepared with the assistance of a specialist in sexually transmitted diseases. The plan shall include, among other things, the following measures: ■ An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STIs, to employees, through workshops, posters and informal information sessions; ■ Encouragement of employees to test and know their HIV status; ■ Prohibition of sexual relationship between fellow workers or workers with the community ■ Supply of condoms at the construction site(s); and ■ Development of a comprehensive construction Camp Management Plan, including for on-site behaviour, entrance and exit policies and prohibition of sex workers on site. ■ Strict access and exit controls at the workers camp to mitigate uncontrolled movement and association of project workers with the host community that may culminate into sexual relationships and heightened risk of prostitution	Construction contractor CNOOCPMT/QHSE	■ Availability of a STI Management Plan and evidence for compliance of the plan; ■ Record of health (STI) sensitization campaigns and ■ Number and nature of health initiatives to mitigate	Quarterly	
2.	Malaria	Loss time, injury and fatality due Malaria	Minimize the prevalence of malaria in host community and project workers through Mosquito vector control, avoidance, diagnosis and treatment	■ Provision of mosquito nets in the construction camp to all project workers ■ Regular fumigation program should be undertaken to control mosquitoes within the camp ■ Provide malaria prophylaxis to project workers particularly expatriate employees from countries that are malaria free ■ Ensure that the camp and other construction site don't have stagnant pools of water that are breeding grounds for mosquistoes ■ Provide adequate medical facilities with qualified medical personnel experienced in treatment of malaria The Construction contractor shall on top of the above measure prepare and a malaria management plan and include detailed measures for vector control, avoidance, diagnosis, treatment, and training.	Construction contractor CNOOC PMT/QHSE Public Affairs Coordinator Environmental Coordinator	■ Record of malaria cases in the work force ■ Evidence of regular fumigation and provision of mosquito nets in the camp ■ Records of ongoing training of employees in respect of malaria avoidance. ■ Evidence of a well facilitated medical facility in camp ■ Evidence of provision of malaria prophylaxis	Weekly inspections and monthly monitoring	

3.	Monitoring	Prevalence of diseases and infection in the community	Enhance early illness detection and ensure physical fitness of project	■ Surveillance and active screening and treatment of workers must be undertaken ■ Medical check up should be undertaken for construction workers ■ Physical fitness check up should be undertaken for field personnel prior to mobilization to the site	Construction contractor Environmental Coordinator Medical Facility Personnel CNOOC PMT/QHSE	Records of medical screening and treatment.	At appointment and annually thereafter.	Medical Service Management Specification (CUL-QHSE-L3(GE)-015)
4.	Education	Un informed contraction of diseases and infection	Educate and create awareness	■ Health awareness and education initiatives must be undertaken (e.g. illustrative posters, training, and counselling)	Construction contractor Public Affairs Coordinator Environmental Coordinator CNOOC PMT/QHSE	■ Records of education sessions; and ■ Photographs of posters	Quarterly	
5.	Medical Facilities	Escalation of Injury and fatality resulting from lack of adequate medical attention	Provide Appropriate and adequate treatment	■ Access to medical treatment, confidentiality, and appropriate care must be provided.	Construction contractor Environmental Coordinator Medical Facility Personnel CNOOC PMT/QHSE	Documented evidence of appropriate treatment.	Quarterly	Medical Service Management Specification (CUL-QHSE-L3(GE)-015)

6.11.4 Vector Borne Diseases

Table 6-27: Vector-Borne Diseases

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Malaria	Loss time, injury and fatality due to malaria	Minimize the prevalence of malaria in host community and project workers through Mosquito vector control, avoidance, diagnosis and treatment	■ Provision of mosquito nets in the construction camp to all project workers ■ Regular fumigation program should be undertaken to control mosquitoes within the camp ■ Provide malaria prophylaxis to project workers particularly expatriate employees from countries that are malaria free ■ Ensure that the camp and other construction site don't have stagnant pools of water that are breeding grounds for mosquistoes ■ Provide adequate medical facilities with qualified medical personnel experienced in treatment of malaria ■ The Construction contractor shall on top of the above measure prepare and a malaria management plan and include detailed measures for vector control, avoidance, diagnosis, treatment, and training	Construction contractor Public Affairs Coordinator Environmental Coordinator CNOOC PMT/QHSE	■ Record of malaria cases in the work force ■ Evidence of regular fumigation and provision of mosquito nets in the camp ■ Records of ongoing training of employees in respect of malaria avoidance. ■ Evidence of a well facilitated medical facility in camp ■ Evidence of provision of malaria prophylaxis ■ .	Weekly inspections and monthly monitoring	
2.	Monitoring	Loss time, injury and fatality due to malaria	Enhance early illness detection and ensure physical fitness of project personnel	■ Medical check up should be undertaken for construction workers ■ Physical fitness check up should be undertaken for field personnel prior to mobilization to the site ■ Surveillance and active screening and treatment of workers must be undertaken.	Construction contractor Environmental Coordinator Medical Facility Personnel CNOOC PMT/QHSE	Records of medical screening and treatment.	At appointment and annually thereafter	Medical Service Management Specification (CUL-QHSE-L3(GE)-015)
3.	Education	Un informed contraction of diseases	Educate and create awareness	■ Health awareness and education initiatives must be undertaken (e.g. illustrative posters, training, and counselling).	Construction contractor Public Affairs Coordinator Environmental Coordinator	■ Records of education sessions; and ■ Photographs of posters.	Quarterly A	

4.	Medical Facilities	Escalated injry and fatality due to inadequate or improper medical attention of victims	Provide adequate and Appropriate treatment	■ Access to medical treatment, confidentiality, and appropriate care must be provided.	Construction contractor PMT/QHSE	Documented evidence of appropriate treatment.	Quarterly	Medical Service Management Specification (CUL-QHSE-L3(GE)-015)

6.11.5 Water quality and availability

Table 6-28: Water quality and availability

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Portable Water quality	Prevalence of water borne diseases Loss time and injury resulting from water borne diseases	Protection of portable water sources for the project and the community Ensure availability of water to the community	■ Map portable water points for the community and the the project ■ Put safeguards in place to minimize pollution of water points from the project through: ■ Allowing a safe functional buffer between portable water source / point and project work sites ■ Minimize siltation of surface portable water sources from construction work sites through installation of silt traps in runoff channels leading such water points ■ Support water and sanitation initiatives that are aimed at protection and improvement of portable water sources to the community ■ Project activities must not compromise local water needs and must take account of potential future water requirements in the project area. ■ Water sources relevant to the project must be managed to ensure water quality meets or exceeds applicable national acceptability standards or in their absence, the latest edition of WHO Guidelines for Drinking-Water Quality.	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Evidence of improved portable water quality in the community ■ Reduced prevalence of water borne diseases in the community ■ No exceedances of Ugandan standards or WHO Guidelines in the absence of Ugandan standards.	Prior to construction and quarterly during construction	■ CUL-QHSE-L3(GE)-014 Food & Drinking Water Hygiene Management Specification; and ■ CUL-QHSE-L3(GE)-054 Water Management Specification.

6.11.6 Structural Safety of Project Infrastructure

Table 6-29: Structural Safety of Project Infrastructure

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Buffers	Direct exposure of project impact to sensitive receptors	Reduce exposure of hazards and nuisance to receipients by creation of safety zones (buffers)	■ Physically separate project active sites from major external hazards and the public to avoid exposure to incidents or nuisances (e.g. noise and odour). This will be achieved through acquisition of additional land at the periphery the actual operational footprint. ■ Allow the community to utilize the buffer zone for regulated activity that are exclusive of settlement e.g grazing to reduce the project landtake and associated pressure on the limited land resource ■ Plant trees in the buffer zone to attenuate project nuisance such as noise and glare	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Evidence of reduced exposure of nuisance to the receipts ■ Reduced record of complaints from public.	Monthly monitoring	
2.	Natural risks	Destruction of project infracture by natural hazards	Minimize the risk of natural hazards to the project installations through Structural designs that are hazard	■ Project engineering designs must factor into the contemplated natural hazards in the area and the design should be full proof in accordance with the area studies undertaken for the respective hazards. (e.g. slope stability, seismic activity, and wind loading.	Construction contractor CNOOC Civil Engineers	■ Evidence of optimized engineering design in line with the hazard specific studies	During engineering design development and structural quality inspection during	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
			proof to natural catastrophies such as floods, earthquakes, land slides etc			■ Verified evidence of the Ability of structures to withstand identified challenges..	and after after construction	
3.	Design, construction, and maintenance	Destruction of project infrastructure resulting from poor design and maintenance Injury and fatality resulting from acccidents due to poor design and / or maintenance	Safe and appropriate practices	■ Locally regulated or internationally recognized design and engineering codes must be enforced to ensure structures are designed and constructed in accordance with sound architectural and engineering practice (e.g. aspects of fire prevention and response).	Construction contractor CNOOC PMT	Evidence of optimized engineering design in line with the hazard specific studies Verified evidence of the Ability of structures to withstand identified challenges .	During engineering design development and structural quality inspection during and after after construction	Current International building codes of the International Code Council (ICC, 2006)
4.	Structural integrity and certification	Destruction of project infrastructure resulting from poor design and maintenance Injury and fatality resulting from acccidents due to poor design and / or maintenance	Ensure that all structures and installations are constructed to the quality and standard that passes of certification	■ All structures must be certified by appropriately qualified professionals to ensure the integrity and appropriateness of the structure.	CNOOC PMT	■ Record of required certifications on file.	After completion of structure	
5.	Hazardous materials management	Injury and fatality resulting from acccidents due to poor design and / or maintenance	Minimise the generation of waste and control hazardous materials handling, storage and disposal Minimize the risk and limit the exposure of hazardous material to people	■ Establish an inventory of all hazardous material to be used on site ■ All Material Safety Data Sheets (MSDS) for hazardous materials should be filed and kept available in the materials yard record center for use in case of emergency response, first aid requirement etc ■ Take any actions needed to control risks of material exposure that can enganger human health and safety. These actions include: ■ storing chemicals according to the manufacturer's instructions on the safety data sheet ■ keeping the smallest quantity of hazardous substances necessary ■ storing incompatible substances separately ■ taking steps to prevent release or leakage of dangerous substances ■ keeping a spill kit near to storage areas, and training staff in what to do in the event of a spill ■ cleaning up any leaks or spills that occur ■ using the right safeguards when handling substances - for example, wearing protective clothing or ensuring adequate ventilation ■ training employees who store and handle dangerous substances ■ properly labelling containers used for short-term storage	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Records of hazmat storage and disposal. ■ ■ Availability of all MSDS of hazardous material on file ■ ■ Record of training in hazardous material handling	Daily inspections and monthly monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
6.	Fires and explosions from Hazardous materials	Injury and fatality resulting from fire and explosion accidents	Minimize the risk of fires and explosions resulting from hazardous materials	■ Ensure that flammable substances are correctly stored in the right containers and are not stored near to a source of ignition such as a heater. ■ Permit to Work (PTW) system must be enforced in case of hot works within or near the storage area of flammable material ■ In addition, ensure the following mitigation practice while handling flammable materials: ■ place stores of liquid above ground where they're unlikely to be damaged, eg away from traffic routes ■ avoid overfilling containers ■ supervise deliveries ■ maintain gauges, valves and pipework ■ track oil use - sudden high use is a sign of a leak ■ have procedures for dealing with emergency leakages ■ use a secondary containment system such as a drip tray or bund (a storage area designed to prevent liquids escaping) ■ Provide adequate and appropriate fire fighting equipment to effectively counter fire breakout ■ Train personnel in fire fighting and regularly undertake fire drills as part of the emergency response preparedness	Construction Contractor Environmental Coordinator CNOOC PMT/QHSE	■ Record of established permit to work system ■ Record of fire fighting traning ■ Record of fire drills .	Daily inspections and monthly monitoring	
8.	Incident response	Escalation of injury and / or fatality due to imprompt / improper incident response	Ensure preparation, identification, Containment, eradication of incidents Promote fast recovery from an incident	■ Development of appropriate and functional (response plans, policies, call trees and ensure that the members of the incident response team including external entities are identified and available ■ The response plans and policies shall contain information relating to evacuation procedures, communication strategy, establish safety zones among others ■ Ensure proper understanding of the work environment to enable an informed judgement of events and incidents and accertain the proper response approach and strategy ■ Contain the incidents through working with the established protocols to limit the damage caused to systems (activities) and prevent any further damage from occurring. This shall include short and long term containment activities. ■ ensuring that have a clean system ready to restore after effective containment has been achieved.	Construction contractor Public Affairs Coordinator Environmental Coordinator CNOOC PMT/QHSE	■ Evidence of functional emergency response plans in place ■ Number of emergency drills undertaken ■ Record of public engagement for emergency response and support ■ Evidence of Demarcatedsafety zones; and ■ Record of medical services provided.	■ Daily inspections, monthly drills and quarterly monitoring	
9.	Safety systems	Loss time, injury and / or fatality from accidents resulting from safety system failure	Appropriate safety systems	■ CNOOCs Safety specifications must be complied with and identify and address (on an ongoing basis) major risks, applicable codes, standards and regulations, and tailored mitigation measures over and above what has been proposed in the Environmental and Social Management Plan of the ESIA . ■ The safety aspects and the entire ESMP shall thus remain a living document and regular update of the following plans should be undertaken: : ■ Fire prevention; ■ Means of evacuation; ■ Detection and alarm systems;	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Record of the review and update of safety documents ■ Safety audit reports and ■ Records of drills held.	Daily inspections, monthly drills and quarterly monitoring	■ CUL-QHSE-L3(GE)-027 Behaviour Based Safety Specification; ■ CUL-QHSE-L3(GE)-033 Electrical Safety Specification;

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Isolation of hazards; ■ Fire suppression and control; ■ Emergency response plan; ■ Operation and maintenance management plan.				■ CUL-QHSE-L3(GE)-019 Festival and Holiday Safety Specification; ■ CUL-QHSE-L3(GE)-035 Fire Safety Specification; and ■ CUL-QHSE-L3(GE)-040 Industry Safety Specification.

6.12 Waste management plan

The waste management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below. The plan includes the management of hazardous materials, including handling and disposal.

Table 6-30: Waste management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	General	Pollution of air, water and soil Injury to humans, plants and animals exposed to the waste Lower the aesthetic value of the project area	Waste minimization and re-use	CNOOC's must implement their Waste Management Specification and manage waste in line with IFC waste management[9], and OGP guidelines for waste management[10] which includes (but is not limited to) the following: ■ Waste must be disposed of safely and responsibly in accordance with relevant local legislation and GIIP; ■ Compliance with the generally held principles of prevention, reuse, recycling, recovery and ultimately disposal of waste as embodied in the principles of the waste hierarchy; ■ Specify the purchase of only the amount of materials required for a specific task; ■ Inventory control and management to avoid surplus, such as use of "just in time" delivery of consumables that have a short shelf life; ■ Purchasing supply contracts must favour bulk purchases to reduce packaging volumes; ■ Bulk supply of products must be in reusable containers (e.g. chemicals in reusable steel tanks rather than plastic drums); ■ As far as reasonably practical , preference must be given to less hazardous and "environmentally	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Clean environmental audit report; and ■ Monthly ECO monitoring reports.	Weekly inspections and monthly monitoring	CUL-QHSE-L3(GE)-053 Waste Management Specification

[9] Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental Waste management (2007) - http://www.ifc.org/wps/wcm/connect/6e4e348048865839b4cef66a6515bb18/1-6%2BWaste%2BManagement.pdf?MOD=AJPERES

[10] Guidelines for waste management with special focus on areas with limited infrastructure; Report No. 413, rev1.1 September 2008 (updated March 2009)

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				friendly" (i.e. biodegradable, inert, recyclable) materials or products and purchasing agreements must allow the return of unused materials or products to the vendor; ■ All wastes must be segregated, quantified, and recorded to facilitate re-use as far as possible; ■ Appropriate community recycling programs must be established and managed; ■ Train all personnel in responsible waste management and provide the necessary colour coded bins for separation of waste at source. Training is to be provided during induction of all personnel and ongoing by means of tool box talks; ■ Monitor waste management performance through review of waste records and regular on-site checks. Monthly ECO monitoring reports are to include specific details of waste management compliance for the recording period; ■ Ensure that waste is neatly stored in a defined, secured, area; ■ Ensure that waste transport manifests are signed on departure from the construction site and on receipt at the approved disposal site; ■ Verify that the selected disposal site is registered with the Ugandan authorities; ■ Ensure that waste is regularly collected from site in order to minimise build-up, particularly organic wastes; ■ Consider the use of an industrial bailer to compact cardboard, paper and plastic wastes; and ■ Install an industrial composter for the treatment of organic kitchen waste.				
2.	Chemicals and substances	Pollution of air, water and soil Injury to humans, plants and animals exposed to the waste	Minimise toxicity	All hazardous products are safely stored and used, and that measures are taken to avoid, minimise, separate, sort and recycle/reuse hazardous wastes before disposal options are considered. In preparing a method statement for compliance with these requirements, the Contractor is to identify each potentially hazardous product and waste and demonstrate that the principles of the waste hierarchy have been implemented. Assess the risks of using hazardous materials in specific applications and train the personnel who use them about materials handling and spill management protocols. Training is to be ongoing in tool box talks. Toxicity must be reduced through CNOOC's Waste Management Specification and OGP guidelines that require the use of the following: ■ Non-chlorinated degreasing agents; ■ Water-based paints in preference to solvent-based paints;	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	Clean environmental audit report.	Weekly inspections and monthly monitoring	Water management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Biodegradable 'plastics'; ■ Asbestos-free gaskets and insulation; ■ Mercury-free components (this includes lighting); and ■ Hydro-testing using low toxicity (or no) additives. Monitor waste management performance through review of waste records and regular on-site checks. Monthly ECO monitoring reports are to include specific details about hazardous waste management compliance.				
3.	Identification and management	Pollution of air, water and soil Injury to humans, plants and animals exposed to the waste	Enhance waste management strategy through observance of the waste management hierarchy	CNOOC's waste management specification details the following which must be complied with: ■ Waste management processes; ■ Waste identification and classification; ■ Waste segregation and storage; ■ Waste transport; ■ Waste disposal; ■ Reporting; ■ Training; and ■ Hazardous waste spill response. CNOOC's waste management specification must be updated monthly as needed.	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Compliance with CNOOC's waste management specification; ■ Documented review of wastes from routine operations as well as incidental and non-routine waste sources (i.e. waste from leak or spill clean-up); ■ Documented characterization of each waste type to hazardous or non-hazardous; ■ Up-to-date waste register; and ■ Appropriate certificates for waste disposal at NEMA certified facilities.	Monthly	CUL-QHSE-L3(GE)-053 Waste Management Specification
4.	Non-hazardous waste management	Pollution of air, water and soil Injury to humans, plants and animals exposed to the non hazardous waste	Minimize non hazardous waste generation Improve non hazardous waste handling and management	■ All non-hazardous camp waste shall be collected, separated for recycling, temporarily stored, transported and disposed of in accordance with relevant legislation and the requirements set out in the CNOOC Waste Management Specification. ■ Compliance with the generally held principles of prevention, reuse, recycling, recovery and ultimately disposal of waste as embodied in the principles of the waste hierarchy;	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ As per CNOOC Waste Management Specification; ■ Records of waste collected and recycling; and ■ Manifests of waste collection and disposal at selected municipal waste disposal site.	Weekly inspection and monthly monitoring	CUL-QHSE-L3(GE)-053 Waste Management Specification
5.	Hazardous waste management	Pollution of air, water and soil Injury to humans, plants and animals	Minimize hazardous waste generation Improve hazardous waste handling and management	■ All camp hazardous waste shall be collected, classified, labelled, temporarily stored, transported and disposed of in accordance with relevant legislation and the requirements set out in the CNOOC Waste Management Specification;	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ ■ Records of waste collected and recycling =; ■ Manifests of waste collection and	Weekly inspections and monthly monitoring	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
		exposed to the hazardous waste		■ Store all potentially hazardous products in fully secured areas, with an impervious floor, bunded perimeter or walls, and roof to avoid rainfall ingress. Place a PPE storage box and spill kit within immediate vicinity of waste storage areas; ■ Temporarily store all hazardous waste, prior to transport off-site, in a fully secured, area, with an impervious floor, bunded perimeter, and roof to avoid rainfall ingress. Design the hazardous waste storage area to have sufficient capacity to safely contain the flux of wastes generated during construction and to have sufficient ventilation. MSDS's for the waste are to be available at the storage area; ■ Store hazardous waste in sealed containers, labelled in accordance with the Ugandan waste regulations. Ensure that waste transport manifests are signed on departure from the construction site and on receipt at the approved disposal site in accordance with the regulations; ■ Ensure that hazardous waste is regularly collected from site in order to minimise build-up in the temporary storage area; ■ Contract with a specialist hazardous waste contractor for the transport and disposal of all hazardous waste from site; Verify that the selected hazardous disposal site is registered with the Ugandan authorities and is suitable for the hazardous wastes being disposed; ■ Maintain accurate manifests of all hazardous waste that is temporarily stored and transported from site in accordance with Ugandan waste regulations. This will necessitate an appropriate industrial scale to weigh all wastes. Verify that the quantity of waste transported tallies with the amount disposed. ■ Ensure that any water treatment brines or hydrocarbon sludges are in sealed containers to avoid spillage during transport; ■ Conduct all servicing of vehicles or equipment within the designated areas for maintenance; ■ Place any field equipment that could leak oil onto drip trays or plastic liners, to prevent spillage into the environment; ■ Prohibit fuelling of vehicles and mobile equipment outside of the designated fuelling areas; ■ Prohibit the use of equipment with lubricants containing PCBs; ■ Develop and implement a procedure for a rapid response to management of spills. In addition to the above the following wastes should be managed as stipulated below:		disposal at selected municipal waste disposal site; and ■ Site audit reports.		

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				Hydrocarbon waste from vehicle maintenance and washing: Ensure that all vehicle washing and maintenance, and the maintenance of potentially oil contaminated equipment takes place in defined workshop areas which have impermeable floors and have controlled wash water/stormwater drainage through a sump and mechanical oil separator. Test potentially contaminated waste water to ensure it meets the project standard before being released into the environment. **Brines from raw water treatment:** Collect and drum all brines and waste chemicals generated by water treatment and dispose at either a hazardous waste disposal site or a domestic site, to be determined by testing the quality of the brines. **Sludges from sewage treatment:** Collect and remove sewage sludge to a hazardous waste disposal site. **Water from pressure vessel testing:** Prior to release of any water from pressure vessels or flowlines that are hydrotested to check their integrity, pass the water through sand filters and test for toxicity, based on recognised bioassay methodologies. Avoid the use of biocides or corrosion inhibitors where possible by minimising residence time of the water in the vessels. **Waste paints, scale, sand blasting residue, waste glues and sealants:** Prior to release of any water from pressure vessels or flowlines that are hydrotested to check their integrity, pass the water through sand filters and test for toxicity, based on recognised bioassay methodologies. Avoid the use of biocides or corrosion inhibitors where possible by minimising residence time of the water in the vessels. **Hydrocarbon contaminated waste (oily rags, oils sludges, etc.):** Contain and drum all hydrocarbon or hydrocarbon-contaminated residues for disposal at a hazardous waste disposal site. **Pesticide waste:** Select and use pesticides following the principles set out in the IFC PS3. These include management of the type of pesticides used (extremely hazardous pesticides, as defined by the WHO, are prohibited), and their handling, storage, use and disposal. **Waste fluorescent lights containing mercury:** Store separately and dispose to hazardous waste disposal site **Biomedical waste:** Store separately and remove to hazardous waste disposal site.				

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
6.	Drilling waste (solid Based Mud cuttings).	Pollution of air, water and soil Injury to humans, plants and animals exposed to the drilling waste waste	Minimize drill waste generation Improve drill waste management strategy	Drilling waste must be disposed safely and responsibly in accordance with relevant local legislation and GIIP. In addition, the following must be implemented: ■ Develop and implement an environmental management system which defines the responsibilities of members of the drilling crew for environmental management. Ensure that full time, competent, HSE staff are employed to manage all aspects of drilling waste; ■ Ensure that the petroleum waste management regulations are complied with in onsite drill waste handling, transportation and offsite treatment and disposal inclusive of the requirement that for contracting a third party waste contractor that is not a CNOOC affiliate or subsidiary. ■ Ensure that the onsite waste handling system design provides for safe containment of drill waste in case of system failure during critical operational time. ■ Develop checklists for daily, weekly and monthly monitoring to ensure that all important aspects of drilling waste management are supervised; ■ Train all members of the drilling crew to understand the risks of drilling and to report any observed incident that could result in a pollution hazard. In addition to induction training, tool box talks should reinforce these lessons throughout the drilling contract; ■ Prepare a detailed method statement, prior to development drilling, which identifies and evaluates all of the specific risks associated with the handling of hazardous products, wastes and spillage during drilling, and the measures to be taken to manage these risks (to be completed by the drilling contractor for review by CNOOC); ■ Comply with all the aspects of hazardous waste management, where hazardous materials such as acids and biocides are used in the drilling and well completion process; ■ Consider methods of enhancing recovery and reuse of the fluids from the drilling cuttings, so as to minimise disposal requirements; ■ Consider methods of cuttings waste storage that allow for ongoing removal by the waste contractor (such as temporary storage in skips) to minimise the need for waste storage on site; ■ Verify that the contractor selected to dispose of the waste is registered with the environmental regulator and that the disposal site is suitable and is certified for the type of waste being disposed; and ■ Maintain spill kits on site and develop rapid response protocols for the clean-up of any spills.	Construction contractor Environmental Coordinator Drilling/QHSE	■ Monitoring of the integrity of the containment must be undertaken (as specified by the manufacturer) to ensure no leakage; and ■ Monitoring must be undertaken when cuttings are being moved.	Daily inspection and weekly monitoring	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Incorporate full proof onsite waste recovery systems in the drilling design preferably thermal desoption units to recover drilling fluids and condition the waste to a state that is practically simple to handle and safely transport offsite for treatment and disposal				
7	Waste rock	Pollution of air, water and soil Injury to plants and animals exposed to the waste rock Lowered aesthetic value of the areas	Minimize waste rock generation from excavation and overburden clearance Improve waste rock management	■ Waste generated during construction excavation and earth cuts should be reused as practicallypossible as fill material. ■ In case of excess waste rock beyond what can be reused as fill material, the waste rock should be disposed to a designated landfill or carted off fill old borrow sites, where it will not harm any significant natural resources or be a nuisance to local residents.. No construction rubble or concrete may be disposed together with excess waste rock	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	Clean environmental audit report.	During trenching operations along the escarpment slope	
8.	Domestic/ Sanitary Waste	Pollution of air, water and soil Injury to humans, plants and animals exposed to the sanitary waste		■ Sewage effluent must be drained to a brick or concrete-lined sump and treated in a package sewage plant. The sewage plant must be sized to cater for the maximum forecast loads over the period it is in use. Regular compliance monitoring of effluent quality shall be undertaken to ensure sewage effluent meets the standards outlined in **Error! Reference source not found.**. ■ Monitor treated sewage effluent discharges daily, using automated monitoring instruments for pH, TSS (as turbidity), , nitrogen and phosphorous. BOD is to be monitored weekly via the collection of effluent discharge samples and analysis an appropriate laboratory. ■ While automated monitoring instruments provide results that are not as accurate as laboratory tests, the information is immediately available which is essential for managing a sewage treatment works in a remote area. Field measurements can be supported by monthly lab tests which serve as quality assurance. ■ Consider installation of an agricultural irrigation system to discharge treated sewage effluent over defined areas around the work sites. This will maximise uptake of nutrients by terrestrial plants, adding value to pasture grasses while reducing risks of seepage to groundwater. Figure 7-4 in the ESIA shows areas near the camp sewage works that could be considered for irrigation. ■ Furthermore, during the construction phase, prior to the establishment of the sewerage treatment plant, portable toilets will be used on site and the following should be implemented: ■ Install ventilated chemical toilets at the well pads, along the flowline construction sites, at the safety check station construction site and at other work areas where the camp toilets are inaccessible to	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	Clean environmental audit report Evidence of no eutrophication of surface resulting from waste water disposal Record	Daily inspections and monthly monitoring	Water management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator/Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				the work force. Portable toilets should be within easy walking distance of any work site; ■ Ensure that there are sufficient toilets for the workforce at the work site; ■ Keep toilets in a clean and sanitary condition at all times; ■ Add disinfectant to toilets to minimise E.coli; ■ Train construction personnel to use the toilets (training to be ongoing, starting at induction and continuing by means of tool box talks); and ■ Monitor the use of site toilets throughout the construction contracts.				

6.13 Cultural Heritage

The Cultural heritage management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below. It is important to realise that, while cultural heritage comprises tangible and intangible components. Simply explained, Tangible heritage other components of heritage that can be seen and touched (graves, places of worship such as churches et cetera) while intangible heritage of those aspects of the landscape and broader environment which are valued by the community but are not necessarily easily identified as having significance to the community (trees, pools in a river, a particular feature of the shoreline et cetera).

Consequently, some aspects of cultural heritage can be physically identified while others necessitate engagement with communities, and ongoing engagement. In addition, certain sites are of sufficient importance to communities that the community is unwilling to have the location of the site identified and documented. For this reason, it is important that construction activities are confined to the designated working areas and that construction workers do not move beyond these regions. Baseline studies have been undertaken during the permitting of initial activities and infrastructure on the Buhuka Flats. Baseline study has also been conducted as part of the EIA process to permit the construction of the major project infrastructure comprising the CPF, remaining well pads to be developed and flow lines on road development. All cultural heritage sites identified, that the community is willing to have documented, contained in the cultural heritage report inclusive of appropriate maps and tables. This report also includes detailed appendices in relation to documented sites. It constitutes the most complete record of cultural heritage in relation to the project area should be clearly referenced and used during construction and subsequent operation of the facility.

6.13.1 Tangible Cultural Heritage

Thirty two archaeological/ historic sites lie within the boundaries of the proposed footprint of the project (plus15 m buffer), which includes the CPF, temporary and permanent camps, laydown yard, well pad, jetty, water intake, access roads and airfield). Eighteen sites are within the project footprint while the remaining sites are within the buffer. These sites are mapped in Figure 4, with the colour coding showing the type of site and its rated sensitivity.

The sensitivity of the archaeological/historic sites and the expected impact significance of project construction activities on them is briefly described below:

- The ‘BO’ (bone) sites are all faunal remains, none of which are fossilised. The remains are not expected to be of significant antiquity, research potential and site sensitivity are very low. Two sites are directly affected by the project footprint (BO-14 and BO-18) and will be lost and the record will be lost when the sites are destroyed (permanent duration);
- The ‘LI’ sites are lithic archaeological sites from the Stone Age. A total of six sites are directly affected by the project footprint. LI-39 lies within the CPF footprint and may be associated ME-04, a metals site, possibly associated with an ancient burial. LI 39 has high sensitivity and its loss will cause impacts of high magnitude and high significance. Four of the other sites, directly affected by the temporary and permanent camps and well pad 4A, are middle and late Stone Age lithic scatter (LI-37, LI-38, LI-45, LI-46) with medium sensitivity, having some National research potential, impacts are of medium magnitude, but coupled with the permanent loss of research information, in the unmitigated case, will still result in impacts of high significance, although less than LI-39. Site LI-36 at the materials yard is scattered and has low sensitivity, but its destruction and the permanent loss of information will be of high medium significance in the absence of mitigation;
- The five LI sites within the 50 m buffer and 4 sites within the 50 m to 100 m buffer all have low sensitivity, being undated, scattered, material providing little research potential. The likelihood of physical construction damage or loss within the buffer zones is low and the overall impact significance is therefore low;

- The ‘ME’ site (ME-04) is a location where a bangle fragment has been found. This site is directly impacted by the footprint of the CPF and has high sensitivity, providing a rare example of metal objects and evidence of past metal production in the region. Together with LI-39, it relates to a possible ancient burial site. Regional research potential is high and may be of National significance. The destruction of this site due to construction will result in the permanent loss of information at local scale, resulting in an impact of high magnitude and high significance; and
- The ‘PO’ sites consist of undated pottery scatter. Twenty-nine sites were found within the project footprint of well pad 4A, well pad 3 (and associated road infrastructure), and the materials yard. The seven sites at well pad 4A are Iron Age pottery scatter, with some research potential and medium sensitivity and magnitude. The destruction of the sites will result in the permanent loss of research potential, causing impacts of high significance. Well pad 3A affects a large concentration of Roulette tradition (late Iron Age) pottery scatter (PO 197–216), including decorated pottery. This is the most important pottery found on the Buhuka Flats, rated as highly sensitive, and its loss will result in impacts of high magnitude and high significance.

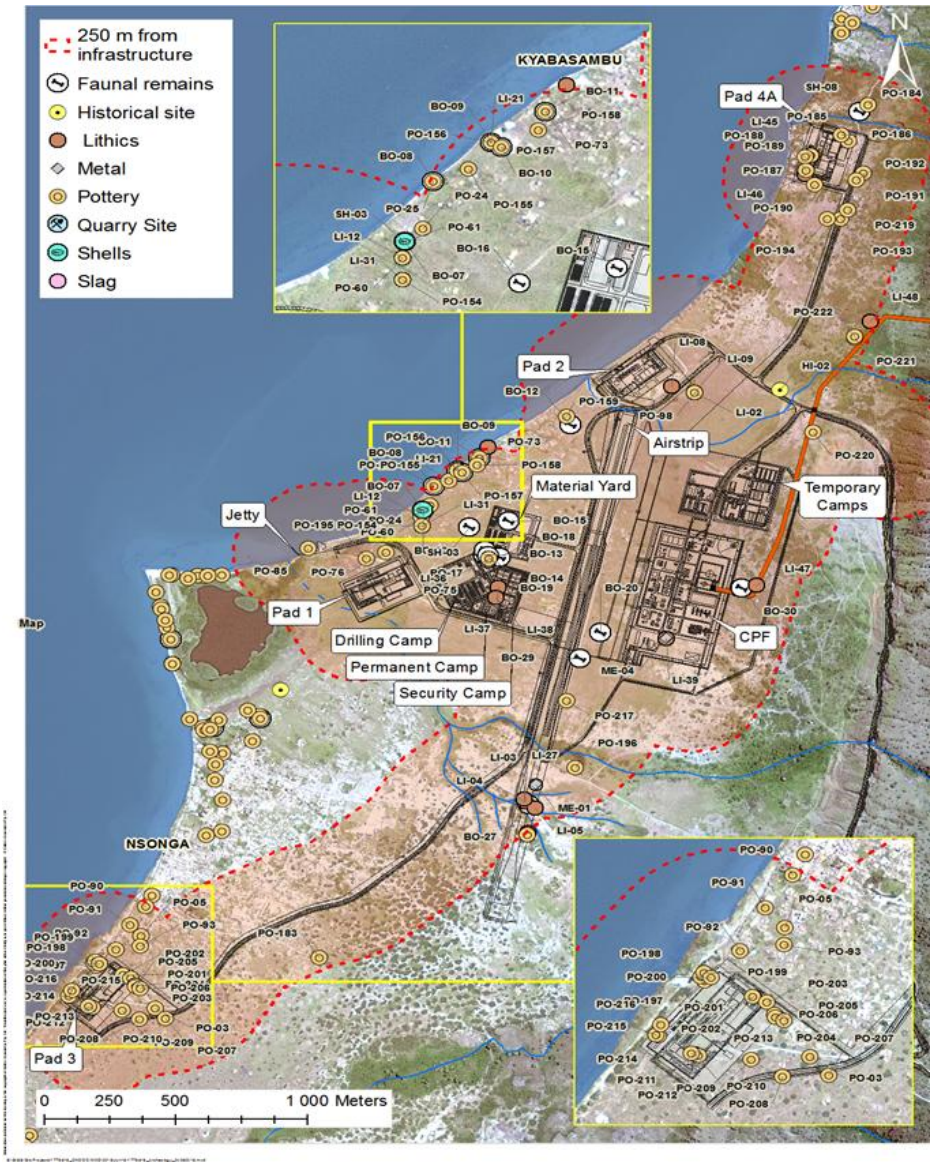


Figure 4: Tangible heritage sites of importance in proximity to project infrastructure

6.13.2 Intangible cultural heritage

According to the 2003 'Convention for the Safeguarding of the Intangible Cultural Heritage' (UNESCO), the intangible cultural heritage (ICH) – or living heritage – is the mainspring of humanity's cultural diversity and its maintenance a guarantee for continuing creativity. In the context of the Project area intangible heritage is defined as the traditional practices, cultural norms and knowledge transmitted from one generation to the next, which communities or individuals recognise as part of their cultural heritage. These elements are recognised by Uganda's Cultural Policy (2006).

The spiritual life of local communities on the Flats is likely to be affected by a range of factors associated with the presence of the project, none of which depends solely on physical damage to valued sites. Seventeen cultural sites lie within the boundaries of the proposed footprint of the project 9or within 15 m of the boundaries), which includes the CPF, temporary and permanent camps, laydown yard, well pad, jetty, water intake, access roads and airfield). A further 36 sites are in close proximity, within the 250 m buffer. These sites are mapped in Figure 5, with the colour coding showing the type of site and its rated sensitivity. The sensitivity of the cultural sites and the expected impact significance of project construction activities on them is briefly described below:

- The 'CE' sites are cemeteries that are all highly sensitive. They are associated with ancestors, present families and/or settlement founders and are frequented by the communities for longstanding cultural purposes. There are four CE sites that will be directed impacted by well pad 4A and associated flowline. There is also a risk of damage to or nuisance affecting seven other sites within the 250 m buffer around well pad 3 and the airfield:
  - These graves must be relocated through the resettlement process.
- The 'CH' sites are churches. None of these will be directly affected by the construction footprint but twenty three are within the 250 m buffer zone of well pads 3 and 4A, the materials yard and the flowlines / new road segments;
- The 'CL' sites are cultural landscapes. Three areas of cultural landscape (**CL-01** - **CL-03**) were identified which have been recognised with reference to the UNESCO definition of an 'associative cultural landscape': "…*justifiable by virtue of the powerful religious, artistic or cultural associations of the natural element*". Lake Albert (CL-01), the Escarpment (CL-02) and the viewpoint (CL-03), on the escarpment road, are iconic features of the natural landscape, defining the local (communal) sense of place and apparent (traditional) cultural associations with the natural environment (rivers, lakes, trees);
- The 'RS' sites are ritual sites with high sensitivity, one of which is within 15 m of proposed project infrastructure and is therefore vulnerable to damage or destruction during construction. This is the Afrocreed Swamp site (**RS-08**) (for the extraction of holy water) which could be directly impacted by preparation for the flow line to well pad 3. Other sites that are within 250 m of project infrastructure and could be impacted by dust, noise and other construction-related nuisance; the Eye of the Lake (Luzira) (**RS-02**), which is associated with the Bukoma lagoon, RS-01 and RS-03 (Kasonga beach sites between the jetty and Nsonga), and RS-09 and RS-10 (known as the Coet/Kuwait site). Sites RS-02 and RS-03 have been particularly noted by all communities on the Buhuka Flats as being important. These sites are considered to be 'non-replicable' (and potentially immovable) cultural heritage sites as defined by IFC (PS 8, 2012); and
- The 'SR' sites are sacred rivers. The Kamansinig River (SR-02), south of the airstrip and in proximity to Well Pad 1 and the Jetty upgrade site is of high value and sensitivity, mainly in the area of the lagoon. This site may be indirectly affected during site construction works, particularly due to noise, visual and dust impacts.

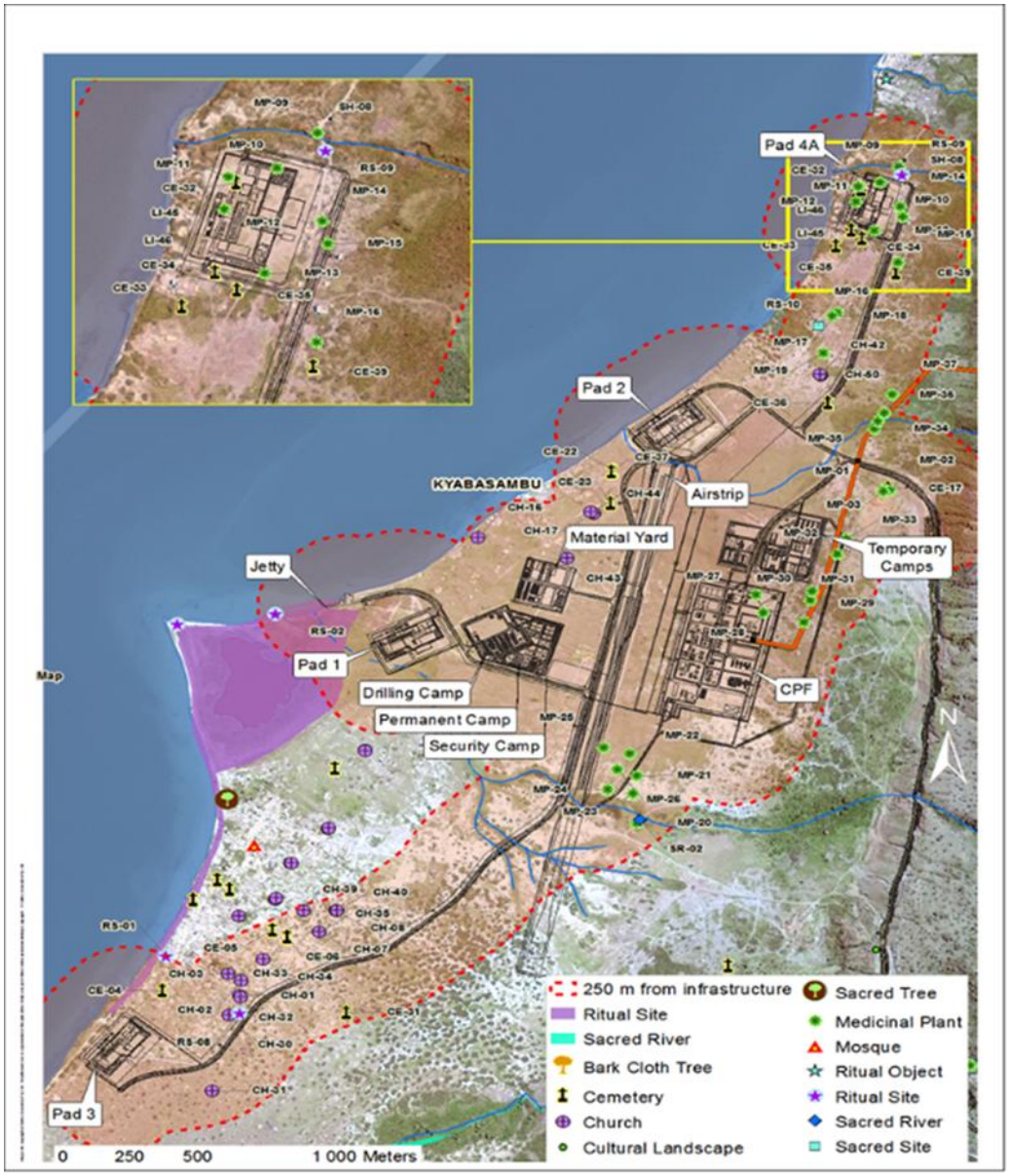


Figure 5: Intangible heritage sites of importance in proximity to project infrastructure

Table 6-31: Cultural heritage management plan

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
1.	General	Distortion and / or destruction of cultural heritage	Appropriate management of cultural heritage	CNOOC's Cultural Heritage Specification must be updated prior to construction and must be complied with in terms of the Historical Monuments Act (Cap 46), 1968, Uganda National Culture Centre (Cap 50), 1959 and the National Culture Policy, 2006.	CNOOC Construction contractor CNOOC PMT/CA	Documented compliance with relevant legislation, CNOOC's Cultural Heritage Specification and IFC performance standard 8 for cultural heritage.		■ Pre-construction planning requirements; ■ CNOOC's Cultural Heritage Management Specification; ■ IFC performance standard 8: cultural heritage; ■ Historical Monuments Act (1968, Cap. 46); ■ Uganda National Culture Centre (1959 Cap 50); and ■ National Culture Policy (2006).
2.	Cultural heritage site data base	Distortion and / or destruction of cultural heritage due to lack cultural heritage knowlege	Identification of all cultural heritage sites	Cultural heritage sites shall be updated, based on the investigation associated with each activity, and any sites within 500 m of construction activities shall be included in the listing of cultural heritage sites. Heritage sites shall be georeferenced for easy identification in the field. This listing is to be maintained as a confidential document by CNOOC. It contains the locality of sites of Heritage importance. Such sites are at risk of plunder. Consequently the document must be treated as sensitive and not for general circulation to contractors. Map information in relation to sites within the immediate construction surrounds should be made available to contractors. Such maps are included in this document as Figure 4 and Figure 5 which indicate all sites of importance within 250 m of construction areas.	CNOOC PMT/CA	Inclusion of updated and geo-referenced cultural heritage site listings.	Pre-construction	■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.
3.	Known cultural heritage sites near the construction works	Distortion and / or destruction of cultural heritage due to lack cultural heritage knowlege	Avoidance of known cultural heritage sites near the construction works	Where project infrastructure is within 100 m of a cultural heritage site, the area shall be flagged for special attention. In such cases, the precise location of the site shall be confirmed with members of the local community. All construction team personnel, particularly operators of vehicles and heavy equipment, shall be made aware of the site and advised of its importance. If considered necessary by CNOOC, in consultation with local community representatives, the site shall be temporarily fenced or demarcated to protect it from damage.	Construction contractor CNOOC PMT/CA	■ Absence of damage to any cultural heritage site; and ■ Absence of complaints from members of the community in the Compliments and Complaints Register.	Daily inspection during construction and monthly monitoring	■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.
4.	Collection of cultural heritage remains	Distortion and / or destruction of cultural heritage due to lack cultural heritage knowlege	Preservation of all cultural heritage remains	The Contractor shall respect local intangible cultural heritage, tradition and taboos during construction to ensure that the negative socio-cultural effects are effectively managed. The collection of archaeological or other cultural artefacts found on site by contractor personnel shall be prohibited.	Construction contractor CNOOC PMT/CA	■ Inclusion of cultural heritage sensitisation in induction programme(s) and contractor tool box talks; and	Daily inspection during construction and monthly monitoring	■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
						■ Absence of complaints from members of the community in the Compliments and Complaints Register.		
5.	Maintenance of community access and communication	Deprivation of the community right to access the heritage sites	Maintain community access to cultural heritage sites	Community access to sacred sites shall, where necessary, be maintained during the construction period. Access requirements shall be determined by the CLO in consultation with local communities.	Construction contractor CLO CNOOC PMT/CA	■ Records of communication with communities; ■ Maintenance of access, as agreed; and ■ Absence of complaints from members of the community in the Compliments and Complaints Register.	As required through consultation with communities	■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.
6.	Chance Find Procedure	Destruction / loss of cultural heritage resources	Preserve cultural heritage	The Chance Finds Procedure (CFP) pre-construction planning requirements (Section 5.1) must provide the necessary mitigation strategy for accidental finds discovered during construction site work. The Contractor must minimise the risk of accidental damage to heritage sites by implementing the (CFP). The Environmental Coordinator (EC) and ESO/ECO shall undergo training provided by a qualified specialist in order to improve their capability to identify archaeological and paleontological finds. In the event of a Chance Find for which the EC determines a professional archaeologist's opinion is required, no further construction work shall be undertaken at the site until the archaeologist has seen the find and made a recommendation.	Construction contractor ESO/ECO Specialist Environmental Consultant CNOOC PMT/CA	■ Records of training of site personnel; and ■ Compliance with CFP.	Daily inspection during construction and monthly monitoring	■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.
7.	Site specific CHMP	Destruction / loss of cultural heritage resources	Up-to-date CHMP	The Cultural Heritage Management Plan (CHMP) must be updated as needed and must highlight the presence of culturally significant places to contractors at an early stage and specify further management necessary (e.g. demarcation/ signage) as required for individual sites – i.e. cemetery sites close to the route. The CHMP must seek to manage and mitigate the identified impacts on cultural resources throughout the Project lifetime in co-operation with local communities and appropriate site guardians. The CHMP must set out a strategy for maintaining community access to cemetery sites; facilitating respect for local intangible cultural heritage, tradition and taboos, while mitigating negative socio-cultural effects through regular platforms for community liaison.	Construction contractor ESO / ECO Specialist Environmental Consultant CNOOC PMT/CA	■ Up-to-date CHMP that addresses needs of individual sites; ■ Community approval of CHMP methodologies; and ■ Evidence of Compliance with local legislation and IFC performance standard 8 for cultural heritage.	Quarterly reviews	■ Pre-construction planning requirements; ■ Cultural Heritage Report (2018); and ■ CNOOC's Cultural Heritage Management Specification.
8.	Ground intrusive activity	Destruction / loss of cultural heritage resources	Implement a watching brief	A 'watching brief' (with an archaeologist in attendance) must take place where ground intrusive activity occurs (e.g. excavation). The CHMP must be	CNOOC Construction Contractor	■ Up-to-date CHMP; ■ Documentation of suitably qualified persons;	During intrusive	

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
				amended at the time to include specifics of the investigation, including the following, to meet the requirements of Ugandan law: ■ A suitably qualified person under a licence for archaeological survey must be present where ground intrusive activity occurs; ■ In the event of artefact discovery, all materials must be surrendered to the National Museum; ■ The watching brief must involve monitoring of soil removal / land take for the presence of cultural heritage material. The archaeologist must have the authority to stop construction work if significant materials (e.g., burial sites, iron furnaces) are exposed. These sites must be fully documented and described in full through a 'preservation by record' methodology; and ■ Results of watching briefs must be presented to the relevant local authority with provision made to exhibit materials to interested stakeholders, including the local community.	CNOOC PMT/QHSE	■ Communication and submission of all artefacts to National museum with National museum; and ■ Documented watching brief reports submitted to local authorities.	construction activity	
9.	Cultural heritage sites	Destruction / loss of cultural heritage resources	Avoidance of Cultural heritage sites	Site specific mitigation may be required during construction, and the guidance of the cultural heritage specialist, and may include: ■ Demarcation of 'no go' sensitive areas (e.g. cemeteries) and enforcement of avoidance. Although these sites may not be directly affected by construction activities there is a potential for disturbance of community access routes to cultural sites and to the environmental setting of the sites themselves; ■ Enhancement or protection of environmental setting in conjunction with local community approval (e.g. through planting/ screening); ■ Demarcation of areas to be avoided by noisy, dust inducing construction vehicles at certain times of the week/year to avoid disturbance of traditional ceremonial activities close to construction routes; ■ Maintaining community access to sacred sites; facilitating respect for local intangible cultural heritage, tradition and taboos, while mitigating negative socio-cultural effects through regular platforms for community liaison; and ■ Culturally significant places must be highlighted to contractors at an early stage and further managed (e.g. through demarcation/ signage) as required.	CNOOC Construction Contractor CNOOC PMT/QHSE	■ Photographic evidence of adequate demarcation; ■ Documented community engagement and approval; ■ Adequate community access to sites; and ■ CHMP awareness training of contractors and signed attendance registers.	Daily inspection during construction and monthly monitoring	
10.	Tangible cultural heritage	Destruction / loss of cultural heritage resources		■ There is potential for the disturbance of previously unidentified archaeological material (i.e. accidental damage or chance finds). Prepare a project-specific, 'site ready', Chance	CNOOC Construction Contractor	■ Compliance with local legislation and IFC performance standard 8 for cultural heritage.	Quarterly update of the chance finds procedure	

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
				Find Procedure. This is a priority since preparation works and environmental studies are ongoing at the project site where highly sensitive artefacts have now been recorded. The Chance Find Procedure must be updated during the course of construction to make provision for a course of action in the event that any cultural heritage artefacts are recovered. It must be presented to the relevant local authority and the National Museum for approval. It must also be provided to all contractors and consultants on the project site during all pre-construction and construction activity and incorporated within the project's 'site induction' process. It must remain in place throughout construction. The Chance Find Procedure is to be implemented at all times (as required by IFC PS 8); ■ Hold an urgent discussion with CNOOC to determine strategies for avoidance of those potentially highly sensitive archaeological sites identified within, or in close proximity to, the project footprint, which include sites within the Central Processing Facility; Pads 3 and 4A; the materials yard / the camps; and the jetty area; ■ Undertake a further stage of cultural heritage study, as a priority, to verify the association (if any) of those surface artefacts recovered and potential sub-surface archaeological features indicative of settlement/industry. This would comprise shallow, targeted, hand-dug test pits (e.g., 1 m x 1 m in size) through which the archaeological potential could be firmly established and any further material analysis undertaken. This excavation programme will seek to eliminate the risk of archaeologically-induced delays during the construction phase; and Implement a programme of pre-construction mitigation in the event that these targeted sites yield archaeological material. Avoidance (preservation in situ) is preferred but where this is not possible, "preservation by record" through systematic recording (e.g., archaeological excavation) is the only recourse. Such work, where required, must be described in appropriate detailed work programmes and specifications to be prepared by the cultural heritage specialist. To meet the requirements of Ugandan law this work should be carried out by a suitably qualified person under a licence for archaeological survey as issued by the Minister. In the event of artefact recovery, all materials should be surrendered to the National Museum.			during construction	

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
11.	Intangible Cultural Heritage	Distortion / loss of cultural heritage resources		■ The CHMP is to be updated as required by law in the event of any changes in understanding related to cultural heritage brought about through chance find, community raised heritage matters, or by other means; ■ Seek to manage and mitigate the identified impacts on cultural resources throughout the construction phase in participation with local communities and identified site guardians. Regular platforms for community liaison are recommended in this regard. This will help to prevent any further (accidental) loss of sensitive cultural assets throughout the pre-construction and construction phases; ■ Facilitate respect for local intangible cultural heritage, tradition and taboo through induction and ongoing education of construction personnel - regular platforms for community liaison are recommended in this regard (and detailed within the CHMP); ■ Set out a strategy for maintaining community access to sacred sites and facilitating respect for local intangible cultural heritage, tradition and taboo, to ensure that the negative socio-cultural effects are effectively mitigated; ■ Avoid all affected cemetery sites as the preferred mitigation. Where avoidance is not possible, a full mitigation strategy should be developed in conjunction with affected communities and the guardians of those sites. If the cemetery sites are found to be adjacent (rather than within) the areas of proposed activity appropriate signage and demarcation is recommended to protect these sites. It will remain important, as the project progresses, to consult with local communities about potential further impacts to other cultural sites in the vicinity; ■ Demarcate other sacred sites that have been identified within the project area and make provision for site-specific monitoring as the Project is finalised. These sites may be affected by (as yet undefined) project access routes. Where a change in a site's setting is anticipated, planting (e.g., screening) may be considered to minimise adverse visual impacts. Any mitigation measures must be agreed with the affected community; ■ Enhance or protect the environmental setting of selected cultural heritage sites in consultation with the local community e.g. through planting/screening; ■ Demarcate areas that should be avoided at certain times of the week/year by construction	CNOOC Construction Contractor CNOOC PMT/QHSE	■ Photographic evidence of adequate demarcation; ■ Documented community engagement and approval; ■ Adequate community access to sites; and ■ CHMP awareness training of contractors and signed attendance registers.	Monthly monitoring and quarterly review and update of the chance finds procedureA	

Ref.	Aspect / Activity	Potential impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency/ Schedule	Additional Reference
				activities that cause nuisance, so as to minimise disturbance of nearby traditional ceremonial activities; and ■ Highlight the presence of culturally significant places to contractor at any early stage and further manage these (e.g., demarcation/ signage) as required. Provide for this should be incorporated into the CHMP.				

6.14 Pollution prevention and response management plan

The pollution prevention and response management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below. The plan also includes oil spill response management.

Table 6-32: Pollution prevention and response management plan

Ref.	Aspect / Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	General	Pollution of air water and soil	Spill prevention and response management	Compliance with CNOOC's spill prevention and control specification in conjunction with the latest IFC general EHS guidelines for hazardous materials management[11] and relevant independent risk assessment (i.e. WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017). The following must be implemented: ■ Spill kits to be available on sites where handling of chemicals occurs; ■ Regular inspection of all chemical and diesel storage tanks during the project; ■ Report all spills or accidental chemical contact immediately to supervisor; ■ If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials; ■ Any spill clean-up is to be appropriately contained and disposed of by a contractor appropriately licenced with NEMA; ■ If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure; and ■ Materials used for the remediation of spills must be used according to product specifications and guidance for use.	CNOOC Contractor CNOOC PMT/QHSE	■ Documented compliance with: ▪ CNOOC's spill prevention and control specification; ▪ IFC general EHS guidelines for hazardous materials management; and ▪ WorleyParsons Oil Spill Planning and Response: Kingfisher Field (2017). ■ Documented records of: ▪ Chemical inspections; ▪ Spills and accidental chemical contact; ▪ Communication with NEMA; and ▪ Compliance with product specifications.	Monthly inspections of spill kits.	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017; ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB; ■ CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0); and ■ Emergency Preparedness and Response procedure (CUL-QHSE-L2-010, version A).
2.	Containment	Pollution of air water and soil	Containment of hazardous material	Secondary containment must be installed for equipment that contains hazardous materials (e.g. hazardous material storage areas, vessels, and tanks) to contain accidental releases. In compliance with IFC hazardous waste materials management, secondary containment must be made of impermeable, chemically resistant material and	CNOOC Contractor CNOOC PMT/QHSE	Adequate secondary containment.	Daily inspection during construction and monthly monitoring .	CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification.

[11] IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: environmental hazardous materials management

Ref.	Aspect / Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				able to safely contain the larger of 110% of the largest tank or 25% of the combined tank volumes in areas with above-ground tanks with a total storage volume equal or greater than 1,000 litres. In the event of a release, contained hazardous materials must not encounter incompatible materials which may cause further hazards (e.g. toxic fumes, fires and explosions).				
3.	Leak detection and corrosion management	Pollution of air water and soil	Monitor, minimise and manage leakage	Piping, process equipment and storage tank designs and construction processes must be appropriate to manage corrosion and potential leakage based on the life of infrastructure, and include: ■ Compliance with the current GIIP standards, as applicable (e.g. American Petroleum Institute, API, standards, see project codes and standards in APPENDIX A); ■ Corrosion protection (cathodic protection and corrosion allowance); ■ Pressure monitoring system and automatic pressure loss detectors; ■ Inlet/outlet process safety control Emergency Shut Down (ESD) system; ■ Flowline leak monitoring system (PLMS) which can detect 1% of designed throughput in 10 minutes; ■ Concrete lining of valve stations; ■ Approved (GIIP) or certified integrity testing methods at regular intervals; ■ Scour protection where the pipeline crosses rivers; and ■ An insulation jacket for flowlines as part of the heat tracing.	CNOOC Contractor CNOOC PMT/QHSE	Documented compliance with the current GIIP standards.	Daily inspection during construction and monthly monitoring	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017; ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB; and ■ Pre-construction planning requirements.
4.	Overfill protection	Pollution of air water and soil	Prevention of overfill	Overfills of vessels and tanks is a common cause of spills and must be addressed through CNOOC's spill prevention and control specification (which is typically aligned with IFC recommendations) as follows: ■ Checklist of measures to follow during filling operations and the use of filling operators trained in these procedures (see CNOOC Spill prevention and control specification); ■ Installation of gauges on tanks to measure internal volumes; ■ Use of dripless hose connections for vehicle tank and fixed connections with storage tanks; ■ Provision of automatic fill shutoff valves on storage tanks to prevent overfilling; ■ Use of a catch basin around the fill pipe to collect spills; ■ Use of piping connections with automatic overfill protection (float valve);	CNOOC Contractor CNOOC PMT/QHSE	■ Documented checklists; and ■ Visual verification supported by photographic evidence.	Inspection during petroleum vessel loading and offloading .	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017; and ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB.

Ref.	Aspect / Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				■ Pumped volumes must be less than the available capacity of tanks or vessel; and ■ Use of overflow valves or pressure relief valves so that excess hazardous substances can be released (and safely contained) when necessary.				
5.	Maintenance and inspection	Pollution of air water and soil	Adequate maintenance	A maintenance programs must include regular pigging to clean the flowlines and intelligent (e.g. magnetic flux leakage) and ultrasonic pigging should be considered as required. Spill control equipment and materials must be inspected monthly to confirm that all specified equipment is always available and that the equipment has not been utilized for alternative purposes.	CNOOC Contractor CNOOC PMT/QHSE	■ Documented inspection at each site; ■ Visual evidence of leaks and/or equipment deterioration supported by photographic evidence; and ■ Spill control equipment and materials are adequately stocked and ready to be used.	Monthly (or as required).	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017; and ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB.
6.	Risk	Pollution of air water and soil	Identify all risks related to spill or release of hazardous materials	All activities, equipment, and areas associated with hazardous material (e.g. in storage, handling, maintenance) must be identified and managed appropriately.	CNOOC Contractor CNOOC PMT/QHSE	■ Documented critical equipment/operation spill control.	At all times.	Pre-construction planning requirements.
7.	Offloading of chemicals, servicing and/or refuelling of equipment and vehicles	Pollution of air water and soil	Prevent contamination of surface water from equipment and/or vehicle spillages	■ Soil contaminated by chemicals, fuel or oil spills, will be collected for treatment at a pre-determined and dedicated location, or will be treated in situ using bioremediation, in accordance with existing procedures; ■ Vehicles will be maintained regularly and kept in good working order; ■ Chemical storage areas will be adequately bunded to prevent chemicals from entering the storm water system; and ■ Vehicle maintenance will not be carried out on the site, but in contractor workshops as appropriate.	CNOOC Contractor CNOOC PMT/QHSE	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Ongoing.	Soil Management Plan.
8.	Discharge of effluent	Pollution (eutrophication, siltation) of surface water	No contamination of water resources	Effluent must be treated to acceptable standards prior to discharge (see **Error! Reference source not found.** in Water Management plan).	Contractor CNOOC PMT/QHSE	■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	At all times.	Water Management Plan.
9.	Storage	Pollution of air water and soil	Safe storage	■ In compliance with Good International Industry Practice (GIIP), all storage of hazardous chemicals and fuels is to be within a contained area made of impermeable, chemically resistant material and able to safely contain 110% of the largest storage vessel or 25% of the combined stored volume in the storage area. In the event	CNOOC Contractor CNOOC PMT/QHSE	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports;	Daily inspection and as needed.	

Ref.	Aspect / Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
				of a release, contained hazardous materials must not encounter incompatible materials which may cause further hazards (e.g. toxic fumes, fires and explosions); ■ All explosives are to be stored in alignment with Ugandan Industrial Standards; ■ All chemicals stored indoors must have adequate ventilation that maintains ambient air below the corresponding occupational exposure limits and below the threshold limit values; ■ Containers and tanks must be legibly labelled to identify the type of material contained within container/tank and the associated hazards; ■ Equipment relevant to chemicals/fuel on site must comply with the relevant MSDS; ■ Secondary containment must be provided for any stored contaminated material and must also be regularly inspected to identify signs of deterioration, cracking, or general damage to containment. Any signs of damage must be addressed; ■ Provision of emergency shower and eye wash station where handling of hazardous materials occurs; ■ Metal drums shall not be stacked more than four (4) high. Containers shall only be stacked four (4) high on a level, concrete or otherwise stable surface. All drums and/or containers must be packed on pallets in alignment with good storage practices; ■ Plastic drums that are 55 gallons and Tote tanks less than 375 gallons will not be stored more than three (3) high. Containers shall only be stacked three (3) high when placed on a level, concrete or otherwise stable surface; ■ Acids, flammables, combustibles, and oxidizers must not be stored next to or near battery chargers, electric panels, or equipment with the potential for arc flash, sparks, or electrical discharges; ■ Maintain a list of chemicals that are stored or dispensed at the location and identify the hazards associated with the chemicals; ■ Maintain a current MSDS for all chemicals on site. The MSDS for each chemical must be available in the area where the chemical is stored or dispensed; ■ All chemical and diesel tanks to be fitted with impermeable secondary containment with a minimum capacity of 110% of the largest tank volume; and ■ Spill kits must be available at storage sites.		■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.		

Ref.	Aspect / Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
10.	Chemical and fuel spillage	Pollution of air water and soil	Adequate response to spills	■ Spill kits to be available on sites where handling of chemicals occurs; ■ Regular inspection of all chemical and diesel storage tanks during the project construction; ■ Report all spills or chemical contact immediately to supervisor; ■ If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials; ■ Any spill clean-up is to be appropriately contained and disposed of by a contractor appropriately licenced with NEMA; ■ If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure; and ■ Materials used for the remediation of spills must be used according to product specifications and guidance for use.	CNOOC Contractor CNOOC PMT/QHSE	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Daily inspection and as needed.	

6.15 Emergency Management Plan

The Emergency management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below.

Table 6-33: Emergency management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Management system	Damage to property, loss time, injury and / or fatality resulting from accidents	minimise and / or prevent accidents	The emergency management system must be implemented and it must include the following general elements: ■ Define the roles and responsibilities of personnel involved in the management of construction during the project execution; ■ Identify the training needs of such personnel and provide the training identified; ■ The roles, responsibilities, accountability, authority and interrelation of all personnel who manage, perform or verify work, which affects safety, should be defined with sufficient manpower provided; ■ Employees and others, for example contractors, present on site, should be involved in the arrangements and their implementation. Particular attention should be paid to contractors to ensure they receive the necessary information and training. They need to be aware of the hazards involved and the roles and responsibilities of key personnel; ■ Adoption and implementation of procedures for systematically identifying hazards arising from construction activities and transport and the assessment of their likelihood and severity.	Contractor CNOOC CNOOC PMT/QHSE	documented reporting of the following where applicable: ■ Fugitive leaks; ■ Spillages; ■ Ignition sources; ■ Firefighting equipment; ■ Hot work permit; ■ Maintenance permit to work; ■ Offloading and filling operations; ■ Flame proof electrical equipment; ■ Filling arm hose integrity; ■ Pipe condition; ■ Relief and blow down devices; ■ Alarm, interlock and trip testing; ■ Filling batch meter calibration and shut off; ■ Tank bund integrity;	Monthly monitoring	■ CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0); and ■ Emergency Preparedness and Response procedure (CUL-QHSE-L2-010, version A).

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				■ The safety management system should describe how hazard identification and evaluation procedures are applied to all relevant stages of construction. ■ Adoption and implementation of procedures and instructions for safe construction, including transport to and from the site; ■ Management of change - adoption and implementation of procedures for construction modifications; ■ Planning for construction and road transport emergencies by adoption and implementation of procedures to identify foreseeable emergencies; prepare, test and review plans to respond to such emergencies; and provide specific training for all construction and transport personnel; ■ Monitoring performance by adoption and implementation of procedures for the on-going assessment of compliance with set objectives, and the mechanisms for investigation and taking corrective action in the case of non-compliance; and ■ Audit and review of the construction and transport accident prevention measures by adoption and implementation of procedures for periodic systematic assessment and the effectiveness.		■ Water deluge on fuel tanks; ■ Near miss incidents related to the process risks; and ■ Institute a management of change system for modifications.		
2.	Preventative and protective measures	Damage to property, loss time, injury and / or fatality resulting from accidents	Develop specific preventative and protective measures	**Specific preventative and protective measures should include (but not be limited to):** **i)** *Provision of special services (but not be limited to) the following:* Security; gas sampling; water levels; soil monitoring/ sampling; explosives; atmospheric monitoring; noise measurements; cleaning services; and precautions for work in confined spaces. ii) *Emergency services required*: Fire; medical & first aid; routes for emergency vehicles; Safety showers; eye-wash facilities; breathing and escape sets; Means of escape (ladders etc.); Handling of accidents on site. *iii) Movement, loading and unloading:* Access/egress for people, plant and equipment; parking; Unloading/loading areas; turning circles; routing; barriers; Tankers, lorries; dumper trucks; cranes; forklifts; Mobile units (pumps, compressors); and Effects on existing site traffic and adjacent public roads; traffic control. *iv) Working conditions during construction:* Noise (compressors; explosion; drills, etc.); time of day, frequency and intensity. Smoke; dust;	Project Manager and Contract manager CNOOC PMT/QHSE	Upkeep and reporting of: ■ Fugitive leaks; ■ Spillages; ■ Ignition sources; ■ Firefighting equipment; ■ Hot work permit; ■ Maintenance permit to work; ■ Offloading and filling operations; ■ Flame proof electrical equipment; ■ Filling arm hose integrity; ■ Pipe condition; ■ Relief and blow down devices; ■ Alarm, interlock and trip testing; ■ Filling batch meter calibration and shut off; ■ Tank bund integrity; ■ Water deluge on fuel tanks;	Daily inspection and monthly monitoring	CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0) and Emergency Preparedness and Response procedure (CUL-QHSE-L2-010, version A).

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				vehicle fumes; Climatic effects on construction activities (wind, rain, heat, cold; fog). *v) Waste handling:* Wash water; storm/flood and fire water/foam; Contamination and damage to existing drains and sewers; Spillage's of chemicals, oil, fuel; Means of disposal and licence. Bunds; pits; sumps; drain isolation; dredging; draining. Tenting; fencing; temporary sheeting; scaffolding. *vi) Construction work safety:* Excavators; warning signs; What effect on live plant equipment? What precautions? How will it be coordinated/supervised? Any checks or tests needed? Is it a recognised safe practice or one-off? Is timing critical? Is access/egress and boundary security satisfactory? Work at heights or elevations; Confined spaces; Excavations, trenches, underground; Access for erection and installation, vehicles, cranes. *vii) Management and supervision:* Guidance to construction traffic (route plan, signs etc.) Obstruction to normal traffic/emergency vehicles (cranes, contractors' vehicles) Increase in site traffic - implications? Size of vehicles (pipe bridge clearances?) Quality of safety equipment and signs on new plants (support and fixing durable?) Personal safety equipment (attitudes/quality) Standards of work, safety, cleanliness (contractors' vehicles, tools, methods of working) viii) *Coordination and organising:* Permits to work etc. (linking with plants & service groups - encourages co-operation); Training and awareness; Communications (who needs to know, why, when) *ix) Auditing and inspections:* Safe working practices (e.g. scaffold-tags, permits, safety equipment etc.); Knowledge of the contractor (does he understand? does he know?)		■ Near miss incidents related to the process risks; and Institute a management of change system for modifications.		

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
3	Explosion/ fire from gas/crude release (blowout)	Damage to property, loss time, injury and / or fatality resulting from accidents	■ Minimize the risk of fire and explosions ■ Prompt response strategy to fire and explosions minimize risk and reoccurrence of fire and explosion incidents	Prior to commencement of construction the contractor must prepare and submit to CNOOC a site-specific Emergency Response Plan that addresses these items and which describes specific actions to be taken in the event of a sudden surge in gas/crude volume.	CNOOC Contractor CNOOC PMT/QHSE	Facility personnel must conduct well control drills at regular intervals and key personnel must attend a certified well control school periodically.	Daily inspection and monthly monitoring	

6.16 Ecosystem services management plan

6.16.1 Food provision Ecosystem Services

Table 6-34: Food provisioning ecosystem services

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	■ Indicator / Performance Criteria	Schedule / Monitoring Frequency	■ Additional Reference
	Grazing for livestock	■ Livelihood deprivation of the herding community due to reduced grazing area ■ Food insecurity resulting from displacement of herding community	Compensation / livelihood restoration for loss of grazing	Economic displacement of herding communities has been addressed in terms of the IFC Performance Standard 5 through a Resettlement Action Plan (RAP). (RAP). The RAP includes provision in the entitlement matrix (see Table 6-35) to compensate people with customary rights for loss of grazing. The RAP will be updated with an independent livestock assessment and include: ■ A management component to address impacts to livestock; and ■ A livelihood restoration plan with mitigation strategies for the loss of grazing land. The project must (where feasible) support: ■ Local sustainable food economies (i.e. markets that do not significantly diminish the capacity of a food source to replenish itself). For example, only sustainable, established and locally sourced meat should be purchased, where practical; and ■ Sub-county administration strategies to solve regional farming difficulties such as crop failure due to disease and drought (e.g. introduction of modern farming methods, training farmers in post-harvest techniques, and sensitising farmers about land degradation) as part of the Community Development Plan/ Corporate Social	CNOOC CNOOC PMT/QHSE	■ Evidence of Compliance with entitlement matrix (■ Table 6-35); ■ Appropriate independent livestock assessment and management plan; and ■ Compliance with Livelihood Restoration Plan.	Quarterly monitoring	■ Ecosystem Services Review and Assessment for the Kingfisher Discovery Area in Hoima District, Uganda (2018); ■ CNOOC KFDA RAP Project 2016 – Phase 1 Resettlement Action Plan (2017); and ■ Pre-construction planning activities. ■ Livestock assessment report

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	■ Indicator / Performance Criteria	Schedule / Monitoring Frequency	■ Additional Reference
				Responsibility initiatives (e.g. CNOOC's Community Development Specification). ■ Initiatives to improve / enhance pasture growth in Buhuka flats such as irrigation using the treated domestic waste water from the camp				
	Fisheries[12]	■ Over fishing due to increased demand and a wider market ■ Food insecurity resulting from dwindling fish catches	Minimise over fishing through influx management.	■ The Influx Management Plan will be updated to address appropriate measures to mitigate the expected Project-associated in-migration effects on capture fisheries. ■ CNOOC should support the fisheries department in efforcement programs to check overfishing and illegal fishing techniques ■ CNOOC should support NaFIRRI in research programs aimed at improving fish stock in Lake Albert	CNOOC CNOOC PMT/QHSE Fisheries department NaFIRRI Kikuube district local government	Inclusion and implementation of appropriate management measures in the Influx Management Plan. Engagement records with NaFIRRI and the Fisheries Department	Quarterly monitoring	■ Influx Management Plan; and ■ Fish Act (Cap 197, 1951).
	Hunting and sport fishing by project personnel	Increased demand pressure on the limited ecosystem goods / food resources	Minimize demand pressure to the limited ecosystem goods / food resources	■ Enforcement of a complete ban on wildlife harvesting (hunting/ trapping/ sport fishing) for all Project personnel. ■ No personnel and/or contractors allowed beyond footprint of Project.	CNOOC Contractor CNOOC PMT/QHSE	■ Complaints registered in grievance procedure; ■ Disciplinary record for culprits	Daily inspection and monthly monitoring.	■ Biodiversity Management Plan; and ■ Fish Act (Cap 197, 1951).
	Community dependence on Wild foods[13] harvest / gathering	Over exploitation of wild foods	■ Minimize dependence on ecosystem food supply ■ Promotion of scientific studies and monitoring	■ Supporting local communities in developing sustainable farming, ecotourism or other activities that provide alternative food sources and income. ■ Support scientific studies and monitoring programs aimed at assessing the sustainability of using local resources, as part of Corporate Social Responsibility initiatives. ■ Enforcement of a complete ban on wildlife harvesting (hunting/ trapping/ fishing) for all project personnel. ■ No personnel and/or contractors allowed beyond footprint of Project. ■ Worker and community education programme focussing on the impacts and risks of bush meat hunting (e.g. disease) to be incorporated into the Community Development Plan	CNOOC CNOOC PMT/QHSE Kikuube district Local Government NAADS	Compliance with Livelihood Restoration Plan.	Quarterly monitoring	CNOOC KFDA RAP Project 2016 – Phase 1 Resettlement Action Plan (2017).

[12] Fish stocks and catch success

[13] Along the feeder pipeline route, wild foods are typically represented by bush meat (e.g. rats) hunting and beekeeping, and to a lesser degree by fruits and roots.

Table 6-35: Entitlement Matrix (CNOOC KFDA RAP Project 2016 – Phase 1 Resettlement Action Plan; 2017)

Type of loss	Category of Affected Person	Entitlement	Eligibility
Dwelling used as primary residence	Owners who occupy affected dwellings	**In kind-** Replacement house of equivalent size (measured floor area or number of rooms) with consideration of functional spatial use. Choice of standardized replacement house designs that comply with building/ planning standards and that take spatial and cultural function into consideration. House constructed from durable wall and floor materials and with permanent roof. Materials may be salvaged at the owner's expense and if project schedule allows this: ■ Disturbance Allowance base on valuation of original property lost and all transport costs to new place of abode for all movable assets; and ■ The relocated persons will be provided with legal land tenure in places where they will be relocated; or **Cash-** Compensation at full replacement cost based on professional valuation: ■ Disturbance Allowance; and ■ Transport allowance will allow for move of up to 100km from point of displacement; or **In kind/ cash combination-** Compensation for area of dwelling not replaced based on agreed rate per square meter for existing materials and finishes: ■ Cash for non- typical/ special finishes (floor and/or wall tiling, fitted kitchens and bathrooms) based on assessment of replacement value by registered valuer; ■ Disturbance Allowance base on valuation of original property lost and all transport costs to new place of abode for all movable assets; and ■ The relocated persons will be provided with legal land tenure in places where they will be relocated.	■ Houses completed and occupied at cut- off date and identified through final asset surveys; ■ Ownership established through final asset surveys; ■ Cash option available to homeowners with proven and verified alternative dwelling suitable for household members identified during final census survey; ■ Combination of cash and in kind package for homeowners who prefer a smaller replacement house and the balance paid in cash for improved finishes assessed on case- basis; and ■ Cash compensation eligibility rules to be further developed.
Dwellings used for secondary purposes (rental houses, free accommodation for relatives, etc.)	Owner of residential structure	**Cash** – Compensation at full replacement cost (taking replacement standard of durable material and permanent roof into consideration) based on professional valuation: ■ Disturbance Allowance.	■ Complete houses at cut-off date, identified through final asset surveys; ■ Ownership established through final asset surveys; and ■ Where dwelling is occupied and used to earn income (livelihood), preference is for replacement house with continuation of tenancy agreement to avoid displacement of tenants.
Sanitation facilities	Owners of residential, commercial and other buildings	**In kind** – Provision of on-site composting latrines, one per affected household or per physical planning standards.	■ Facilities in place and used for designated purpose at cut-off date and identified through final asset surveys; and ■ Physically displaced households, businesses and other community buildings identified through final census and asset surveys.
Non-residential privately-owned buildings including commercial buildings, constructed with permanent materials	Owner of building	**Cash** – Compensation at full replacement cost based on professional valuation: ■ Disturbance Allowance.	■ Complete building at cut-off date, identified through final asset surveys; and ■ Ownership established through final asset surveys.
Moveable and other structures such as fences, livestock enclosures, bridges, fish ponds, livestock water points, etc.	Owner of structures	**Cash** – Compensation at full replacement cost for affected structures based on assessment by registered Valuer.	■ Ownership established through final asset surveys; and ■ Structures in place at cut-off date and identified through final asset surveys.

Type of loss	Category of Affected Person	Entitlement	Eligibility
Incomplete buildings and structures	Owners of incomplete structures	**Cash** – Compensation for incomplete buildings and structures based on assessment by registered Valuer and based on % of completion: ■ Materials may be salvaged at the owner's expense.	■ Incomplete at cut-off date, identified through final asset surveys; and ■ Ownership established through final census and asset surveys.
Land for Residential Plot – permanent loss	Registered owner or claimants of customary held land on which complete immoveable housing structure is established Registered leaseholders on public land on which complete immoveable housing structure is established	**Cash** – Where in-fill resettlement is possible on the remainder of the affected parcel of land or the existing community, or where the household owns land for residential use elsewhere which they choose to occupy as primary residence, compensation in cash for surveyed land at agreed rates. OR **In kind –** Where in-fill resettlement on the remainder of the affected parcel of land or within existing community is not possible, provision of standardized housing plot on planned resettlement site. Settlers will be given the same security of tenure as their displaced land, but a Customary Certificate of Ownership (CCO) as a minimum.	■ Persons must prove ownership of complete immoveable housing structure and in land (not necessarily through title20) at the time of final asset surveys; and ■ Persons must prove ownership of a suitable house elsewhere to qualify for cash compensation.
Permanent loss of agricultural (crop) land	Registered owners or claimants of customary held lands	**In kind** – Package to empower farmers to find their own replacement agricultural land of same size, or an amount of land with equivalent productive value, contingent on timely payment. Land will be brought to same level of preparedness as at time of crop survey (see also livelihood section below). OR **Cash** – where in kind replacement is not possible, or where owner has access to alternative farm land suitable for the same agricultural purpose compensation in cash at agreed rates for full replacement cost, in proportion to the tenancy or sharecropping agreement should there be any.	■ Persons must prove ownership (not necessarily through title) at the time of final asset surveys; and ■ Persons must prove interest in surveyed alternative land.
Permanent loss of grazing land	Registered owners or claimants of customary held lands	**Cash** – Compensation in cash of the value of the land at full replacement cost.	Persons must prove ownership (not necessarily through title) at the time of final asset surveys.
Permanent loss of natural resources and access to natural resources.	Resource Users	The Project must try to find resettlement sites (if applicable) that maintain access to natural resources. If these resources cannot be replaced communities will receive additional livelihood improvement or alternative livelihood support.	Persons identified through final census.
Permanent loss of fallow land	Registered owners or claimants of customary held lands	**In-kind** – Provision of support package to identify suitable fallow land; OR **Cash –** Compensation in cash of the value of the fallow land.	Persons must prove ownership (not necessarily through title) at the time of final asset surveys.
Loss of improvements to land	Farmers	**Cash-** Compensation at full replacement cost based on professional valuation: ■ Disturbance Allowance; or **In kind** -Improvements to land such as irrigation ditches will be provided on the replacement land or included in the calculation of cash compensation.	Person must prove interest in land.
Annual Crops	Owners of crops on farm land	Where the Project will give sufficient notice (90 days) to farmers to harvest their annual crops no compensation will be paid for annual crops. **Cash** – Where annual crops cannot be harvested due to a reduced notice period, damaged crops will be compensated as mature crops at agreed rates determined annually by the District Land Board. **In kind** – Access to agricultural improvement package consisting of labour and mechanical inputs to bring land to same level of preparedness and inputs for 1 year such as improved seeds, pesticides, training, and equipment if replacement agricultural land has been secured. OR	■ Crops in place (rooted) at cut-off date and identified through final surveys; ■ Compensation according to defined age or size categories; and ■ Crop owners identified through final asset surveys.

Type of loss	Category of Affected Person	Entitlement	Eligibility
		■ **Cash** – Once-off land preparation allowance based on agreed rates determined annually by the District Land Board21 or formal market studies. ■ **In kind** – Participation in livelihood improvement programmes to increase earning capacity.	
Perennial Crops	Owners of crops on farm land	**Cash**- compensation at full replacement cost at agreed rates determined annually by the District Land Board or based on full replacement cost determined by formal market studies. **In kind** – Access to agricultural improvement package consisting of labour and mechanical inputs to bring land to same level of preparedness and inputs for 1 year such as improved seeds, pesticides, training, and equipment if replacement agricultural land has been secured. OR ■ **Cash** – Once-off land preparation allowance based on agreed rates determined annually by the District Land Board21 or formal market studies. ■ **In kind** – Participation in livelihood improvement programmes to increase earning capacity.	■ Crops in place (rooted) at cut-off date and identified through final surveys; ■ Compensation according to defined age or size categories; and ■ Crop owners identified through final asset surveys.
Fruit and economic trees	Owners of trees on farm land	**Cash** compensation at full replacement cost, including the cost of forfeited economic benefits, for all agreed fruit and economic trees, shrubs (e.g. coffee) and plants (e.g. cassava) at agreed rates determined annually by the District Land Board or based on full replacement cost determined by formal market studies. **In kind –** Where cash compensation is not preferred for fruit and economic trees, two (2) replacement saplings for every damaged tree of a crop variety suitable for the identified replacement farm land: ■ No replacement fruit and economic tree saplings will be planted within infrastructure corridor with land-use restrictions.	■ Trees in place (at cut-off date and identified through final surveys; ■ Compensation according to defined age or size categories; and ■ Tree owners identified through final asset surveys.
Restricted access to landing areas and associated facilities	Fisher folk	**In kind** – Address access restrictions through consolidated and improved alternative landing areas and associated facilities: ■ Participation in livelihood improvement programmes to increase earning capacity.	Organized fisher folk identified during baseline surveys.
Temporary loss of land or assets	Registered owners or claimants of lands or assets	■ Rental amount equivalent to value of income lost access to land or assets for duration of the impact; and ■ Full restoration of land and assets by developer prior to the land and associated assets being returned.	Persons must prove ownership (not necessarily through title) at the time of final asset surveys.
Loss of Accommodation	Tenants occupying affected dwellings	Where vacation is immediate (less than 3 months' notice period), tenants with proof of rental agreement with the landlord shall be compensated for the disturbance and loss of shelter in form of a rental allowance package calculated per occupied room. The project will assist in identifying rental options and securing rental agreements. Where the tenant can relocate into a replacement dwelling, the compensation shall be calculated for the transition period for the construction of the replacement structure (up to a maximum of 6 months). The project will assist in identifying rental options and securing rental agreements. Where the tenant is unable to relocate into the replacement dwelling and continue their tenancy with existing landlord, the compensation shall be calculated for 3 months with transportation and moving assistance.	Tenants with proof of rental agreement with landlord, identified through final census.
Vulnerable Support Programme	Vulnerable individuals and families who may find it difficult to cope	**In kind** – Transitional hardship assistance program appropriate to specific cases and based on Project assessment, including:	Identified through final census survey based on agreed vulnerability criteria relevant to Project.

Type of loss	Category of Affected Person	Entitlement	Eligibility
	with the transition e.g. disabled and elderly persons	■ Priority in physical mobilization and transfer to resettlement plot; ■ Special assisted transit to resettlement plot; ■ Additional moving, loading and unloading assistance, if necessary; ■ Assistance from support case workers during transit process; and ■ Other specific support related to moving process (e.g. medical assistance) identified by support case workers.	
Loss of burial grounds and relocation of graves	Households	**In kind** – Complete relocation of graves (exhumation, transportation and reburial) in designated cemetery at agreed rates per grave (in accordance with national legislation): ■ Provision in kind (or cash equivalent) of agreed customary ceremonial assistance per family.	■ Familial graves identified during asset surveys; ■ Unmarked graves identified through chance-find do not qualify for ceremonial assistance; and ■ Chance find procedures to be adhered to.

6.16.2 Biological Raw Materials Ecosystem Services

Table 6-36: Biological Raw Materials – construction material for traditional houses

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Traditional house construction material	Controlled accommodation minimising use of biological raw material	The construction camp must have accommodation facilities for workers to avoid use of traditional houses. No wood burning at the construction camp.	CNOOC CNOOC PMT/QHSE	■ Appropriate accommodation facilities; ■ No traditional houses used for accommodation; and ■ Use of sustainable building materials.	Construction phase	General Administration and Liaison.
2.	Traditional house construction material	Sustainable local resource supply	Support scientific studies and monitoring programs aimed at assessing the sustainability of using local resources for home construction.	CNOOC CNOOC PMT/QHSE	CNOOC supported studies and monitoring (documented) by suitably qualified professionals.	At all times.	
3.	Construction aggregates	Minimise land disturbance	Avoid aggregate extraction in areas of natural habitat or close to sites of cultural heritage importance; target aggregate extraction in degraded areas with approval from relevant stakeholders.	CNOOC CNOOC PMT/QHSE	■ Documented avoidance of natural habitat and sites of cultural heritage; ■ Documented preference given to degraded areas for aggregate extraction; and ■ Documented approval from relevant parties.	At all times.	Community, Stakeholder and Government engagement
4.	Construction aggregates	Sustainable resource supply	Develop a procurement strategy that encourages use of locally-sourced aggregates with mechanisms for assessing and maintaining the sustainability of the supply. The volume of material needed must be minimised by specifying the amount of materials needed for specific tasks and through inventory control to avoid surplus (e.g. use of “just in time” delivery).	CNOOC CNOOC PMT/QHSE	■ Documented sourcing of aggregate from sustainable sources; and ■ Appropriate procurement strategy.	Pre-construction	Waste Management Plan

6.16.3 Biomass Fuel Ecosystem Services

Table 6-37: Biomass Fuel – fire wood and charcoal

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Biomas Fuel	Deforestation of the escarpment woody vegetation cover Soil erosion due to deforestation of the hilly / escarpment area	Reduce local dependence on firewood and charcoal	■ Supply of cheap alternatives (e.g. gas) to local markets by CNOOC to be investigated. If feasible, CNOOC must facilitate the supply of the alternative fuels in line with the requirements of General Administration and Liaison. ■ CNOOC should support tree planting initiatives within the community ■ Stock should work with the communal land association to indentify and provide land for establishment of a communal wood lot ■ Support scientific studies and monitoring programs aimed at assessing the sustainability of using commercially-planted forms of biomass fuel, such as Jatropha and construction of biogas generating toilets in the community ■ Enforcement of a complete ban on harvesting of firewood by all project personnel.	CNOOC PMT/QHSE	Documented investigations into the feasibility of supplying alternative fuels to firewood and charcoal to local markets.	Quarterly monitoring.	Procurement of Local Goods and Services.

6.16.4 Fresh Water Ecosystem Services

Table 6-38: Fresh Water

Ref.	Aspect / Activty	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Refe
1.	Fresh Water (Type I)[14]	■ Pollution of surface water Destruction / degradation of surface water ■ Deprivation of the community from fresh water supply	Appropriate water pollution control measures.	The Project footprint may impact the supply of fresh water for beneficiaries, particularly near areas where the infrastructure will intercept drainage lines, streams, rivers and/or swamps. CNOOC must: ■ Reduce water volumes needed by Project activities through treatment and re-use of process water and waste water; and ■ Implement appropriate water pollution control measures such as oil interceptors, treatment of sewerage and hydrotest discharge.	CNOOC PMT/QHSE	Documented compliance with the Water Management Plan.	Monthly monitoring .	Water Managem
2.	Fresh Water (Type I)	■ Pollution of surface water Destruction / degradation of surface water ■ Deprivation of the community from fresh water supply	Non-exceedance of lake Albert's carrying capacity[15]	Assessment of the natural capacity of Lake Albert to provide waste assimilation services, and insurance through monitoring and analysis that these are not exceeded.	CNOOC PMT/QHSE	Documented monitoring of lake water quality once assimilation capacity has been calculated.	Monthly monitoring	Cumulative Impa Assessment.
3.	Fresh Water (Type I)	■ Pollution of surface water Destruction /	Appropriate waste management	The development of an Influx Management Plan will identify appropriate measures to mitigate the expected increased waste-loading to surface water systems resulting from in-migration (due to the presence of the Project).	CNOOC PMT/QHSE	Documented compliance with Influx Management Plan.	Monthly monitoring	Influx Manageme

[14] Services that potentially affect beneficiaries' livelihoods, health, safety or culture

[15] Carrying capacity is defined as the number of people, animals, or crops which lake Albert can support without environmental degradation of the Lake occurring.

Ref.	Aspect / Activty	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Refe
		degradation of surface water ■ Deprivation of the community from fresh water supply						
4.	Fresh Water (Type II)[16]	■ Water Destruction / degradation of surface water ■ Deprivation of the community from fresh water supply	Collaborative catchment management	Degradation of ecosystem services that maintain the Project's social license to operate must be avoided by: ■ Reducing water volumes needed by Project activities through treatment and re-use of process water and waste water; and ■ Contributing to water catchment management in association with other Projects in neighbouring exploration blocks to promote equitable sharing of fresh water resources of Lake Albert.	CNOOC PMT/QHSE	Documented collaboration with neighbouring companies extracting water from Lake Albert.	Monthly monitoring	Cumulative Impa Assessment.

[16] Services that potentially affect the project and ability to achieve operational performance (i.e., impact the Project) (Type II).

6.16.5 Air Quality Regulation Ecosystem Services

Table 6-39: Air Quality Regulation

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Vegetation and wetland ecosystems	Air pollution due to loss of vegetation (emission sinks)	Minimise loss of vegetation and wetland ecosystems	Loss of vegetation and wetland ecosystems and associated indirect effects are addressed in the Biodiversity Management Plan and the Water Management Plan.	CNOOC PMT/QHSE	Documented compliance with both the Biodiversity and Water Management Plan.	Monthly monitoront	■ Biodiversity Management Plan; and ■ Water Management Plan.
2.	Offset areas	Air pollution due to loss of vegetation (emission sinks)	Enhance vegetation that improves air quality	If feasible, an appropriately sized portion of the land within the project footprint should be dedicated for native forest, and/ or CNOOC should invest (if feasible) in replacing or protecting CO_2 sequestration/ storage services in the immediate area, as part of Corporate Social Responsibility initiatives.	CNOOC PMT/QHSE	■ Documented feasibility investigation; ■ Allocation of project land for growing native forest; ■ Appropriate investment into replacing or protecting CO_2 sequestration/storage services in the immediate area; and ■ Documented Corporate Social Responsibility initiatives that enhance local air quality.	Monthly monitoront	
3.	Regulatory services	Air pollution from project infrastructure / activities (emission sinks)	Promote infrastructure that enhances air quality	Assess the relative importance of natural air quality regulatory services within the Project Area of Influence, and design infrastructure to accommodate and enhance such services where feasible.	CNOOC PMT/QHSE	■ Documented assessment of natural air quality services; ■ Infrastructure design that enhances local air quality; and ■ Documented Corporate Social Responsibility initiatives that enhance local air quality.	Monthly monitoring	
4.	Community education	Air pollution arising out of human / community activity	Minimise pollution through public sensitization / education	Implementation of community education programmes on pollution prevention and monitoring schemes. Promotion of CNOOC corporate social responsibility initiatives.	CNOOC PMT/QHSE	■ Documented pollution education programmes. Community awareness of pollution prevention and monitoring; and ■ Documented Corporate Social Responsibility initiatives that enhance local air quality.	Quarterly	Community, Stakeholder and Government engagement.

6.16.6 Water Ecosystem Services

Table 6-40: Water Ecosystem Services: Flow, timing, purification and waste treatment

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1.	Natural flood barriers	Property damage, injury and / or fatalities arising from floods	Maintain natural flood barriers	Where possible, avoid or enhance natural flood barriers (e.g. wetlands) before investing in man-made replacements.	CNOOC PMT/QHSE	Compliance with Surface Water and Biodiversity Management plans.		Water Management Plan.
2.	Natural water flow	Destruction of wetlands and loss of wetland ecosystem service functionality due to distortion of local hydrology	Maintain natural water flow	■ If necessary, appropriately engineered design features (approved by a suitably qualified professional per site) must be installed to ensure that water flows (e.g. flow volume and direction) in impacted wetland systems are maintained. ■ Management actions outlined in Biodiversity Management Plan and the Water Management Plan must be implemented.	CNOOC Contractor CNOOC PMT/QHSE	■ Documented investigation by suitably qualified professional per site; ■ Photographic evidence showing maintenance of natural water flows; and ■ Documented compliance with the Biodiversity and Water Management Plan.	Monthly monitoring .	■ Biodiversity Management Plan; and ■ Water Management Plan.
3.	Water Purification and Waste Treatment	Destruction of wetlands and loss of wetland ecosystem service functionality due to distortion of local hydrology	Maintain the size of wetlands	Wetland area directly lost to the Project footprint must be minimised as far as possible to avoid reducing water purification and waste treatment ecosystem services.	CNOOC PMT/QHSE	■ Documented investigation by suitably qualified professional per site; ■ Documented compliance with the Biodiversity and Water Management Plan; and ■ No complaints received through grievance procedure.	Monthly Monitoring	■ Biodiversity Management Plan; and ■ Water Management Plan.
4.	Research	Destruction of wetlands and loss of wetland ecosystem service functionality due to exceeding wetland / lake carrying capacity	Maintain carrying capacity of Lake Albert	Monitoring and analysis of the natural capacity[17] of Lake Albert and Project-affected wetlands to quantify water filtration and waste assimilation services.	CNOOC Contractor CNOOC PMT/QHSE	■ Documented investigation by suitably qualified professionals; and ■ No complaints received through grievance procedure.	Quarterly	
5.	Waste	Pollution (eutrophication, siltation) arising deposition of waste and erosion into wetlands / lake	Appropriate management of waste	Appropriate sewerage facilities and wastewater treatment systems to be put in place at construction camp.	CNOOC PMT/QHSE	Documented compliance with Water and Waste Management Plan.	Daily inspection and monthly monitoring	■ Water Management Plan; and ■ Waste management Plan.

[17] Carrying capacity is defined as the number of people, animals, or crops which lake Albert can support without environmental degradation of the Lake occurring.

6.16.7 Cultural Heritage Ecosystem Services

Table 6-41: Cultural Heritage Ecosystem Services

	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency/ Schedule	Additional Reference
1.	General	Destruction / loss of cultural heritage resources	Appropriate management	Comply with Cultural Heritage Plan and IFC Performance Standard (PS) 8 (Cultural Heritage) by identifying and avoiding critical cultural heritage that is essential to the cultural, ceremonial, and spiritual aspects of beneficiaries' lives.	CNOOC Contractor CNOOC PMT/QHSE/CA	■ Documented compliance with Cultural Heritage Plan and IFC PS 8 (Cultural Heritage); and ■ Documented Informed Consultation and Participation of the affected communities.	Monthly monitoring	■ Cultural Heritage Plan; and ■ Historical Monuments Act (1968, Cap. 46).
2.	Communication	Destruction / loss of cultural heritage resources	Informed communities	Where significant project impacts on critical cultural heritage are unavoidable, CNOOC must obtain the free, prior and informed consent (FPIC) of the Affected Communities, as per IFC PS8 and PS1 requirements. Regular platforms for community liaison must be outlined in the Cultural Heritage Management Plan.	CNOOC Contractor CNOOC PMT/QHSE/CA	■ Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage); and ■ Documented Informed Consultation and Participation of the affected communities.	As needed	Cultural Heritage Plan.
3.	Access control	Destruction / loss/ distortion of cultural heritage resources	Restrict access to project personnel	Protection of the environmental setting for sacred sites close to project activities by ensuring: ■ No personnel and/or contractors allowed beyond footprint of Project; ■ Designated no-go areas, e.g., sacred sites, ritual sites; and ■ Planting of screening vegetation around Project facilities to protect views.	CNOOC Contractor CNOOC PMT/QHSE/CA	Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage).	Daily inspection and monthly	Cultural Heritage Plan.
4.	Access control	Deprivation / disturbance of the community right to visit the sacred sites	Maintain community access	Community access to sacred sites must be maintained.	CNOOC Contractor CNOOC PMT/QHSE/CA	Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage).	At all times	Cultural Heritage Plan.
5.	Education	Destruction / loss of cultural heritage resources	Sensitisation of employees to local culture and heritage	Cultural sensitivity training must be provided to Project staff and incorporated into relevant site induction processes to ensure appropriate respect (sensitivity) for local intangible cultural heritage, traditions, and taboos.	CNOOC Contractor CNOOC PMT/QHSE/CA	Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage).	Quarterly	Cultural Heritage Plan.

6.17 Visual assessment management plan

The visual management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in Table 6-42.

Table 6-42: Visual management plan

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Reductions in aesthetic value / Habitat quality	Degradation of the aesthetic value	Minimize the degradation of the aesthetic value	Daytime measures: ■ Watering large bare areas associated with the construction and rehabilitation phases as frequently as is required to minimise airborne dust; ■ Rehabilitate temporary bare areas as soon as feasible using appropriate vegetation species;	Contractor CNOOC PMT/QHSE	■ Records of observations in ESO/ CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve complaints.	Daily inspection and monthly monitoring.	

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
				■ Place a sufficiently deep layer of crushed rock or gravel over parking surfaces for vehicles and machinery; ■ Apply chemical dust suppressants if wet dust suppression is insufficient; ■ Implement a dust bucket fallout monitoring system; ■ Maintain the construction sites in a neat and orderly condition at all times; ■ Create designated areas for material storage, waste sorting and temporary storage, batching, and other potentially intrusive activities; ■ Limit the physical extent of areas cleared for material laydown, vehicle parking and the like as much as possible and rehabilitate these areas as soon as is feasible; and ■ Repair project related erosion damage to steep or bare slopes as soon as possible and re-vegetate these areas using a suitable mix of indigenous grass species. Control Night lighting: ■ All night lighting must face in towards the Project footprint; ■ No lights should face out towards the lake; ■ Lighting should be kept to a functional minimum in all areas; ■ Lamps should not emit light at angles greater than 70°; ■ Lights that emit a broad spectrum of light with a high UV component should be avoided; and ■ Polarised light sources should not be used.				
2.	Generation of artificial light	Light intrusion distorting the human and animal behavioural patterns	Minimise artificial light	■ High-level, high-intensity lighting must be avoided unless there is a strong safety case and motion sensor control should be considered to reduce anthropogenic light to a minimum; ■ Artificial lighting must be positioned so that the extent of light emissions beyond the site boundary is minimised to the extent possible (e.g. direct lighting downwards and inwards towards site and avoid up-lighting of structures); and ■ Community awareness of lighting requirements should be carried out.	Contractor CNOOC PMT/QHSE	■ Records of observations in ESO/ CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve complaints.	Daily inspections and monthly monitoring .	
3.	Housekeeping	Degradation of the aesthetic value	No litter on site	A high standard of general housekeeping and management of the construction site should be maintained	Contractor CNOOC PMT/QHSE	■ Clean and well managed site.	Daily inspections and monthly monitoring	

6.18 Soil management plan

The soil management plan for the construction of the CPF, wells, and ancillary infrastructure is presented in Table 6-43.

Table 6-43: Soil management plan

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Contamination from machinery and vehicles	Soil pollution due to contamination	No soil contamination	The following must be undertaken: ■ Vehicles and machinery must be subjected to daily inspections for possible leakages and damages that could cause leakage; ■ Vehicles and machinery must be maintained regularly and kept in good working order; ■ Maintenance tasks must be restricted to designated workshops and must not be conducted on site; ■ Spill kits should be on-hand to deal with immediate oil/fuel spills; ■ Vehicles and equipment must be regularly serviced off site; and ■ Vehicles must remain on designated roads to avoid disturbance beyond the construction footprint.	Construction contractor CNOOC PMT/QHSE	■ Appropriate journey management plans; ■ Photographs showing appropriate management actions; ■ Records of observations in ESO/ CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve complaints.	Daily	
2.	Soil contamination	Soil pollution due to contamination	Appropriate treatment of contamination	The following must be undertaken: ■ All containment structures must be maintained and regularly monitored; ■ Where hazardous substances are required to be moved, it must be safely contained and transported to minimise the risk of spilling; ■ In the event of a spillage or leakage the emergency response plan must be initiated and trained personnel must be ready to deal with it; ■ Where seepages and leakages are noted, it must be treated according to an applicable procedure as determined by a plan of action for the specific type of disturbance; ■ A leakage detection/monitoring system should be installed in identified high risk areas; ■ Adequate waste facilities must be provided and maintained at plant, accommodation and construction facilities; ■ Personnel must be trained to deal appropriately with contamination; ■ Storage of fuel/fluids and chemicals – should only occur in appropriately bunded are where all spills can be contained. Construction Contractor shall be consulted to ensure that appropriate chemicals are stored together to prevent chemicals reacting with one another; ■ Spill contingency measures and spill kits must be available on site; ■ Any spill clean-up is to be appropriately contained and disposed of by a contractor appropriately registered with NEMA; and ■ Hazardous chemicals (e.g. fuel, lube oil and solvents, used fuel storage containers) must be contained in impenetrable bunds (of 110% capacity of the stored material.	Construction contractor CNOOC PMT/QHSE	■ Records of observations in ESO/ CLO monthly reports; ■ Photographs showing appropriate management actions; and ■ Appropriate journey management plans.	Monthly monitoring	

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
3.	Soil compaction	Soil degradation Reduced soil productivity	Prevent/ reduce soil compaction	■ Where possible, remove and place soils when in a dry state and not when moist or wet; ■ Loosening of the soil through ripping prior to the stripping process is recommended in order to break up crusting; and ■ Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially by heavy machinery.	Construction contractor CNOOC PMT/QHSE	■ Records of observations in ESO/ CLO monthly reports; ■ Photographs showing appropriate management actions; and ■ Appropriate journey management plans.	During rehabilitation	
4.	Stockpiling and storing of materials	Soil degradation Reduced soil productivity	Appropriate stockpiling and storage of materials	■ Prior to construction the upper usable soil layer should be removed and set aside for use in rehabilitation of the site after site decommissioning. The depth of soil to be recovered is 300 mm, unless indicated otherwise by a registered soil scientist. Soil that is stripped should be stockpiled; ■ Wherever possible ensure that stockpiles exist for the shortest possible time; ■ All stockpiles are to be located upstream of active construction sites and away from areas where any form of chemical or potentially polluting material is handled and stored; ■ All stockpiles are to be protected by bunds to divert stormwater around the stockpiles and prevent loss of soil material; ■ All usable soil stockpiles should not exceed 2 m in vertical height; ■ Long term stockpiles containing material that will be required for rehabilitation of the site after decommissioning are to be vegetated (grass seed mix); ■ Minimise surface areas of stockpiled material to reduce the surface area exposed to wind erosion; ■ Do not build steep sided stockpiles or those that have sharp changes in shape; ■ Whenever possible, keep stockpiles away from the site boundaries, sensitive receptors and surface drains; ■ If possible, keep stockpiles securely stacked; and ■ Cover and protect stored materials from wind and dampen stored materials where appropriate.	Construction Contractor CNOOC PMT/QHSE	■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■	At all times.	

6.19 Greenhouse Gas Management Plan

The greenhouse gas (GHG) management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below.

Table 6-44: Greenhouse gas management plan

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency /Schedule	Additional Reference
1.	Greenhouse gases (GHG)	Air pollution	Minimise and control GHG	GHG include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. CNOOC's Greenhouse gas management specification must be complied with and the following must be undertaken where feasible: ■ Enhancement of energy efficiency (see CNOOC's energy management specification); ■ Protection and enhancement of sinks and reservoirs of greenhouse gases (i.e. mechanisms to trap or slow the release of GHG); ■ Minimisation of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy; ■ Promotion of sustainable agriculture and animal husbandry; ■ Use and promotion of renewable forms of energy; and ■ Use of carbon capture and storage technologies[18].	Construction contractor Environmental Coordinator CNOOC PMT/QHSE	■ Documented information suitable to assess GHG produced by the project; ■ Up to date GHG Emissions Inventory; ■ Calculation of Industry GHG Emissions; and ■ Appropriate implementation of emissions reduction and offset measures.	Monthly Monitoring	
2.	Maintenance of vehicles and machinery	Air pollution from vehicular emissions	Minimise emissions	Vehicles and equipment must be designed, maintained, and operated in accordance with Good International Industry Practice (GIIP) and the manufacturer's specifications. Vehicles and machinery must use low-sulphur fuels or biofuels where practical.	Construction contractor CNOOC PMT/QHSE	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; and ■ Records of observations in ESO/ CLO monthly reports.	Monthly monitoring	
3.	Route selection	Air pollution	Minimise emissions from vehicles	Selected roads must, as far as possible, avoid steep gradients and sharp turns which may increase congestion (traffic) and atmospheric emissions. A journey management plan must be developed to minimise vehicle travel (i.e. trips to and from locations). Halving the number of trips undertaken can halve the GHG emissions from the vehicle.	Construction contractor CNOOC PMT/QHSE	■ Appropriate journey management plans; and ■ Records of observations in ESO/ CLO monthly reports.	Monthly monitoring	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
4.	Vehicle idling	Air pollution	Minimise emissions from vehicles	Idling of vehicles must be minimised as far as possible (i.e. drivers must switch engines off when not in use).	Construction contractor	Records of observations in ESO/ CLO monthly reports.	Monthly monitoring	
5.	Mobile equipment	Air pollution from mobile equipment emissions	Minimise emissions	Where practical: ■ Diesel-fuelled mobile equipment should be replaced with electrical equipment, utilizing solar-powered back-up where possible; and ■ Low-sulphur fuels or bio-fuels should be used where the use of electrical equipment is not feasible.	Construction contractor CNOOC PMT/QHSE	Records of observations in ESO/ CLO monthly reports.	Monthly monitoring	
6.	Generation of air emissions (GHG)	Air pollution	Minimise emissions	Vehicles, equipment, and associated infrastructure must be designed, maintained, and operated in accordance with Good	Construction contractor	■ Personnel using equipment must be properly trained and certified; and	Monthly monitoring	

[18] Carbon dioxide capture and storage (CCS) comprises separation and isolation of carbon dioxide from industrial and energy-related sources; transport to a storage location; and long-term isolation from the atmosphere (air).

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency /Schedule	Additional Reference
				International Industry Practice (GIIP) and the manufacturer's specifications. Vehicles and machinery must use low-sulphur fuels or bio-fuels as far as possible (if practical).	CNOOC PMT/QHSE	■ The quantity of fuel consumed must be included on a daily report and report to support a calculation of pollutant emissions.		

6.20 Health Management Plan

The health management plan for the construction of the CPF, wells, and ancillary infrastructure is presented below.

Table 6-45: Project induced influx and unplanned settlements/ 'urbanization'

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency / Schedule	Additional Reference
1	Influx Management Plan	Disease prevalence due to influx	Minimize disease prevalence due to influx	Update the Influx Management Plan (IMP) to include consideration of health determinants and labour recruitment (Table 6-5).	CNOOC Contractor CNOOC PMT/QHSE	■ Up-to-date Influx Management Plan with health determinants and labour recruitment; and ■ Documented compliance with Table 6-5.	IMP prior to commencement of operations and compliance at all times thereafter.	■ Influx Management Plan; and ■ Labour, working condition, and employment management plan.
2	Capacity building	Disease prevalence and poor standard of living due to un matched physical planning to population growth	Support physical planning in settlement development	Support capacity building for town planning in anticipation of Project induced influx and growth in existing settlements. This should be part of a broader district plan to avoid local make-shift settlements and allow established villages to develop through a clear plan.	CNOOC PMT/QHSE	Documented support of government with regard to town planning.	Quarterly monitoring prior to construction and monthly monitoring during construction .	
3	Communicable disease	Prevalence of communicable diseses in the community Loss time, injury and / or fatality due to communicable disease prevalence	Control of communicable diseases in the community and project personnel	■ Develop communicable disease strategies to include tuberculosis, HIV, STI and malaria programmes, with the objective of promoting/ protecting workplace and community health; ■ Screen local employees/contractors for TB at recruitment and provide adequate care and treatment programmes from the Project's workplace medical service while complying with the requirements of the national TB programme; ■ Develop a site-based TB management programme; ■ Evaluate the origin of any incoming contracted construction workers (especially from high burden TB countries) and understand TB and MDR risks in this group. Ensure effective TB screening in the external contracted workforce prior to final appointment and mobilization as part of the Project's Fitness to Work (FTW) procedures to ensure that diseases are not introduced in the study area; ■ Develop a vaccine preventable disease programme for all employees, and visitors based on risk for travellers and at-risk occupations. All employees and contractors residing	Contractor CNOOC PMT/QHSE Ministry of Health	Documented implementation of strategies to deal with communicable diseases.	Quarterly Prior to - construction and monthly during construction.	

				in close contact in camps should receive the quadrivalent meningococcal meningitis vaccine; ■ Support a HBV vaccination campaign/ or antibody testing on employee who may have not been vaccinated as a child; ■ Develop nutritional programmes that promote proper nutritional practices at the workplace to prevent obesity and related health impacts, including education programmes in the workforce on financial management and support of the household units in employees that have traditionally followed a subsistence lifestyle; ■ Train employees to ensure that they are aware of the requirements of the Occupational Health and Safety standards established by the Government of Uganda; ■ Provide ongoing monitoring of worker health through a dedicated Employee Health Assessment Programme with the following key focus areas: ▪ Malaria control and prevention programme; ▪ Tuberculosis control and prevention program; ▪ Vector surveillance and control; ▪ Clinical operations; ▪ Food safety; ▪ Water safety; and ▪ Camp hygiene and sanitation. ■ Industrial hygiene.				
4	Disease Outbreaks	Loss time, injury and / or fatality due to communicable disease outbreaks	Assess outbreak risk	Undertake an outbreak control risk assessment and planning for communicable disease such as influenza and meningitis.	Contractor CNOOC PMT/QHSE	Documented outbreak control risk assessment and planning for communicable disease.	Prior to construction .	
5	Camp facilities	Disease contraction between community and project personnel	Effective camp facility management	Ensure effective camp facilities management. For example, the location of camps must be away from communities to prevent exposure to disease risks (such as malaria) and to prevent the workforce from interacting with the community.	Contractor CNOOC PMT/QHSE	■ No registered grievances; and ■ Appropriate barriers preventing workforce from interacting with local communities.	Daily inspection and monthly monitoring .	
6	Overcrowding	Disease contraction and prevalence within the camps due to over crowding	Adequate accommodation and facilities	■ Accommodation and facilities management should be well designed and planned in employee and contractor camps to prevent overcrowding and need to use accommodation developed in communities; ■ Comply with the Occupational Health and Safety standards established by the Government of Uganda, as well as the requirements in place in respect of the IFC; ■ Properly design the accommodation and other facilities in the personnel camp to prevent overcrowding and need to use rented accommodation available in communities; and ■ Ensure adequacy of welfare and amenities, including the supply of adequate drinking water as per WHO recommended 5 litres per day, cloak rooms, sanitary facilities separate for men and women, adequately furnished eating places, hand wash rooms/areas and proper meals.		No complaints about overcrowding.	Daily inspection and monthly monitoring.	

7	Awareness	Disease contraction and prevalence in the community and project personnel due to ignorance in public health	Minimise communicable disease risks	■ Develop information, education and communication (IEC) programmes in the community to increase awareness and reduce communicable disease risks. Ideally, support the development of village health teams (VHTs) in the study area to deliver these (in partnership with the health department or non-governmental organisation); ■ Create awareness of all Occupational Health and Safety requirements from and measures for workers that include adequate orientation as well as ongoing/routine training and sensitisation on OSH; ■ Adopt a zero tolerance approach to employees who transgress health and safety rules; and ■ Implement health education programmes for employees in order to disseminate information regarding general social pathologies and spread of disease.	Contractor CNOOC PMT/QHSE	Recorded results of programmes.	Monthly monitoring .	
8	Veterinary health programmes	Disease prevalence arising from consumption and / or interaction with livestock products	Promote veterinary health	■ Support selected veterinary health programmes in the KFDA, including vaccination of domestic animals for rabies and cattle for brucellosis. ■ Support rodent control in settlements likely to receive the bulk of influx and ensure effective camp management to prevent attraction of rodents; and ■	CNOOC PMT/QHSE	Recorded results of programmes.	Monthly monitoring	
9	Medical services	Increased Pressure on the limited existing medical facilities	Minimise burden on established local medical services	■ Develop and design appropriate site based medical services that can cater for all workplace health needs so that local health services are not overburdened with medical cases from the workforce; ■ Develop effective management of emergencies, illness and injuries through adequate medical provision, equipped first aid points at the workplace and as needed in the field and the availability of emergency response facilities; and ■ Ensure that the CNOOC Emergency Response and Exposure Control Plans are understood by all workers, including labourers undertaking routine construction related tasks, and not only by first responders, and that adherence is strictly enforced under all circumstances and conditions.	Contractor CNOOC PMT/QHSE	Records of medical services provided.	Monthly monitoring	
10	Medical staff	Increased pressure on the limited medical personnel	Attract medical staff to public facilities	■ Avoid the recruitment of local medical staff to work on Project medical services and work with the government to support ways to attract medical staff to work in the public health facilities in the study area. ■ CNOOC should support the medical personnel through for example providing remuneration subsidies to attract medical personnel in the project area	Contractor CNOOC PMT/QHSE	■ Personnel records show no medical professionals directly employed by CNOOC; and ■ Records of medical services provided.	Monthly monitoring.	
11	Health system	Increased Pressure on the limited existing medical services	Enable a clear integrated district health strategy	■ Evaluate opportunities for health systems strengthening (HHS) and support the development and implementation of a clear, integrated district health strategy, which can plan for influx and requirements to upgrade health services in alignment with government structures, but ideally focused at the entire district and especially the oil development nodes; and ■ CNOOC should have a partnership role to play in their study area, but solely in supporting the government to fulfil its mandate of providing public health services and not assuming this role. All HSS should be performed after a	CNOOC PMT/QHSE	■ Signed memorandum of understanding; and ■ Personnel records show no medical professionals directly employed by CNOOC.	Bi annual monitoring Prior to construction and quarterly monitoring during construction	

				formal memorandum of understanding has been concluded that defines each party's role and responsibilities and delivery timeframes. These agreements must be based on sound sustainability principles.				
12	Basic services	Increased Pressure on the limited existing basic services	Meet anticipated demand	As an element of town planning, support local authorities in the provision of basic services to cater for the anticipated demand, especially environmental health including water, sanitation, and hygiene programmes.	CNOOC PMT/QHSE	Signed memorandum of understanding.	Bi annual monitoring Prior to construction and quarterly monitoring during construction .	
13	Fishing and agriculture	Food insecurity resulting malnutritional related diseases	Enable sustainable fishing and agriculture practices	Support sustainable fishing practices through education, assisting with enforcement of fishing laws and economic interventions to manage demand so that overfishing is managed. In a similar way, support agriculture (such as conservation farming) to increase yields on land that will reduce in availability.	CNOOC PMT/QHSE	Records of support for fishing laws and conservation farming.	Bi annual monitoring Prior to construction and quarterly monitoring during construction after.	
14	Financial management	Poverty leading to psychological disorders	Minimise debt	Information, Education and Communication (IEC) campaigns to educate the local workforce (and contractors) on financial management.	CNOOC PMT/QHSE/CA	Records of campaigns.	Bi annual monitoring Prior to construction and quarterly monitoring during construction	
15	Gender and vulnerable groups	Health disorders due to distress of the vulnerable groups (children, women, the elderly and disabled)	Empowerment and equality	Support to Potentially Affected Communities (PACs) and vulnerable groups on gender empowerment, local development programmes, and health issues. Issues must be addressed through contractor management and practices. Develop influx management and monitoring programmes and support vulnerable groups. Evaluate opportunities to maintain local cultures and norms and build an equitable society, taking note of especially vulnerable groups.	CNOOC PMT/QHSE/CA	Records of such support.	Bi annual monitoring Prior to construction and quarterly monitoring during construction	
17	Violence and crime	Prevalence of Psychological disorders resulting from crime exposure Loss time, injury and / or fatality resulting from violence and crime		■ Sensitise and build the capacity of local governance systems (village chairperson and councillors at settlement level), including the establishment of checks and balances for maintaining individual rights and responsibilities and for managing crime; ■ Identify mechanisms for constructively incorporating traditional (clan) leaders into processes for promoting stability and moral 'regeneration' at village level; ■ Promote the development of a disciplined policing forum for the area, in collaboration with appropriate civil society organisation as well as the Hoima District Police Department and Sub-county anti-crime institutions and systems; and ■ Ensure the development of appropriate mechanisms as part of the Community Health, Safety and Security Plan.	CNOOC PMT/QHSE/CA	Identified mechanisms for incorporating traditional leaders.	Bi annual monitoring Prior to construction and quarterly monitoring during construction	

6.20.1 Workforce health

Table 6-46: Workforce health

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Workforce health	Loss time, injury and / or fatality due to disease / illness	Minimise influence of Workforce health on local population.	The incoming workforce has the potential to exacerbate the communicable disease burden associated with poor socio-economic and living conditions, especially those transmitted by close contact. The following must be undertaken: ■ Develop a workplace TB, HIV, STI and malaria management plan as part of the communicable disease strategy; ■ Evaluate the origin of any incoming contracted construction workforce and screen for TB and associated communicable diseases as part of the Projects fitness to work programme; ■ Support effective vaccine preventable disease programmes; ■ Develop effective design and planning of workplace accommodation to prevent overcrowding; ■ Develop effective workplace medical services; and ■ Wellness programmes in workforce to prevent NCDs. These plans must make provision for contractors or be part of formal contractor management plans.	CNOOC PMT/QHSE Contractor	Documented management plan and records of its implementation.	Quarterly monitoring	
2.	Driver and Mobile Equipment Safety	Property damage, Loss time, injury and / or fatality due vehicle accidents	Reduced personnel injury	■ Implement driver and mobile equipment training programmes in accordance with internationally recognised guidelines for workplace safety; and ■ Prohibit all drivers (permanent employees, contractors and suppliers) from giving lifts to the local community.	CNOOC PMT/QHSE Contractor	Records of Training Programmes and any complaints.	Bi annual monitoring Prior to construction and quarterly monitoring during construction	
3.	Sanitary and Hygiene related diseases	Loss time, injury and or / fatality due to illnesses related to poor sanitation		■ Ensure that the construction camp has all required and adequate amenities such as water supply, sanitation and waste management; ■ Provide adequate medical infrastructure and facilities at camp to address any potential risk to workers‘ health; ■ Ensure that human waste is managed via proper disposal and treatment facilities to avoid seepage (which may contaminate water sources); ■ Ensure that food waste is disposed of in a proper manner (incineration, burial or taken off site and disposed of in sanitary landfill sites) to prevent the proliferation of pests within the camp; and ■ Encourage good personal hygiene through ongoing training throughout the construction contract.	CNOOC PMT/QHSE Contractor	Hygiene training records .	Daily inspection and monthly monitoring	

6.20.2 Sexually transmitted infections (STIs) and HIV/AIDS

Table 6-47: Sexually transmitted infections (STIs) and HIV/AIDS

Ref.	Aspect / activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Workforce health	Increased prevalence of STIs in project personnel and the community Loss time, injury and / fatality from STIs	Minimise influence of Workforce health on local population.	There is a risk of increasing STIs in the community from the workforce which must be minimised through the following: ■ Develop specific programmes for high-risk groups including transport workers; ■ Develop a code of conduct that prohibits sexual fraternisation within the workforce, especially women that originate from the local community. Maintain a closed camp status; ■ Screen for STIs as part of fitness to work programme in both the contracted and full time workforce; ■ Support health systems strengthening activities with the local health authorities and other organisations to develop a co-ordinated approach to STI/HIV prevention and management in the broader area; ■ Support IEC programmes on awareness and education, and use VHTs to spread messaging, as well as supporting HIV counselling/testing and referral for care/treatment; ■ HSS in the local health centres to be able to provide effective care and treatment services; ■ Support women and young girl empowerment programmes; ■ Develop a clear HIV policy and programme in the workplace which includes ensuring that there is adequate accommodation capacity at the temporary personnel camps to eliminate the need for contractors or visitors to seek accommodation in the local villages; ■ Screen for STDs and hepatitis B/C virus as part of pre-employment fitness to work process. Treatable causes should be managed, and chronic carriers excluded from employment until managed; ■ Develop a code of conduct that actively discourages sexual relationships between the workforce and the local community; ■ Work with the village and traditional leaders to manage truck stops, as well as district authorities to report any increase in high-risk sexual behaviour from elements of the workforce, including the collection of baseline data; ■ Develop and implement an HIV and STI management programme in the construction workforce, to include awareness and education, treatment services that link to the public health service, provision of free condoms, access to counselling, proper provisioning of the work camps to dissuade workers travelling into communities for	CNOOC PMT/QHSE Contractor	Documented management plan and records of its implementation.	Bi Annual monitoring prior to construction and quarterly during constructrustion	

				entertainment and support of family friendly accommodation in the camps; ■ Develop and implement an HIV and STI prevention programme for suppliers, which is to include awareness and education about STI's. The design and placement of rest stops for drivers transporting goods and materials to and from the production facility should be away from local communities and properly subsidised for cheap food / entertainment; ■ Develop an Employee Health Awareness Policy and ensure its implementation among CNOOC personnel and its contractors or sub-contractors. The policy must provide for: ▪ HIV/AIDS related advocacy, factual data provision, awareness creation as well as behaviour change issues around the transmission and infection of HIV/AIDS that provides linkages with the Government of Uganda HIV/AIDS related initiatives; ▪ Health awareness training for workers including communicable diseases at induction and then periodically throughout construction; ▪ Awareness raising on communicable diseases for communities close to camps (via posters, leaflets, through health clinics, community meetings); and ▪ Liaison with local health authorities. ■ Implement interventions aimed at reducing the impacts of vector borne diseases through mechanisms such as sanitary improvements and minimising areas where water is impounded as a result of construction activities.				

6.20.3 Physical and economic resettlement

Table 6-48: Physical and economic resettlement.

Ref.	Aspect / Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency / Schedule	Additional Reference
1.	Resettlement	Disease prevalence and constrained access to medical care for resettled communities	Enhance access to health care and Minimimize disease prevalence in resettlement communities	■ Health inputs should be reviewed when planning the resettlement communities to ensure that these are addressed effectively; and ■ Communication and consultation as part of the resettlement action plan will be required and must include relevant social determinants of health.	CNOOC PMT/QHSE/CA Contractor	■ Documented management plan and records of its implementation.	Bi Annual monitoring prior to construction and quarterly during constructrustion	Waste Management Plan.
2.	cultural resources, norms and behavioural patterns	Distortion / destruction of cultural resources, norms and behavioural patterns	Preserve cultural resources, norms and behavioural patterns	Develop programmes that maintain positive traditional values and cultural structures in communities.	CNOOC PMT/QHSE/CA Contractor	■ Documented management plan and records of its implementation.	Bi Annual monitoring prior to construction and quarterly during constructrustion	

6.21 Responsibilities for Managing Cumulative Impacts

The management of cumulative impacts associated with oil industry development in the Albertine graben , Western Uganda will require the involvement of Government, the oil and gas industry and individual developers. Each party bears different responsibilities in this process. For clarity, key identified cumulative impacts are tabulated below and the broad responsibilities of Government, the oil industry as a collective and CNOOC as an individual developer are described in relation to each identified impact in Table 6-49. This table should be used as a guide in interpreting the responsibilities described in the management plans above should there be any uncertainty. CNOOC is only responsible for baring their part of collective management responsibility where cumulative impacts are applicable. In many instances, Government of Uganda is responsible for the primary management of the cumulative impact and to ensure that associated planning is in place. To the extent agreed with the oil industry, the oil industry has a role to play. Similarly, individual companies, and CNOOC specifically within the zone of influence of the Kingfisher Field Development, is encouraged to play an active supporting role in the mitigation of cumulative impact as they relate to the proposed urbanisation of the Buhuka Flats, threats to critical biodiversity habitat and species and the multiple impacts identified in relation to growing population pressure in the local area.

Table 6-49: Description of the responsibilities of Government, the Oil Industry and CNOOC for management of cumulative impacts

	Cumulative impact or identified risk	Government Responsibilities	Suggested support to be provided by the Oil Industry	The responsibility of CNOOC in such initiatives
Infrastructure	Capacity of key regional roads to accommodate oil industry traffic volumes	The Government of Uganda is upgrading the P1 road between the Buhuka Flats and Hoima (P1). The ESIA recommends that this road be tarred to limit dust through villages.	Oil industry alignment on regional biodiversity planning and support of regional biodiversity initiatives	CNOOC to engage with Government and pursue a decision on the tarring of the road. Should Government not intend to proceed with tarring of the road, CNOOC to take responsibility for control of dust along this road during the construction period. The air quality management plan should then be amended to include responsibility for control of dust on the P1 during the construction period, paying particular attention to application of dust suppressants on roads passing through villages.
	The proposed upgrade of R5 Northern Road through Bugoma Forest as an oil road	Government proposal to upgrade R5: recommendation that Government reconsider this decision in light of biodiversity sensitivity of ecosystem, particularly in support of Eastern chimpanzee	Oil industry alignment on regional biodiversity planning and support of regional biodiversity initiatives	CNOOC to indicate clearly to government that this particular road is not required for their proposed operation during either construction or operational period (letter has already been sent to Government). CNOOC to engage with government to encourage a decision not to upgrade this road.
Emergency response capability	Limited emergency response capability within the region	It is Government's responsibility to provide urbanised areas with emergency response services	The oil industry is encouraged to engage with government in the development of an emergency response plan, training program and support for the development of appropriate resources in the local area to respond to pollution and civil emergencies such as residential/urban fires	CNOOC to actively engage with physical development plan and local government to ensure that proposed urbanisation that will result from physical development plan is supported by appropriate emergency's response capability within the local area. The extent of such support to be determined in discussion with government.

	Cumulative impact or identified risk	Government Responsibilities	Suggested support to be provided by the Oil Industry	The responsibility of CNOOC in such initiatives
Urbanisation	Increased urbanisation due to in migration with associated reduced reliance on traditional lifestyles	It is government's responsibility to pursue and implement the development of villages, towns and associated support infrastructure	Oil industry encouraged to support the development of town planning capacity, to actively participate with government in regional planning to ensure that future urban plans do not impact negatively upon the requirements of the oil industry (encroachment into buffer areas) or result in undue environmental deterioration through unstructured planning and settlement	CNOOC to actively engage with government in relation to the proposed Buhuka flats physical development plan and specifically as it relates the requirements to revise the plan to ensure that the Kingfisher development project environmental impacts, as currently assessed, are appropriately considered by government in finalisation of the physical development plan.
Biodiversity	Threat to regionally important biodiversity	It is the responsibility of Government to manage biodiversity resources within the regional area. Specifically, to ensure that there is adequate enforcement and protection provided to such resources and that appropriate plans are in place to monitor change on biodiversity protected areas and biodiversity critical habitats	Industry encouraged to establish a forum to identify areas of importance within areas of project cumulative influence and pursue regional biodiversity plans and support the implementation of such plans. Specifically, a focus on research, long-term management of population health & reproduction and detection of change within both habitat and species	CNOOC to participate actively in the establishment and running of an industry collective aimed at regional biodiversity management and bear their share of costs in support of regional biodiversity initiatives. Specifically, to ensure that regional biodiversity plans cater for the following species of concern: - Grey crowned crane - Eastern Chimpanzee - Nahan's francolin -Mud snails
	Increased pressure on natural resource use	It is the responsibility of government to manage population distribution within the region, access to and limitation on the harvest of natural resources and management and stewardship of forest resources	Industry support for regional biodiversity planning and support for identification and development of appropriate programs to reduce the reliance on traditional materials for construction and biomass burning for purposes of cooking.	CNOOC to actively participate in regional biodiversity planning and bear their share of cost associated with such efforts
	Threat to Lake fish stocks due to over exploitation	It is the responsibility of government to appropriately regulate and control the fishing industry. This includes commercial and subsistence fishing.	Lake fish stocks are not limited to the Kingfisher development project area only where enhanced road access has exacerbated the over-exploitation of fish stock. The oil industry is encouraged to engage with government to support the development of a Lake Albert fisheries plan, support Government in the implementation of the plan and support the development of an appropriate long-term monitoring program to detect change in key indicator species. The oil industry is also encouraged to consider initiatives to introduce local species aqua-culture to provide additional protein into the local community to alleviate pressure on wild stock; also, to consider the development of aquaculture for purposes of restocking depleted lake populations	CNOOC to actively participate in support of oil industry initiative to support government to manage fish stock and threat on fishing industries. CNOOC to bear their portion of cost in this regard.
Food security	In-migration posing a risk to food security	Ugandan local Government Sub-county administration are in process of pursuing strategies aimed at improving agricultural production. The intent is to both solve regional farming problems affecting production such as crop failures due to disease and drought. Interventions may include introduction of modern farming methods, training of farmers in post-harvest techniques, development of accessible market access mechanisms, and sensitising farmers about land degradation.	Provide support to this regional agricultural program particularly centred around the oil development node at Kabaale. Increasing sustainable food production, and improving agricultural capacity and access to markets, will in the long term reduce pressure to convert new areas of natural land to agricultural use and decrease reliance on forest harvested products.	CNOOC to participate actively in the regional agricultural program and co-ordinate the involvement of the oil industry in support of this initiative
In migration: Veterinary	In migration will introduce additional pressure on local government resources to provide Veterinary control with associated risk of a break of Veterinary diseases	It is the responsibility of government to provide a regional Veterinary service to ensure that the risk of outbreak of Veterinary disease is appropriately controlled	The oil industry is encouraged to work with government to develop a regional Veterinary control plan to ensure that in migration associated with the oil industry does not result in outbreak of Veterinary disease, in particular vaccination programs against rabies in domesticated animals and brucellosis in cattle	CNOOC to actively support industry initiatives to develop joint Veterinary control plans with in the region and specifically to support the Government in local Veterinary control plans and vaccination programs targeting the KFDA

	Cumulative impact or identified risk	Government Responsibilities	Suggested support to be provided by the Oil Industry	The responsibility of CNOOC in such initiatives
In migration: human health	In migration is likely to overtax the already limited regional health facilities under strain from a burgeoning population and refugee influx into the Western Ugandan area.	It is the responsibility of government to provide a regional health service and appropriate preventative medical programs	The oil industry is encouraged to support government in the planning and development of appropriate health control plans for the cumulative regional areas. Specifically, health emergency response plans in the event of communicable disease outbreak (haemorrhagic fevers in particular) and waterborne vector control (malaria and similar)	CNOOC to support local health programs and participate actively in oil industry regional initiatives in support of government health program and preventative medicine programs and emergency response to health incidence

7.0 PERFORMANCE ASSESSMENT, CORRECTIVE ACTION, MANAGEMENT REVIEW AND AUDITING

The assessment of performance and provision for corrective actions has the following aims:

- Confirmation of compliance with the requirements as set out in the C-ESMP, i.e. Construction Contractor performance measured against the C-ESMP;
- Measurement of environmental and social performance (degree of success of the C-ESMP specifications in managing social and environmental impacts); and
- Ensuring that any deficiencies in the Contractor's performance or the C-ESMP itself are identified and remedied.

Aims will be met by responsible parties and will entail:

- Ongoing monitoring / inspections undertaken by full time site staff (the ESO(s) and CLO(s) as part of CNOOC's team);
- Senior staff review (CNOOC Environmental Coordinator); as well as review by independent consultants (where considered necessary by CNOOC or CNOOC Environmental Coordinator);
- Auditing by independent consultants; and
- Corrective action by the Construction Contractor shall ensure that any identified problem areas identified by CNOOC's team are effectively addressed. Specifications for monitoring, review and auditing are provided in the sections below.

CNOOC must establish a database management system to store and track the findings of the various monitoring programmes so that the appropriate modifications to the plans can be made.

7.1 Environmental Monitoring Strategy

A monitoring[19] strategy must be defined to ensure that the effectiveness of mitigation measures can be tracked and corrective action (see Table 7-1) taken as necessary. Monitoring is not only intended to verify the contractor's compliance with the C-ESMP but also to assess the effectiveness of environmental management, independently of whether the specifications in the C-ESMP have been complied with.

Table 7-1 defines, in broad terms, the monitoring requirements necessary during the construction phase of a project. Monitoring is undertaken by CNOOC's team, with assistance where necessary, from the CNOOC Environmental Coordinator and from Specialist Consultants. Much of the monitoring in this kind of civil construction contract involves the ESO or CLO being present when potentially significant construction activities are taking place, being observant, and checking that the Construction Contractor is not materially deviating from the requirements set out in the C-ESMP.

There are some specific metrics that define performance and are based on actual quantitative measurements (dust and noise are examples), but much of the monitoring is simply careful observation to check that the Construction Contractor is meeting the obligations set out in the C-ESMP. Even in the case of noise and dust, it is not always necessary to measure performance against the quantifiable standards, and this judgement must be made at the time by the ESO and the EC, depending on the circumstances. The performance standards often provide an indirect measure of effectiveness – for example, the monitoring of the Contractor's compliance with local employment requirements and the communication of these requirements widely is an indirect measure of the control of in-migration.

It must be noted that this monitoring strategy must be considered a live strategy and must be updated and amended as required, based on the findings of the various monitoring plans.

[19] *Monitoring is a process of surveillance, based on specified approaches and schedules, used to detect whether any changes have occurred in the predefined, quantifiable properties of the particular environment under consideration.*

Table 7-1: Monitoring requirements.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
Community Nuisance (Dust)	To be based on the location of sensitive receptors in relation to construction activities. ESO/CLO to prioritise locations in which monitoring is required	Daily observation at key locations where dust is being generated near sensitive receptors Passive sampling when specified by the ESO/CLO in cases where dust impact is in question either due to visible evidence or public complaint	**Observation:** ■ ESO to monitor and log dust incidents where dust control is ineffective or only partially effective in sensitive areas. Log to include time of day, period over which incident occurs, and apparent severity (low, medium, high); and ■ Data from dust fall buckets measuring dust fall must be compared with standards for residential and construction/ industrial/mining areas. **Community Concerns:** ■ Number of community complaints recorded in the Compliments and Complaints register or made directly to the CLO. **Quantitative Monitoring** ■ Dust Fall: 600 mg/m^2 /day (measured over 30 days).	Monthly ESO/CLO progress reports	ESO/CLO	■ Air Quality Management Plan; ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification; ■ CUL-QHSE-L2-016 Monitoring and Measurement Equipment Management Procedure; and ■ CUL-QHSE-L2-017 Monitoring and Measurement Management Procedure.
Air quality	Suitable ambient air quality monitoring network for the construction phase	Ongoing	■ Fine PM_{10} particulate monitoring via active monitoring methodologies; ■ Monitoring of gaseous trace gas pollutants (i.e. SO_2, NO_2, O_3 etc.) with passive diffusion tubes should be undertaken biannually (twice a year during construction); and	Monthly air quality monitoring reports	ESO/CLO	Air Quality Management Plan

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Audit and optimise the air quality monitoring network annually audit to ensure that it is maintained in accordance with best practice and is relevant to the key emission sources on the ground **Quantitative Monitoring:** ■ Suspended Particulates (Ugandan daily standard): ≤200 µg/m^3; ■ PM_{10} (IFC daily standard): ≤50 µg/m^3; ■ PM_{10} (IFC annual standard): ≤20 µg/m^3; and ■ Respirable particulate matter ■ (<10 µm) (Ugandan daily standard <100 µg/m^3).			
Community Nuisance (Noise)	To be based on the location of sensitive receptors in relation to construction activities. ESO/CLO to prioritise locations in which monitoring is required	Daily observation at key locations where noise is being generated near sensitive receptors Noise monitoring using an integrating noise meter as specified by the ESO/CLO when there is clear evidence of community	**Observation:** ■ ESO to monitor and log noise incidents where noise control is ineffective or only partially effective in sensitive areas. Log to include time of day, period over which incident occurs, and apparent severity (low, medium, high). **Community Concerns** ■ Number of community complaints recorded in the Compliments and Complaints register or made directly to the CLO	Monthly ESO/CLO progress reports	■ ESO/CLO	■ Noise and Vibration Management plan; ■ CUL-QHSE-L3(GE)-056 Noise Management Specification; ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
		nuisance.	**Quantitative Monitoring:** ■ Need to be in compliance with Ugandan Noise standards for construction. In their absence, the World Health Organization guidelines for daytime and night-time noise should be adopted.			Monitoring Specification.
Population influx and social pathologies	Camp sites, work sites	Ongoing watching brief	■ Compliance with PLA employment requirements; ■ No ad hoc employment at the work sites or camp sites; ■ Adherence to closed camp, alcohol-free camp policy; ■ Evidence of implementation of communicable disease programmes; and ■ Compliments and Complaints Register.	■ Construction contractor; ■ Communications Plan; and ■ ESO/CLO progress reports.	CLO/ESO Construction contractor	Influx Management Plan.
Communicable Diseases	Non-specific	Ongoing watching brief	■ CNOOC-approved STI Management Plan; ■ Number and nature of initiatives as per the plan; ■ CNOOC-approved Malaria Management Plan; ■ Record of actions taken in accordance with the Malaria Management Plan; ■ Record of STI and malaria incidents recorded among Contractor staff; and	■ STD Management Plan; ■ Malaria Management Plan; ■ ESO/CLO monthly reports; and ■ Malaria/STD incidence reports.	ESO/CLO Construction contractor	Community Health, Safety, and Security Management Plan.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Record of induction training and tool box talks.			
Traffic and Pedestrian Safety	Principally areas where households and construction teams interact	Ongoing watching brief	■ Vehicle accident records; ■ Pedestrian accident records; ■ Near misses; ■ Compliance with speed limits; ■ Advanced driver training for Contractor heavy vehicle staff; ■ Community safety references in induction briefings and ongoing toolbox talks; ■ Safety briefings of communities; and ■ Compliments and Complaints Register.	■ Accident/incident reports; and ■ ESO/CLO progress reports.	ESO/CLO Construction contractor	Traffic Management Plan
Water Use Management	Community boreholes within 1 km of project boreholes. Water abstraction sites	Ongoing	■ Records of groundwater use; ■ License for use of water from the Directorate of Water Resources Management (DWRM); ■ Records of monitoring of impact on community water supply when Project supply closer than 1 km to community borehole; ■ Records of corrective action, where necessary; and ■ Record of authorisation of use of surface water.	■ Record of community borehole monitoring; ■ Groundwater abstraction report; ■ Surface water abstraction report; and ■ ESO monthly report.	Construction contractor ESO	■ Water Management Plan; ■ Water Act (Cap 152); and ■ Uganda Bureau of Standards (US 201) Specification for Drinking (Potable Water; 1994).
Vehicle and Materials Management	Camp sites, work sites	Ongoing watching brief	■ Records of inspection and maintenance of vehicles and equipment;	■ ESO progress reports;	Construction contractor	Traffic Management Plan; and

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Approved method statement for handling of hazardous materials on site; ■ Compliance with requirements of approved method statement; ■ Inventory of hazardous materials and CNOOC's Documentation available at specified locations; ■ Documentation confirming PCB and CFC free equipment; ■ Protection of fuel storage and camp generators as per requirement; ■ Availability of spill/drip clean-up materials at specified locations; ■ Availability of sheeting/drip trays in all key vehicles; ■ Incident and corrective action records; ■ Provision of appropriate PPE to employees; ■ Records of induction training and tool box talks; and ■ Records of bio-remediation.	■ Logistics Superintendent progress reports; ■ SHE advisor progress reports; and ■ Camp manager progress reports.		■ Waste Management Plan.
Natural Heritage – general and bush clearing	Project footprint and surrounding areas	Ongoing watching brief	■ Induction and toolbox talks about protection of plants and wild animals; ■ Record of training of dozer operators to minimise Project footprint;	ESO progress reports.	ESO	Cultural Heritage Management Plan.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Record of training vehicle operators to remain within the approved Project footprint. ■ Records of removal of dangerous animal from work sites and camps; ■ Records of communication with IUCN regarding reptile identification; ■ Absence of evidence of hunting or animal harassment; ■ Absence of evidence of unauthorised vehicle access outsider of the approved Project footprint; ■ Records of ESOs accompanying surveyors and dozer operators during bush clearing and salvaging of threatened species or relocation of infrastructure to avoid local areas of high biodiversity; and ■ Footprint compliance with C-ESMP buffer zones and access restrictions.			
Natural Heritage – alien invasive species	Project footprint and surrounds	Ongoing watching brief	■ Records of wash-down of site vehicles and equipment prior to use on site to remove alien weeds; ■ Production of illustrated alien invasive species booklet; ■ Photographic record and GPS locations of alien infestation in Project footprint area; and	■ Records of vehicle wash-down; and ■ Records of alien plant identification and removal; and	ESO	Biodiversity Management Plan.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Records of application of removal strategy.	■ ESO monthly report.		
Natural Heritage – rehabilitation management	Project footprint	Ongoing watching brief	■ Record of induction and toolbox talks for dozer operators; ■ Record of training of dozer operators regarding topsoil removal; ■ Absence of contamination of topsoil with other materials; and ■ Evidence of reinstatement as per rehabilitation requirements of the specification.	■ Photographic record pre-bush clearing; and ■ ESO monthly report.	ECO/ESO	
Cultural Heritage	Project footprint and surrounding area	Ongoing watching brief	■ Records of training of key personnel to identify cultural/ archaeological artefacts; ■ Record of communication with communities to verify location of sacred sites when construction is within 100 m of a known cultural heritage site; ■ Compliments and Complaints Register; and ■ Compliance with Chance Find Procedure and subsequent recommendations by specialist where artefacts are found.	■ Specialist Report (if significant artefacts found); and ■ ESO/CLO monthly report.	ESO/CLO Specialist archaeologist	
Employment	Project Area	Ongoing watching brief	■ Signed Project Labour Agreement (PLA); ■ Evidence of maximising labour use in preference to machinery, where practical;	■ Project Labour Agreement; ■ Records of employment;	Construction contractor CNOOC Local Procurement Officer	Labour, Working Condition, and Employment Management Plan

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Compliance with the Community Liaison Forum procedure for selection and vetting of unskilled personnel; ■ Compliance with the PLA; ■ Records of communication initiatives to improve understanding of Project-affected communities about how to apply for a job; ■ Percentage of unskilled workers from Project-affected communities; ■ Evidence of vetting semi-skilled and skilled workers according to the 'spiral' principle; ■ Percentage of women, disabled or otherwise disadvantaged people employed; ■ Provision and briefing of personnel about the grievance procedure; ■ Workers understanding and use of the Grievance Procedure; and ■ Frequency of complaints in the Compliments and Complaints Register rand the Grievance Procedure.	■ Grievance Procedure; and ■ CNOOC Local Procurement Officer monthly report.		
Local Procurement	Project Area	Ongoing watching brief	■ Implementation of CNOOC procurement of local Goods and services; ■ Local procurement records in compliance with approved Local	■ Construction contractor Local Content Plan; and	Construction contractor CNOOC Local Procurement Officer	Procurement of Local Goods and Services Management Plan.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Content Plan, developed in accordance with the CNOOC procedure; and ■ Local content spend in relation to total spend.	■ CNOOC Local Procurement Officer monthly report.		

In addition to the above the following must be implemented:

Groundwater monitoring

The following locations must be **sampled and monitored quarterly** (every 3 months) during the construction phase of the project (8 years).

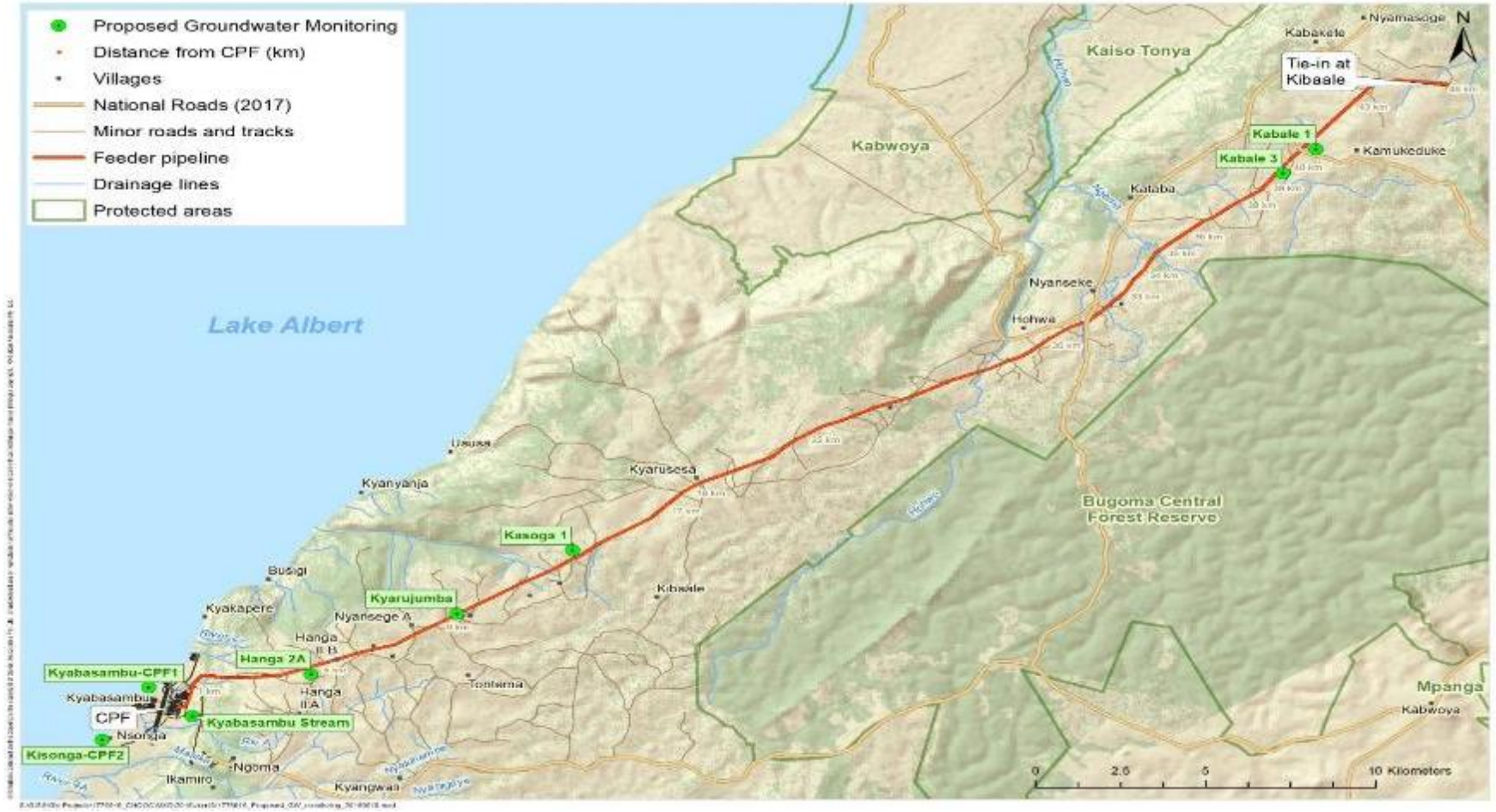


Figure 6: Proposed Groundwater monitoring sites

The Table below outlines the location and parameters that should be monitored for the groundwater sampling sites.

Table 7-2: Water quality sampling for selected groundwater sites for the CPF, wells and ancillary infrastructure

Sample Description	Coordinates (Decimal Degrees)		pH	EC (mS/m)	Total Hardness ($CaCO_3$)	Total Alkalinity ($CaCO_3$)	TDS	Sulphate (SO_4)--	Nitrate (NO_3-N)	Calcium	Magnesium	Sodium	Chloride	Aluminium	Lead	Mercury	Iron	Copper	Manganese	Selenium	Nickel	Chromium	Faecal Coliforms
	North	East																					
US 201 Potable Water Standard (Class 2)			6.5 – 8.5	250			1200			75	50	400	500	0.2	0.01	0.001	0.03 - 3.5		0.1 – 0.5	0.01		0.05	
Ugandan Drinking Water Standard (NEMA, 1996			6.5 – 8.0	250	500		600	200	5	-	-	-	-	0.2	0.01	0.001	0.03 - 0,5	1	0.1 - 0.5	0.01	0.02	0.05	N
Kyabasambu (CPF 1)	1.25287	30.744691	7.1	719.3	1362	304	4776		2.21	262.4	168	858.9	2420.9	-	0.02	-	0.04	-	1.54	-	-	-	Y
Kisonga – CPF2	1.234941	30.732276	10.03	58.9	-	88	387.8	-	0.11	16	48	-	0.03	0.03	0.0025	0.0011	0.04	-	0.0007	0.014	-	0.0003	Y
Kyabasambu stream	1.242998	30.756071	10	35.1	-	76	284	-	1.3	48	19.2	-	0.03	-	-	0.001	0.05	-	0.0016	0.01	-	-	Y

Surface water monitoring

The following locations must be **sampled and monitored monthly** during the construction phase of the project (8 years):

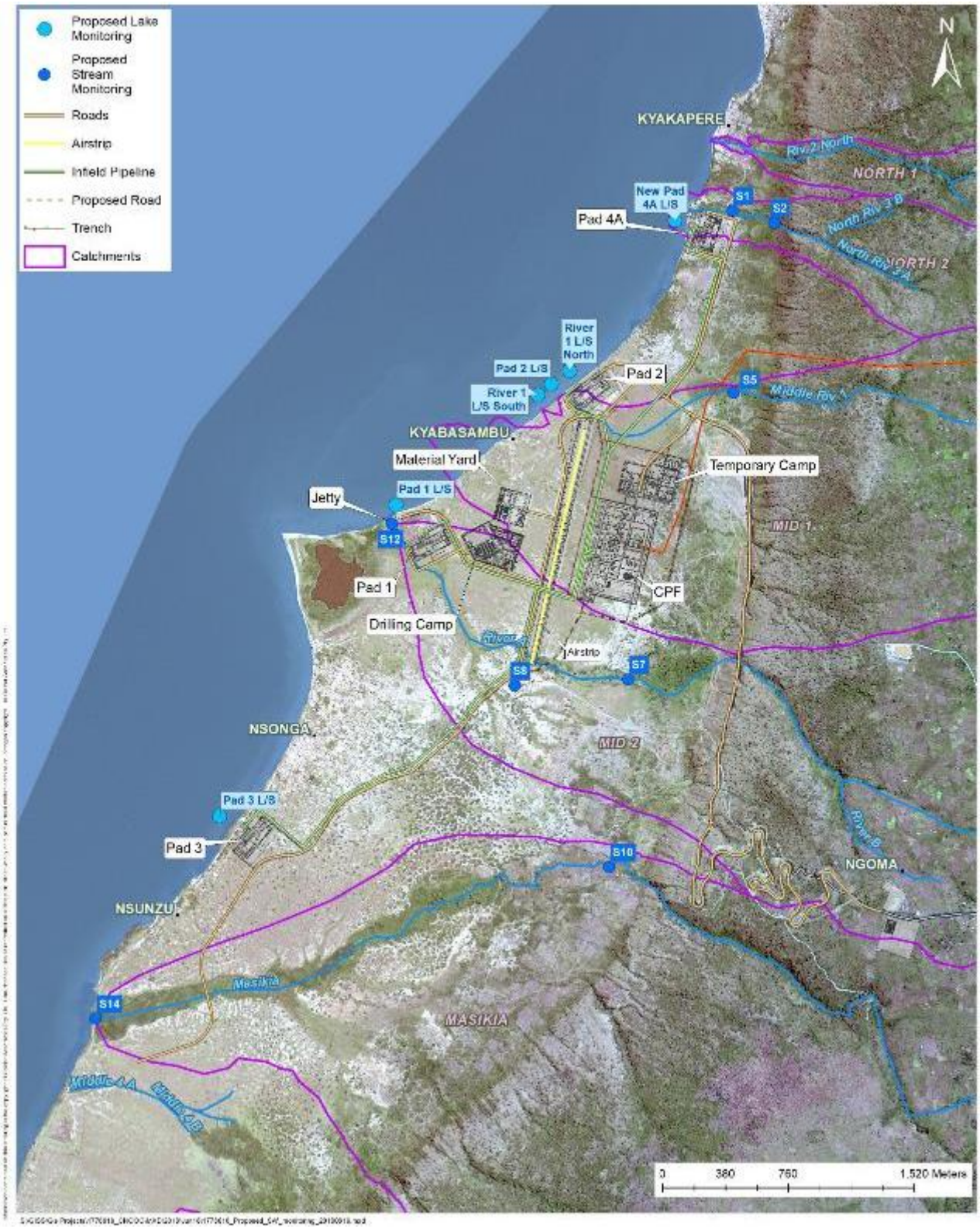


Figure 7: Proposed Surface Water monitoring points

The Tables below outline the location and parameters that should be monitored for the surface water and lake shore sampling sites:

Table 7-3: Location of surface water monitoring points

Monitoring Point ID	Name or Description	Coordinates (Decimal Degrees)	
		North	East
S1	Tributary associated with proposed road cross section 3 (Kyakapere)	1.26472	30.75764
S2	Upstream of cross section 3 - Kyakapere (upstream)	1.22883	30.75097
S5	Upstream of Spoil Area A(Quarry and Asphalt Plant) (Kowet)	1.21694	30.72425
S7	Kamansinig river upstream of the airstrip	1.20750	30.73461
S8	Culvert on Kamansinig river western side of the proposed airstrip	1.20769	30.73378
S10	Maslka river downstream of proposed Spoils Area B (Nyakateke)	1.23925	30.74886
S12	Kamansinig river inflow to Bugoma Lagoon and adjacent to Jetty (associated with Pad 1)	1.38586	30.99458
S14	Downstream of Maslka prior to entering Lake Albert	1.26797	30.75853
Pad 1 L/S	Lake shore monitoring point adjacent to Drill Pad 1	1.248617	30.739358
Pad 2 L/S	Lake shore monitoring point adjacent to Drill Pad 2	1.255222	30.747797
Pad 3 L/S	Lake shore monitoring point adjacent to Drill Pad 3	1.231594	30.729817
New Pad 4A L/S*	Lake shore monitoring point adjacent to Drill Pad 4A	1.264184	30.754502
River 1 L/S North*	Lake shore monitoring point +/- 100m North of Drill Pad 4A	1.255964	30.748796
River 1 L/S South*	Lake shore monitoring point +/- 100m South of Drill Pad 4A	1.254638	30.747085
Sewage treatment plant *	Treated sewage effluent from both sewage plants	-	-

* = new monitoring point

Table 7-4: Parameters to monitor for surface water monitoring sites

Sample Description	pH	EC (mS/m)	Total Hardness ($CaCO_3$)	Total Alkalinity ($CaCO_3$)	TDS	Sulphate (SO_4)--	Ammonia Nitrogen (NH_3N)	Nitrate (NO_3-N)	Calcium	Magnesium	Sodium	Chloride	Aluminium	Lead	Mercury	Iron	Copper	Manganese	Selenium	Cadmium	Arsenic	Nickel	Chromium	Faecal Coliforms (Y/N)
US 201 Potable Water Standard (Class 2)	6.5 – 8.5	250			1200				75	50	400	500	0.2	0.01	0.001	0.03 - 3.5		0.1 – 0.5	0.01	0.01	0.01		0.05	
Ugandan Drinking Water Standard (NEMA, 1996)	6.5 – 8.0	250	500		600	200	1	5	-	-	-	-	0.2	0.01	0.001	0.03 - 0,5	1	0.1 - 0.5	0.01	0.01	0.01	0.02	0.05	N
S01																								
S02																								
S05																								
S07																								
S08																								
S10																								
S12																								
S14																								

Table 7-5: Monitoring parameters for Lakeshore monitoring sites

Parameters	Units	*Nat Std	Pad 1 L/S	Pad 2 L/S	Pad 3 L/S	New Pad 4A L/S*	River 1 L/S North*	River 1 L/S South*
Total Depth	m		1.5	2.6	1.8			
Secchi Depth	m		0.7	0.81	0.71			
Dissolved Oxygen	mg/L	**NS**	7.53	7.03	7.56			
Temp	°C	**20-35***	28.4	27.8	28.5			
Conductivity	µS/cm	**2500**	634	633	632			
pH	--	**6.5-8.5**	9.60	9.61	9.45			
Alkalinity	mg/L	**500**	316	316	324			
Hardness	mg/L	**500**	180	160	180			
TDS	mg/L	**1200**	304	317	310			
TSS	mg/L	**0**	3	1	2			
Turbidity	NTU	**10**	2	2	4			
Calcium: Ca^{2+}	mg/L	**75.0**	20.8	24	24			
Magnesium: Mg^{2+}	mg/L	**50.0**	30.7	24	28.8			
Fluoride: F^-	mg/L	**1.5**	1.2	1.2	1.1			
Iron	mg/L	**5**	0.01	0.02	0.04			
Sulphate	mg/L	**200**	11	10	11			
Chloride: Cl^-	mg/L	**500**	0.05	0.05	0.05			
BOD_5 at 20°C	mg/L	**30***	0.0	0.9	0.5			
COD	mg/L	**100***	11	11	7			
SRP	mg/L	**5000***	0.003	0.001	0.002			
TP	mg/L	**10**	0.026	0.029	0.044			
Nitrate	mg/L	**4.5**	0.023	0.095	0.055			
Nitrite	mg/L	**3**	0.008	0.010	0.002			
Ammonia	mg/L	**1**	0.008	0.022	0.015			
Total Nitrogen	mg/L	**10**	0.32	0.185	0.122			
Chlorophyll a	µg/L	**NS**	2.1	2.1	1.0			
Faecal coliform	CFU/ 100mL	**0**	50	2	10			

Noise monitoring

The following locations must be **monitored continuously for two months per drill site each time a site is re-entered as well as during any other construction activities,** of the project (8 years). The findings of this monitoring must then be used to adapt the Noise Management Plan for a more effective management. Furthermore, once the Physical Development Plan is finalised, these management and monitoring plans must be revised.

Figure 8: Proposed Noise Monitoring Locations

Table 7-6: Noise monitoring location co-ordinates

Monitoring Location Number	Decimal Degrees	
	North	East
CPF NMP1	1.245564	30.753945
CPF NMP2	1.242676	30.750739
Pad 1 NMP1	1.248025	30.743049
Pad 2 NMP1	1.253655	30.748192
Pad 2 NMP2	1.255983	30.751441
Pad 3 NMP1	1.232105	30.732896
Pad 4A NMP2	1.26533	30.756837
Pad 4A NMP1	1.261612	30.755699

Socio-Economic monitoring

When monitoring the effectiveness of the Resettlement process, the RAP monitoring programme must be implemented and should incorporate the relevant IFC standards. It is recommended that the social management plans outlined in this document may need to be re-visited and adapted to take into account the Physical Development plan, should it be implemented by the Government of Uganda.

7.2 Inspections and Reporting

7.2.1 Monthly Reporting

The ESO and CLO shall be full time appointments for all projects that require NEMA authorisation, and shall produce a monthly compliance monitoring report, which covers all aspects of compliance with the specification in this C-ESMP. The content of the report shall include, but not be limited to:

- Main site activities during the month;
- Community nuisance (e.g. dust, noise);
- Community health and safety;
- Traffic and pedestrian safety;
- Hazardous waste management;
- Non-hazardous waste management;
- Spills and hazardous product management;
- Waste management;
- Influx Management;
- Biodiversity Management;
- Ecosystems services management;
- Cultural heritage;
- Natural heritage;
- Bush clearing and topsoil stockpiling;
- Rehabilitation;
- Control of alien invasive plants;
- Erosion and sedimentation;
- Communication with stakeholders;
- Compliments and complaints;
- Trends in performance;
- Corrective actions/Conformance Certificate; and
- The format of the report may be modified with the agreement of the CNOOC Environmental Coordinator and Public Affairs Coordinator.

7.2.2 Corrective and Preventive Action

The need for corrective action shall arise from:

- Material deviations from a predetermined baseline or limit (as detected by monitoring); or
- General inspections based on C-ESMP requirements.

CNOOC shall establish an incident and non-conformance reporting procedure which shall be implemented prior to the initiation of any works. The procedure shall set out a structure for the proper recording of incidents/non-conformances and shall determine the necessary reporting channels.

Incident recording shall include a brief description of the non-conformance with the contract specification, the date it was first logged, the reason for the non-conformance, the responsible party, the result (consequence), the corrective action taken, and any necessary follow up required. Repeated non-compliances in respect of the same issue shall be highlighted. Corrective actions may include:

- Implementation of a specific action to remedy an identified non-conformance; or
- A recommended change in the targets or objectives set in the C-ESMPs[20]. In this case, following discussion and agreement with CNOOC, the proposed change shall be brought about in the C-ESMP, which shall be submitted to Government as a part of CNOOC's six monthly reporting cycle.
- Should a Government Authority audit find that construction activities are causing unacceptable environmental damage, CNOOC shall immediately consult with CNOOC and agree, in consultation with the Government Authority, the remedial measures to be undertaken. Such agreed measures shall be implemented as quickly as possible to prevent further damage and to repair any damage that may have occurred.

7.2.3 Environmental Committee Meetings and Reporting

CNOOC must establish an environmental committee that includes as a minimum: the ESO, the EC, a member of the Community Liaison Team, and the Contractor's environmental representative. This committee shall meet every two weeks to review environmental performance, including incidents/ non-conformances reported, corrective actions implemented, monitoring results and C-ESMP compliance. The meeting must be documented.

7.2.4 Six-Monthly Report

The CNOOC Environmental Coordinator must prepare a report every six months for submission to CNOOC management and NEMA. The report must:

- Summarise environmental and social performance over the 6-month period and examine any trends and corrective actions taken to comply with the C-ESMP.
- Evaluate environmental performance by reviewing monitoring results;
- Consider trends over the period as an indication of improving or deteriorating performance;
- Identify any critical areas of performance that require immediate improvement;
- Evaluate changing circumstances and lessons learned that may need to influence and be reflected in the C-ESMP; and
- Set new objectives or specifications in the C-ESMP, as appropriate.

[20] *Modification to the ESMPs may only be made by the CNOOC Environmental Co-ordinator. If the changes are major or are material changes as defined in CNOOCs license, an independent environmental specialist must verify their applicability and the ESMP must be submitted to NEMA.*

7.2.5 Independent Audits

An independent auditor shall prepare the project audits. An audit procedure shall be developed by CNOOC to ensure that audits are sufficiently comprehensive and comply with the requirements of the National Environment (Audit) Regulations, 2006 (currently under review), the Regulation on the Environmental Audit Process. The audit procedure shall include:

- Audit approach;
- Scheduling;
- Reporting; and
- Responsibilities.

There shall be two audits, scheduled as follows:

- Post-construction audit report based on a site visit, the review of monthly monitoring reports and discussion with the Contractor's environmental team, CNOOC's environmental team and any other party whose views/ opinions are relevant; and
- Final audit report at the end of the construction contract and at the end of the maintenance period (one-year post contract sign-off), prior to CNOOC's representative issuing a closure certificate for rehabilitation.

Auditing shall consider monitoring results to assess whether C-ESMP objectives and targets have been met, and whether there has been any significant non-conformance with the C-ESMP and/ or legal requirements.

The audit shall also assess whether EMP implementation has been undertaken according to the planned staffing and administrative arrangements and whether respective EMPs are being appropriately updated. The audit shall ascertain whether any identified corrective action has been undertaken and assess the effectiveness of the action as a basis for recommendations to improve contractor performance and the effectiveness of the C-ESMP.

8.0 COMPETENCY, TRAINING AND AWARENESS CREATION

8.1 General Training Requirements

The Contractor shall ensure that training is provided to all employees about CNOOC's commitment to conduct the proposed activities in a manner that is respectful to local people, and which minimises the impact on their lands, resources and the natural environment. Training shall take the form of, but not be limited to:

- Induction training;
- Use of educational posters; and
- Daily environmental discussion topics prior to the start of each shift (toolbox talks).

The Contractor shall provide induction training material and key educational posters to the Engineer for approval prior to establishment on site. Ongoing toolbox talks and educational posters shall be structured to meet specific needs, depending on the activities being undertaken. The Contractor shall maintain an updated list of all training sessions for review at the monthly meetings. For induction training, the material shall include (but not be limited to) the following:

- CNOOC's corporate environmental, health and safety policies and applicable Ugandan environmental regulations;
- Avoidance of activities outside of the approved construction right of way;
- Traffic and pedestrian safety;

- Permitted communication and courteous behaviour in interactions with communities;
- Purchase of food and goods from hawkers;
- Management of STIs and malaria;
- Alcohol and drug policy;
- Minimising nuisance impacts on local communities;
- Minimising impacts on cultural heritage (including Chance Find Procedure);
- Minimising impacts on natural heritage (hunting, harassing animals, plant collection, animal collection for sale as pets);
- Dealing with dangerous animals;
- Handling potentially hazardous and polluting substances;
- Use of sanitary facilities on site;
- Dealing with pollution spills;
- Littering;
- Firefighting procedures;
- Procedure for emergency response; and
- Reporting of incidents.

Toolbox talks shall be structured to provide more detail around the specific tasks that are the responsibility of the construction crew. Contractors and CNOOC shall make financial provision for unforeseen potential impacts that may require specific mitigation/management measures.

8.2 Specialist Training Material

CNOOC shall prepare and provide to the Contractor the following field booklets for use by key members of staff and for dissemination to employees, as requested:

- 'Encountering Wild Animals': the booklet shall contain easy to understand, fully illustrated information about wild animals that could be encountered, whether they are dangerous, and the necessary actions to be taken in the event that they are found;
- 'Managing Alien Invasive Plant Species': The booklet is to include all alien plant species listed in the C-ESMP, with clear illustrations and recommended methods of eradication; and
- 'Good Relationships with Communities': The booklet is to provide all personnel with basic rules of courteous communication with community members when encountered in the field.

8.3 Handling of Dangerous Snakes and other Animals

The Contractor is to train selected members of staff in safe methods of handling snakes and other potentially dangerous animals. Sufficient capacity shall be developed to ensure that there is always a trained member of staff on site in the event that a snake needs to be removed from a work site or camp. The necessary snake handling equipment is to be provided to the employees responsible for removing snakes. All animal relocations are to be photographed, logged and reported at the monthly meetings.

In cases where reptiles that are captured could be rare (including snakes, skinks, lizards) they should be photographed and temporarily kept in safe containment until they can be positively identified and safely relocated by a suitably qualified professional.

9.0 EMERGENCY PREPAREDNESS AND RESPONSE

All emergencies shall be handled according to the existing CNOOC Emergency Plan. CNOOC's Emergency Response Team shall provide immediate response to any significant incident, and the emergency contingency plan will also be integrated with that of the local Municipality, if required.

The Project and Contract manager shall establish and maintain procedures to identify the potential for, and the response to, new accidents and emergency situations in accordance with recognised international standards. The procedure shall also address measures to prevent such situations and to mitigate environmental impacts that may be associated with them.

It is also recommended that the Emergency Response Plan is finalized and reviewed by independent experts, taking into consideration the sensitivities in the project area and the need for very rapid response times in the event of an accident.

Finally, it is recommended that CNOOC's safety management systems and risk management performance in respect of accidents is reviewed annually by external auditors with extensive experience of hazard management and best safety practices in oil industry facilities.

Emergency plan update

When preparing additional measures for dealing with emergencies, the following aspects must be taken into account:

- An evacuation procedure that is consistent to that of the neighbouring activities, and which includes the consideration of shelter in case of gas releases;
- Details of the method for identifying and accounting for the number of persons on site at all times;
- Means of visitor control;
- All employees, contractors and visitors will be made aware/trained on the contents of the Emergency plan;
- Allocated responsibilities and specific action details;
- Training of staff to manage emergencies on site;
- Frequency of revision and update of the plan;
- A procedure for activating the emergency plan;
- An Emergency Control Centre (ECC) available on site, complete with:
  - Copies of the most recent version of the emergency plan and the most recent version of the site layout and location plans/maps;
  - Diagrams of those service facilities, communications, fire hydrants, safety refuges, building emergency exits and muster points required in an emergency;
  - Relevant equipment for both internal and external communications;
  - A readily available means of recording messages and communications in chronological order; and
  - Sufficient room to accommodate the emergency management personnel.
- Emergency resources including but not limited to:
  - On-site first aid services and facilities must be available;
  - A vehicle, suitable for the transport of casualties, must be available on site at all times;

- Fixed location firefighting equipment (extinguishers, hose reels, etc.) must be distributed and located where necessary, accordingly to a risk analysis and maintained in accordance with the manufacturer's instructions;
- Fire extinguishers must be available in all vehicles and accommodation/administration facilities;
- A fire water main system, which would include a fire water source, must be available and in good operating condition;
- All construction personnel must receive basic training in firefighting, first aid and other emergency responses;
- Regular (quarterly) emergency response drills should be held; and
- The coordination and approach regarding these resources must be consistent with neighbouring operations.

- An incident command protocol must be drawn up and agreed upon by the local Fire Service to avoid conflict when they arrive on site for large incidents;
- A Mutual Aid corporation agreement with neighbouring sites should be negotiated. This agreement should address all relevant factors, such as financial contributions by both parties, maintenance of equipment, emergency response plan shared between the two sites, location of emergency response vehicles, training etc.; and
- Measures to be taken in respect of unplanned fires and explosion hazards are:
  - The CPF control room lies within a damage zone affected by an explosion. A blast proof design should be considered;
  - The consequences of an explosion or a fire on the well pads would exceed the maximum threshold values at the duty room, living quarters, manager's room, meeting room, security room in all cases for an explosion and in some cases for a fire. The study recommends that prevention measures will need to be considered for the construction phase (i.e.: drilling). Flammable gas detectors must be available on the well pads (location and number to be determined). All staff must be required to leave the well pad as quickly as possible in the event of gas detection; and
  - The airstrip will be used an airfield during the construction phase for emergency evacuation purposes. After construction, it may be converted helipad.

In terms of the Bureau Veritas (2017) 8 critical groups for an effective management strategy on major hazards, Group D and F in particular require the following from CNOOC Uganda:

- Continuous monitoring through a Facility Status Management (FSM) system – the FSM shall provide a continuous status monitoring of Preventative Maintenance (PM) and Corrective Maintenance (CM) tasks in PMMS; and provide an indication of the state of technical integrity on the facility;
- Operations/Asset management and Technical Authorities shall review FSM at any stage and look into performance issues of a specific piece of equipment on the facility, or gain an overall picture/trend of the integrity of the facility; and
- Periodic monitoring through Audits – there are a number of specific audits which will assure the performance of SCEs and validate the daily monitoring/control through FSM:
  - Audits or any program to verify the barrier integrity and effectiveness i.e. regular Barrier Health Checks by Technical Authorities, Maintenance, Operations and Asset team members;
  - Structured technical integrity audits – such as Independent Asset Integrity Review, by technical authorities or external party; and

- Technical Integrity Framework Review – to validate the process underpinning the technical integrity monitoring.

The following prevention and control measures must be implemented within the design of the Kingfisher Field project:

Sources	Prevention and Control Measures
Storage tanks	■ Bund 110%; ■ Overfilling protection (level protection ESD – HHLL); and ■ Local level indication (DCS) – no actions.
Oil production manifold	■ Process safety control; ■ Well pad bunded and drainage system; ■ Pressure control system (HHLL, HLL etc. with automatic link to ESD); ■ Emergency shutdown control (ESD); ■ Thick walls (over pressure not possible); and ■ Corrosion prevention and allowance.
Christmas tree	■ Process safety control; ■ Pressure control system (HHLL, HLL etc. with automatic link to ESD); ■ Emergency shutdown control (ESD); ■ Wellhead control system (subsurface safety valve and surface safety valve and choke valve); and ■ Drainage system.
Well casing	■ Well integrity control; ■ Pressure control system; ■ Wellhead control system (subsurface safety valve and surface safety valve and choke valve); and ■ Drainage system.
Closed drain drum	■ Process safety control; ■ Concrete lined; and ■ Inspection regime.
Wastewater pit/ underground storages	■ Concrete lined and secondary HDPE.
Infield flowlines	■ Corrosion protection (cathodic protection and allowance); ■ Automatic pressure loss detectors; and ■ Process safety control ESD system.
CPF piping	■ Insulated which will contain small leaks; ■ Corrosion allowance; ■ Isolation valves; ■ Gas detection; ■ ESD (pressure control); and ■ Drainage system.

10.0 DOCUMENT CONTROL

The C-ESMP forms the basis for the management of environmental and social impacts on site, during the construction phase. Based on the results of the performance assessment and review process, the C-ESMP may be modified as the project progresses. Modifications shall only be permitted by the CNOOC

Environmental Co-ordinator (EC), who shall retain a single master copy of the C-ESMP on site (hard copy and electronic format). All changes to the C-ESMP must be tracked, including details of the change, date of the change and name of the reviewer. The EC shall ensure that any modifications are communicated, explained to and discussed with all affected parties (the Contractor, CNOOC management and any directly affected party who requests this information), and shall be submitted to and approved by NEMA.

CNOOC shall prepare a document control procedure which the Contractor shall comply with. This procedure shall define:

- Document distribution;
- Document retention;
- Management of C-ESMP revisions; and
- The document control procedure shall also apply to the Incident and Non-Conformance Reporting.

APPENDIX A

Environmental, Health and Safety Specifications, and Applicable Design Codes and Standards

Environmental, Health and Safety Specifications

Specification code	Specification Name
QHSE-MS - General Volume (L2)	
CUL-QHSE-L2-001	QHSE Committee Rules
CUL-QHSE-L2-002	Infrastructure and Equipment Management Procedure
CUL-QHSE-L2-003	Training Management Procedure
CUL-QHSE-L2-004	Contractor QHSE Management Procedure
CUL-QHSE-L2-005	Communication Management Procedure
CUL-QHSE-L2-006	Document Management Procedure
CUL-QHSE-L2-007	Hazard Identification and Risk Assessment Procedure
CUL-QHSE-L2-008	Legal and Other Requirements Management Procedure
CUL-QHSE-L2-009	MOC Procedure
CUL-QHSE-L2-010	Emergency Preparedness and Response Procedure
CUL-QHSE-L2-011	Engineering Quality Management Procedure
CUL-QHSE-L2-012	Engineering Schedule Control Procedure
CUL-QHSE-L2-013	Preservation of Products and Deliverables Procedure
CUL-QHSE-L2-014	Identification and Traceability Management Procedure
CUL-QHSE-L2-015	Partner Property Management Procedure
CUL-QHSE-L2-016	Monitoring and Measurement Equipment Management Procedure
CUL-QHSE-L2-017	Monitoring and Measurement Management Procedure
CUL-QHSE-L2-018	Audit Management Procedure
CUL-QHSE-L2-019	Incident Management Procedure
CUL-QHSE-L2-020	Nonconforming Product Management Procedure
CUL-QHSE-L2-021	Corrective and Preventive Action Procedure
CUL-QHSE-L2-022	Management Review Procedure
CUL-QHSE-L2-023	QAQC Procedure
QHSE-MS - General Volume (L3)	
CUL-QHSE-L3(GE)-001	QHSE Responsibility Management Specification
CUL-QHSE-L3(GE)-002	Contract QHSE Clause Specification
CUL-QHSE-L3(GE)-003	Quality Management Survey Specification for Contractor Pre-Qualification
CUL-QHSE-L3(GE)-004	QHSE Meeting Management Specification
CUL-QHSE-L3(GE)-005	Employee Participation Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-006	Stakeholder Engagement Specification
CUL-QHSE-L3(GE)-007	Respiratory Protection Specification
CUL-QHSE-L3(GE)-008	Hearing Conservation Specification
CUL-QHSE-L3(GE)-009	Radiation Management Specification
CUL-QHSE-L3(GE)-010	Ergonomics Management Specification
CUL-QHSE-L3(GE)-011	Fitness for Duty Management Specification
CUL-QHSE-L3(GE)-012	Heat Stress at Work Specification
CUL-QHSE-L3(GE)-013	Alcohol & Drugs Management Specification
CUL-QHSE-L3(GE)-014	Food & Drinking water Hygiene Management Specification
CUL-QHSE-L3(GE)-015	Medical Service Management Specification
CUL-QHSE-L3(GE)-016	Communicable Disease Management Specification
CUL-QHSE-L3(GE)-017	Stress & Fatigue Management Specification
CUL-QHSE-L3(GE)-018	Office HSE Management Specification
CUL-QHSE-L3(GE)-019	Festival and Holiday Safety Specification
CUL-QHSE-L3(GE)-020	Business Travel Specification
CUL-QHSE-L3(GE)-021	Marine Operation Specification
CUL-QHSE-L3(GE)-022	Aviation Management Specification
CUL-QHSE-L3(GE)-023	Land Transportation Specification
CUL-QHSE-L3(GE)-024	Workplace Transportation Specification
CUL-QHSE-L3(GE)-025	PPE Management Specification
CUL-QHSE-L3(GE)-026	Sign and Signal Management Specification
CUL-QHSE-L3(GE)-027	Behaviour Based Safety Specification
CUL-QHSE-L3(GE)-028	Job Hazard Analysis Specification
CUL-QHSE-L3(GE)-029	PTW Management Specification
CUL-QHSE-L3(GE)-030	Excavation Management Specification
CUL-QHSE-L3(GE)-031	Confined Space Entry Specification
CUL-QHSE-L3(GE)-032	Lifting Operation Specification
CUL-QHSE-L3(GE)-033	Electrical Safety Specification
CUL-QHSE-L3(GE)-034	Hot Work Specification
CUL-QHSE-L3(GE)-035	Fire Safety Specification
CUL-QHSE-L3(GE)-036	Working at Height Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-037	Fall Prevention Specification
CUL-QHSE-L3(GE)-038	Scaffolding Operation Specification
CUL-QHSE-L3(GE)-039	Slip and Trip Prevention Specification
CUL-QHSE-L3(GE)-040	Industry Safety Specification
CUL-QHSE-L3(GE)-041	Suspension and Resumption Specification
CUL-QHSE-L3(GE)-042	Energy Isolation Specification
CUL-QHSE-L3(GE)-043	SIMOPS Specification
CUL-QHSE-L3(GE)-044	Camp Management Specification
CUL-QHSE-L3(GE)-045	Hazardous Chemicals Management Specification
CUL-QHSE-L3(GE)-046	Explosive Management Specification
CUL-QHSE-L3(GE)-047	H2S Prevention Specification
CUL-QHSE-L3(GE)-048	Fuel Management Specification
CUL-QHSE-L3(GE)-049	Fieldwork Management Specification
CUL-QHSE-L3(GE)-050	Working Near or Over Water Specification
CUL-QHSE-L3(GE)-051	Personnel Dynamic Information Management Specification
CUL-QHSE-L3(GE)-052	Environmental Permitting Management Specification
CUL-QHSE-L3(GE)-053	Waste Management Specification
CUL-QHSE-L3(GE)-054	Water Management Specification
CUL-QHSE-L3(GE)-055	Air Quality Management Specification
CUL-QHSE-L3(GE)-056	Noise Management Specification
CUL-QHSE-L3(GE)-057	Biodiversity Management Specification
CUL-QHSE-L3(GE)-058	Aquatic and Terrestrial Habitat Management Specification
CUL-QHSE-L3(GE)-059	Spill prevention and Control Specification
CUL-QHSE-L3(GE)-060	Sediment and Erosion Control Specification
CUL-QHSE-L3(GE)-061	NORM Management Specification
CUL-QHSE-L3(GE)-062	Greenhouse Gas Management Specification
CUL-QHSE-L3(GE)-063	Energy Management Specification
CUL-QHSE-L3(GE)-064	Quality Control Reporting Specification
CUL-QHSE-L3(GE)-065	Materials Inspection and Acceptance Specification
CUL-QHSE-L3(GE)-066	QHSE Inspection Specification
CUL-QHSE-L3(GE)-067	Occupational Health Monitoring Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-068	Occupational Health Surveillance Specification
CUL-QHSE-L3(GE)-069	Environmental Monitoring Specification
CUL-QHSE-L3(GE)-070	HSE Award Specification

Engineering

Specification code	Specification Name
QHSE-MS – Engineering Volume (L3)	
CUL-QHSE-L3(EN)-001	Design Management Procedure
CUL-QHSE-L3(EN)-002	Design Quality Control Specification
CUL-QHSE-L3(EN)-003	Construction Management Procedure
CUL-QHSE-L3(EN)-004	Construction Quality Control Specification
CUL-QHSE-L3(EN)-005	Inspection and Testing Management Specification
CUL-QHSE-L3(EN)-006	Concealed Work Inspection and Acceptance Specification
CUL-QHSE-L3(EN)-007	Mechanical Completion Inspection Procedure
CUL-QHSE-L3(EN)-008	Commissioning Management Procedure
CUL-QHSE-L3(EN)-009	Engineering Inspection and Acceptance Procedure
CUL-QHSE-L3(EN)-010	Project Handover Procedure

Exploration

Specification code	Specification Name
QHSE-MS – Exploration Volume (L3EX)	
CUL-QHSE-L3(EX)-001	Mud Logging HSE Specification
CUL-QHSE-L3(EX)-002	Mud Logging Equipment Management Specification
CUL-QHSE-L3(EX)-003	Mud Logging HSE Specification in Special Situation
CUL-QHSE-L3(EX)-004	Seismic Drilling Rig Operation Specification
CUL-QHSE-L3(EX)-005	Vibrator Operation Specification
CUL-QHSE-L3(EX)-006	Airgun Source Operation Specification
CUL-QHSE-L3(EX)-007	Explosive Source Operation Specification
CUL-QHSE-L3(EX)-008	Vertical Seismic Profile Logging Specification
CUL-QHSE-L3(EX)-009	Seismic Data Acquisition Specification

QHSE-MS Drilling & Completion Volume

Specification code	Specification Name
CUL-QHSE-L3(DC)-001	Definitions and Responsibility
CUL-QHSE-L3(DC)-002	Drilling and Completion Program Management Specification
CUL-QHSE-L3(DC)-003	Engineering Before Spud Management
CUL-QHSE-L3(DC)-004 Rig	Mobilization and Installation Specification
CUL-QHSE-L3(DC)-005	Drilling Unit Inspection Specification
CUL-QHSE-L3(DC)-006	Personnel Qualification Verification Specification
CUL-QHSE-L3(DC)-007	Preparation for Drilling and Completion Operation
CUL-QHSE-L3(DC)-008	Drilling and Tripping Specification
CUL-QHSE-L3(DC)-009	Running Case Specification
CUL-QHSE-L3(DC)-010	Cementing Operation Specification
CUL-QHSE-L3(DC)-011	Drilling Into Reservoir Specification
CUL-QHSE-L3(DC)-012	Coring Specification
CUL-QHSE-L3(DC)-013 n	Shallow Gas Operation Specification
CUL-QHSE-L3(DC)-014	Cluster Well Management Specification
CUL-QHSE-L3(DC)-015	Steering and Anti-collision Specification
CUL-QHSE-L3(DC)-016	HTHP Wells Specification
CUL-QHSE-L3(DC)-017	Extended Reach Well Specification
CUL-QHSE-L3(DC)-018	Sidetrack Specification
CUL-QHSE-L3(DC)-019	Managed Pressure Drilling Specification
CUL-QHSE-L3(DC)-020	Well Control Specification
CUL-QHSE-L3(DC)-021	H2S Prevention Specification
CUL-QHSE-L3(DC)-022	Radiation Management Specification
CUL-QHSE-L3(DC)-023	Wireline Logging Specification
CUL-QHSE-L3(DC)-024	Logging While Drilling Specification
CUL-QHSE-L3(DC)-025	Fishing Specification
CUL-QHSE-L3(DC)-026	Drilling and Completion Fluid and Cuttings Management Specification
CUL-QHSE-L3(DC)-027	Assembling, Disassembling and Pressure Test of Wellhead Equipment Specification
CUL-QHSE-L3(DC)-028	Scraping and Flushing Specification
CUL-QHSE-L3(DC)-029	Perforation Specification
CUL-QHSE-L3(DC)-030	Sand Control Specification

Specification code	Specification Name
CUL-QHSE-L3(DC)-031	Acidizing Specification
CUL-QHSE-L3(DC)-032	Fracturing Specification
CUL-QHSE-L3(DC)-033	Production String Tripping Specification
CUL-QHSE-L3(DC)-034	Gas Lift Specification
CUL-QHSE-L3(DC)-035	Coiled Tubing Operation Specification
CUL-QHSE-L3(DC)-036	Slickline Operation Specification
CUL-QHSE-L3(DC)-037	Induced Flow Specification
CUL-QHSE-L3(DC)-038	Flowback Specification
CUL-QHSE-L3(DC)-039	Installation of ESP and Surface Control System Specification
CUL-QHSE-L3(DC)-040	Plug and Abandonment Specification
CUL-QHSE-L3(DC)-041	Tieback and Re-entry Specification
CUL-QHSE-L3(DC)-042	Well Testing Specification

Project Codes and Standards

Specification code	Specification Name
KF-FD-LST-CPF-GE-0001	List of Project Codes and Standards
KF-FD-PHI-GEN-PM-0001	HSSE Design philosophy
KF-FD-PHI-GEN-SA-1025	Waste Management philosophy
KF-FD-RPT-GEN-SA-1001	HAZID Report
KF-FD-RPT-GEN-SA-1010	ENVID Report
KF-FD-RPT-GEN-SA-1011	Oil spill Risk Identification and Assessment report
KF-FD-RPT-GEN-SA-1022	Flare and Vent System Study
KF-FD-RPT-GEN-SA-1023	Energy Effieciency study report
KF-FD-RPT-GEN-SA-1026	Emission Inventory Report
KF-FD-RPT-GEN-SA-1027	Waste Management study report
KF-FD-SCH-CPF-PR-0004	CPF Chemical use summary

APPENDIX B

Guide to Permits, Licenses and Approvals

This table is a non-exhaustive guide only and it is responsibility of CNOOC and contractors to ensure all relevant permits, licenses, and approvals are acquired and complied with.

Type of permit/ approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Groundwater Abstraction Permit/Surface Water Abstraction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	Any abstraction of water from natural surface waters (lake, river or stream) and groundwater (aquifer, spring, etc.)	Directorate of Water Resource Management (DWRM)	■ Form A: Application for a Surface Water Permit; and ■ Form B: Application for a Ground Water Permit.	Prior to any project-related surface or groundwater abstraction
	The Water Resources Regulations, 1998	Regulation 3, sub-regulation (1): A person who, (a) occupies or intends to occupy any land; and (b) wishes to construct, own, occupy or control any works on or adjacent to the land referred to in Regulation 10; May apply to the Director for a water permit.				
		Regulation 3, Sub-regulation (2): An application referred to under sub-regulation (1) shall, (a) be in the form specified in the First Schedule to these regulations except that, i) Form A shall be used for surface water permits; and ii) Form B shall be used for ground water permits.				
Construction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	■ Any works or structures constructed in or adjacent to natural waters (rivers or lakes) whether temporary or permanent; and ■ Any abstraction of groundwater requiring construction of a borehole.	DWRM	Form F1: Application for Construction Permit.	Prior to any project-related water abstraction construction of works or structures in or adjacent to natural waters.
	The Water Resources Regulations, 1998	Regulation 16, Sub-regulation (2): A person who wishes to engage a driller under sub-regulation (1) to construct a borehole on his or her land for the purpose of, (a) using water; (b) re-charging an aquifer; or (c) fitting a motorised pump to a borehole. May apply to the Director for a construction permit in Form F1 of the Sixth Schedule.					
Waste Water Discharge Permit	The Water (Waste Discharge) Regulations, 1998	Regulation 4, sub-regulation (1): No person shall discharge effluent or waste on land or into the aquatic environment contrary to the standards established under regulation 3 unless he or she has a permit in the format specified in the First Schedule issued by the Director.	Any project likely to result in the discharge of effluent or waste water (treated or untreated) onto land or into a water body.	DWRM	Form A: Application for a Waste Discharge Permit	Prior to construction of project facilities (e.g. camps, well pads)
Licence to Emit Noise in Excess of Permissible Noise Levels	The National Environment (Noise Standards and Control) Regulations, 2003	Regulation 12, Sub-regulation (1): An owner or occupier of premises whose works or activities are likely to emit noise in excess of the permissible noise levels shall apply to the Executive Director in the form prescribed in Part I of the Second Schedule, for a Licence to Emit Noise in Excess of the Permissible Levels.	Projects in which it is highly likely that noise levels generated by the proposed activity will exceed permissible levels and cause a significant nuisance effect (e.g. flaring and quarrying).	NEMA	Form NEMA/NC: Application For A Licence To Emit Noise In Excess Of Permissible Noise Levels.	Prior to commencement of activities likely to emit noise in excess of permissible levels

Type of permit/ approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000	■ Regulation 12, Sub-regulation (1): Subject to the provisions of Regulations, a person shall not carry out any activity in a wetland without a permit issued by the Executive Director. ■ Regulation 12, Sub-regulation (2): Any person intending to carry out an activity listed in the Second schedule to these Regulations shall apply to the Executive Director for a permit in Form A of the First Schedule. Regulation 23, Sub-regulation (1): A person who intends to carry out any of the following activities shall make an application to the executive Director in Form A set out in the First Schedule to these Regulations - (a) use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, under, or over the river banks or lake shore; (b) excavate, drill, tunnel or otherwise disturb the river bank or lake shore; (c) introduce or plant any of a plant whether alien or indigenous on a river bank or lake shore; (d) introduce any animal or micro-organism, whether alien or indigenous in any river bank or lake shore; or (e) deposit any substance on a riverbank or lakeshore if that substance would or is likely to have adverse effects on the environment.	Any regulated activity (listed in the Second Schedule to the Regulations) undertaken in a wetland, or within the protection zone of a riverbank: ■ 100 m from the highest watermark of a river listed in the Sixth Schedule; ■ 30 m for a non-listed river; ■ 200 m from the low watermark for a listed lake; and ■ 100 m for a non-listed lake.	NEMA	Form A: Application for a Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	Prior to undertaking any project activities within wetlands, riverbanks or lake shores
Registration of a Workplace	The Occupational Safety and Health Act, 2006	Section 40, Subsection (2): a person shall not less than one month before he or she begins to occupy any premises as a workplace, serve on the Commissioner, a notice with the particulars prescribed in Schedule 3.	Any project requiring the establishment of a work place (e.g. drill site or camp).	Department of Occupational Safety and Health Ministry of Gender, Labour and Social Development	Particulars to be Submitted When Applying for the Registration of a Workplace or a Change in the Registered Occupier.	Immediately upon (not later than one month) prior to undertaking any site works (construction, operation, pre-construction surveys).
Development Permission	The Physical Planning Act, 2010	Section 33, Subsection (1): A person shall not carry out a development within a planning area without obtaining development permission from a physical planning committee.	Any development involving construction of permanent or semi-permanent structures or establishments such as base camps.	District Technical Planning Committee	Form PPA 1: Application for Development Permission.	Before commencement of any project activities.
Licence for Storage of Hazardous/Non-Hazardous Waste	The National Environment (Waste Management) Regulations, 1999	Regulation 6, Sub-regulation (1): A person intending to store waste on his or her premises shall apply to the Authority for a licence in Form III set out in the First Schedule.	Any project requiring construction or operation of a storage facility for hazardous or non-hazardous waste (e.g. drill cuttings).	NEMA	Form III: Application for a Licence for Storage of Hazardous Waste.	Prior to commencement of any activity requiring temporary storage of hazardous waste.

Type of permit/ approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Authorisation to use radioactive sources	The Atomic Energy Act, (Cap 143)	Section 32, Subsection (1): Subject to section 33, no person shall acquire, own, possess, operate, import, export, hire, loan, receive, use, install, commission, decommission, transport, store, sell, distribute, dispose of, transfer, modify, upgrade, process, manufacture or undertake any practice related to the application of atomic energy and regulated by this Act unless permitted by an authorisation issued under this Act.	Projects requiring the use of radioactive materials e.g. oil well drilling.	Atomic Energy Council, Ministry of Energy and Mineral Development	■ Notification of Council (requirements listed in Section 34 (2)); and ■ Application for an Authorisation (required information listed in Section 35 (1) of the Act.	Prior to commencement of project activities (specifically well drilling).
Licence to erect or carry on a magazine	The Explosives Act, (Cap 298)	Section 22, Subsection (1): Any person desiring to erect or carry on a magazine for the storage of explosives shall make application for a licence to erect or carry on a magazine.	Activities requiring the temporary storage of explosives	Ministry of Internal Affairs	Licence to erect or carry on a magazine	Prior to procurement and/or use of explosives
Lease Agreement	The Registration of Titles Act, (Cap 230)	Section 101: The proprietor of any freehold under the operation of this Act may, subject to any law or agreement for the time being in force, lease that land for any term exceeding three years by signing a lease of it in the form in the Eighth Schedule to this Act.	Access to or use of land for project activities.	District Land Board	Application for Lease.	Prior to temporary use of or access to land for project activities.
	The Land Act, (Cap 227)	Section 73: Where it is necessary to execute public works on any land, an authorised undertaker shall enter into mutual agreement with the occupier or owner of the land in accordance with this Act; and where no agreement is reached, the Minister may, compulsorily acquire land in accordance with section 42.				
	The Land Acquisition Act, (Cap 226)	Section 19: Nothing in this Act shall prevent the Government from entering into an agreement with a person having an interest in land by which— ■ that person's interest in land is acquired by the Government; or ■ that person's claim to compensation for land under this Act is settled by the grant of other land or in any other way.				

November 2019

REPORT – VOLUME 2, PART 2

CNOOC UGANDA LIMITED

Environmental and Social Impact Assessment for the Kingfisher Field Development Area in Kikuube & Hoima Districts, Uganda

Operation - Environmental Management Plans: CPF, Wells and Ancillary Infrastructure

Submitted to:
The Executive National Environmental Management Authority
NEMA House, Plot 17/19/21 Jinja Road
P.O. Box 22255 Kampala, Uganda

Table of Contents

TABLES

FIGURES

APPENDICES

List of Acronyms and Abbreviations

Acronym	Description
3LPP	3 Layer Polypropylene
BAT	Best Available Technology
Barg	Gauge pressure in bars above ambient or atmospheric pressure
BLPD	Barrels of Liquid per Day
BOPD	Barrels of Oil per Day
BS&W	Basic sediment and water content of crude oil. Part of quality specifications.
BVS	Block Valve Station
BWPD	Barrels of Water per Day
CCO	Customary Certificate of Ownership
CCR	Central Control Room
CCTV	Closed Circuit Television
CDP	Community Development Plan
C-ESMP	Construction Environmental and Social Management Plan of the Central Processing Facility, wells, and ancillary infrastructure
CFC	Chlorofluorocarbons
CFP	Chance Find Procedure
CFR	Central Forest Reserve
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLF	Community Liaison Forum
CLOs	Community Liaison Officers
CNOOC	China National Offshore Oil Corporation
CO_2	Carbon Dioxide
CPF	Central Processing Facility
CR	Critically Endangered
CSR	Corporate Social Responsibility
CUL	CNOOC Uganda Limited
CV	Curriculum Vitae
DEO	The District Environment Officer
D-ESMP	Decommissioning Environmental and Social Management Plan of the Central Processing Facility, wells, and ancillary infrastructure
DRC	Democratic Republic of Congo
DWRM	Directorate of Water Resources Management
EA	Exploration Areas

Acronym	Description
EACOP	East African Crude Oil Pipeline
EBRD	European Bank for Reconstruction and Development
EBS	Environmental Baseline Study
EC	Environmental Coordinator
ECC	Emergency Control Centre
EFOs	Environmental Field Officers
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EOR	Enhanced Oil Recovery
FP	Feeder Pipeline
FP C-ESMP	Feeder Pipeline Construction Environmental and Social Management Plan
ERP	Emergency Response Plan
ES	Ecosystem Services
ESD	Enterprise and Supplier Development
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental and Social Management Plan
ESO	Environmental Site Officer
ESP	Electric Submersible Pump
FBE	Fusion Bonded Epoxy
GIIP	Good International Industry Practice
GPS	Global Positioning System
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HV	High Voltage
ICSS	Integrated Control and Safety Systems
IFC	International Finance Corporation
IMP	Influx Management Plan
IPIECA	International Petroleum Industry Environment and Conservation Association
ISO	International Standards Organisation
IT	Information Technology
IUCN	International Union for Conservation of Nature
KFDA	Kingfisher Field Development Area
LC	Least Concern
LC	Local Council

Acronym	Description
LOCSA	Liaison Officer-Community and Stakeholder Affairs
LP	Liquefied Petroleum
LPG	Liquefied Petroleum Gas
LSA	Local Study Area
mbgl	metres below ground level
MEMD	Ministry of Energy and Mineral Development
MGLSD	Department of Occupational Safety and Health, Ministry of Gender Labour and Social Development
MMS	Machine Monitoring System
MPFM	Multiphase Flow Meter
MSDS	Material Safety Data Sheets
MV	Medium Voltage
MTWH	Department of Museums and Monuments, Ministry of Tourism, Wildlife and Heritage
MW	Megawatts
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGO	Non-governmental Organisations
NORM	Naturally Occurring Radioactive Material
NOx	Oxides of Nitrogen
NPSH	Net Positive Suction Head
NSRs	Noise Sensitive Receptors
O-ESMP	Operational Environmental and Social Management Plan of the Central Processing Facility, wells, and ancillary infrastructure
OGP	International Association of Oil and Gas Producers
PAC	Public Affairs Coordinator
PCB	Polychlorinated biphenyls
PEPD	Petroleum Exploration and Production Department
PLA	Project Labour Agreement
PLDS	Pipeline Leak detection System
PLMS	Pipeline Leak Monitoring System
PM	Particulate Matter
POC	Potentially Oil Contaminated
PPE	Personal Protective Equipment
PS	Performance Standards
PSAs	Production Sharing Agreements
Ptb	Pounds per Thousand Barrels

Acronym	Description
RAP	Resettlement Action Plan
RoW	Right of Way
RSA	Regional Study Area
RTU	Remote Terminal Unit
RVP	Reid vapour pressure (RVP), a common measure of the volatility of gasoline.
SCADA	Supervisory Control and Data Acquisition
SDS	Safety Data Sheets
SEHT	Skin-effect Heat Tracing System
SO_2	Sulphur Dioxide
SoCs	Species of Conservation Status
SoW	Scope of Work
STP	Sewage Treatment Plant
STI	Sexually Transmitted Infections
UCPs	Unit Control Panels
UNRA	Uganda National Roads Authority
UWA	Uganda Wildlife Authority
VOC	Volatile Organic Compound
VOIP	Voice over Internet Protocol
WAT	Wax Appearance Temperature
WCP	Waste Collection Points
WHCP	Hydraulic Wellhead Control Panel
WHO	World Health Organisation
WHRU	Waste Heat Recovery Unit
WHSIP	Well Head Shut in Pressure
WMD	Wetlands Management Department
WRMD	Water Resource Management Directorate

1.0 INTRODUCTION

This Operational Environmental and Social Management Plan (O-ESMP) provides guidance for the environmental and social management of China National Offshore Oil Corporation (CNOOC's) proposed development of the Kingfisher Field Development Area (KFDA). It pertains directly to the operational phase of the Central Processing Facility (CPF), wells, and ancillary infrastructure within the Buhuka flats and the safety check station at the top of the escarpment only (hereafter referred to as the Project). Environmental and social management of the operational phase of the export pipeline is addressed separately from this O-ESMP. The O-ESMP aims to mitigate and enhance potential negative and positive impacts respectively. Responsibilities for implementing mitigation measures are allocated and appropriate monitoring actions are described.

The O-ESMP has been informed by the ESIA (and associated specialist studies) Independent Consultants who were appointed by CNOOC, and as such must be read in conjunction with the ESIA executive summary. Key objectives of the O-ESMP are to:

- Facilitate compliance with applicable acts, regulations and guidelines;
- Avoid and/or minimise negative social and environmental impacts of the Project and maximise positive impacts;
- Recognise that social responsibility and environmental management are among the highest corporate priorities;
- Assign clear accountability and responsibility for environmental protection and socio-economic enhancement to management members and employees;
- Facilitate environmental and social planning throughout the Project life cycle;
- Provide a process for achieving targeted performance levels; and
- Provide appropriate and sufficient resources, including training, to achieve targeted environmental performance levels on an on-going basis.

The O-ESMP is a "living document" and information contained in this version will be reviewed and updated as and when necessary. The findings and recommendations following from environmental and social monitoring assessments (annually or more frequently) by internal/external auditors will form the basis of updates to the O-ESMP, as required.

CNOOC will develop and implement an Environmental and Social Management System (ESMS) in accordance with their environmental policies to ensure that environmental impacts caused by the Project are continually monitored and to provide a basis for the development of improved impact management measures. The EMS will be in place prior to the commencement of the operational phase and it will include the stipulations contained in the relevant environmental laws and regulations of Uganda.

1.1 What is included?

The O-ESMP provides environmental and social impact management measures for all of CNOOC's operational activities directly related to the CPF, wells, and ancillary infrastructure (i.e. the Project) within the KFDA on the Buhuka Flats, along the south-eastern side of Lake Albert. The O-ESMP:

- Defines a set of recommended strategies for managing the environmental and social impacts associated with the operation of the Project in the license area. These rules are based on detailed work done following the impact assessment of the project and have social and environmental components which all operational activities must comply with; and
- Covers the operation and general maintenance of the CPF, wells, and ancillary infrastructure to the point at which the Project approaches decommissioning. The impact monitoring and management measures to be applied during decommissioning are detailed in the Decommissioning ESMP (D-ESMP).

Environmental Impact Management Measures

An environmental impact is defined as any change to the environment, whether adverse or beneficial, resulting from a project activity. Listed below are some typical environmental impacts that could adversely affect the environment:

- Pollution of surface and groundwater resources by contaminated runoff;
- Emission of harmful gases and/or particulates into the atmosphere;
- Seepage of contaminants from hazardous materials into soil or water;
- Generation of harmful or nuisance noise;
- Death of or injury to animals;
- Destruction of natural habitat, leading to reduced biodiversity;
- Reduction of local residents' ability to produce food and make traditional use of the ecological resources of the area;
- Damage to cultural and heritage resources; and
- Degradation of visual aesthetics.

The project will go through a life cycle consisting of three phases, namely construction (site clearing, excavation and construction) and operation (processing), and decommissioning (closure). The activities, their impacts and the management actions required to implement the recommended mitigation measures are dealt with in the sub-sections below.

Applicability of maintenance corrective actions

Maintenance corrective actions are provided in the document but are only applicable to maintenance activities

1.2 What is excluded?

The O-ESMP does not include the management of impacts associated with the Feeder pipeline. The reader is referred to the Feeder Pipeline (FP) ESMPs for construction, operation and decommissioning.

The O-ESMP also excludes specifications regarding occupational health, hygiene or safety requirements. CNOOC and Contractor obligations in this regard are determined by legislation.

1.3 Report Structure and Content

The O-ESMP is structured as follows:

- Chapter 2 describes CNOOC's environmental and social policies and commitments in Uganda;
- Chapter 3 describes the operational activities covered by this O-ESMP that are directly associated with the CPF, wells, and ancillary infrastructure;
- Chapter 4 describes the environmental management structure, including the approach to the O-ESMP and the organisational structure and responsibilities relevant to the project;
- Chapter 5 sets out the detailed specifications, including management of impacts associated with the operational phase;
- Chapter 6 describes requirements for performance assessment, corrective action, management review and auditing;
- Chapter 7 sets out requirements for competency training and awareness creation;
- Chapter 8 outlines requirements for dealing with emergencies; and

- Chapter 9 specifies requirements for document control.

The content of the report is set out according to an internationally recognised framework, which includes the following:

- Avoidance/mitigation/management measures required during the operation phase of the project;
- A description of the activities necessary to achieve the mitigation measures;
- Programming and scheduling requirements;
- Definition of responsibilities, resources, communication and reporting structures;
- Specification of performance evaluation requirements;
- Identification of training requirements;
- Identification of monitoring requirements; and
- Identification of audit requirements.

1.4 Key point of contact

The key point of contact for the Kingfisher Field Development Area is indicated in Table 1-1.

Table 1-1: Details of the developer, CNOOC

Title	**CNOOC Uganda Limited (CNOOC)**
Organisation	CNOOC Uganda Limited (CNOOC)
Postal address	CNOOC Uganda Limited Simba Towers, Plot 22 Acacia Avenue, P.O BOX 7862, Kololo, KAMPALA, UGANDA
Contact Name	Andrew Otuba
Telephone	+256 204 500224
Cellular phone	+256 772 798 111
E-mail	andrew.OTUBA@cnoocuganda.com

2.0 CNOOC POLICIES AND COMMITMENTS IN UGANDA

CNOOC's development philosophies are listed in Table 2-1, while environmental, health and safety specifications are listed in APPENDIX A with relevant Project design codes and standards. All documents that form part of the O-ESMP and must be complied with.

Table 2-1: CNOOC development philosophies

Reference	Philosophy
KF-FS2-RPT-CPF-SA-0002	Environmental Philosophy
KF-FS2-RPT-CPF-SA-0003	Noise Control Philosophy
KF-FS2-RPT-CPF-SA-0004	Waste Management Philosophy
KF-FS2-RPT-CPF-SA-0007	Design HSE Philosophy
KF-FS2-RPT-CPF-SA-0008	Oil Spill Contingency philosophy
KF-FS2-RPT-CPF-SA-0009	Emergency Response Philosophy
KF-FS2-RPT-CPF-C0-0001	Telecommunication Philosophy
KF-FS2-RPT-CPF-EL-0001	Electrical Power System Philosophy
KF-FS2-RPT-CPF-PR-0006 REV0	Restart & Displacement Philosophy
KF-FS2-RPT-CPF-IN-0001 REV0	Control & Instrument Philosophy

2.1 Leadership and Commitment

CNOOC commits itself to deliver sustainable energy to society by promoting clean, healthy, and green energy development models with their partners along the industry chain. The development of existing natural resources must be undertaken in a safe, efficient, and environment-friendly manner and provide society with clean, reliable, and stable energy that will meet people's reasonable energy demands.

2.2 Corporate Social Responsibilities

During project implementation, CNOOC must communicate their strategy toward social investment in Uganda and, in particular, in regions and local communities potentially affected by the project. This strategy should emphasise the distinction between social investment offered as philanthropic goodwill to support community needs and "mitigation" required to reduce negative impacts. This distinction should be combined with efforts to align ongoing communication processes between the community liaison officers and the local communities. CNOOC currently engages in activities that benefit society and is involved in the following ventures in Uganda:

- Support to Education Best Performers' Award;
- Basic Skills Training;
- Buhuka School Donation;
- Promotion of Culture and Talent;
- Support to Health Sector and Medicine Donation for District Health Centers; and
- Disaster Relief Donation.

2.3 Compliance with Legislation and Best Industry Standards

CNOOC is committed to comply with all Ugandan environmental legislation. A legal register in this regard is maintained and regularly updated. CNOOC will also comply with best industry practice worldwide and, to this end, uses the IFC and World Bank Performance Standards, Safeguard Polices and the Equator Principles as a guide to its actions.

The following international principles and standards have been incorporated into the O-ESMP:

- Equator Principles;
- IFC Documents, including:
  - IFC Performance Standards on Social & Environmental Sustainability, including:
    - Performance Standard 1: Social & Environmental Assessment & Management System;
    - Performance Standard 2: Labour and Working Conditions;
    - Performance Standard 3: Pollution Prevention and Abatement;
    - Performance Standard 4: Community Health, Safety and Security;
    - Performance Standard 5: Land Acquisition and Involuntary Resettlement;
    - Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management;
    - Performance Standard 7: Indigenous People; and
    - Performance Standard 8: Cultural Heritage.
- Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual, International Finance Corporation 1998;
- General IFC Environmental, Health and Safety (EHS) Guidelines, including Environmental, Occupational Health and Safety, Community Health and Safety, Construction and Decommissioning (e.g., Air Emissions and Ambient Air Quality, Noise); and
- Workers' accommodation: Processes and standards: A guidance note by IFC and the EBRD.

2.4 Mitigation hierarchy

The priority of environmental management is always to **minimise adverse impacts**, thereafter management measures with other objectives are considered. Environmental management measures can be varied and the measures themselves can have a variety of objectives. World Bank guidelines for a best practice approach to the management of environmental and social impacts are presented in Table 2-2.

Table 2-2: Primary objectives of mitigation measures for adverse environmental impacts (listed in decreasing order of priority)

Objective	Description
Avoidance	■ Avoiding activities that could result in adverse impacts; and ■ Avoiding resources or areas considered as sensitive.
Prevention	■ Preventing the occurrence of negative environmental impacts and/or preventing such an occurrence having negative environmental impacts.
Preservation	■ Preventing any future actions that might adversely affect an environmental resource. Typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
Minimisation	■ Limiting or reducing the degree, extent, magnitude or duration of adverse impacts. This can be achieved by scaling down, relocating, or redesigning elements of a project.
Rehabilitation	■ Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.

Restoration	■ Restoring affected resources to an earlier (and possibly more stable and productive) state, typically 'background/pristine' condition.
Offset	■ Creation, enhancement or protection of the same type of resource at another suitable and acceptable location, offsetting for lost resources.

Ref: The World Bank. Environment Department. January 1999. Environmental Management Plans. Environmental Sourcebook Update. Number 25

3.0 PROJECT DESCRIPTION

The O-ESMP applies to the Kingfisher Field Development Area (KFDA, Figure 1) along the eastern border of Lake Albert and is ~15 km long by 3 km wide with an area of 32.3 km^2. While the O-ESMP relates solely to the operational phase of the CPF, wells and ancillary infrastructure, a Feeder Pipeline forms part of the project connecting the production infrastructure to the export pipeline. Environmental and social management related to the feeder pipeline is addressed independently through a parallel set of environmental and social management plans.

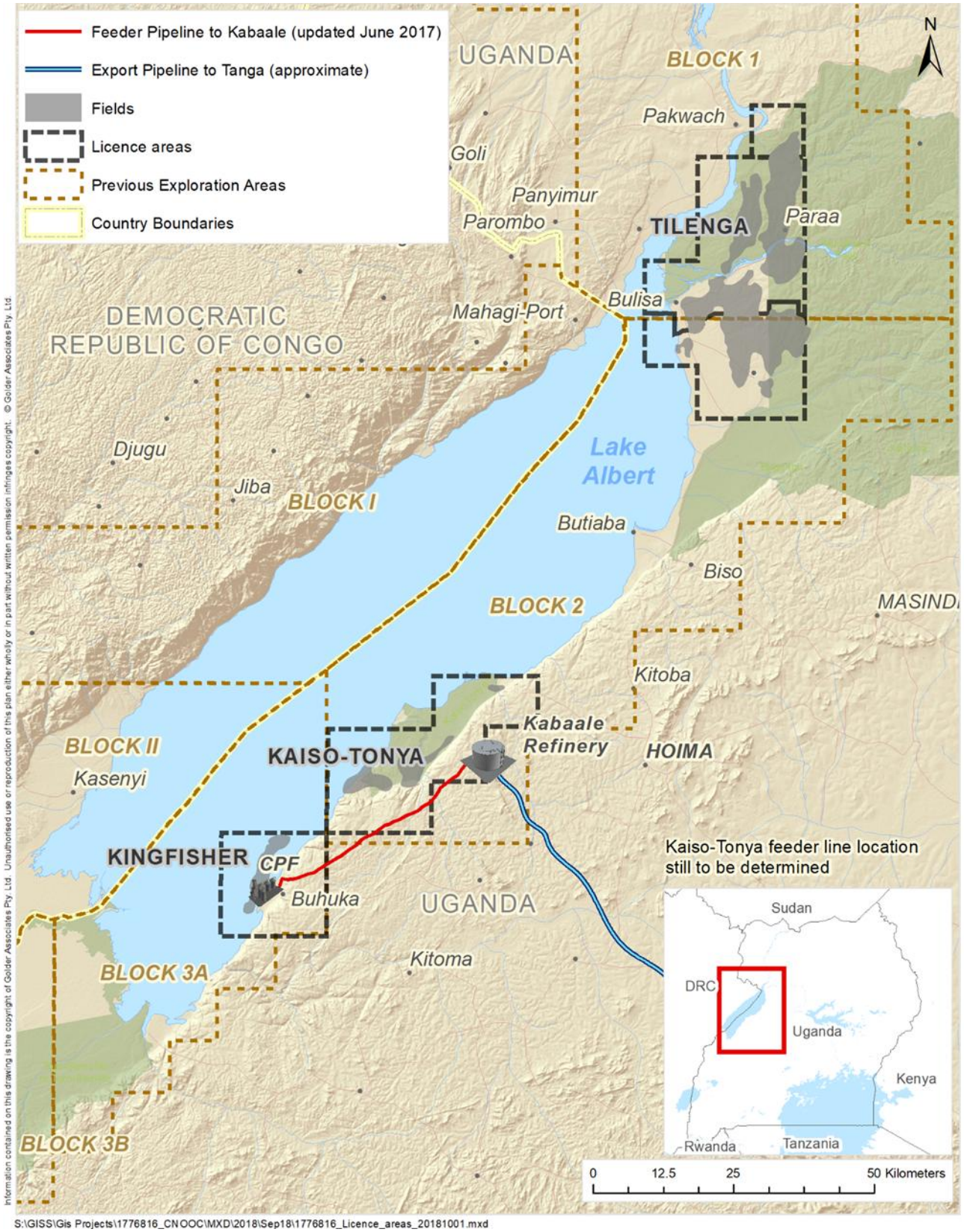


Figure 1: The Kingfisher Field Development Area (KFDA), Kaiso-Tonya License Area and the Tilenga License Area

3.1 Feeder Pipeline

The Feeder Pipeline runs from the CPF storage tanks to a delivery point near Kabaale (Figure 1). It leaves the battery limits of the CPF on the east side of the plant, turning northward to the base of the escarpment, where it turns directly east up the escarpment. The average gradient in this section of the route is 1:3 (Vertical: Horizontal), rising from roughly 650 to 1 040 mamsl within a horizontal distance of 740 m. From this point, the pipeline is routed north-eastward in gently undulating terrain, extensively cultivated and interspersed with rural settlements. The route passes south-east of Hohwa and Kaseeta villages and passes immediately north of the planned Kabaale Airport, turning eastward to the terminal point at the proposed Kabaale Refinery. The total length of the pipeline is approximately 46 km. At Kabaale, the Government of Uganda is planning an industrial park which, among other facilities, will include a refinery, associated petrochemical processing factories and airport and related supporting infrastructure. At the delivery point, there will be metering of the crude oil, which will be piped either to the industrial park to feed the refinery and associated petrochemical industry or exported through the East African Crude Oil Pipeline (EACOP), planned from Kabaale to Tanga sea port in Tanzania. The EACOP will be a public - private partnership between the governments of Uganda, Tanzania and oil company(s).

The Feeder Pipeline ends at the delivery point in Kabaale. The industrial park and the EACOP are independent projects that will be planned and developed by parties and as such will independently follow a separate permitting process from the KFDA ESIA permitting process. Apart from their inclusion in the Cumulative Impact Assessment of oil industry activities, they are outside of the scope of the present O-ESMP.

3.2 Project activities

Project components relevant to the O-ESMP are illustrated in Figure 2. The O-ESMP specifically addresses the operation of the:

- Production wells and associated infrastructure;
- Flowlines;
- Central Processing Facility (CPF); and
- Safety check station at the top of the escarpment

The construction and decommissioning phases of these components, as well as the Feeder pipeline (all phases) are addressed separately from this O-ESMP.

3.2.1 Production Wells and Associated Infrastructure

The Project (Figure 2) will typically consist of 20 production wells (producers) and 11 water injection wells (injectors). This number may change during final engineering design and during the operating life of the project, depending on oil field conditions at the time. All of the wells will be situated on four onshore well pads, three of which are existing exploration/appraisal wells (Kingfisher-1A, Kingfisher-2 and Kingfisher-3A), that will be upgraded to accommodate development wells and completed as production wells.

3.2.1.1 Infrastructure on the Well Pad

After well completion, the rig and the auxiliary facilities will be removed and the well will be connected to a manifold combining well fluids from all of the wells on the well pad into a single flowline to the CPF. The well pads will be security fenced, with a 24-hour security guard, but will not otherwise be manned. All normal monitoring and operational requirements will be managed from the CPF control room.

Simultaneous production and drilling on the well pads will occur for the first five years. The design will allow for the drilling rig to move between different slots without shutting down production on the well pad. Only one drilling rig will operate on site at any time.

3.2.1.2 Well Bore Temperature

The crude oil temperatures in the reservoir will be between 85ºC and 100ºC, which will facilitate its flow up the well bore. Additional heating to provide the required flow will not be required.

3.2.1.3 Artificial Lift to Extract Reservoir Fluids

Artificial lift will be required to provide the desired flow and to meet the required Flowing Wellhead Pressure. For the first 5 years of production, this will be achieved by jet pumps in the wells, (driven by pressurised water, an excess of which will be available in early years) after which the project will convert to electrical submersible pumps (ESP).

3.2.1.4 Multiport flow selectors to Gather Well Fluids

A multiport flow selector will be installed at each well site to gather the well fluids from the production choke valves on each well head for delivery to the CPF via the flowline from the well pad. A second multiport flow selector will also be provided to allow well testing without interrupting production. The individual well flowlines will be provided with manual block valves to divert produced fluids from production to test multiport flow selectors.

3.2.1.5 Production of Sand

The wells will produce sand. Sand screens will be installed in each well although some will still escape to the surface, necessitating further downstream sand screening at the CPF to remove it.

3.2.1.6 Overpressure Protection

There will be no flaring or venting at the well pads under normal operations, except during well testing prior to commissioning. Overpressure protection will not be provided on the well pads, which will avoid the need for burn pits and emergency flares during production.

3.2.1.7 Produced Water Injection

Eleven water injection wells are planned on the well pads. Water injection is intended to meet the following two objectives:

- Disposal of large quantities of produced water, removed from the well fluids at the CPF, in a safe and environmentally responsible manner; and
- Assist to maintain reservoir pressures throughout the life of the project.

Injection water will consist of a combination of produced water, water from POC areas at the CPF and make up water from Lake Albert. All injection water will be treated to meet the injection water specification. Relative quantities from the sources will change through the life of the project, with the proportion of lake water being a significant component of the total at start up and in the early years, but steadily reducing in later years.

Water injection temperature at the well head will be 75ºC. Make up water will be mixed with produced water at the CPF and heated prior to injection. The heated injection water will be transmitted along the injection flowlines to the injector wells. The thermal energy to heat the injection water will be mainly waste heat recovered from the electricity generation process at the CPF. Backup heating systems are proposed, to be used in cases when the power generation process from associated gas is shut down or when the generators are operating below the level necessary to provide power and thermal energy to heat the injection water. A wide variety of additives will be required but these will be injected in different areas of the produced water circuit at the CPF, prior to delivery to the wells. CNOOC proposes to pilot test polymer flooding in the first year of production. Polymer flooding is a method of adding a polymer to the injection water that increases its viscosity for Enhanced Oil Recovery (EOR) from the reservoir (see definition of terms).

3.2.1.8 Production Waste Generated on the Well pad

In order to handle oily drainage from pipelines and equipment, each well pad will be provided with an underground closed drain system leading to a sump with a submersible pump. The levels will be monitored and the sump periodically emptied into a mobile tanker for handling at the CPF.

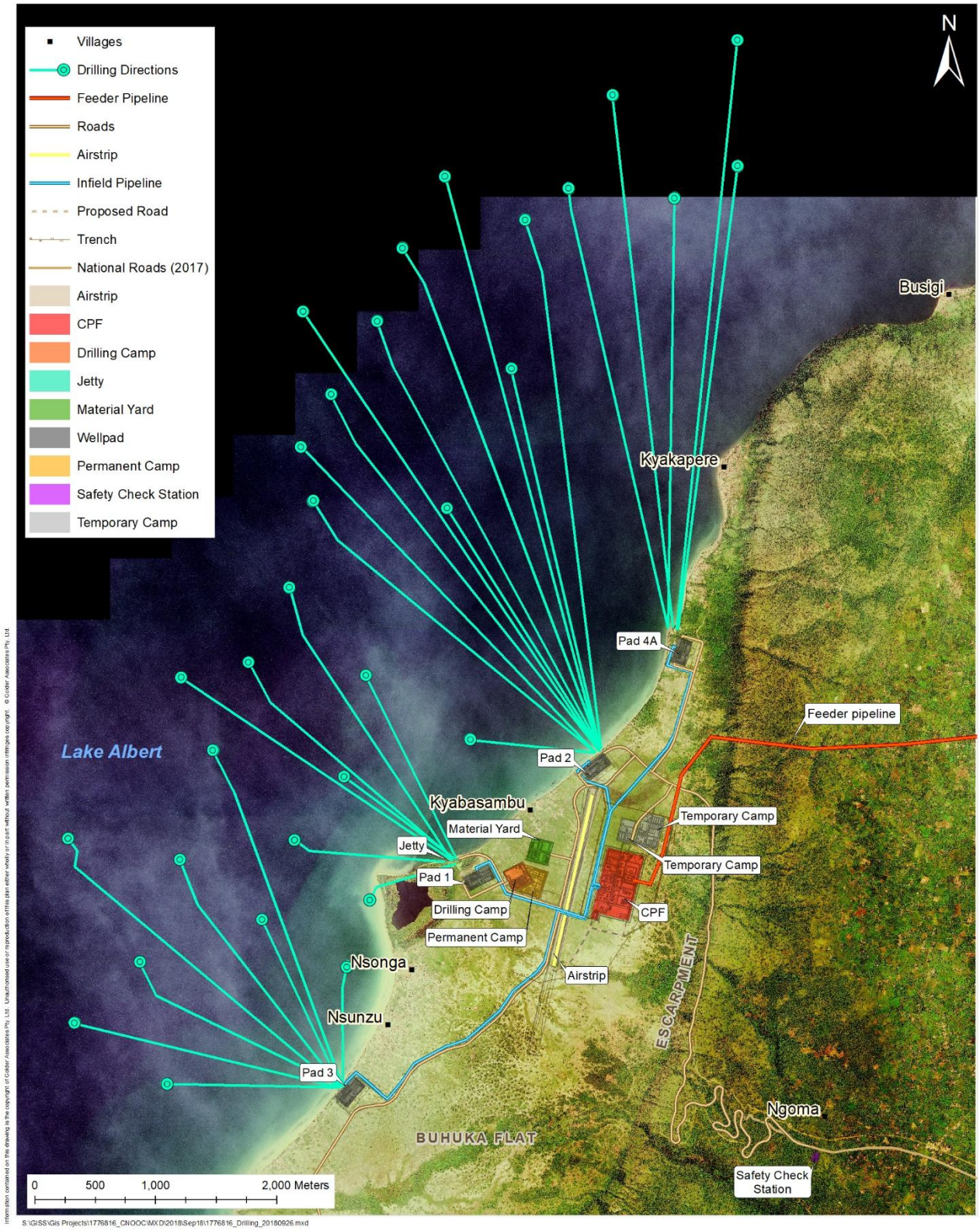


Figure 2: Approximate locations and horizontal extent of the production wells and associated infrastructure, flowlines, and CPF. Note that flowlines are between Pads and CPF

Only small quantities of solid waste will be generated, once drilling is completed. The wells are unmanned and will be remotely operated from the CPF over extended periods, without intervention on the well pad. Small quantities of potentially oil contaminated and non-hazardous waste will be generated during maintenance. These will be separated into non-hazardous and hazardous components, delivered to the CPF for temporary storage and then recycled, or earmarked for disposal by a certified hazardous waste contractor. CNOOC has indicated that NORMs are not expected in the pigging wastes.

3.2.1.9 Lake Flies

Operational problems are periodically encountered at the drilling sites due to swarms of lake flies that are attracted by flood lighting and sucked into the equipment air intakes. Preventative measures will be incorporated in the design of lights and equipment air intakes to minimise blockages and other problems caused by lake flies and other insects.

3.2.2 Flowlines

The KFDA well fluids, consisting of a mixture of crude oil, gas and water, will be delivered to the CPF via buried flowlines from each of the four well pads. The flowlines will have a lifespan of 25 years and are shown in Figure 2.

3.2.2.1 Arrangement of the Flowlines

The wells on each well pad will be connected through a manifold to a single underground flowline to the CPF (four flowlines entering the CPF, one from each well pad). The length and diameter of individual flowlines will typically range from 1.63 - 2.99 km and 8 - 12 inches respectively and the lines will be buried 1m below ground. The flowlines will be buried with a surrounding cushion of appropriate material, typically a well-graded sand without rocks or large stones in it, to prevent damage to the pipe coating during the process of pipe laying or during operation. The flowlines will cross minor drainage lines from the escarpment near Pad 2 and south of the airstrip en-route to Pad 3. The flowlines will be buried beneath the maximum scour depth of the river course.

3.2.2.2 Design for Overpressure

Flowlines will be rated to cater for overpressure conditions. The Well Head Shut in Pressure (WHSIP) is 228 barg[1] and is the highest pressure that could be expected in a flowline. Overpressure protection will entail fully rating the flowlines and valves to the intake of the first stage production separator at the CPF.

3.2.2.3 Power and Telecommunications

A power cable and fibre optic cable will be laid down separately (with redundancy for both services) in the flowline trench.

3.2.2.4 Corrosion Protection

The outer surface of the flowlines is likely to be encased in an FBE coating in order to inhibit corrosion. Welded joints will be protected using a heat shrink wrap sleeve, applied after the weld is completed. An impressed current Cathodic Protection System will be used to apply a small electrical current to the metal surface of the flowlines. Combined with a sacrificial anode, this minimises external corrosion of the pipe. The system poses no risk to humans or animals. Taking into account current methods of pipe manufacture, pipeline construction and maintenance and cathodic protection, the design life of a pipe buried according to these specifications is likely to exceed 30 years.

3.2.2.5 Land Requirements and Community Access

The total permanent right of way, inclusive of the adjoining access road, will be 20 m wide and access roads will typically run parallel to the flowlines.

No constraints will apply to community access across the buried flowlines during the operational phase of the project. Right of way will not be fenced, allowing free access to communities, and natural indigenous grass

[1] Gauge pressure in bars above ambient or atmospheric pressure.

cover will be encouraged over the flowlines to prevent erosion. The acquired buffer zone around the CPF will also be unfenced to allow community access and utilization for regulated activities like grazing but exclusive to settlement.

The normal operating pressure of the flowlines is 19 barg. The safety zone along the flowline within which settlement and other sensitive permanent community infrastructure is prohibited is not expected to extend beyond the permanent right of way. Grazing of stock will be permitted but cultivation and settlement will be prohibited.

3.2.2.6 Maintenance and Leak Detection

Once the contractor's obligations have been met with respect to the reinstatement of topsoil, and the warranty period has expired, the responsibility for rehabilitation maintenance along the flowlines will revert to CNOOC. Flowlines require little maintenance on a day to day basis. The right of way will be monitored regularly for any signs of human activity (e.g. excavation) that could create a risk, and for any leaks. A major flowline failure would result in a pressure drop in the line, detected and recorded in the control room at the CPF. Minor leaks would typically manifest as a small patch of dying vegetation at the surface. While rare, such minor leaks can be observed and are reported by third parties.

3.2.3 Central Processing Facility

The well-fluids from the CNOOC KFDA wells will be sent to a Central Processing Facility (CPF) on the Buhuka flats. Nearly three quarters of the total volume of fluids from the wells over the 25-year period will be formation water. The well-fluids will be processed in the CPF to separate formation water and associated gas from the oil phase. The oil will be stabilised, desalted and dehydrated to meet the export specification. Associated gas will be separated and utilised as fuel gas for power generation, the heating system and other utilities. Power generation combined with LPG recovery is proposed to utilise excess associated gas. Produced water from the separators will be treated to achieve the injection water specification. Produced water, along with treated lake water from the CPF, will be injected into the reservoir. Lake water will be pumped to the CPF via a dedicated flow line running from the Lake Albert intake facilities.

The operation phase of the CPF and supporting infrastructure (Figure 3) will comprise the following activities and areas:

- Oil separation flash gas facilities;
- Gas treatment and compression facilities;
- Produced water treatment and injection facilities;
- Oil storage and export facilities;
- Ground flare;
- Power generation plant;
- Electrical substation;
- Water treatment plant;
- Heat exchange unit for recovery of waste heat;
- Fire water and pumps;
- Plant utilities area;
- Control room and administrative buildings;
- Maintenance workshop;
- Gatehouse; and

- Perimeter fencing, lighting and internal access road system.

3.2.3.1 CPF Capacity

The CPF is designed for a throughput of 120,000 barrels of well fluid per day which will be separated to produce:

- 40,000 barrels of oil per day;
- 9.1 MM Standard cubic feet of gas; and
- 112,563 barrels of produced water per day.

Maximum oil production will be in years 2-6, while the maximum water production will be in year 25.

3.2.3.2 CPF Process Overview

The process, overview of oil production, produced gas, and LPG separation at the CPF are illustrated in Figure 4, Figure 5 and Figure 6 respectively.

3.2.3.3 Flaring and Venting

A ground flare is proposed at the CPF and flaring will occur only occasionally, during purge (when fuel gas is being used), due to emergencies, mal-operation, start-up, shutdown or maintenance of the plant. There will be no continuous venting of hydrocarbons, but there may be occasional, low volume, venting during maintenance.

3.2.3.4 Crude Oil and LPG Storage

A 10 000 m^3 floating roof tank oil storage vessel will make provision for 30 hours of storage. Heat loss from the oil storage tanks will be countered by heating coils inside the tanks to maintain a temperature of 68ºC.

Off-spec oil storage will be stored in a 3 000 m^3 dome roofed tank with 10 hours storage time and nitrogen gas blanketing. Off-spec crude oil will be recycled to the 2nd Stage Separator with tank low level override. Heat loss from the tanks will be similarly countered by heating coils inside the tanks to maintain a temperature of 68ºC. The off-spec tank may be used for storage of on-spec crude during inspection and maintenance of the on-spec tank. LPG will be stored in two 135 m^3 storage bullets and a loading facility will be built for LPG bulk road transport to the local market.

3.2.3.5 Electricity Generation and Distribution

Electricity will be generated at the CPF by four 16 MW gas turbine-driven generators (3 operational, 1 standby), powered by fuel gas from the CPF process. Medium Voltage (MV) switchgear and High Voltage (HV) switchgear will be provided for different processes. The electricity distribution system will comprise:

- Transformers and switchgear at the CPF to power CPF requirements and the pump station for the Feeder Pipeline to Kabaale;
- Cables from the CPF to each of the well pads, and transformers and switchgear at each well pad;
- A cable from the CPF to the Lake Water Extraction Station, and a transformer and switchgear at the pump station; and
- A cable from the CPF to the permanent operators' accommodation camp and a transformer, switchgear and distribution system at the camp.

In addition, capacity will be reserved for Enhanced Oil Recovery (EOR) in the later stages of the project's life and for the KT oilfield.

3.2.3.6 Heating System

The thermal energy requirements of the CPF will be supported by three Waste Heat Recovery Units (WHRUs) and one fired heater.

Under normal operating conditions, the WHRUs will provide sufficient heat to meet operational requirements. The Make-up Water Heater will be the major consumer, comprising about 60% of the total heating load of the CPF.

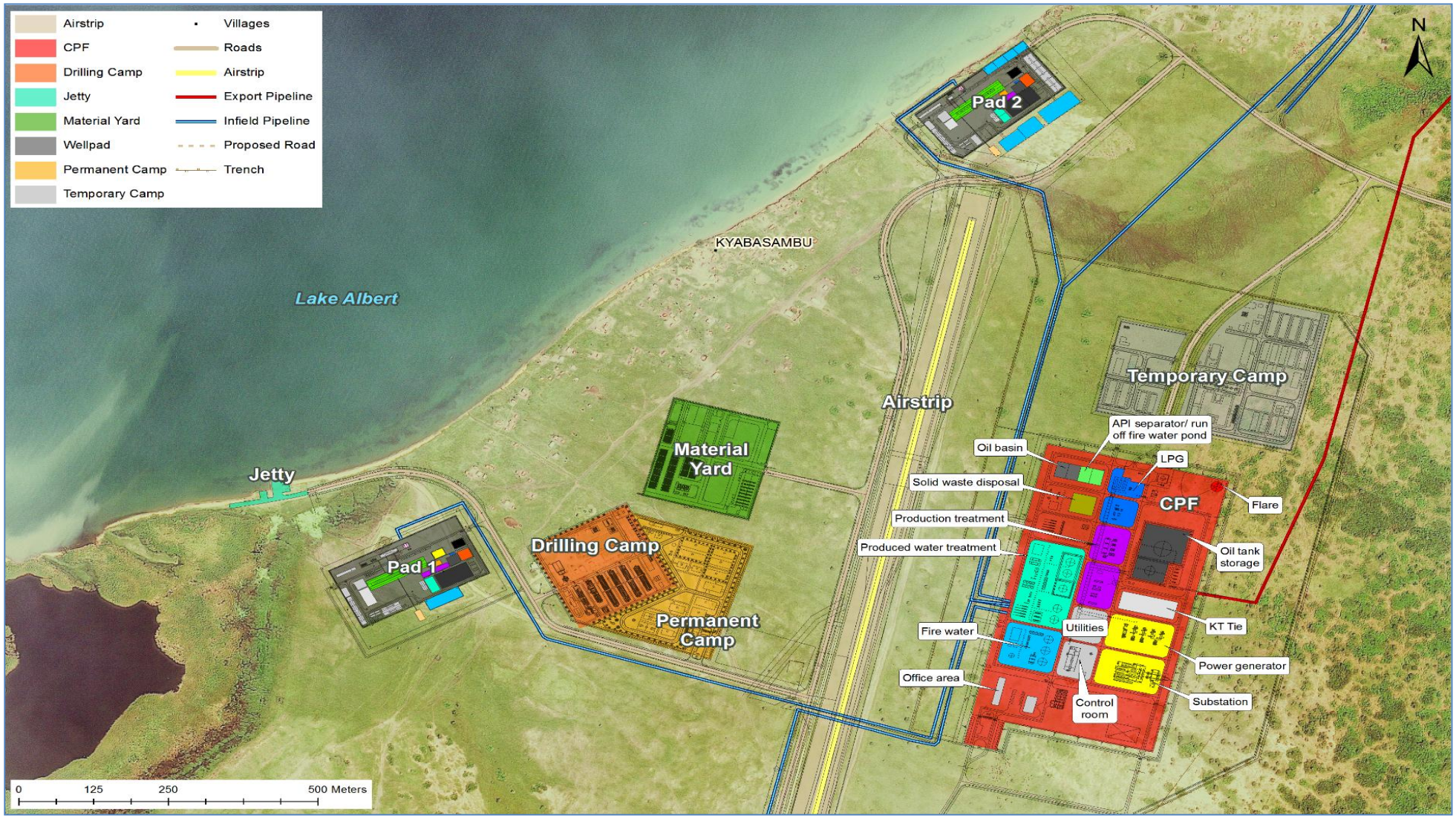


Figure 3: CPF and supporting infrastructure

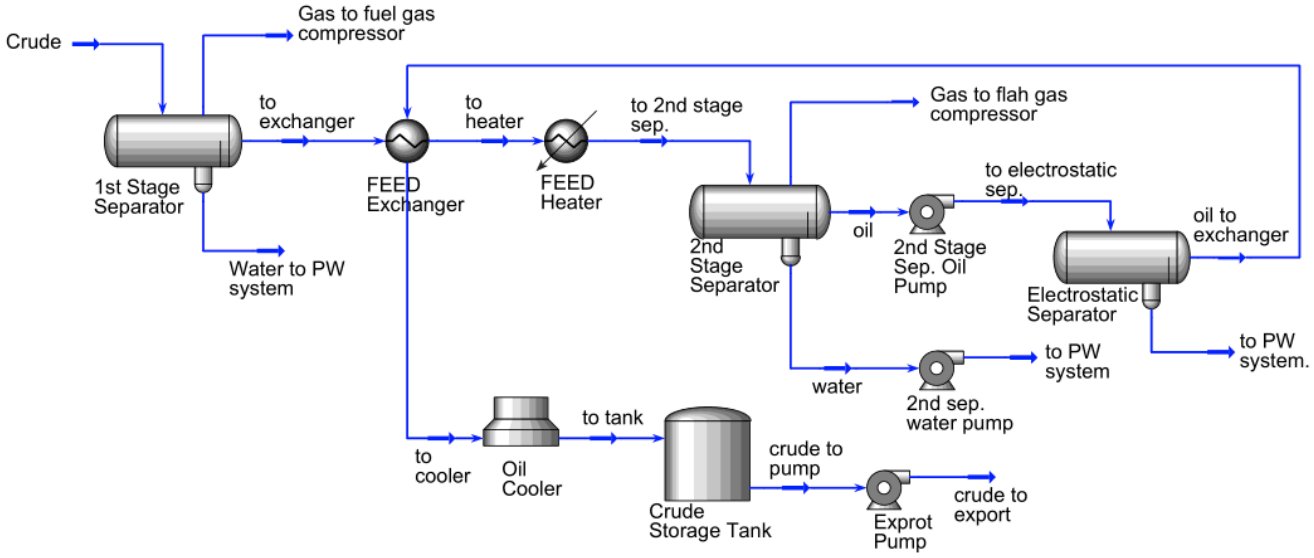


Figure 4: Oil production process overview

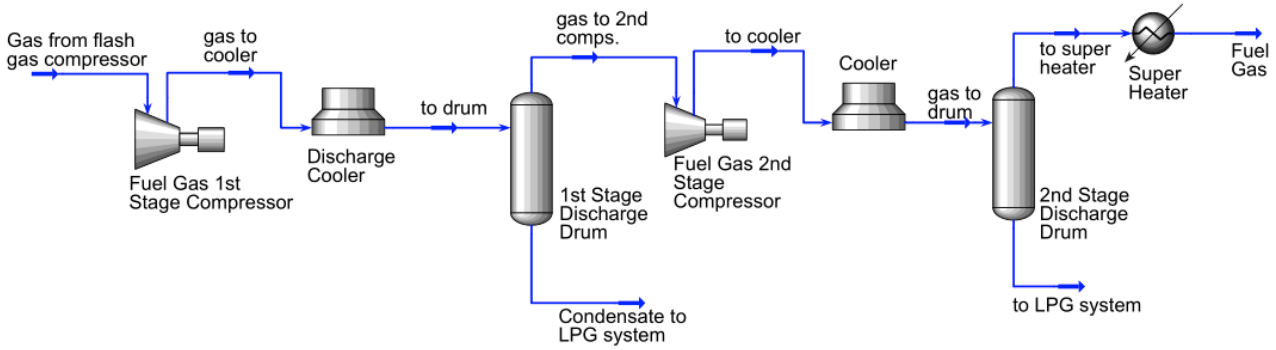


Figure 5: Fuel gas system overview

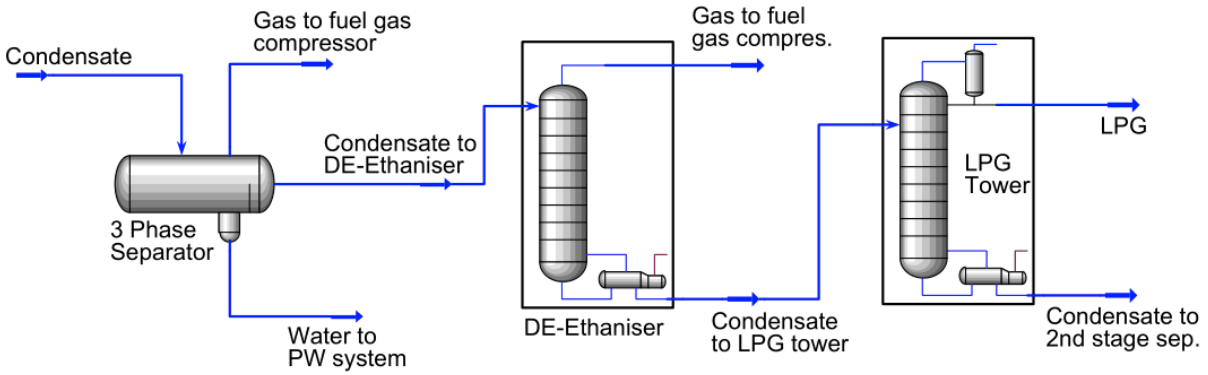


Figure 6: LPG system overview

3.2.3.7 Instrumentation and Control System

The KFDA instrumentation and control is segregated into **onsite** requirements, which include the Central Processing Facility (CPF), pumping station & delivery point facility; and **offsite** requirements, which include well pads, valve manifold and pigging stations, block valve station, flowlines and crude oil transmission pipeline. The primary source of process information will be field instruments capable of measuring all of the physical process parameters necessary for the project's control and safety functions to be carried out. Field instruments will be linked to an Integrated Control & Safety System (ICSS), which will be operated from the Central Control Room (CCR) at the CPF. The ICSS will provide seamless integration of all instrument systems to serve plant monitoring, control, safety and operations of the facilities, including those off-site. Operator Work Stations in the Central Control Room will monitor and control the CPF and associated well pads, flowlines and manifolds. A subset of the ICSS will be in the Feeder Pipeline delivery point tie-in to facilitate exchange of monitoring and control signals to the CPF CCR. The Operator Work Stations will also display Emergency Shutdown and Fire and Gas Detection system data and alarms and provide access to the safety functions of these systems.

3.2.3.8 Water Supply

All Project water requirements will be supplied from a water intake station on Lake Albert, roughly 1 km north-west of the CPF. A reinforced concrete chamber comprising a pump basin, a silt collection basin and a trash screen section will be sunk close to the shore edge. The depth of the structure will be set to cover the range of design lake water levels and the pump basin depth will be chosen to ensure pump performance at the minimum lake level. The planned capacity of the intake station is 390 m^3/hr, which includes provision for the maximum make-up injection water demand (~301 m^3/hr in year 5), potable water demand of 52 m^3/d and incidental (unaccounted) water demand, estimated to be in the order of 37 m^3/hr, which considers water requirements for makeover of wells during operations, which is an intermittent activity. The average daily water demand at the CPF, excluding domestic requirements is expected to be approximately 100 m^3/day.

3.2.3.9 Wastewater

The following wastewater streams will be generated at the CPF:

- Produced water - removed from the well fluids and delivered to the water treatment plant before injection down one of 11 injection wells on the well pads;
- Process effluent routed to the Closed Drain system;
- Drainage (mainly stormwater) routed to the Open Drain system; and
- Domestic effluent - treated in a sewage treatment plant at the permanent camp.

3.2.3.10 Air Emissions

Emissions to air from the new project facilities will comprise flue gas emissions from the gas fired power plant, emissions from various process pumps, blowers, heaters, compressors, gas turbines, process vents, storage tanks and truck-loading activities, other fugitive emissions and emissions from the flare during upset or emergency conditions (or in the event that the excess power evacuation infrastructure is not in place at the start of production).

There are no applicable Ugandan air emission standards and the project will use the IFC/World Bank guidelines as the basis of design. These include maximum SO_2, NO_2 and PM_{10} and H_2S emission limits for reciprocating engines, gas turbines and boilers (equivalent to fired heaters). Low NOx burners will be used on all combustion equipment.

3.2.3.11 Solid Waste

The Project will comply with the Ugandan National Environment (Waste Management) Regulations, S.I. No 52/1999 and the petroleum (Waste Management) Regulations S.I No.3 of 2019. Reference will also be made to the OGP (International Association of Oil & Gas Producers), Guidelines for Waste Management with special focus on areas with limited infrastructure (updated March 2009) as a best practice reference.

CNOOC's Waste Management Design Philosophy (2016) commits the company to comply with the key principles underpinning the waste hierarchy, which are, to avoid or reduce the generation of waste (or waste toxicity) at source, and/or to re-use or recycle the waste, before considering disposal options. Wastes will be segregated and stored temporarily at designated Waste Collection Points (WCPs) which will operate at the CPF. The WCPs will typically comprise of concrete hardstands, storage containers, secondary containment for hazardous liquid wastes (oil etc), and provisions to prevent ingress of rain and sunlight, as well as fire protection measures. Food and organic wastes will be disposed of through on-site composting utilising industrial composting equipment.

3.2.3.12 Supporting Facilities and Infrastructure

Facilities and infrastructure in support of the project include in-field access roads, a helipad and a material yard (supply base). Access roads will connect with the tarred escarpment road and an access road to well pad 4A has yet to be built. For the development and production phases, most equipment and supplies will be brought in by road. At this stage there are no plans to further upgrade the jetty. The airstrip will be used an airfield however may be converted to a helipad for the operational phase. Available space within the CPF footprint will be used as material lay down areas.

3.2.3.12.1 Materials Yard (Supply Base)

The supply base is 3.7 ha in extent (200 m x 185 m), situated west of the airfield and north of the drilling camp. It includes an assembly area, contractors' materials area, warehouse, material inspection and preparation area, casings area, chemical shed, parking and other minor use areas. Topsoil and subsoil will be stockpiled for future use during site restoration.

4.0 ENVIRONMENTAL MANAGEMENT FRAMEWORK

4.1 Obligations and Responsibilities of CNOOC

CNOOC has the overall responsibility for ensuring that the Project is undertaken in accordance with the recommendations of this O-ESMP. CNOOC is also responsible for updating the O-ESMP, as and when necessary, during the life cycle of the Project and must ensure that its contractors adhere to the stipulations of the O-ESMP.

CNOOC undertakes to manage all Project activities in a manner that minimises adverse effects on the environment and the public, maximises socio-economic benefits for the project area and protects the health and safety of employees, contractors, visitors and the general public. To this end, CNOOC will:

1) The O-ESMP shall available to all contractors and a print copy retained in the CNOOC site office. Ensure that the contractors are familiar with the O-ESMP which forms an integral part of the contract documents entered into with the consulting engineers and all contractors;

2) Educate its personnel, contractors and visitors with regard to the safety, health and environmental (SHE) requirements applicable in general to the project;

3) Provide professional staff to give effect to its safety, health and environmental management commitments;

4) Appoint a competent Project Manager to oversee all aspects of the project;

5) Appoint a competent CNOOC Environmental Coordinator (EC) prior to the commencement of operations. The EC will perform regular inspections to monitor compliance with the O-ESMP, provide the appropriate level of management within CNOOC with monthly reports on environmental compliance and performance and provide guidance on the remediation of any unplanned environmental impacts. The EC will also motivate and draft any updates to the O-ESMP as and when they become necessary;

6) Undertake internal O-ESMP compliance inspections and audits are undertaken by the EC. These inspections and audits will include all activities associated with the CNOOC project site in its entirety, including activities undertaken by CNOOC's contractors and agents;

7) Monitor, evaluate and report performance in safety, health and environmental protection to the relevant management level within CNOOC; and

8) CNOOC and its contractors will be responsible for implementation of the O-ESMP during the project.

4.2 Obligations and Responsibilities of Contractors

Obligations and responsibilities of the contractors are outlined below. Contractors shall:

1) Ensure that they are familiar with the O-ESMP and adhere to the requirements of this O-ESMP and the environmental guidelines and standards contained therein which form part of the contractual commitment with CNOOC and develop appropriate work method statements;

2) Familiarise themselves with the undertakings and requirements relevant to the project activities contained in this O-ESMP, educate their personnel accordingly and ensure that such undertakings and requirements are adhered to;

3) Prepare method statements describing the methods through which compliance with environmental standards will be achieved and submit them to CNOOC for approval. Although CNOOC may comment on any inadequacies in these statements, the contractor will be solely and exclusively responsible in case of non-compliance with the standards contained in this document;

4) Employ techniques, practices and methods that will ensure the fulfilment of these requirements, with specific reference to the control of waste and pollution, the prevention of loss or damage to natural resources and the minimisation of adverse effects on users and holders of neighbouring land and the public in general;

5) Take cognisance of the basic information provided in this O-ESMP, but shall also verify the accuracy of any information provided, report any inaccuracies or omissions to CNOOC's Management and Field Environmental Manager and, irrespective of any inaccuracies or omissions, comply with the intentions of the requirements stated in this O-ESMP;

6) Undertake any remedial measures within a reasonable period of time following the receipt of a written instruction from CNOOC to do so;

7) Take all reasonable and prudent measures to prevent the occurrence of accidents that may compromise the integrity of the environment and/or the health and safety of all persons on site, of all persons on neighbouring land and of the general public;

8) Report all incidents to CNOOC or its representative, including but not limited to environmental damage, injuries and/or loss of or damage to CNOOC's physical assets or corporate image;

9) In the event of an incident as described in point 8 (above) occurring, present a detailed plan to:

   a) Restore the environmental conditions, to a state similar to that existing before the incident;

   b) Address any injuries caused in a manner satisfactory to the injured party or parties and CNOOC; and

   c) Prevent the future occurrence of similar incidents.

10) Comply with CNOOC's internal environmental and social policies and standards;

11) Cooperate in periodic O-ESMP compliance audits by CNOOC, its external auditors and/or relevant government bodies and provide the necessary information to this effect; and

12) Should government authorities believe any activities executed by the contractor cause unacceptable environmental damage or are inadequate to mitigate environmental damage; the contractor shall immediately consult the competent government authorities and CNOOC and reach an agreement about the remedial measures to be implemented.

The measures agreed upon shall be implemented, so as to avoid the occurrence of further damage and to repair any damage that may have occurred. The contractor will be responsible for all relevant costs related to the applicable environmental damage.

4.2.1 Organisational Structure and Roles

A proposed organisational structure for CNOOC and the Contractor is set out in Table 4-1 for the overall environmental and social management of the Project. Role nomenclature and structure may change or vary but responsibilities should be allocated appropriately. In essence therefore, CNOOC and the contractor may adjust the form of the structure/Office nomenclature but make certain that the substance as relates to coverage of the responsibilities is fully achieved thus what is provided only serves as a provisional structure. In all cases, CNOOC and/or the Contractor (as outlined above) are responsible for the implementation of the O-ESMP through representation by the roles outlined below. For instance, all references to the 'Contractor' refer to the main contractor and all sub-contractors.

Table 4-1: Suggested organisational Structure and Responsibility

Role	Responsibility
CNOOC	CNOOC management is responsible for oversight of the project. Where an Operation Contractor is appointed for an activity, the CNOOC project manager will liaise with them. In cases where a Contractor is not appointed, the CNOOC manager will be responsible for all oversight of the relevant activity. The manager is responsible for: ■ Engineering, procurement, and management of the project, including all social and environmental management; ■ Ensuring conformance with accepted standards in the international petroleum industry, and that the Contractor employs up to date techniques, practices, and methods of Operation that comply with the appropriate standard; ■ Minimising general environmental damage, controlling waste, avoiding pollution, minimising loss of or damage to natural resources, and minimising effects on surrounding landowners, occupants, and the public; ■ Keeping the CNOOC Environmental Coordinator (EC) informed about any non-conformance in respect of this O-ESMP and advising the EC of actions that will be taken to rectify non-conformance; and ■ Employing the staff indicated in this table to monitor the Contractor's performance and to ensure that all staff are competent and fully briefed about the nature of the relevant project activity.
Site Engineer (Engineer)	■ The Site Engineer is CNOOC's representative on site; and ■ The Community Liaison Officer (CLO) and Environmental Site Officer (ESO) must report directly to the Site Engineer.
Contractor (including all sub-contractors)	■ The Contractor is responsible for all project activities; ■ The O-ESMP must form part of the Contractor's agreement with CNOOC and shall be legally binding; ■ The Contractor (or 'Contractor') must be responsible for the actions and performance of all sub-contractors; ■ The Contractor shall be responsible for ensuring compliance with relevant Ugandan legislation applicable to environmental management; ■ The Contractor must take proactive steps to ensure that the requirements in the O-ESMP are met, including, but not limited to: ▪ Employment of competent and dedicated staff to ensure implementation of the O-ESMP. All staff responsible for environmental management of the contract must be approved by CNOOC and the Contractor; ▪ Active participation of environmental management staff in the planning, Operation, and re-instatement of works; and

Role	Responsibility
	▪ Regular interaction with the Contractor's environmental staff. ■ Staff must be instructed about the relevant environmental sensitivities and the specific measures that each employee must implement to meet the environmental protection and management standards defined by the O-ESMP.
CNOOC Environmental Coordinator (EC)	■ The EC must be a senior CNOOC employee with extensive environmental work experience. The EC must liaise with consultants or specialists as needed and monitor environmental performance on the project, as well as review of monthly non-conformance reports. The EC must communicate with the Contractor regarding any significant non-compliance by the Contractor and agree the steps to rectify the non-compliance; ■ The EC must support the ESOs and CLOs and approve the ESO/CLO monthly reports; ■ The EC can propose E O-ESMP updates to NEMA and make necessary changes to the O-ESMP if approved by NEMA; ■ The EC must oversee the re-instatement of the site and provide final sign-off following acceptable re-instatement; and ■ The EC, in conjunction with the CNOOC Liaison Officer – Community and Stakeholder Affairs (LOCSA), must coordinate and manage all necessary communication with the Government (local, provincial and national).
CNOOC Liaison Officer – Community and Stakeholder Affairs (LOCSA)	■ The LOCSA is a permanent CNOOC officer responsible for all ongoing communications with communities and stakeholders affected by the project; ■ The LOCSA must guide the CLO(s) appointed under the management contractor's staff, where necessary, and must support interaction between the CLO(s) and relevant community leaders; ■ The LOCSA must review the ESO/CLO monthly reports and must work with the EC on matters of common interest, including review of non-conformances in the reports; and ■ Together with the EC, the LOCSA must initiate, coordinate, and manage all necessary communication with the Government (local, provincial and national).
CNOOC Local Procurement Officer	The CNOOC local procurement officer must implement enterprise and supplier development strategies and tactical plans (including necessary supporting business and governance processes, procedures, systems, and tools) in order to enable CNOOC to meet its preferential procurement and Enterprise and Supplier Development (ESD) targets. The officer must also: ■ Identify, nurture, grow, and leverage internal and external partnerships necessary to successfully execute the local content strategy, particularly as it relates to ESD and local procurement; and ■ Oversee the management of the delivery of business and technical support activities provided to CNOOC's ESD beneficiaries.
Community Liaison Officer (CLO)	■ Community Liaison Officers (CLOs) must be employed full time under CNOOC's staff as the principal interface between communities and the Contractor. They must guide and advise the Contractor with communication and local community issues through ongoing liaison and monitoring of relations with communities, identification of problem areas, and conflict resolution; ■ The CLO(s) must report directly to the Site Engineer. Where advice about community issues is required, the CLO shall notify and request assistance from the LOCSA; ■ The CLO must comply with all requirements for ongoing communication with affected communities;

Role	Responsibility
	■ The CLO(s) should be hired from the District in which the Project is proposed and must: ▪ Be trained by CNOOC and LOCSA about all relevant aspects of the project; ▪ Have experience in communication with communities and local and district authorities; ▪ Be able to communicate in local languages; and ▪ Be able to evaluate the effectiveness of specified social management measures and provide solutions to problems in respect of the implementation of the O-ESMP. Responsibilities of the CLO shall be set by CNOOC and may include the following: ■ Informing communities of upcoming activities and progress; ■ Organisation of occasional visits to site for District Government and community leaders; ■ Educating communities about traffic safety where they are near or on project access routes; ■ Implementation of support for labour agreements (among others) through communication with government, village leaders, and community members; ■ Liaising between CNOOC, communities and NGOs/ service providers implementing community projects; ■ Communication and management of the Compliments and Complaints Register; ■ Reporting of transgressions of foreign workers in the communities to the Site Engineer and the EC; ■ Preparation of monthly reports with the ESO.
Environmental Site Officer (ESO)	■ The Environmental Site Officer (ESO) must be appointed under CNOOC's staff and must be employed on a full time basis. The ESO must perform all tasks necessary to monitor the performance of the contractor with respect to the environmental specifications in the O-ESMP. Specific responsibilities of the ESO include: ▪ Ensure the protection of the environment; ▪ Perform all of the day-to-day tasks necessary to monitor the performance of the Contractor(s) with regard to the requirements of the O-ESMP; ▪ Liaise with the Site Engineer and the EC in the case of incidents, non-conformance, or any matter where the course of action is unclear; ▪ Verify the accuracy of the information contained in the O-ESMP and bring any errors, omissions, oversights to the attention of the Contractor and EC; ▪ In consultation with the EC, guide all aspects of the re-instatement process as applicable; and ▪ Prepare monthly reports with the CLO(s). ■ The ESO must be fully briefed about the project, and receive any necessary training from CNOOC and the EC. Through the Site Engineer, the ESO shall guide and advise the Contractor in respect of compliance with the O-ESMP on environmental issues. This will be achieved by ongoing internal coordination meetings, inspections/monitoring of the project, identification of problem areas, and provision of actions plans to avoid environmental damage. The ESO must liaise frequently with the CLO(s) and with the Contractor's environmental staff (ECO); and ■ The ESO must have experience in environmental management and be capable of evaluating the effectiveness of specified management measures and be familiar with environmental management techniques. The ESO must be capable

Role	Responsibility
	of proposing solutions to problems identified in respect of the implementation of the O-ESMP.
Specialist Environmental Consultant (Advanced Project Planning and Authorisation)	For activities requiring submissions to NEMA for authorisation, a specialist registered with NEMA as an environmental practitioner must be appointed. The specialist shall be responsible for assembling the necessary team to prepare necessary reports for submission to relevant authorities. The team must be determined based on the nature of the proposed activity and include relevant specialists.
Specialist Environmental Consultant (Project Implementation)	■ CNOOC shall employ the services of an Environmental Specialist as needed during project implementation. The specialist must ensure compliance with the requirements of the O-ESMP and inform CNOOC if the O-ESMP requires amending. This Specialist can be directly employed by CNOOC (where appropriate expertise is available) or contracted, where the expertise is not available, as determined by the Scope of Work prepared by the EC; and ■ The Specialist shall report directly to the EC; who will determine the responsibilities of the specialist. The specialist must have a demonstrated track record in the specific environmental aspect under consideration and advise CNOOC of any appropriate actions to be taken and recommend any necessary changes to the O-ESMP.
Independent Environmental Auditor	■ The independent environmental auditor must be an experienced environmental expert, familiar with auditing requirements and procedures, appointed to audit the project on completion of operation and for a year thereafter; ■ The auditor shall prepare a report documenting the effectiveness of environmental management, problem areas, remedial actions proposed and taken, and compliance/non-compliance by the Contractor(s) with the project standards; and ■ Prior to the audit the following must be discussed with the EC: specific audit objectives, individuals and organisations that the auditor proposes to meet, documented evidence of performance, and the locations to be visited during the audit. Audit findings and corrective actions must to be reported to NEMA.

4.3 Communication with Government, Communities and Stakeholders

Communication with the Ugandan Government regarding environmental management matters will be via CNOOC's Environmental Coordinator (EC) and Liaison Officer – Community and Stakeholder Affairs (LOCSA). Communication with local structures shall be undertaken by the Community Liaison Officer(s) (CLOs) appointed for the operation period, with assistance, where necessary, from the LOCSA.

4.4 Permits and Licences

Applicable approvals, permits, consents, and licences relating to the environment should be in place prior to all operational activities and must be stored in a location which is easily accessible to appropriate staff on site. It is the responsibility of CNOOC and contractors to ensure that all relevant permits, licences, and approvals are acquired and complied with. A non-exhaustive guide to permits, licences, and approvals is provided in APPENDIX B and it is the responsibility of CNOOC and contractors to ensure that all relevant permits, licences, and approvals are acquired and complied with

5.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

The O-ESMP has been structured into Standard Controls and specific Management Plans. The standard controls relate to general management actions required in project administration, procurement and stakeholder controls. These are exclusive to Tables 5.1- 5.4 and respectively include;

a) General administrative and liaison (Table 5-1)
b) Community stakeholder and Government Engagement (Table 5-2)
c) Procurement of local goods and services (Table 5-3) and
d) Labour Working Conditions and Employment (Table 5-4)

The subsequent tables are specific management plans that form part of an Environmental Management System (EMS). The Specific management plans relate specifically to operational activities of the CPF, wells, and ancillary infrastructure. CNOOC will implement, maintain and update the following plans in accordance with the provisions of the O-ESMP:

1) Air Quality management plan;
2) Noise and vibration management plan;
3) Biodiversity management plan
4) Water management plan;
5) Marine works management plan;
6) Traffic management plan;
7) Community health, safety and security management plan;
13) Waste management plan;
14) Cultural heritage management plan;
15) Labour working conditions and employment management plan;
16) Pollution prevention and response management plan;
17) Emergency management plan;
18) Influx management plan;
19) Ecosystem services management plan;
8) Visual assessment management plan;
9) Soil erosion and siltation management plan;
20) Greenhouse gas management plan; and
21) Health management plan.

5.1 General Administration and Liaison

5.1.1 Administration and General Issues

Table 5-1: Standard Controls for Administration and general issues

Ref.	Aspect/ Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria[2]	Schedule	Additional Reference
1.	Release of contracts	Compliance with O-ESMP	This O-ESMP shall be made available to all contractors working at the CPF. In addition, the documents should be available at the site office at all times.	CNOOC	■ Availability of the O-ESMP at the site office and proof of communication of such availability to all contractors.	Project tendering	
2.	Legislation	Compliance with relevant legislation	In all cases, the requirements of Ugandan legislation shall be met (see APPENDIX A for list of relevant Environmental Legislation). Should this not be the case, for any reason, CNOOC shall be immediately notified of any breach in the legislation or pending breach. This notification shall be accompanied by full details of the contravention or pending contravention and shall be accompanied by a corrective action plan.	Contractor CNOOC	■ Project records; ■ Absence of legal warnings/ prosecutions; and ■ ESO/CLO monthly reports with reference to legal non-compliances.	At all times	
3.	Sub-contractors	Compliance with O-ESMP	The main contractor shall be responsible for ensuring the compliance of sub-contractors with all aspects of this O-ESMP (all references to the Contractor refer to the main contractor and all sub-contractors).	Contractor CNOOC	■ Evidence of C-ESMP knowledge of the contractor and physical possession of the same by all contractors ■ Evidence of compliance by all sub-contractors.	At all times	
4.	Working period and work hours	Nuisance avoidance	Operation is a 24-hour operation. All activities, particularly at night, shall be managed to minimise potential nuisance in surrounding communities.	Contractor CNOOC	■ Availability of permits from NEMA for generation of noise beyond permissible levels ■ ESO/CLO monthly reports; ■ Absence of complaints; and ■ Contractor's reports on weekly hours worked by personnel.	At all times	
5.	Personnel management	Adequate HSE controls ensuring a safe work environment	A site and project-specific HSE induction shall be drafted prior to commencement of operations and be presented to all employees before they start work on the Project. CNOOC shall approve the content of the induction and a register shall be kept by the Contractor of all personnel who attend the induction.	Contractor Environmental Coordinator CNOOC	■ Inclusion in training/induction programme(s); and ■ Register of attendance of induction;	Prior to employment	
6.	Personnel management	Safe work environment and no unauthorised fires	Smoking is only permitted in designated areas and where there is no risk of starting bush fires (subject to normal safety precautions about flammable materials).	Contractor CNOOC	■ Inclusion of smoking areas; and ■ in training/induction programme(s).	At all times.	
7.	Work site employment	Employment of appropriate personnel	Workers shall not be employed at the gate of any work site. The recruitment procedure will be clearly communicated to the locals through sensitization programs	Contractor CNOOC	■ No soliciting of work by workers observed at the campsites or work locations.	At all times.	
8.	House-keeping	Safe work environment and no unnecessary pollution	Working areas shall be kept tidy and free of litter at all times.	Contractor CNOOC	■ Inclusion in training/induction programme(s); and ■ Absence of litter on site.	At all times	
9.	Disciplinary procedures	Appropriate correction of non-compliance with O-ESMP	Appropriate disciplinary procedures shall be taken against offenders by the contractor's management in the event of deliberate non-compliance with any of the specifications in this O-ESMP and notification shall be given to the Site Engineer of the actions taken.	Contractor CNOOC	■ Evidence of disciplinary procedures where deliberate non-compliance is registered.	At all times	
10.	Alcohol and drug use	Safe work environment	No alcohol or narcotic substances shall be permitted on site.	Contractor CNOOC	■ Records of disciplinary procedures.	At all times	

[2] Performance indicators are only specified where there may be additional requirements to the verification that the requirement / specification have been met. Additional monitoring requirements are specified under Section 6.0. Note that number of incidents, audit findings etc. shall also be used as indicators of performance.

5.1.2 Community, Stakeholder and Government engagement

A key management principle during the operational phase of the project shall be that of ensuring that the rights of the inhabitants are not infringed and that all operations are conducted in a manner that is respectful of the local residents and the land and resources that belong to them. Most people are tolerant of operational impacts if treated courteously and this shall be a guiding principle of all CNOOC's contractors' activities and relationships with communities.

The project area is characterised by the following socio-economic conditions, which shall always be taken into consideration:

- Subsistence living;
- Poverty;
- Strong dependence on local natural resources;
- Lack of health and education facilities, access roads; and
- Very limited employment opportunities;
- Cross border commerce and influx of migrants from DR Congo.

Table 5-2: Standard Controls for Community, Stakeholder and Government engagement

Ref.	Aspect/ Activity	Objective	Standard Control Management Action	Responsibility	Indicator / Performance Criteria	Schedule/ Monitoring Frequency	Additional Reference
1.	Community expectations	Understand and manage community expectations	Community leaders and residents may have expectations that CNOOC will play a supporting and developmental role within the area and that the project will have other positive economic benefits. In order to encourage realistic expectations, close communication shall be maintained between local communities and the Community Liaison team with the objective of clarifying the limitations to CNOOC's involvement in development initiative in project-affected communities.	CNOOC	■ Number and nature of communication initiatives; and ■ Minutes of meetings and correspondence indicating the activity of the CLOs and LOCSA.	At all times	
2.	General	Open and transparent communication with community leaders and residents	Access to land, the integrity of fences, control of bush fires, littering, harassment of domestic and wild animals, sedimentation and contamination of ground and surface waters, damage to landscape and vegetation, nuisance (noise and dust) and all such environmental matters, shall be controlled in the best interests of the local inhabitants and shall, where necessary, be the subject of open communication between the parties.	CNOOC	■ Record of compliments/ complaints; ■ Number of complaints registered and resolved; ■ Nature of corrective actions taken; and ■ Trends in complaints.	At all times.	
3.	Community consultation	Ongoing communication with communities	Ongoing communications with communities during operation. Where teams are active, the frequency of communication with local communities shall be increased. Records of all communication shall be kept and regularly updated.	CNOOC	■ Records of ongoing communication/ sensitization programs; and ■ Compliments and Complaints Register and necessary follow up actions.	Ongoing/all the time	
4.	Forums	Communication through formal forums	Where CNOOC already has existing communication forums or can re-establish these where they have ceased to function, they shall be considered for use before establishing new forums. Contractors are obligated to source labour via the Community Liaison Forums (CLF).	CNOOC	■ Availability of forums ■ Record of forum activity in respect to project sensitization ■ Use of pre-existing forums, where available.	Ongoing/all the time	
5.	CNOOC compliments and complaints register	Documentation of compliments and complaints	■ Each Project Affected community shall be provided with a Compliments and Complaints Register and informed how to use it. Information about its use shall also be included in the register itself. Marginally literate and illiterate people are to be encouraged to obtain assistance to use the register or to contact CNOOC by phone or in person on days when the register is checked; and ■ The Register in each community shall be inspected weekly by CNOOC as a part of ongoing communication and any complaints are to be resolved within 48 hours. The	CNOOC	■ Compliments and Complaints register in each affected community; and ■ Record of the follow up resolution register for ■ Compliments and Complaints and necessary follow up actions.	Register to be provided to local communities prior to the commencement of any operational activity.	

Ref.	Aspect/ Activity	Objective	Standard Control Management Action	Responsibility	Indicator / Performance Criteria	Schedule/ Monitoring Frequency	Additional Reference
			Register shall be structured in accordance with the requirements set out in the CNOOC Communications Plan.			Weekly check of register by the CLO	
6.	Responsibility for communicating with stakeholders	Assign communication to responsible parties within organisational structure	Project personnel shall not deal directly with surrounding communities about operational-related issues and shall bring to CNOOC management's attention any issues that are raised by the community that require action. CNOOC shall attend community meetings to resolve any issues that have arisen.	CNOOC	■ Records of communication with communities and resolution of issues; and ■ Meeting and discussion records in the monthly ESO/CLO reports.	Ongoing/ All the time	
7.	Prohibition of access/ trespass of project personnel into community homesteads and private property	Avoid public nuisance arising from trespass of project personnel onto community private property	Access by all project personnel to homesteads and associated lands outside of the project footprint shall be prohibited.	CNOOC	■ Absence of complaints.	At all times	

5.2 Procurement of Local Goods and Services

CNOOC aligns its project planning to support Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and will promote competitiveness of Ugandan labour and enterprises in the oil and gas industry and the overall economy.

Table 5-3: Standard Controls for Procurement of Local Goods and Services.

Ref.	Aspect/Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule/ Monitoring Frequency	Additional Reference
1	Procurement of local goods and services Procurement of local goods and services	Promotion of procurement of local goods and services Appropriate procurement of local goods and services	CNOOC must comply with Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and will: ■ Build the capabilities of Uganda's human resources to effectively participate in the oil and gas subsector; ■ Promote employment of Ugandans in the oil and gas industry; ■ Develop the competitiveness of Ugandan enterprises as suppliers and joint venture partners; ■ Increase the use of locally produced or available goods and services by the oil and gas industry; and ■ Promote research and development and technology transfer. The above will be achieved through the following: ■ All available positions will be publicly advertised; ■ Recruitment and training will be prioritised for Ugandans; ■ Establish operational bases in Uganda; ■ Procurement and contracting procedures will be put in place to benefit Ugandan enterprises and locally available goods and services will be exclusively tendered to Ugandan enterprises and whenever these meet CNOOCs established procurement requirements; ■ Development and implementation of plans for the transfer of technology and knowhow to Ugandan institutions;	CNOOC Contractor Contractor CNOOC Local Procurement Officer	Local suppliers in service provider list Register and percentage of procurement in communities, the District and Province and nationally. ■ Prepared and implemented Local Content Plan; ■ Records of percentage of procurement from local communities, the district, province and nationally; and CDP established.	Pre-operation. Periodic ongoing reporting	■ Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017); and ■ Labour working condition and employment management plan. ■ Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017); and ■ Labour working condition and employment management plan.

Ref.	Aspect/Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule/ Monitoring Frequency	Additional Reference
			■ The Contractor shall prepare and submit a Local Content Plan to CNOOC for approval, in compliance with Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017) and CNOOC's procedures and guidelines for procurement in Uganda, as described above. The Contractor will comply with this plan and use a specific template as a part of reporting requirements to CNOOC. Detailed records of procurement shall be kept for submission to Ministry of Energy and Mineral Development;				
2	Procurement of local goods and services Procurement of local goods and services	Promotion of procurement of local goods and services Appropriate procurement of local goods and services	■ The plan will focus on stimulating economic growth throughout the value chain and creating opportunities for local suppliers. Local content, which covers a range of categories, from highly specialised to the commoditised, must be an integral part of tender evaluation criteria in all procurement; ■ Promote economic development and infrastructure improvement in the project area and the Kikuube District in a partnership with central, regional and local government to develop a comprehensive infrastructure, services and local economic development plan; ■ Ensure that the Community Development Plan (CDP) for the Buhuka Flats and surrounding areas includes a focus on mechanisms that will promote an inclusive business development approach, in particular focusing on innovative technologies and solutions for environmental protection; ■ Engage with the Ugandan government to consider investment in broad-based economic development in Kikuube District, promoting traditional sectors such as agriculture, which will serve to reduce oil-related dependence; ■ Develop comprehensive strategies to build the capacity of local service providers to compete within the local and regional business environment, ideally on a diversified basis that does not only serve the oil industry; ■ Develop a local procurement policy and steadily increase project spend in support of local capacity and the further development of the business supply chain through appropriate purchasing and business development strategies; ■ Identify and support programmes (including related to micro-financing) in support of vulnerable groups as required (elderly, single women or child headed households) in settlements most directly impacted by the development; and ■ Maximise local procurement of goods and services. CNOOC has committed to this principle, which is expected to apply to the construction contractors responsible for the feeder pipeline as well.	CNOOC Contractor Contractor CNOOC Local Procurement Officer	Local suppliers in service provider list Register and percentage of procurement in communities, the District and Province and nationally. ■ Prepared and implemented Local Content Plan; ■ Records of percentage of procurement from local communities, the district, province and nationally; and ■ CDP established.	Pre-operation. Periodic ongoing reporting	■ Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017); and ■ Labour working condition and employment management plan. ■ Uganda's National Content Policy for the Petroleum Subsector in Uganda (Draft; 2017); and ■ Labour working condition and employment management plan.
3	Gender	Equality	Uganda's Gender policy (2017) will be complied with and gender equality principles will be included in corporate policies to broaden corporate social responsibility and interventions that promote gender equality.	Contractor CNOOC	Implementation of policies to facilitate gender equality.	Quarterly Pre-operation monitoring and. Periodic ongoing reporting	■ Uganda Gender Policy (2007); and ■ Labour working condition and employment management plan.
4	Human Capital Development	Promotion of Local human resource and skill development	■ Collaborate with the Petroleum Authority of Uganda (PAU), which is tasked with establishing, maintaining and operating a national talent capacity register for the petroleum sector to ensure that CNOOC contributions in the form of bursaries and scholarships support the development of an appropriately skilled labour force; ■ Align the CNOOC Education and Training related support initiatives as well as in-house training and competency development of Ugandan nationals with the critical and scarce skills requirements of the Oil and Gas sector;	CNOOC	Number of scholarships/ busaries given to the local community Infrastructural support and technical assistance given to education institutions to foster STEM and /or vocational training Implementation of human capital development policy.	Pre-operation. Periodic ongoing reporting	

Ref.	Aspect/Activity	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule/ Monitoring Frequency	Additional Reference
			■ Consider promoting a process of Recognition of Prior Experience (RPE) and Recognition of Prior Learning (RPL) in collaboration with tertiary technical training institutions that will allow the accrual of credit for informal and non-formal skills development into the formal skills development sector; ■ Promote STEM at school level by incorporating support to the development of science laboratories at schools, strengthening education in maths and science at schools and the development of well-stocked school libraries as a specific focus of CNOOC Corporate Social Responsibility (CSR); and ■ Support initiatives that will promote and strengthen the levels of competence of master artisans and crafts persons within the Technical Education and Training (TVET) system, and design mechanisms that will support the entrance of female scholars into TVET institutions.				

5.3 Labour, working conditions, and employment management plan

The labour working conditions and employment management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-4: Labour working condition and employment management plan

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Labour Force Management Plan (LFMP)	Establish a LFMP in communication with relevant stakeholders	CNOOC shall develop a Labour Force Management Plan (LFMP) to guide recruitment processes and the workforce wellbeing in line with the Ugandan labour laws and regulations and IFC PSs.	CNOOC	■ Signed Project Labour Agreement; and ■ Records of disputes.	In advance of contract signing	
2.	Implementation of the LFMP	Compliance of local labour force laws during operation phase Establish and foster Compliance with LFMP and Ugandan labour law	Employment shall be undertaken and managed by the Contractor according to Ugandan labour law and the approved Project Labour Agreement (provided to the Contractor by CNOOC). The following should be addressed in the LFMP and implemented by the Contractor: ■ The maximum use of local labour during operation; ■ All unskilled temporary jobs should be for the project-affected communities, subject to availability of sufficient workers from these communities who meet with project requirements for employment; ■ Recruitment methods for the project shall be agreed with the local authority and community leaders but shall under no circumstances be *ad hoc* recruitment; ■ No fees shall be levied for recruitment or preferred status for employment opportunities; ■ Develop and implement training and skills development programmes in the production workforce to expand the human capital available within the local economy; and ■ Consider offering bursaries or internships to promising students (refer to discussion on the community development impacts) to build a sustainable and educated future workforce.	CNOOC Contractor	■ Signed Project Labour Agreement; ■ Maximisation of labour use,; ■ Records of CLF, showing unskilled employment from project-affected communities; and ■ Absence of justifiable complaints in the Compliments and Complaints Register.	Quarterly before and during operation	
3.	Recruitment for Jobs for unskilled workers	Transparency and equitability in recruitment of Fair distribution of jobs for unskilled workers	Selection for unskilled employment shall further be based on the procedures developed and agreed by the Community Liaison Forum (CLF), which is intended as a mechanism for identifying and selecting unskilled workers from local communities in a fair and transparent manner.	CNOOC Contractor	■ Compliance with LFMP; and ■ Records from Community Liaison Forum.	Quarterly prior to operation and all the time during project operation	

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
4.	Requirements for employment opportunities	Communication of requirements for employment opportunities	In order to maintain a transparent labour recruitment process, the information concerning procedures and eligibility requirements shall be communicated through channels used by local authorities and grass roots community organisations. Details of communication channels shall be included in the Communications Plan.	CNOOC Contractor	■ Number and nature of communication initiatives; and ■ Records of communication.	Quarterly prior to operation and all the time during project operation	
5.	Grievance Management	Amicable management of all grievances in the shortest time	The LFMP shall include a formal Employee Grievance Procedure which provides employees with a mechanism for raising issues with the company without fear of victimisation. Contractors shall ensure that the induction of employees includes instruction on how to use the grievance procedure.	CNOOC Contractor	■ Evidence of availability of Grievance Procedure; ■ Induction regarding Grievance Procedure; and ■ Records of grievances and how they were resolved.	Quarterly prior to operation and all the time during project operation	
6.	Semi-skilled and skilled employment	Localise employment	Where positions are available for semi-skilled and skilled jobs, the Contractor shall coordinate with local authorities and the education sector to identify appropriate local candidates. The Contractor shall follow the 'spiral' principle in seeking qualified candidates (i.e. start in local communities, and move outwards to the closest town, province, and finally nationally.	CNOOC Contractor	■ Percentage of semi-skilled and skilled employees from local communities, District and Province; and ■ Evidence of use of the 'spiral principle'.	Quarterly prior to operation and all the time during project operation	
7.	Employment of women, disabled and other disadvantaged people	Prioritise previously disadvantaged/ project affected people	Uganda's Gender policy (2017) will be complied with and gender equality principles will be included in corporate policies to broaden corporate social responsibility and interventions that promote gender equality. The Contractor shall weight the award of specific unskilled jobs in favour of women, disabled, and other disadvantaged people.	CNOOC Contractor	Percentage of women, disabled and other disadvantaged people employed.	Quarterly prior to operation and all the time during project operation	
8.	Employee agreements	Alignment of employee agreements with the LFMP	The Contractor shall ensure that agreements with employees (including disciplinary criteria, working conditions, payment of overtime etc.) are in line with the LFMP and are properly understood by all employees.	CNOOC Contractor	Records of employee briefings and induction.	Ongoing	
9.	Temporary nature of employment	Management of job tenure expectation for employees Foster financial literacy for employees to cope with life after expiry of the job tenure	The Contractor shall ensure that contract employees fully understand the temporary nature of their employment contracts.	CNOOC Contractor	Record of financial literacy to employees whose contract tenure is more than 4months Employment Contract and records of employee briefings and induction.	Monthly	
10.	Employee supervision	Adequate supervision	Contractors shall ensure proper supervision of employees at all times, including after-hours where employees are resident on site.	CNOOC Contractor	Compliance with LFMP.	At all times	
11.	Skills Development	Enhance skills of local workers	■ Collaborate with the Petroleum Authority of Uganda (PAU), which is tasked with establishing, maintaining and operating a national human capacity register for the petroleum sector to ensure that CNOOC contributions in the form of bursaries and scholarships support the development of an appropriately skilled labour force; ■ Align the CNOOC Education and Training related support initiatives as well as in-house training and competency development of Ugandan nationals with the critical and scarce skills requirements of the Oil and Gas sector; ■ Consider promoting a process of Recognition of Prior Experience (RPE) and Recognition of Prior Learning (RPL) in collaboration with tertiary technical training institutions that will allow the accrual of credit for informal and non-formal skills development into the formal skills development sector;	CNOOC Local Procurement Officer Construction contractor	Compliance with LFMP and Records of employee training.	Ongoing	

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
			■ Promote STEM at school level by incorporating support to the development of science laboratories at schools, strengthening education in maths and science at schools and the development of well-stocked school libraries as a specific focus of CNOOC Corporate Social Responsibility (CSR); and ■ Support initiatives that will promote and strengthen the levels of competence of master artisans and crafts persons within the Technical Education and Training (TVET) system, and design mechanisms that will support the entrance of female scholars into TVET institutions.				

5.4 Air Quality Management Plan

The air quality management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-5: Air quality management plan

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
	Operations at the Power plant, CPF and ancillary infrastructure	Flue gas emissions from the gas fired power plant, emissions from various process pumps, blowers, heaters, compressors, gas turbines, process vents, storage tanks and truck-loading activities, other fugitive emissions and emissions from the flare during upset or emergency conditions	Comply emission standards and guidelines	Point source emissions are distinct, immobile, and identifiable sources of air pollutants (e.g. flaring and venting of hydrocarbons). Emissions from point sources must be minimised and controlled according to CNOOC's Air Quality Management Specification (includes control technologies, as well as stack height and emission guidelines) and Good International Industry Practice (GIIP)3. The contractor shall comply with the Ugandan legal requirements and the following IFC/ World Bank air quality guidelines: ■ Sulphur Dioxide (IFC daily standard): 20 µg/m^3; ■ Nitrogen dioxide (IFC annual/hour standard): 40 µg/m^3 and 200 µg/m^3; ■ Ozone (IFC 8-hour daily standard): 100 µg/m^3; and ■ Particulate Matter $PM_{2.5}$ (IFC annual/ daily standard): 10 µg/m^3 and 25 µg/m^3. Energy efficiency must be maximised to minimize air emissions as outlined in CNOOC's energy management specification. Additional measures that should be applied are outlined by the IFC[4]. Fugitive source emissions are unconfined air emissions distributed over a wide area (i.e. not confined to a specific release point). CNOOC's air Quality Management Specification must be complied with and the following must be done to minimise and control these emissions: ■ Open burning of waste material must be prohibited; ■ A procedure must be developed for monitoring of fugitive emissions from infrastructure (e.g. pipes, valves, seals, tanks) and other components with vapour detection equipment, and with subsequent maintenance or replacement of components as needed. The procedure should specify the monitoring frequency and locations, as well as the trigger levels for repairs; ■ Collection of vapours through air extractors and subsequent treatment by removing VOCs with control devices such as condensers or activated carbon absorption; and ■ Ozone depleting substances[5] must be minimised as far.	CNOOC	■ Point source emissions inventory; ■ Documented evidence of regular emissions monitoring; ■ Compliance with air emissions standards and guidelines; ■ Resolution of air quality complaints linked to point source emissions in a timely manner; ■ Regular review and updates of emissions monitoring data, including resolution of information gaps; ■ Monitoring location represents point source; ■ Monitoring time represents maximum point source emission period; ■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records in ESO monthly reports; and ■ No adverse impacts to human health and the environment.	Daily inspection with monthly monitoring or as specified by relevant authority.	■ CUL-QHSE-L3(GE)-055 Air Quality Management Specification; ■ CUL-QHSE-L3(GE)-062 Greenhouse Gas. Management Specification; ■ Integrated Emission Standard of Air Pollutants (GB16297-1996); and ■ IFC Air Emissions Guidelines ■ CUL-QHSE-L3(GE)-063 Energy Management Specification..

[3] IFC Guidelines: Air Emissions and Ambient Air Quality (2007) - http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES

[4] IFC Guidelines: Energy Conservation (2007) - http://www.ifc.org/wps/wcm/connect/c25b18004886583db4eef66a6515bb18/1-2%2BEnergy%2BConservation.pdf?MOD=AJPERES

[5] Examples provided by IFC (2007) include: chlorofluorocarbons (CFCs); halons; 1,1,1-trichloroethane (methyl chloroform); carbon tetrachloride; hydrochlorofluorocarbons (HCFCs); hydrobromofluorocarbons (HBFCs); and methyl bromide. They are currently used in a variety of applications including: domestic, commercial, and process refrigeration (CFCs and HCFCs); domestic, commercial, and motor vehicle air conditioning (CFCs and HCFCs); for manufacturing foam products (CFCs); for solvent cleaning applications (CFCs, HCFCs, methyl chloroform, and carbon tetrachloride); as aerosol propellants (CFCs); in fire protection systems (halons and HBFCs); and as crop fumigants (methyl bromide)

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
						■ Compliance with Energy Management Specification and IFC recommendations[3]. ■ Implementation of methods to control and reduce fugitive emissions in design, operation, and maintenance of facilities; ■ Selection of appropriate infrastructure to minimise emissions; ■ Implementation of adequate leak detection and repair programmes; and ■ No adverse impacts to human health and the environment.		
	Operation of mobile equipment/vehicles in KFDA	Emissions from Mobile Sources	Minimise and control emissions	Emissions from vehicles include CO, NOx, SO_2, PM and VOCs and general control measures that must be implemented are outlined by CNOOCs Air Quality Management Specification. Measures include: ■ Vehicles must be maintained according to manufacturer's recommended maintenance programs; ■ Drivers must be instructed on the benefits of driving practices that reduce both the risk of accidents and fuel consumption; ■ Aging vehicles must be replaced by newer more fuel-efficient alternatives. All vehicles must use clean fuels (i.e. low-sulphur fuels or biofuels); ■ Where feasible, emission control devices (e.g. catalytic converters) must be installed and maintained in vehicles and mobile machinery; ■ Consider emission technology for gas engines that meets the IFC emission requirements; ■ Implement annual emission testing of the main emission sources; ■ Develop and maintain a site-wide emissions inventory for the project; ■ Continue to operate and maintain the site-specific particulate monitoring and trace gas monitoring network established during the construction phase; ■ Re run the air dispersion model to verify the operational ambient air quality impacts on surrounding receptors every 5 years or when a significant change to operations takes place. Calibrate the dispersion model using actual emission data and measured results from the monitoring network; ■ Audit and optimise the air quality monitoring network annually to ensure that it is maintained in accordance with best practice and is relevant to the key emission sources on the ground; ■ Update the air quality management plan every 5 years, based on the accumulated results; ■ Reduce unnecessary traffic; and ■ Control vehicle speeds and institute traffic calming measures to reduce vehicle dust entrainment.	CNOOC Contractor	■ Maintenance as per manufacture's requirements; ■ Visual evidence of emissions or exhaust residue; ■ Air Quality complaint; ■ Gaps identified in monitoring data and reporting requirements; and ■ Appropriate Journey management plans.	Safety Inspections before use and daily inspection during operation	■ CUL-QHSE-L3(GE)-055 Air Quality Management Specification; and ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification.

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
	Handling materials likely to get airborne Vehicle movement on unpaved roads	Dust emissions from stockpiles, open dusty surfaces	Minimise dust generation and comply to relevant legislation and guidelines	■ Use wet suppression and wet misting during materials handling activities; ■ Apply wet suppression on Buhuka Flats unpaved roads using water or a suitable dust palliative to achieve 50% control efficiency or better; ■ Cover stockpiles and keep stockpile heights as low as practicable to reduce their exposure to wind erosion and dust generation; ■ Progressively rehabilitate and re-vegetate disturbed areas; ■ Monitor dust generation through visual observation and by means of dust samplers for PM_{10} and dust fallout. Include a background monitoring station at a location representative of the local area but unaffected by any dust generated by the project; and ■ Act immediately on any dust episodes that are clearly resulting in nuisance in adjacent communities. This implies competent, effective, and full time environmental personnel at the CPF. Dust caused by operational activities shall be controlled to ensure no detrimental effect on landowners, occupants, employees or the public. The contractor shall comply with the Ugandan legal requirements and IFC/ World Bank air quality guidelines for suspended particulates. The upper limit values are as follows: ■ Suspended Particulates (Ugandan daily standard): 200 µg/m^3; ■ PM_{10} (IFC daily standard): ≤50 µg /m^3; ■ PM_{10} (IFC annual standard): ≤20 µg/m^3; ■ Respirable particulate matter (<10 µg/m^3) (Ugandan daily standard <100 µg/m^3); and ■ Dust fall 600 mg/m^2/day determined in accordance with ASTM D1739 methodology. Where considered necessary Construction Contractor and the CLO, Contractor shall demonstrate compliance with the above standard by monitoring.	Contractor CNOOC	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records of observations in ESO/CLO monthly reports (Need for use of formal monitoring equipment to be determined by CLOs and ESO, based on circumstances on site); and ■ No adverse impacts to human health and the environment.	Daily Inspection and monthly monitoring	
	Air quality monitoring	Degeneration of air quality in project area	Minimise the degeneration of the ambient air quality	■ CNOOC must operate and maintain a site-specific ambient air quality monitoring network during the operational phase; ■ The construction phase monitoring network should be audited and optimise to form an appropriate operational phase air quality monitoring network the air quality monitoring network; ■ Visual dust inspections should be undertaken daily. If dust is observed as a nuisance, dust fall monitoring should be undertaken with the ASTM D1739 methodology; ■ Fine PM_{10} particulate monitoring via active monitoring methodologies should be continued from the construction phase; ■ Monitoring of gaseous trace gas pollutants (i.e. SO_2, NO_2, O_3 etc.) with passive diffusion tubes should be undertaken biannually (twice a year during operations); ■ Audit and optimise the air quality monitoring network annually audit to ensure that it is maintained in accordance with best practice and is relevant to the key emission sources on the ground; ■ The emissions inventory and model should feed into future updates of the air quality management plan; ■ Responsibility for the monitoring network can be allocated by CNOOC to the Contractor through contractual agreements;	Contractor	Monthly air quality monitoring reports.	Daily inspection and Monthly monitoring	

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
				■ During construction, dust fall monitoring is to be undertaken with the ASTM D1739 methodology and fine PM_{10} particulate monitoring via active monitoring methodologies; and ■ Monitoring of gaseous trace gas pollutants (i.e. SO_2, NO_2, O_3 etc.) with passive diffusion tubes should be undertaken biannually (twice a year during construction).				

5.5 Noise and Vibration Management Plan

The noise and vibration management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-6: Noise and vibration management plan

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Vehicle and machinery noise	Noise pollution causing nuisance to exposed community/ homesteads Disturbance/ distortion of the behavioural pattern of animals and humans	Minimise and control noise	The following measures must be implemented: ■ Installation of vibration isolation for mechanical equipment; ■ Training drivers and equipment operators to minimise unnecessary generation of noise; ■ Maintenance of machinery and equipment as by the manufacturer's schedule and specification ■ Training all personnel to be aware of noise nuisance and to minimise their noise footprint in the surrounding community; ■ , Reasonable re-location of noise sources to less sensitive areas to take advantage of distance and shielding to reduce noise impacts; ■ Limiting traffic routing through community areas wherever feasible; ■ All vehicles and equipment shall be fitted with noise suppression devices, as appropriate, and operated and maintained as per manufacturer's specifications, instructions, and manuals; ■ Noise producing equipment such as generators, air compressors, etc. should be enclosed in acoustic enclosures. Mufflers, bafflers must also be used where feasible; ■ Noise generating facilities (e.g. well sites, compressors, camps) must be located as far away from noise receptors; ■ Noisy activities must be limited to week days daylight hours, while non-noise related work can take place at any hour; ■ Should high noise activities need to be conducted at night, these will need to 1st be approved by CNOOC, who will make arrangements with the communities accordingly; ■ Specify acoustic enclosures and noise attenuation measures to fixed plant at the CPF to reduce sound power level of each noise source to a maximum of 75 dB(A); ■ Monitor noise regularly around the battery limit of the CPF, around the battery limit of the well pads and at key selected receptors. Develop and maintain records and trends in this regard; ■ Maintain equipment to ensure that the noise emissions generated remain in accordance with their design standard; ■ Acquire land around the CPF to act as a noise buffer zone ■ Monitor, log and respond to noise complaints from members of surrounding communities. Provide communities with details of the staff member responsible for dealing with community concerns and complaints;	CNOOC Contractor	■ Maintained as per manufacturer's specifications, instructions, and manuals; ■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Record of agreed high noise activities and corresponding engagement with community to inform communities of such activities in advance of occurrence; ■ Records of timeous corrective action to resolve complaints; ■ Records of monitoring in ESO weekly and monthly reports; ■ Comprehensive inventory of sensitive noise receptors within influence areas (e.g. wildlife areas, protected species, and residents etc.); ■ Compliance with CNOOC's noise management specification; and ■ Registers of training (including type of training, date and name).	Daily inspection and Monthly monitoring	■ CUL-QHSE-L3(GE)-056 Noise Management Specification; ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.

Ref.	Aspect/Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
				■ Consider Corporate Social Investment (CSI) in local communities, as recommended, to offset the residual impacts of noise; ■ For the mitigation of drilling noise, see construction management plan; ■ The noise emission profile (i.e. anticipated noise output) of heavy fleet vehicles, machines, and equipment must be used as a key reason for its selection. Items with high noise emission profiles must not be selected if; and ■ Machines and transport equipment must not be allowed to idle and must be shut- or throttled down to a minimum.				
2.	Operation activities at the CPF, wells, Ancillary structures	Noise pollution causing nuisance to exposed community/ homesteads	Compliance with relevant legislation and international guidelines	■ Must comply with the World Bank guideline for daytime noise affecting communities (Laeq of 55 dBA, measured outside at the nearest receiver) and activity not result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. [6]; ■ Monitoring data should be analysed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions can be taken. Reference should be made to the 2007 International Finance Cooperation General Environmental, Health, and Safety (EHS) Guidelines; and ■ Noise monitoring must be done at schools within 100 m - 200 m of noisy activities and other sensitive areas like hospitals, residences, areas of worship etc. If necessary, take measures to minimise the effect of the noisiest activities by timing them to avoid critical periods in the school day.	CNOOC Contractor	■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records in monthly reports; ■ Monitoring results; ■ Comprehensive inventory of sensitive noise receptors within influence areas (e.g. wildlife areas, protected species, and residents etc.); ■ Compliance with CNOOC's noise management Specification; and ■ Use of a Type 1 or 2 sound level meter that comply with all appropriate and current IEC standards[7].	Daily inspection and Monthly monitoring	■ CUL-QHSE-L3(GE)-056 Noise Management Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.

5.6 Biodiversity Management Plan

The Biodiversity Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented in below.

Table 5-7: General requirements

Ref.	Aspect/ Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator/ Performance Criteria	Monitoring Frequency	Additional Reference
1.	Collecting or harvesting fruits, vegetables, grains and any other plant material	Over exploitation of locally available food resources	Local produce industry must not be negatively impacted.	The harvesting or collection of fruits, vegetables, grains and other plant material by CNOOC employees or the Contractor for use or sale is not allowed.	CNOOC Contractor	■ Inclusion of prohibition in training/induction programme(s) and contractor tool box talks ■ Absence of evidence of plant harvesting by employees. ■ Evidence of disciplinary procedures	All times sensitization and Monthly monitoring.	

[6] Guidelines for Community Noise, World Health Organization (WHO), 1999.

[7] International Electrotechnical Commission (IEC) standards are used to obtain accurate and repeatable noise measurements.

Ref.	Aspect/ Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator/ Performance Criteria	Monitoring Frequency	Additional Reference
						in the event of non-compliance.		
	Hunting or harassing wild animals – including fishing	Over exploitation of animal resources in the area	Local meat industry must not be negatively impacted	Hunting, harassing, or capturing of wild animals for sale as pets or food is not allowed. The purchase of wild animals for food by CNOOC employees and Contactors is not allowed.	CNOOC Contractor	■ Inclusion of prohibition in training/induction programme(s) and contractor tool box talks ■ Absence of evidence of hunting or animal harassment by employees	All times sensitization and Monthly monitoring.	
2.	Vehicle movement in the project area	Road kills due to vehicular traffic Animal injury and or mortality arising from accidents	Minimise animal injury or mortality	■ The following should be implemented to reduce animal injury and mortality: ▪ Limit vehicle speeds on the escarpment road; ▪ Include appropriate signage showing speed limits and enforce the speed limits; ▪ Prohibit night driving to or from the construction site except in emergencies; ▪ Educate personnel and suppliers about wildlife impacts caused by road traffic; and ▪ Monitor road kills in the escarpment section of the route. ■ Report all relevant wildlife and livestock incidents so that proper monitoring of the effectiveness of mitigations can occur and necessary improvements implemented; ■ Security fence surrounding the CPF and well pads must be erected to prevent the entry of fauna and must be regularly inspected to check integrity, overall condition, and to remove any climbing vegetation that could attract fauna; ■ Any fauna within the CPF and well pads must be removed immediately by the designated personnel; and ■ Ensure no spillage of waste food on or near sites and ensure food waste is stored in wildlife proof bins/pits fitted with appropriate covers.	CNOOC Contractor	■ Observation record of fauna on site; ■ Compliance with journey management plans; ■ Documented inspections; ■ Correspondence with relevant authorities; and ■ Evidence of disciplinary procedures in the event of non-compliance.	All times sensitization and Monthly monitoring.	
3.	Operation of the CPF, wells and ancillary facilities	Proliferation of invasive alien species	Minimise alien vegetation	CNOOC shall prepare a booklet of alien plants, annotated with photographs, as a basis for identification and control. The booklet shall be available on site. ■ If alien vegetation establishes itself, it shall be removed. ■ All machinery and vehicles entering the site should be certified clear of weed propagules	CNOOC Contractor	■ Booklet must include all alien plants that have been identified in the relevant area and it must be up to date; and ■ Availability of copies of booklet. ■ Records of alien plant removal.	Bi-annual monitoring	
4.	Operation of the CPF, wells and ancillary facilities	Animal mortality	Minimise animal mortality	An education programme must be implemented with appropriate awareness communication to all relevant personnel.	CNOOC	Record of awareness training with specific reference to avoidance of animal injury/mortality.	Six-monthly and as needed	
5.	Operation close to sensitive habitats	Disturbance in sensitive habitats	Minimise disturbance to sensitive habitats	■ Sensitive habitat areas (including protected areas) must be clearly identified through signage and avoided, during all phases of the project; ■ Establishment of a relationship and close coordination with external monitoring agencies and entities; ■ Natural drainage patterns must be avoided;	CNOOC Contractor	■ Regular inspections and monitoring plans for flora and fauna management as part of the site and activity	At all times	■ CUL-QHSE-L3(GE)-057 Biodiversity Management Specification;

Ref.	Aspect/ Activity	Potential Impacts	Objective	Management Action	Responsibility	Indicator/ Performance Criteria	Monitoring Frequency	Additional Reference
				■ Appropriate buffers must be established and maintained between project activities along water courses and bodies that comply with Ugandan national regulations and GIIP; ■ Low frequency noise emitters must be adopted in place of high frequency noise emitters; ■ Prohibit personnel tresspassl outside of the defined project work sites and access roads. Train personnel to understand the sensitivity of the local environment in induction and ongoing tool box talks; and ■ Specifically prohibit project personnel from access to the Bugoma swamp (lagoon), which is resource of exceptionally high ecological and cultural value. The Bugoma swamp (lagoon) is a part of the Kamansinig wetland system, all of which is regarded as sensitive.		specific management systems and plans; ■ Specific or targeted monitoring annually or as advised by an experienced external consultant; ■ Appropriate signage and mapping of sensitive habitat areas; ■ Co-operation with external monitoring agencies; ■ Documented training and compliance of personnel; ■ Personnel awareness of sensitive areas and their importance and ■ Documented compliance with Noise Management Plan.		■ CUL-QHSE-L3(GE)-058 Aquatic and Terrestrial Habitat Management Specification; and ■ Noise Management Plan.
6.	Influx	■ Habitat destruction resulting from over exploitation of community resources due to increase in local population ■ Increased pressure on natural resources	Monitor influx	■ Avoid or reduce influx of work seekers to the project area and those seeking to take advantage of Project related economic opportunities through strict offsite recruitment approaches; ■ Ensure that the recruitment of unskilled workers is strictly reserved to the local community and the candidates are vetted by local leadership before employment; ■ Avoid or reduce influx of opportunity seekers through preferential sourcing of goods and services from local suppliers this discouraging immigrants to the area that that will not contribute to development and upliftment of local communities; ■ Proactively support programs that facilitate the attraction of skilled people such as teachers, health workers, and experienced traders and entrepreneurs in the project area; ■ Manage such undesired influx as cannot be avoided through support to existing Government and donor initiatives for planning and development of Kikuube District, and the protection of habitats and ecosystem integrity and species of conservation concern; and ■ Implement the Influx Management Plan.	Contractor CNOOC	Monitoring records.	Annually	

5.6.1 Habitats and Ecosystem integrity

Table 5-8: Near-Shore Environment of Lake Albert

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Spillages into the lake	Aquatic habitat pollution and destruction	Minimise the risks of spillages	The following impact mitigation is recommended to minimise the risks of spillages affecting lake biota: ■ Establish a pollution management system, to be fully defined in the employee commitments, covering personnel, training, lines of responsibility, immediate action requirements, on-site spill kits,	CNOOC Contractor	■ Presence of fauna on site; and ■ No spillages in the near shore environment as indicated in the incident's registers.	Continuous	

				and all other factors necessary to ensure there is a provision for effective preventative and corrective action during operation; ■ Develop a culture of zero tolerance for pollution during the operation phase of the project; ■ Provide a high level of competent environmental oversight of operation of the CPF; ■ Provide for thorough induction training of all personnel regarding pollution management, and ongoing refresher training throughout operations; ■ Provide specific training to staff responsible for the oversight of pollution control systems; and ■ Ensure structured, daily, monitoring of pollution control systems on the well pads and at the CPF to minimise the risk of inadvertent spills and to respond quickly and effectively to any spills that occur. Emphasis must be on preventative measures.				

Table 5-9: Bugoma Central Forest Reserve (CFR)

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Operation of access road through Bugoma Forest	Increased illegal hunting, encroachment and illegal logging facilitated by the improved access to the forest	Avoid Bugoma CFR	The Bugoma Central Forest Reserve (Bugoma CFR) is widely recognised as a biodiversity hotspot and constitutes a network and corridor for critical biodiversity sites in Uganda. The R5 must be de-listed from the proposed oil road upgrades and CNOOC must use the P1 as the major haul road during the construction phase and, if upgraded in time, the R7. CNOOC should continue to engage with UNRA to make certain that R5 upgrade is indeed not taken forward under the oil roads upgrade program	Construction contractor Environmental Coordinator	Verify use of P1 and R7 instead of R5.	Quarterly during operations	
2.	Transportation by project through forest section	Road kills Disturbance to wildlife from traffic noise and increased human presence along the road	Minimize animal kills and accidents	■ Limit vehicle speeds to 40 km/h along the P1 road in the section from Mpanga to Nsozi; ■ Monitor vehicle speeds and enforce disciplinary action to drivers who do not comply with the speed limit; ■ Prohibit transport of materials near the forest at night, except in case of emergency; ■ Ensure that all transporters are fully aware of the risks to wildlife in the Bugoma Forest; ■ Widen the P1, on the non-forest side of the road in order to minimise forest habitat loss; and ■ Ensure that all transporters are fully aware of the risks to wildlife in the Bugoma CFR and train their drivers accordingly.	contractor CNOOC	■ Tachograph records; and ■ Records of training and standing instructions.	Monthly Monitoring	
3.	Influx	Increased pressure on forest resources leading to over exploitation Increased illegal activities in the BCFR	Minimize impacts from influx on BCFR such as illegal logging, encroachment and poaching	■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources; and ■ Implement the Influx Management Plan. ■ CNOOC should reasonably support National Forestry Authority (NFA) enforcement programs against illegal loggers, poachers and encroachers	Contractor CNOOC	■ Monitoring records ■ GIS records of the forest cover ■ Records of CNOOC collaboration with NFA to counter illegal activity	Monthly Monitoring	

5.6.2 Wetlands and drainage lines

Table 5-10: Wetlands and drainage lines

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Access of project vehicles through wetland areas	Destruction of wetland ecosystem from encroachment	Minimize physical footprint and encroachment	■ Prohibit access of personnel outside of the defined project work sites and access roads. Train personnel to understand the sensitivity of the local environment in induction and ongoing tool box talks; and ■ Specifically prohibit project personnel from access to the Bugoma Lagoon which is resource of exceptionally high ecological and cultural value. The Bugoma Lagoon is a part of the Kamansinig wetland system, all of which is regarded as sensitive. Should it be necessary to maintain any infrastructure proximity to wetlands, the following will be applicable: ■ Limit vehicle access to the right of way and other existing road networks, wherever feasible; ■ Cross rivers and wetlands, in the dry season. Minimise the handling of wetland soils with heavy tracked equipment to the greatest extent; ■ Minimise wetland vegetation cleared to the smallest footprint; ■ Demarcate the right of way across wetlands to prevent inadvertent damage outside of this footprint; ■ Re-evaluate the drainage across the in-field road to well pad 3 across the Kamansinig River, taking into account additional storm flow from the production facility and the maintenance of drainage across the seasonal floodplain. Install additional drainage as required to minimize obstruction of wetland flow; and ■ Adjust the final design of the canals channelling storm water and treated from the CPF to remain outside of the seasonally wet areas associates with River 1, crossing the river channel just upstream of the road culvert the ESIA). From the culvert onward, it may be necessary to canalise the flow to the lake. Use open cross section swales for this purpose (not concrete canalisation), reinforced if necessary and grassed. Finalise the canal design and align the stormwater drains with the assistance of a wetland ecologist.	CNOOC	■ Training records, training materials. ■ Environmental inspections; ■ Environmental manager reports; and ■ Compliance with conditions of ESMP.	Monthly Monitoring	
2.		Sedimentation leading to Destruction of the wetland habitat and ecosystem functionality	Prevent erosion	■ Ensure that erosion protection measures are in place during operation to minimise runoff from disturbed areas into the rivers and wetlands; ■ Adjust the final design of the canals channelling stormwater from the CPF to remain outside of the seasonally wet areas associates with River 1, crossing the river channel just upstream of the road culvert. From the culvert onward it may be necessary to canalise the flow to the lake. Use open cross section swales for this purpose (not concrete canalisation), reinforced if necessary and grassed. Finalise the canal design and align the stormwater drains with the assistance of a wetland ecologist; and ■ Prohibit access to personnel outside of the defined project work sites and access roads, particularly the operators of earth moving equipment and large vehicles. Train personnel to understand the sensitivity of the local environment in respect of water pollution in induction and ongoing tool box talks.		■ Environmental inspection reports, ■ Audit report.	Monthly Monitoring	

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
3.	Operation of equipment in the KFDA	Pollution and Destruction of the wetland habitat and ecosystem functionality resulting from spills	Collection of hazardous fluids Avoid pollution	■ Ensure that any pumps, generators or other equipment containing oil and used to manage water at the wetland crossing are located on impervious plastic sheeting or drip trays. ■ Ensure that all vehicles and machinery are in sound mechanical order, do not have any oil leaks and are fitted with appropriate mufflers to minimise nuisance noise affecting wildlife; and ■ Prohibit any refuelling of equipment within 100 m of a wetland.		Easier inspections, Audit report	Monthly Monitoring	
4.	Hazardous material storage	Contamination and or pollution of wetland habitats close to hazardous waste storage areas	No contamination	■ Prohibit the storage of oils, fuel or other hazardous materials within 100 m of delineated wetlands and riparian zones; and ■ Manage all hazardous products and wastes to minimise the risk of escaped outside of controlled areas (management according to Waste Management Plan.		■ In situ water quality downstream of Project footprint (pH, EC, TDS, TSS, DO); ■ Monthly water quality parameters in the lake, wetlands and watercourses (pH, EC, TDS, TSS, DO, metals, hydrocarbons); and ■ Volume of water extracted and treated on site.	Weekly and monthly	

5.6.3 Species of concern

Environmental management of the Grey Crowned Crane, Mud Snail (*Gabbiella candida*), are addressed below.

Table 5-11: Grey Crowned Crane

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Maintenance works or operations in	Disturbance to the ecosystem resources vital for the grey crowned crane survival and continued existence	Promote abundance, reproduction and survival of grey crowned crane	■ Implement measures to minimise impacts on Grey Crowned Crane abundance and distribution, and reproduction and survival in the CHAA, and the Buhuka Flats in particular. Measures should include: ▪ Restrict access by any CNOOC staff, subcontractors and members of the public from any identified areas of breeding habitat used by Grey Crowned Crane within 200 m of suitable nesting sites. ▪ Erect/plant screens between operation activities and wetland habitats in order to reduce the likelihood of disturbance of Grey Crowned Crane via human presence and minimise noise disturbance; ▪ Prohibit CNOOC staff and subcontractors from entering areas beyond the operational footprint; ▪ Develop and disseminate community education programmes on Grey Crowned Crane habitat conservation, prevention of illegal trade in wild birds and chicks, and prevention of incidences of poisoning; ▪ Ensure rapid recovery of areas disturbed by construction; ▪ Strictly limit personnel outside of the defined areas of project activity. Permit approvals are to be required for any activity that is not in a recognized work areas;	Contractor CNOOC	Documented surveys showing extent as well as presence/ absence of Grey Crane in relation to operational activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Clean environmental audit report; and ■ No avoidable habitat degradation.	Quarterly Monitoring	

				▪ Educate all personnel about the sensitivity of the cranes and the importance of not approaching them at distances closer than 200 m or otherwise interfering with them in any way; and ▪ Monitor the occurrence of the cranes on the Buhuka Flats. ■ Develop and implement a long-term research and monitoring programme to improve understanding of the behaviour and status of Grey Crowned Crane.				

Table 5-12: Mud Snail (*Gabbiella candida*)

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Maintenance and operation of facilities close to the shoreline Discharges from the KFDA into Lake Albert	Disturbance to the ecosystem resources vital for the mud snail survival and continued existence	Avoid destruction of potential mud snail habitat	■ The Mud Snail (*G. candida)* triggers Tier 1 Critical Habitat and if it is found to be present, project impact exposure / footprint in near-shore habitats should be postponed until appropriate solutions for the conservation and management of the snail are devised by suitably experienced molluscan specialists and approved by NEMA; ■ If found to be present within the CHAA, the CNOOC will need to demonstrate that the proposed operation of the Project will affect less than 10% of the known global population of the species –a comprehensive survey of habitats with potential to support the Mud Snail on the shores of Lake Albert will be required to support this demonstration. Thereafter, if less than 10% of the known population would be affected, a Species-Specific Action Plan as part of the overall Biodiversity Action Plan (BAP) must be developed to achieve net gain for the affected species; ■ In the event that greater than 10% of the known global population of the species stands to be affected by proposed project infrastructure (which is highly unlikely given the small potential footprint of disturbance associated with the water intake structure) then redesign to avoid impact on this habitat will be necessary; ■ Additional specialist work is committed to in the construction management plan in advance of intake structure construction. Should these studies have identified the presence of the mud snail, the management plan to protect the species in the local area will need to be adapted. In this regard the following key measures of note during the construction phase: ▪ update the management plan in relation to mud snail in the event that additional biological work confirmed the presence of the species; ▪ update the benefits of the action plan accordingly; alternatively ▪ document clearly that the species has not been recorded through additional studies and that further monitoring will only be conducted in the event that additional nearshore construction will commence.	CNOOC Contractor	■ Recommendations of the additional specialist screening work to be conducted on the mud snail during the construction phase; ■ Documented studies (and habitat surveys) showing that activities will affect less than 10% of the known global population of the species; ■ In event of greater than 10% of known global population being affected, either redesign to remove impact or alternatively reposition of the affected infrastructure. Proof of this consideration to be documented; and ■ Appropriate Species-Specific Action Plan as part of the overall Biodiversity Action Plan (BAP) that achieves net gains for *G. candida*.	Quarteyrly	

Table 5-13: Nahan's Francolin

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator /Performance Criteria	Monitoring Frequency	Additional Reference
1.	Maintenance and operations close to the BCFR	■ Disturbance to the ecosystem resources	■ Preserve habitat ■ Minimise disturbance	■ Maintain the mitigation set out in Table 5-7 and for the Bugoma CFR in ■ Table 5-9 to reduce further loss, fragmentation and degradation of habitat;	CNOOC Construction contractor	Correspondence and engagement with NFA and other relevant authorities Research reports	Quarterly monitoring for the species in	

		vital for the Nahan's Francolin survival and continued existence; ■ Sensory disturbance caused by human presence and mechanical noise generated during activities associated with the P1 road upgrade	through appropriate schedules	■ Large, mature buttressed trees that constitute suitable nesting habitat for Nahan's Francolin should be avoided during vegetation clearance works for the P1 road upgrade; ■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is discussed in further detail in Chapter 17 of the ESIA; ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and enchroachers; ■ Pre-construction surveys for Nahan's Francolin; ■ Avoid small areas of sensitive habitat (such as large indigenous trees) where Nahan's Francolin potentially nest through micro-adjustments to infrastructure placement where feasible. Decisions in this regard should be informed by a competent ecologist; ■ Plan construction access roads to minimise their total length. Documented surveys showing extent as well as presence/albescence of Nahan's Francolin in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation ■ Develop and implement a long-term research and monitoring programme to improve understanding of the behaviour and status of Nahan's Francolin in Bugoma Forest (this recommendation is developed further in Chapter 17 of the ESIA, Cumulative Impacts). ■ Support the government in enforcement of existing forestry policies in Uganda.	Environmental Coordinator	Documented surveys showing extent as well as presence/ albescence of Nahan's Francolin in relation to activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located; ■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation.	areas likely to be its habitat	

Table 5-14: Eastern Chimpanzee

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Maintenance and operations close to the BCFR	Disturbance to the ecosystem resources vital for the chimpanzee survival and continued existence	Preserve habitat Minimise illegal trade in wild animals Determine the behaviour and status of Eastern Chimpanzee	Implement the mitigation set out in Table 5-7 and for the Bugoma CFR in Table 5-9 to reduce further loss, fragmentation and degradation of habitat. ■ Increase monitoring of population changes in the CHAA, particularly incursions into the Bugoma CFR by settlement or people harvesting natural resources. A strategy for this initiative is discussed in further detail in Chapter 17 of the ESIA; ■ CNOOC should reasonably support National Forest Authority (NFA) enforcement programs against illegal loggers, poachers and encroachers	CNOOC Contractor Environmental Coordinator	Documented surveys showing extent as well as presence/ albescence of Nahan's Francolin in relation to construction activities. The following must be included: ■ Specialist used to survey and identify species; ■ Number of species located;	Quarterly Monitoring	

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				■ Undertake pre- operation surveys for Eastern chimpanzee to better understand their behavioural pattern and ecology; ■ Avoid small areas of sensitive habitat (such as large indigenous trees) where chimpanzee potentially nest. Decisions in this regard should be informed by a competent ecologist; ■ Support UNRA in planning of access roads to minimise their total length ■ Develop and disseminate community education programmes on Eastern Chimpanzee habitat conservation, and prevention of illegal trade in wild animals and bushmeat, in liaison with existing Eastern Chimpanzee conservation programmes (e.g. Jane Goodall Institute Uganda's environmental education programme); and ■ CNOOC must manage and monitor the behaviour of its suppliers through a code of practice for drivers travelling through the BCFR..		■ Locality and populations of invasive species; ■ Location of significant habitats, including nesting sites; ■ Locations of suitable relocation sites for individuals; ■ Number of individuals relocated; ■ Realignment of Project footprint to avoid sensitive habitats; ■ Impactive translocation of threatened plants, and/or collection of reproductive material; and ■ No avoidable habitat degradation. ■ Training/education records. ■ Research and monitoring records regarding Chimpanzee behaviour and status ■ Proof of support of government forestry policies.		

5.7 Water Management Plan

The Water Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-15: General below and details the management of water use and discharge.

5.7.1 General

Table 5-15: General

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring schedule	Additional Reference
1.	Water abstraction for project operations	Over exploitation of water resource Pollution of surface and ground water resources	Compliance with local legislation and GIIP.	CNOOC's water management specification must be enforced and water use and waste water discharge must comply with local legislation (e.g. National Environment Standards for Discharge of Effluent into Water or on Land Regulations, S.I. No 5/1999, Water (Waste Discharge) Regulations, 1998), as well as the latest IFC wastewater and ambient water quality guidelines.[8 & 9] Appropriate water abstraction permits must be obtained before using groundwater or surface water. All requirements in the permit must be complied with and a water flow meter must be	CNOOC Contractor	■ No exceedances of relevant water quality guidelines. ■ All required permits in place; ■ Flow meters installed; ■ Operational water balance recording water intake	Quarterly or as advised by Government agencies	■ CUL-QHSE-L3(GE)-054 Water Management Specification; and

[8] IFC General EHS Guidelines: Wastewater and Ambient Water Quality (2007).

[9] IFC Onshore oil and gas development: Environmental, Health, and Safety Guidelines for Onshore Oil and Gas Development (2007).

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring schedule	Additional Reference
				installed at the point of water abstraction to record daily water usage: ■ Maintain an updated water balance for the facility that is informed by appropriate monitoring of all intake and discharge volumes and qualities; ■ Record any deviation from normal practice in relation to intake or discharge volumes. If design volumes are exceeded, notify the Environmental manager; and Environmental manager to evaluate, in the event of exceedances, together with CPF manager whether exceedances due to an atypical event or changed basin parameters. Plan accordingly should modification to water infrastructure be required.		and water discharge volumes and qualities; ■ Record of monitoring; and ■ record of notification of Environmental manager in the event of exceedances.		■ IFC General EHS Guidelines: Environmental Wastewater and Ambient Water Quality (2007).
2.	Sewage water management	Water Pollution (eutrophication, siltation) of the surface and ground water resources	Ensures appropriate treatment	■ Any discharge from sewage works should meet Ugandan discharge water standards and the IFC Environmental, Health and Safety (EHS) Guidelines for treated sanitary sewage discharge quality (Table 5-16); ■ The sewage from the existing treatment plant at the drilling camp, requires treatment and disposal. Disposal via the recommended agricultural irrigation method around the CPF as outlined in the ESIA should be considered. Sewage effluent must be directed away from the Kamansiniga river and wetland system; ■ No discharge of treated sewage water directly to any drainage lines that flow into the lagoon to the south or drainage channel to the north of the CPF; ■ All volumes of treated sewage to be recorded (daily flow measurements) and quality records. Should daily treated sewage volume approach within 20% of design threshold, Environmental manager and CPF manager to evaluate whether volumes are within design parameters taking account of the number of people present in the camp, and if not (and exceeding design parameters), restrict camp numbers to manageable numbers until such time as additional sewage capacity can be implemented; ■ Sewage waste must be treated and disposed of in accordance with Environmental (Standards for Discharge of Effluent into Water or on Land) Regulations, S.I. No 5/1999. Reference also needs to be made to World Bank Group EHS Guidelines, Onshore Oil and Gas Development, 2007. Discharged sewage water must meet the following criteria: ▪ pH: 6-8[10]; ▪ Biochemical oxygen demand (BOD): 30 mg/l; ▪ Chemical oxygen demand (COD): ≤100 mg/l; ▪ Total Nitrogen: ≤10 mg/l; ▪ Total Phosphorus: ≤2 mg/l; ▪ Oil & Grease: ≤10 mg/l; ▪ Total suspended solids (TSS): ≤50 mg/l; and ▪ Total Coliform Bacteria: ≤400 MPN (most probable No.) per 100 ml.	CNOOC Contractor	■ Water quality analysis on treated water; ■ Compliance with domestic wastewater specification; and ■ Records of daily sewage volumes, treated sewage water discharges and qualities.	Monthly monitoring with daily inspections on sewerage plant throughput volumes and key discharge quality parameters.	

[10] In line with CNOOC CUL-QHSE-L3(GE)-054 Water Management Specification

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring schedule	Additional Reference
				■ The above standards are minimum requirements and any other parameters or stricter concentration requirements included in the permit issued by a local environmental authority must be complied with by treating the waste water to meet the standards (at an appropriate treatment facility) prior to discharge.				
3.	Process Water Management	Water Pollution (eutrophication, siltation) of the surface and ground water resources	Minimize water pollution due to spillages	Management of process water to prevent spillages into the environment.	CNOOC Contractor	■ Environmental incidents register, Spill volumes; and ■ No process water spillages into the environment.	Monthly Monitoring	

5.7.2 Waste water

Table 5-16: Waste water

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Waste water management and discharge	Water Pollution (eutrophication, siltation) of the surface and ground water resources	Minimize wastewater pollution	■ Develop and enforce a culture of zero tolerance for pollution during the operational phase of the project; ■ Provide a high level of competent environmental oversight during operation of the CPF. Responsibilities of the environmental manager should include the establishment of a liquid and solid waste management system, to be fully defined before the start of operations, covering personnel, training, lines of responsibility, immediate action requirements in the event of spills, on-site spill kits, and all other factors necessary to ensure there is a provision for effective preventative and corrective action during all stages of operations; ■ Provide thorough induction training to all operational personnel regarding pollution management, and ongoing refresher training throughout the operational phase of the project; ■ Provide management training to staff responsible for the oversight of pollution control systems; ■ Develop specific biological and social performance indicators, in respect of water pollution, as a part of the operational EMP; ■ Ensure structured, daily, monitoring of pollution control systems at the CPF to minimise the risk of inadvertent spills and to respond quickly and effectively to any spills that occur. Emphasis must be on preventative measures; and ■ Maintain accurate, long term, records of all aspects of pollution control, consolidated to show trends for ease of reference and management.	CNOOC	■ Training records; and ■ Incident records.	Daily inspections and monthly monitoring	
2.	Discharge of potentially oil-contaminated (POC) wastewater	Water Pollution of the surface and ground water resources	Minimise wastewater pollution	Small quantities of POC wastewater may result from washdown of spillages in the POC work areas at the Base Camp. All wastewater generated from these activities must be managed in accordance with the CNOOC Waste Management Plan and meet produced water requirements outlined in Table 5-16.	CNOOC Contractor	POC-contaminated areas contained and drainage routed through mechanical oil traps.	Daily Inspections and monthly monitoring	

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
3.	Discharge of domestic wastewater	Contamination of water resources	Minimise impact of domestic wastewater	All domestic wastewater shall be disposed of in accordance with the CNOOC Waste Management Plan and in line with sewage water discharge requirements outlined in Table 5-16. ■ Any discharge from sewage works should meet Ugandan waste water discharge standards and the IFC Environmental, Health and Safety (EHS) Guidelines for treated sanitary sewage discharge quality (Table 5-16); ■ The sewage from the existing treatment plant at the drilling camp, requires treatment and disposal. Disposal via the recommended agricultural irrigation method around the CPF as outlined in the ESIA should be considered. Sewage effluent must be directed away from the Kamansiniga river and wetland system; ■ No discharge of treated sewage water directly to any drainage lines that flow into the lagoon to the south or drainage channel to the north of the CPF; ■ All volumes of treated sewage to be recorded (daily flow measurements) and quality records. Should daily treated sewage volume approach within 20% of design threshold, Environmental manager and CPF manager to evaluate whether volumes are within design parameters taking account of the number of people present in the camp, and if not (and exceeding design parameters), restrict camp numbers to manageable numbers until such time as additional sewage capacity can be implemented; ■ Sewage waste must be treated and disposed of in accordance with Environmental (Standards for Discharge of Effluent into Water or on Land) Regulations, S.I. No 5/1999. Reference also needs to be made to World Bank Group EHS Guidelines, Onshore Oil and Gas Development, 2007. Discharged sewage water must meet the following criteria: ▪ pH: 6-8[11]; ▪ Biochemical oxygen demand (BOD): 30 mg/l; ▪ Chemical oxygen demand (COD): ≤100 mg/l; ▪ Total Nitrogen: ≤10 mg/l; ▪ Total Phosphorus: ≤2 mg/l; ▪ Oil & Grease: ≤10 mg/l; ▪ Total suspended solids (TSS): ≤50 mg/l; and ▪ Total Coliform Bacteria: ≤400 MPN (most probable No.) per 100 ml. The above standards are minimum requirements and any other parameters or stricter concentration requirements included in the permit issued by a local environmental authority must be complied with by treating the waste water to meet the standards (at an appropriate treatment facility) prior to discharge	CNOOC Contractor	Compliance with domestic wastewater specification.	Daily inspections and monthly monitoring	
4.	Discharge of Storm water	Contamination of water resources	Appropriate management	■ Any storm water that has been potentially contaminated by oil, grease or other chemicals from site activity needs to be treated to the discharge standards listed in Table 5-17 before it can be released to the environment.	CNOOC Contractor	Clean environmental audit report.	Monthly monitoring	

[11] In line with CNOOC CUL-QHSE-L3(GE)-054 Water Management Specification

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				■ Develop and enforce a culture of zero tolerance for pollution during the operational phase of the project; ■ Provide a high level of competent environmental oversight during operation of the CPF. Responsibilities of the environmental manager should include the establishment of a liquid and solid waste management system, to be fully defined before the start of operations, covering personnel, training, lines of responsibility, immediate action requirements in the event of spills, on-site spill kits, and all other factors necessary to ensure there is a provision for effective preventative and corrective action during all stages of operations; ■ Provide thorough induction training to all operational personnel regarding pollution management, and ongoing refresher training throughout the operational phase of the project; ■ Provide management training to staff responsible for the oversight of pollution control systems; ■ Develop specific biological and social performance indicators, in respect of water pollution, as a part of the operational EMP; ■ Ensure structured, daily, monitoring of pollution control systems at the CPF to minimise the risk of inadvertent spills and to respond quickly and effectively to any spills that occur. Emphasis must be on preventative measures; and ■ Maintain accurate, long term, records of all aspects of pollution				

Table 5-17: Discharge standards to surface water and land

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Sewage	Appropriate management	■ Sewage waste must be treated and disposed of in accordance with Environmental (Standards for Discharge of Effluent into Water or on Land) Regulations, S.I. No 5/1999. Reference also needs to be made to World Bank Group EHS Guidelines, Onshore Oil and Gas Development, 2007. Discharged sewage water must meet the following criteria: ▪ pH: 6-8[12]; ▪ Biochemical oxygen demand (BOD): 30 mg/l; ▪ Total Nitrogen: ≤10 mg/l; ▪ Total Phosphorus: ≤2 mg/l; ▪ Oil & Grease: ≤10 mg/l; ▪ Total suspended solids (TSS): ≤50 mg/l; and ▪ Total Coliform Bacteria: ≤400 MPN (most probable No.) per 100 ml. The above standards are minimum requirements and any other parameters or stricter concentration requirements included in the permit issued by local environmental authority must be complied with by treating the waste water to meet the standards (at an appropriate treatment facility) prior to discharge.[13] ■ Select the sewage treatment plant for the project with a view to reliability in a remote environment, taking into account the final effluent water quality requirements. An activated sludge plant should be considered in preference to a membrane bioreactor plant; ■ If the sewerage irrigation system was implemented during the construction phase, as per the ESIA recommendations, the system will require maintenance to ensure ongoing operation and irrigation of treated sewage effluent onto land surrounding the CPF; and ■ Use treated sewage effluent as irrigation water for the lawns and gardens at the permanent camp. If a football field is provided irrigate this as well, using treated sewage effluent.	CNOOC Contractor	■ Operation of plant as per requirements; ■ Compliance with sewage effluent wastewater standards; and ■ Records of treated sewage effluent monitoring and trends in monthly reports.	Monitoring at specified intervals	■ CUL-QHSE-L3(GE)-054 Water Management Specification; ■ IFC General EHS Guidelines: Environmental Wastewater and Ambient Water Quality (2007); ■ US EPA National Recommended Water Quality Criteria; NS ■ http://www.epa.gov/waterscience/criteria/wqcriteria.html.
2.	Produced Water		Discharged produced water must meet the following criteria[14]: ■ Total hydrocarbon content: 10 mg/l; ■ pH: 6 to 8[10]; ■ BOD: ≤25 mg/l; ■ Chemical oxygen demand (COD): ≤125 mg/l; ■ Total dissolved solids (TSS): ≤35 mg/l; ■ Phenols: ≤0.5 mg/l; ■ Sulphides: ≤1 mg/l; ■ Heavy metals[15] (total): ≤5 mg/l; ■ Total hydrocarbon content ≤10 mg/l; and ■ Chlorides: ≤600 mg/l (average) and ≤1 200 mg/l (maximum).	CNOOC Contractor	■ Monitored criteria are within specified parameters; and ■ Absence of surface water degradation and smells.	Daily Inspections with monthly monitoring	
3.	Storm water drainage		Storm water runoff must be treated through an oil/ water separation system able to achieve oil and grease concentration of ≤10 mg/l.	CNOOC Contractor	Clean environmental audit report.	Daily Inspections with monthly monitoring	

[12] In line with CNOOC CUL-QHSE-L3(GE)-054 Water Management Specification

[13] Examples of appropriate industrial waste water treatment approaches are provided in Annex 1.3.1 of the IFC General EHS Guidelines: Environmental Wastewater and Ambient Water Quality (2007).

[14] Emissions, Effluent and Waste Levels from Onshore Oil and Gas Development (International Finance Corporation, 2007)

[15] Heavy metals include: Arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc.

5.7.3 Water supply

Table 5-18: Water supply

Ref.	Aspect	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Permits for water use	Compliance with relevant permits	■ Obtain all necessary permits for the use of surface water and groundwater; and ■ Maintain water balance as described previously.	CNOOC Contractor	Compliance with relevant permits.	As recommended by Government Agency	Uganda Bureau of Standards (US 201) Specification for Drinking (Potable Water; 1994)
2.	Groundwater use	Minimise impact on groundwater supply and quality	■ Monitor water quality in selected boreholes as a means of verifying the absence of impact; and ■ Ensure that treated sewage effluent consistently meets the project specification. If treated water exceeds specifications, it must be appropriately treated to meet specifications before being released.	CNOOC Contractor	Records showing monitoring of water quality in selected boreholes as a means of verifying the absence of impact.	As recommended by Government Agency	
3.	Surface water use	Compliance with Ugandan water authorities	Use of surface water must be subject to the approval of the Ugandan water authorities. The use of surface water from pans and depressions in the study area shall be prohibited.	Contractor CNOOC	■ Permit from authorities; and ■ Quantity and location of surface water use.	As recommended by Government Agency	

5.8 Lakeshore Works Management Plan

The Lakeshore Works Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-19 below.

Table 5-19: Lakeshore works management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Shoreline	Disturbance of the shoreline habitat Loss of the shoreline habitat ecosystem functionality	Minimise shoreline habitat disturbance	Induced erosion often occurs where shorelines are disturbed through vegetation removal and shoreline exposure to the erosive energy of waves and currents with potential changes in shoreline processes and sediment transport. Vegetation along the lake's edge must be preserved and maintained through the following measures: ■ Vegetated (e.g. grass) buffer strips must be maintained along the shoreline to aid stabilization and provide filtration of potentially polluted runoff; ■ Activity must be restricted to the Jetty/Materials Offloading Facility and no activity must occur on the shoreline adjacent to the facility and water intake station; and ■ Naturally or anthropogenic Degraded shoreline sections in proximity to project infrastructure should be rehabilitated by use of stabilizing gabions or embankment walls .	CNOOC Contractor	■ Photographic evidence of Jetty/Materials vegetated buffer strips and Offloading Facility in relation to shoreline zone (including low and high-water mark); and ■ Environmental audit report.	Quarterly Monitoring	Species of concern.
2.	Water intake	Disturbance of the shoreline habitat Disturbance of the shoreline habitat ecosystem functionality	Avoid trapping and damage of aquatic plants and animals	Appropriate screens must be maintained at the water intake, to avoid entrainment and impingement of aquatic plants and animals.	Contractor	No aquatic flora or fauna in water abstracted and pumped to lakeshore works site.	Quarterly Monitoring	

5.9 Traffic Management

The traffic management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-20: General

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	General		Appropriate management	CNOOC's Land Transportation Specification must be implemented.	CNOOC Contractor	Compliance with CNOOC's Land Transportation Specification.	At all times	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
2.	Vehicle movement in project area	Property damage, loss, time, injury and or fatality due to accidents	Avoid causing accidents	■ Drivers to adhere to CNOOC's Land Transportation Specification; ■ All off-road driving prohibited without prior approval from CNOOC; ■ Establish and enforce strict journey management plan; ■ Use of road marshals to control traffic at designated points such as crossings for animals and people, corners and black spot areas; ■ Except for emergencies, hooting must be prohibited to avoid unnecessary noise; ■ Vehicles must not be allowed to idle to avoid unnecessary noise and air pollution; and ■ Transported goods must be securely stowed and covered so that materials cannot fall/ fly off, causing injuries or pollution.	CNOOC Contractor	■ Limited new access road development; ■ Record of Journey management plan; ■ Total Recordable Incident Rate (TRIR); and ■ Written authorisation from CNOOC where access roads necessary ■ Complaints registered by communities or employees in the Complaints Register; and ■ Itemised inventory registers showing that nothing has been lost from vehicle.	Monthly monitoring	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
3.	Speed limits	Property damage, Loss time, injury and / or fatality due to traffic accidents	Minimize Property damage, Loss time, injury and / or fatality due to traffic accidents	Safe travelling speeds for each section of the route along the right of way shall be determined and enforced. Enforcement may include, but not be limited to, the monitoring of vehicle speeds, the erection of speed limit signs and the installation of speed humps; Installation of vehicle tracking system to monitor vehicle speeds.	CNOOC Contractor	■ Record of installation for vehicle tracking system. ■ Speed testing, speed limit signage; ■ Absence of community complaints; and ■ Accident records.	Montly Monitoring	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
4.	Defensive driver training			All vehicle operators shall have received defensive driver training, aimed at promoting improved driver safety performance		■ Records of defensive driver training; and ■ Accident records and trends.	At beginning of driver's employment contract	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
5.	Driving under the influence of alcohol or drugs			Strong sanctions against driving under the influence; Breathalyser tests for drivers at commencement of shift and when there is reason to suspect a driver being under the influence; Dismissal after second offence.		■ Past history of breathalyser testing and off-duty behaviour; and ■ Accident record.	Monthly Monitoring	CUL-QHSE-L3(GE)-013 Alcohol and Drug Specification.
6.	Driving while fatigued			Working shift not to exceed 8 hours within 24 hours; Changing drivers every 4 hours on long trips.		Personnel Shift records.		
7.	Community traffic awareness			CNOOC shall conduct an ongoing traffic safety awareness campaign, particularly in communities where vehicles will be most active.		Records of traffic awareness campaigns.	Quarterly	CUL-QHSE-L3(GE)-023 Land Transportation Specification
8.	Injuries to community members			In the event of an accident in which a community member is harmed, CNOOC (or the Contractor) shall take responsibility for transporting the injured person to an appropriate health facility capable of dealing with the injuries.		■ Total recordable incident rate (TRIR) ■ Number of near misses; and ■ Number and nature of accidents involving community members (minor to serious).	Monthly	CUL-QHSE-L3(GE)-023 Land Transportation Specification.

5.9.1 Traffic Safety

Table 5-21: Traffic safety

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring schedule	Additional Reference
1.	Vehicle traffic through community areas	Property damage, Loss time, injury and / or fatality due to traffic accidents	Appropriate safety practices	CNOOC's land transportation specification must be implemented and transport safety practices must include: ■ Promotion of safety aspects among drivers; ■ Continuous improvement of driving skills and appropriate licensing of drivers; ■ Incorporating limits for trip duration and arranging driver rosters to avoid overtiredness; ■ Avoiding dangerous routes and times of day to reduce the risk of accidents; and ■ Use of speed control devices (governors) on vehicles, and remote monitoring of driver actions; and Prepare an updated Traffic Management Plan. This is to be based on CNOOCs existing driving and traffic management plan, updated to accommodate specific aspects related to the operational phase of the project. The final plan should include provision for speed control along roads, requirements for training of drivers to ensure competence (including those of contractor's/suppliers), monitoring of driver hours and performance, tracking devices in vehicles to monitor speed limit compliance, monitoring of vehicle roadworthiness, requirements for warning signs along in-field roads, ongoing education of communities in the LSA, particularly children, and procedures to follow in the event of an accident. CNOOC's hazardous chemical management specification must be complied with and procedures must be in place to ensure compliance with local laws and international requirements applicable to the transport of hazardous materials. Transport of hazardous materials must include: ■ Appropriately trained personnel; ■ Proper labelling on containers (i.e. quantity, identification, and relevant MSDS); ■ Chain of custody documents; ■ Appropriate packaging; ■ Application of special provisions, as appropriate; ■ Vehicle specifications relevant to transported material; and ■ A 24 hour/day emergency response system.	CNOOC Contractor	■ Record of Compliance with CNOOC's land transportation specification and journey management plan; ■ Documented training for drivers and equipment operators ■ Records of sensitization campaigns; ■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; and ■ Records in ESO monthly reports. ■ Record of hazardous material transport manifest; ■ Availability of MSDS; ■ Reporting of investigations including findings and recommendations; ■ Report findings and recommendations are addressed promptly; and ■ Evidence that relevant personal have reviewed documents.	Daily inspection and monthly monitoring	■ CUL-QHSE-L3(GE)-023 Land Transportation Specification ■ CUL-QHSE-L3(GE)-045 Hazardous Chemicals Management Specification.
2.	Vehicle/mechanical failure		No accidents or premature equipment malfunction	Vehicles must undergo regular maintenance and repair using manufacturer approved parts.	CNOOC Contractor	■ Compliance with CNOOC's land transportation specification; ■ Documented maintenance records; and ■ Complaints registered by communities or employees in the Complaints Register.	Monthly monitoring	CUL-QHSE-L3(GE)-023 Land Transportation Specification.
3.	Traffic	Property damage, Loss time, injury and / or fatality due to traffic accidents	Minimise traffic	■ Pedestrian interaction with project vehicles must be limited; ■ Local communities and responsible authorities must be engaged and educated on visibility, signage, and overall safety of roads (especially where children may be); ■ Coordination with emergency responders to ensure that appropriate first aid is provided in the event of accidents; ■ Using locally sourced materials, to minimize transport distances; ■ Locating associated facilities such as worker camps close to project sites and arranging bus transport for workers to minimize external traffic; and ■ Construct pedestrian walkways along the perimeter of the in-field access roads. Educate local inhabitants to use these walkways and not the roads.	CNOOC Contractor	■ Compliance with CNOOC's land transportation specification; ■ Documented awareness campaigns including photographic evidence of engagement; ■ Correspondence and coordination records with relevant stakeholders; ■ Documents indicating preference for locally sourced materials; and	Monthly monitoring	■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CNOOC Grievance Mechanism Specification.

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring schedule	Additional Reference
						■ Complaints registered by communities or employees in the Complaints Register.		
4.	Transport Emergency response	Property damage, Loss time, injury and / or fatality due to traffic accidents	Minimise transport emergency severity	CNOOC's emergency response plan and emergency preparedness and response procedure must be implemented and must address: ■ Co-ordination with the public and emergency response agencies; ■ First aid and medical treatment; ■ Appropriate response actions; ■ Review and updating to reflect change and the notification of employees of such change; ■ Appropriate emergency equipment (use, inspection, and maintenance); and ■ Appropriate training.	CNOOC Contractor	■ Record of community training and sensitization to support emergency response; ■ Record of Investigations undertaken; ■ Reporting of investigations including findings and recommendations; ■ Report findings and recommendations are addressed promptly; and ■ Evidence that relevant personal have reviewed documents.	At all times	■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; ■ CUL-QHSE-L2 010 Emergen Preparedness and Respons Procedure; ar CUL-QHSE ERP Emergency Response Pla

5.10 Community health, safety and security

The community health, safety and security management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-22: Nuisance

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Referenc
	Influx in the project area	Conflict between project personnel and neighbouring communities Distortion of the behavioural pattern and social fabric of the community Disturbance of community peace and quiet	Minimise conflict with neighbouring communities brought about by nuisance and ill-considered activities by personnel and contractors operating at the site	■ Ensure that induction programmes are held for all new employees, as well as ongoing sensitisation for new as well as existing employees about the Employee Code of Conduct. A copy of the Code of Conduct is to be presented to all new workers post induction and signed by each person. The Code of Conduct must continue to address the following aspects: ▪ Respect for local residents and customs; ▪ Zero tolerance of bribery or corruption; ▪ Zero tolerance of illegal activities by construction or operational personnel including prostitution, illegal sale or purchase of alcohol, sale, purchase or consumption of drugs, illegal gambling or fighting; ▪ Zero tolerance policy of drunkenness and no alcohol and drugs policy during working time or at times that will affect ability to work or within permanent camp or acquired from outside the camp whilst accommodated in the camp; ▪ A programme for drug and alcohol abuse prevention and random testing that is equivalent in scope and objectives to the policies prescribed in the code of conduct; and ▪ Description of disciplinary measures for infringement of the code and company rules. If workers are found to be in contravention of the code of conduct, which they signed at the commencement of their contract, they must face proportionate disciplinary procedures. ■ Update and publicise the Code of Conduct in the settlements potentially affected by operations as well as the permanent camp as part of the community relations plan. This will help ensure that the local residents are aware of the expected behaviour of operational staff. Posters with the Camp Rules should also be posted in neighbouring settlements or lodged with the LC1 of each village and communication related to such rules monitored;	CNOOC	■ Record of drug and alcohol program and evidence of random testing ■ Recrd of awareness raising for project personnel regarding the code of conduct ■ Record of support offered to community health information system ■ Record of monitoring for disease in KFDA ■ Presence of personnel entertainment facilities in the KFDA camp area ■ Record of ■ Current and updated Community Health, safety and security plan; ■ Emergency response plan; ■ Record of updated code of conduct; ■ Record of awareness raising in communities for and ■ Record of compliance with Code of conduct.	Pre-operation , ongoing through life of operation, review and update annually	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Referenc
				■ Ensure that entertainment facilities for workers at the permanent accommodation camp meet the reasonable needs of operational staff and continue to apply clear rules for conduct during leisure time as well as the need to remain within the camp boundaries during leisure time; ■ Provide appropriate sporting facilities, including organised sporting activities for workers at the permanent accommodation camp; ■ Implement interventions aimed at reducing the impacts of vector borne diseases through mechanisms such as sanitary improvements and minimising areas where water is impounded as a result of operational related activities; ■ Ensure that no waste whatsoever, including operational waste is dumped in watercourses or at any site that impacts on villagers or their land use; ■ Ensure that the CNOOC use of water does not disturb public water availability and that sources of water are carefully selected; ■ Support the development of a Community Health Information System (CHIS) to monitor specific key health indicators in a longitudinal fashion, including to monitor the BOD from malaria and other mosquito-borne diseases in partnership with the district health authorities; ■ Develop community-based anti-mosquito interventions in partnership with the Ugandan National Malaria Control Programme (NMCP) and related national strategies; ■ Encourage mosquito source reduction in communities through environmental control mechanisms based on community work groups; ■ Develop health intervention programmes in support of community nutrition education and health programmes, including school deworming and feeding schemes and the promotion of food gardens for roll-out into the settlements impacted by the operations. As part of the process, mobilise NGOs and CBOs that operate in this space; ■ Establish a baseline and surveillance system for a knowledge, attitude, practices (KAP) survey on ways TB is transmitted and prevented, BOD from ARIs, and questionnaires on specific environmental hygiene determinants related to housing and influx; ■ Evaluate opportunities for health systems strengthening (HSS) with government and key partners for improved case detection and treatment of TB especially from Buhuka Flats and the immediate escarpment area as well as training on the management of integrated management of childhood illness (IMCI) to support care for ARIs; ■ Evaluate opportunities for health systems strengthening (HSS) with government and key partners for the detection of MDR-TB in the district, by supporting the use procurement and use of the GeneXpert diagnosis system in the public health system; ■ Support community-based information, education and communication (IEC) campaigns to promote improved knowledge and awareness of TB, other infectious diseases and their associated determinants; ■ Re-assess project impacts on community-dependent ecosystem services and develop corresponding mitigation measures. This includes the design and development of appropriate environmental health programmes to reduce the potential risk of airborne pollutants such as dust, which may impact on community health; ■ Develop educational materials regarding the prevention of water, sanitation and waste related diseases; ■ Monitor changes to footprints of animal husbandry activities adjacent to the CNOOC facilities;				

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Referenc
				■ Develop and maintain epidemic preparedness policies and programmes to reduce the impact of any suspected or confirmed outbreak of a communicable disease at the local level; ■ Plan and regularly update outbreak control risk assessments by keeping abreast of pandemic alerts through WHO notifications. Project outbreak management plans should align and be integrated with local government outbreak response systems; ■ Develop and maintain strong relationships with local health authorities to receive local disease outbreak reports; ■ Support the improvement of veterinary public health services in study area, including preventive programs such as vaccinating and sterilizing dogs, vaccinating livestock and the control of public slaughter of livestock. ■ Incorporate and integrate the Voluntary Principles on Security and Human Rights into CNOOC operational related security management policies, awareness creation and training materials and procedures and assessment processes; ■ Communicate regularly with stakeholders about the CNOOC operations as well as plans in support of community initiatives, as a means of reducing local unease or resistance. It is a critical requirement that CNOOC builds trust with its stakeholders in respect of the continuing safe operation of all facilities; ■ Ensure the ongoing functionality and accessibility of the grievance procedure that has been implemented for the local community, and that complaints related to CNOOC contractor or employee behaviour that infringes on the health, safety or security of community members that are lodged are responded to in a satisfactory manner. The grievance procedure must include ongoing efforts in respect of: ▪ Circulation of contact details of community liaison officers or, if separate, of 'grievance officers' or other key contact; ▪ Circulation of details of the Witness NGO as well as the mechanisms to access the NGO; ▪ Raising of awareness amongst the local community regarding the grievance procedure and how it will work; ▪ Establishment of a grievance register that is continuously updated and maintained by CNOOC; and ▪ Provision of a mechanism to provide feedback to individuals, groups and village councillors regarding actions that have been taken in response to complaints lodged. ■ Provide support for the establishment of an appropriate crime prevention and policing forum in collaboration with role players from central, district as well as local levels; ■ Consider establishing a corruption and crime "whistle-blower" mechanism that allows for anonymous reporting, as well as issuing rewards for reports that are of critical importance in respect of crime and/or general security; and ■ Ensure that project staff avoid making use of social infrastructure, including during periods of leave, unless they are resident in the project area.				
	Maintenance activities at the CPF, wells and ancillary facilities	Disturbance of community peace and quiet	Provide an operating framework that regulates the time and schedule of operations	■ No maintenance other than that required to deal with an emergency, shall take place outside of daytime hours without the written permission of CNOOC, after due consideration of the potential of the activity to create nuisance. ■ Reasonably schedule operational activities that generate all of noise to day time. ■ Should such work be technically unavoidable to require activity continuation throught day and night time such as during concrete casting of massive structures, the contractor will inform CNOOC in not less than a week's time in advance to enable ample time for community sensitization and engagement of the affected homesteads.	CNOOC Contractor	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; and ■ Records of observations in monthly reports.	Daily insection and monthly monitoring	■ CUL-QHSE-L2-005 Communication Management Procedure; and ■ CUL-QHSE-L3(GE)-006 Stakeholder Engagement Specification.

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Referenc
	Maintenance activities at the CPF, wells and ancillary facilities	Noise emissions	Minimize the Disturbance of public peace and quiet resulting from noise	Noise levels shall be controlled to ensure no detrimental effect on landowners, occupants, employees or the public. All vehicles and equipment shall be fitted with noise suppression, as appropriate, and operated and maintained at all times in conformity with the manufacturer's specifications, instructions manuals and schedule.	CNOOC Contractor	■ Complaints registered by communities or employees in the Complaints Register; ■ Records of timeous corrective action to resolve complaints; ■ Records in monthly reports; and ■ Monitoring results.	Daily insection and monthly monitoring	
	Operation activities at the CPF, wells and ancillary facilities	Loss of social licence to operate by CNOOC	Facilitate open communication with households	■ CNOOC shall communicate regularly with households and other receivers living close to operational activities where noise and dust are potentially affecting them. Most people are tolerant of short term nuisance when treated courteously and when efforts are made to minimise their issues of concern; ■ Ensure that community forums are created in which landowners can raise issues and discuss with CNOOC staff any ongoing concerns about safety associated with KFDA operations or about crime believed to be related to the CNOOC infrastructure and facilities; ■ Provide all stakeholders with contact details of maintenance and emergency staff at the production facility and ensure that this information remains updated. Local inhabitants will be CNOOCs eyes and ears in this regard and can be of assistance in day to day monitoring of any events that should be noted or acted upon in relation to the safety and maintenance of CNOOC infrastructure and facilities; ■ Ensure that maintenance staff wear CNOOC-branded safety vests and use CNOOC branded vehicles to provide land owners with an immediate means of distinguishing them from intruders; ■ Establish reliable systems to monitor violence and crime at the community level; and ■ Establish appropriate policies and management mechanisms for countering the use of CNOOC jetties or areas adjacent to them for illegal activities, including related to smuggling of goods out of or into Uganda via Lake Albert. Establish protocols with the appropriate authorities regarding the management of incidents.	CNOOC Contractor	■ Complaints registered by communities or employees in the Compliments and Complaints Register; ■ Records of timeous corrective action to resolve complaints; and ■ Records of observations in monthly reports.	Daily insection and monthly monitoring	
	Operation activities at the CPF, wells and ancillary facilities	Distortion of the social – economic network and social – cultural fabric Social Fragmentation	Minimize the distortion of the social – economic network and social – cultural fabric	■ Ensure that consideration of conflict issues - latent, existing and potential – is built into all phases and aspects of operations; ■ Monitor and track responses to risks and impacts, involving workers and communities; ■ Continue to implement the Community Relations Strategy (CRS) and establish a formalised communication forum. The forum should be open to representatives from villages (including but beyond the formalised governance system provided by LC1s), CSOs, NGOs, FBOs as well as traditional clan chiefs (or representatives) and other stakeholders as identified. Ensure regular meetings at local level, hosted by CNOOC, aimed at: ▪ Communicating with stakeholders to build understanding and demonstrate transparency and accountability ▪ Strengthening channels for the provision of further information that may be needed; ▪ Promoting mechanisms for understanding real issues and concerns related to the project and impacts being experienced from direct (unmitigated), indirect and cumulative impacts; and ▪ Publicly and transparently debating options for sharing out benefits at local level that will take account of the negative impacts experienced locally, including the costs and benefits of different options, their management implications and their role in supporting wider economic development.	CNOOC	■ CRS; ■ Complaints received; and ■ Community development action plan compiled.	Annually	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Referenc
				■ Develop - in consultation with all relevant stakeholders - a Community Development Action Plan (aligned with the Kikuube District and Sub-county Development Plans) for implementation of activities aimed at: ▪ Promoting strategic Corporate Social Responsibility (CSR) projects which will not require CNOOC to usurp the government's role or act as substitute government agent in fulfilling human rights related delivery; ▪ Planning and implementing projects, in partnership with government, that will serve to alleviate existing challenges to the survival, livelihood and dignity of the people of the Buhuka Flats in a sustainable manner. This could include engaging NEMA as well as relevant authorities in implementation of effective solid waste management and associated recycling programmes; ▪ Planning and establishing adequate sports facilities for schools as well as for youth, in partnership with government and the Banyoro Kitari Kingdom; ▪ Planning and achieving critical objectives set out in the project Livelihoods Restoration Plans; ▪ Planning and implementing immediate measures that will assist in earning and maintaining CNOOC's social license to operate; and ▪ Taking collective action where appropriate to address environmental, social and human rights issues. ■ Facilitate and financially support the establishment of a district/area-wide Development Organisation, with a formalised legal structure (such as a Foundation or a Community Development Agency). Such an organisation or agency would: ▪ Address issues related to human security, as an approach that brings together development, human rights, and peace and security (as defined by the United Nations General Assembly, 2012); ▪ Allow the identification and redress of widespread challenges to the survival, livelihood and dignity of villagers on the Buhuka Flats and beyond in a sustainable manner; ▪ Draw together the financial and human resources of the private and public sectors, the traditional leadership and other stakeholder bodies as well as donor and aid organisations; ▪ Develop issue-based action plans, including business plans for donor funding in respect of various focus areas of need that will address identified human security issues and concerns; and ▪ Allow CNOOC to use its own budget to leverage significant additional budget from other role-players (including international 'gofundme' initiatives) and aid organisations with a specific mandate (e.g. The distribution of mosquito nets) to address specific problems encountered at village level. ■ Ensure that at the point of CNOOC closure, such a development organisation could reasonably be expected to be self-sustaining. As well, to have made a lasting contribution to the well-being of the region, particularly within the villages on the Buhuka Flats.				

5.10.1 Population influx and Social Pathologies

Table 5-23: Population Influx and Social Pathologies

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Influx of job / opportunity seekers in the the project area	Increased pressure on available resources Over exploitation of available resources Encroachment and destruction of natural habitats Increased disease prevalence and crime Distortion of the social economic fabrique	Minimize influx of immigrant job seekers into the project area Minimize the Health, safety and security impact (disease prevalence, reduced sanitation, crime, prostitution) arising from influx to the host community Minimize influx related pressure on local resources (water, food, shelter, infrastructure) that would undermine the health and livelihood of the host community	The Communication Plan shall be updated including national coverage and community communication campaigns, starting prior to establishment on site, Implementation of the following recruitment strategies that discourage influx of job seekers into the project area: ■ Ensure that the recruitment of un skilled workers is strictly reserved to the local community and the candidates are vetted by the local leadership before enrolment ■ Avoid or reduce influx of opportunity seekers through preferential sourcing of local goods and services from local suppliers thus discouraging immigrants that will not contribute to development and upliftment of local communities; ■ Avoid procurement of casual goods and services at the gate or around the project fence ■ Proactively supporting programs that attract skilled people such as teachers, health workers, and experienced traders and entrepreneurs; ■ Manage such undesired influx as cannot be avoided through support to existing Government and donor initiatives for planning and development of the Kikuube District, and ■ Implement the Influx Management Plan ■ Support the local and central government to strengthen controls to immigrant influx into the project area	CNOOC Contractor	■ Monitoring records. ■ Demographic records at district and national levels Records of origin of recruited unskilled labour force.	Quarterly	
2.	Community sensitization and public engagement	Community mistrust and reduced confidence Loss of the social licence to operate by the project	Foster community engagement through regular information sharing with the host community and general public	▪ A stakeholder engagement plan shall be developed by CNOOC and will have a stakeholder mapping, frequency and mode of engagement of the respective stakeholders. ▪ Sensitization meetings shall be regularly held with all stakeholders including Government, development partners, host community and the general public to provide project information and also receive community feedback to issues of interest. .	CNOOC Contractor	■ Record of stakeholder engagement meetings ■ Minutes of stakeholder meetings ■ Evidence of the stakeholder engagement plan in place ■ Evidence of compliance with the stakeholder engagement plan ■	Monthly monitoring	
3.	Land and Property Rates	Loss of livelihood and reduced	Minimize the Loss of livelihood and	■ It is recommended that the project engages closely with governmental authorities to monitor land ownership and changes thereto surrounding the project development;	CNOOC	■ Engagement in the developing land policies; and	Quarterly and as frequent as may be required	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
		standard of living for the project affected persons	reduced standard of living for the project affected persons	■ Prepared to accommodate the changes arising from the population influx by sensitising the LC system. This is particularly important, as it is at this level that the stability of a village is decided, including the establishment of checks and balances for maintaining individual rights and responsibilities, and for managing crime; ■ Support work to develop comprehensive land policies. This includes support for Government capacity to do strategic, long-term land use planning that protects small holder farmers and helps balance multiple uses of land, including for oil and gas extraction; ■ Contribute to economic development and infrastructure improvement in the project area, in partnership with central, district and local government. Government to finalise, review and implement plans to for structured urban development on the Buhuka Flats; ■ Develop a transparent community development and contribution policy; ■ Ensure that CNOOC staff who reside outside the LSA are required to return to their place of residence during periods of leave to avoid potential use of rental property in the area; ■ Provide accommodation for all personnel who do not reside in the LSA and are not brought in on a BIBO or FIFO basis; ■ Ensure that local communities are fully aware of the reasons for the buffer. Install painted markers to demonstrate where the restrictions are; and ■ Consider the use legal instruments to enforce the buffer zone as a long term means of protecting the interests of both communities and the KFDA. CNOOC would be required to motivate this proposal to Government for action.		■ Community development and contribution policy.	As required	

5.10.2 Communicable and Vector Borne Diseases

Table 5-24: Communicable Diseases

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Interactions of Project personnel with community members	Loss time, injury and fatality due sexually transmitted diseases Distortion of the moral fabrique of the society through increased prostitution	Minimize the risk of sexually transmitted infections (STIs)	An STI Management Plan designed to minimise the spread of HIV infection and other STIs must be maintained. The plan will include, among other things, the following measures: ■ An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STIs, to employees, through workshops, posters and informal information sessions; ■ Encouragement of employees to determine their HIV status; ■ Supply of condoms; and ■ Updated Accommodation Management Plan, including rules for on-site behaviour, entrance and exit policies and prohibition of sex workers on site ■ Strict access and exit controls at the workers camp to mitigate uncontrolled movement and association of project workers with the host community that may culminate into sexual relationships and heightened risk of prostitution.	CNOOC Contractor	■ Availability of a STI Management Plan and evidence for compliance of the plan; ■ Record of health (STI) sensitization campaigns and ■ Number and nature of health initiatives to mitigate	Quarterly	
2.	Operation of CPF, wells and ancillary facilities	Loss time, injury and fatality due Malaria	Minimize the prevalence of malaria in host community and project workers through Mosquito vector control, avoidance,	▪ Provision of mosquito nets in the operation camp to all project workers ▪ Regular fumigation program should be undertaken to control mosquitoes within the camp ▪ Provide malaria prophylaxis to project workers particularly expatriate employees from countries that are malaria free ▪ Ensure that the camp and other construction site don't have stagnant pools of water that are breeding grounds for mosquitoes ▪ Provide adequate medical facilities with qualified medical personnel experienced in treatment of malaria	Contractor CNOOC	■ Record of malaria cases in the work force ■ Evidence of regular fumigation and provision of mosquito nets in the camp ■ Records of ongoing training of employees in respect of malaria avoidance. ■ Evidence of a well facilitated medical facility in camp	Monthly monitoring	

			diagnosis and treatment	A malaria management plan shall be prepared and maintained that includes vector control, avoidance, diagnosis, treatment, and training. The plan shall; ■ be reviewed and updated annually taking account of the incidence of malaria during the preceding 12 month period; ■ take account of company community-based anti-mosquito interventions in partnership with the Ugandan National Malaria Control Programme (NMCP) and related national strategies; and ■ Encourage mosquito source reduction in communities through environmental control mechanisms based on community work groups.		■ Evidence of provision of malaria prophylaxis		
3.	Disease Monitoring and Management	Prevalence of diseases and infection in the community	Enhance early illness detection and ensure physical fitness of project	▪ Medical check up should be undertaken for project workers ▪ Physical fitness check-up should be undertaken for field personnel prior to mobilization to the site ▪ Surveillance and active screening and treatment of workers must be undertaken	CNOOC Contractor	■ Records of medical screening and treatment.	At appointment and annually thereafter	Medical Servic Management Specification (CUL QHSE-L3(GE)-015).
4.	Education	Un informed contraction of diseases and infection	Provide Educate and create awareness	Health awareness and education initiatives must be undertaken (e.g. illustrative posters, training, and counselling)	CNOOC Contractor	■ Records of education sessions; and ■ Photographs of posters.	Bi Annually	
5.	Medical Facilities and medical care	Escalation of Injury and fatality resulting from lack of adequate medical attention	Provide Appropriate and adequate treatment	Access to medical treatment, confidentiality, and appropriate care must be provided.	CNOOC Contractor	Documented evidence of appropriate treatment.	Quarterly	Medical Service Management Specification (CUL-QHSE-L3(GE)-015).

5.10.3 Water quality and availability

Table 5-25: Water quality and availability

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Portable Water quality	Prevalence of water borne diseases Loss time and injury resulting from water borne	Protection of drinking water sources for the project and the community Ensure availability of water to the community	▪ Map portable water points for the community and the project Put safeguards in place to minimize pollution of water points from the project through: ▪ Allowing a safe functional buffer between portable water source / point and project work sites ▪ Minimize siltation of surface portable water sources from construction work sites through installation of silt traps in runoff channels leading such water points ▪ Support water and sanitation initiatives that are aimed at protection and improvement of portable water sources to the community ▪ Project activities must not compromise local water needs and must take account of potential future water requirements in the project area. Water sources relevant to the Project must be managed to ensure water quality meets or exceeds applicable national acceptability standards or, in their absence, the latest edition of WHO Guidelines for Drinking Water Quality.	CNOOC Contractor	• Evidence of improved portable water quality in the community • Reduced prevalence of water borne diseases in the community No exceedances of Ugandan standards or WHO Guidelines in the absence of Ugandan standards.	Monthly monitoring	■ CUL-QHSE-L3(GE)-014 Food & Drinking Water Hygiene Management Specification; and ■ CUL-QHSE-L3(GE)-054 Water Management Specification.

5.10.4 Structural Safety of Project Infrastructure

Table 5-26: Structural Safety of Project Infrastructure

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Impact isolation by buffer zone	Direct exposure of project impact to sensitive receptors	Reduce exposure of hazards and nuisance to recipients by creation of safety zones (buffers)	Avoid conflict with communities through the maintenance of permanent fenced barrier to restrict community access, and access of their livestock, into areas utilised for purpose of petroleum production. This will be achieved through acquisition of additional land at the periphery the actual operational footprint. Allow the community to utilize the buffer zone for regulated activity that are exclusive of settlement e.g. grazing to reduce the project land take and associated pressure on the limited land resource Plant trees in the buffer zone to attenuate project nuisance such as noise and glare	CNOOC Contractor	Evidence of reduced exposure of nuisance to the recipient No complaints from public.	Monthly monitoring	
2.	Facility Maintenance	Destruction of project infrastructure resulting from poor design and maintenance Injury and fatality resulting from accidents due to poor design and / or maintenance	Safe and appropriate practices	Locally regulated or internationally recognized design and engineering codes must be enforced to ensure structures are maintained in accordance with sound architectural and engineering practice (e.g. aspects of fire prevention and response).	CNOOC Contractor	Evidence of optimized engineering design in line with the hazard specific studies Verified evidence of the Ability of structures to withstand identified challenges	During engineering design development and structural quality inspection during construction and operation	Current International building codes of the International Code Council (ICC, 2006)
3.	Natural risks	Destruction of project infrastructure by natural hazards	Minimize the risk of natural hazards to the project installations through Structural designs that are hazard proof to natural catastrophes such as floods, earthquakes, land slides etc	Project engineering designs must factor into the contemplated natural hazards in the area and the design should be full proof in accordance with the area studies undertaken for the respective hazards. (e.g. Slope stability, seismic activity, and wind loading.	Construction contractor CNOOC	Evidence of optimized engineering design in line with the hazard specific studies Verified evidence of the Ability of structures to withstand identified challenges..	During engineering design development and structural quality inspection during construction and operation	
4.	Incident response	Escalation of injury and / or fatality due to imprompt / improper	Ensure preparation, identification, Containment, eradication of incidents	Development of appropriate and functional (response plans, policies, call trees and ensure that the members of the incident response team including external entities are identified and available The response plans and policies shall contain information relating to evacuation procedures, communication strategy, establish safety zones among others	CNOOC Contractor	■ Evidence of functional emergency response plans in place ■ Number of emergency drills undertaken	Daily inspections, monthly drills and quarterly monitoring	

		incident response	Promote fast recovery from an incident	Ensure proper understanding of the work environment to enable an informed judgement of events and incidents and accertain the proper response approach and strategy Contain the incidents through working with the established protocols to limit the damage caused to systems (activities) and prevent any further damage from occurring. This shall include short and long term containment activities. Ensuring that a clean system ready to restore after effective containment has been achieved. public.		■ Record of public engagement for emergency response and support ■ Evidence of demarcated safety zones; and Record of medical services provided.		
5.	Safety systems		Loss time, injury and / or fatality from accidents resulting from safety system failure	CNOOCs Safety specifications must be complied with and must identify and address (on an ongoing basis) major risks, applicable codes, standards and regulations, and appropriate mitigation measures. Over and above what has been proposed in the Environmental and Social Management Plan of the ESIA The safety aspects and the entire ESMP shall thus remain a living document and regular update of the following plans should be undertaken:: ■ Signage showing hazards, names and contact numbers of responsible persons and a single contact number for emergencies; ■ Emergency doors in outer walls of buildings must open outwards and must be fitted with quick release bars on the inside; ■ Fire prevention; ■ Means of evacuation; ■ Detection and alarm systems; ■ Isolation of hazards; ■ Fire suppression and control; ■ Emergency response plan; and Operation and maintenance.	CNOOC Contractor	■ Record of the review and update of safety documents ■ Safety audit reports and Records of drills held.	Daily inspections, monthly drills and quarterly monitoring	■ CUL-QHSE-L3(GE)-027 Behaviour Based Safety Specification; ■ CUL-QHSE-L3(GE)-033 Electrical Safety Specification; ■ CUL-QHSE-L3(GE)-019 Festival and Holiday Safety Specification; ■ CUL-QHSE-L3(GE)-035 Fire Safety Specification; and CUL-QHSE-L3(GE)-040 Industry Safety Specification.

5.11 Waste Management Plan

The waste management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below. The plan includes the management of hazardous materials, including handling and disposal.

Table 5-27: Waste management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1	Waste generation and management	Pollution of air, water and soil Injury to humans,	Waste minimization and re-use	CNOOC must implement their Waste Management Specification and manage waste in line with IFC waste management[16], and OGP guidelines for waste management[17] which include (but are not limited to) the following: ■ Waste must be disposed of safely and responsibly in accordance with relevant local legislation and GIIP; ■ Compliance with the waste hierarchy principle (Figure 7);	CNOOC Contractor	Clean environmental audit report.	Weekly inspection with monthly monitoring	CUL-QHSE-L3(GE)-053 Waste Management Specification.

[16] Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental Waste management (2007) - http://www.ifc.org/wps/wcm/connect/6e4e348048865839b4cef66a6515bb18/1-6%2BWaste%2BManagement.pdf?MOD=AJPERES

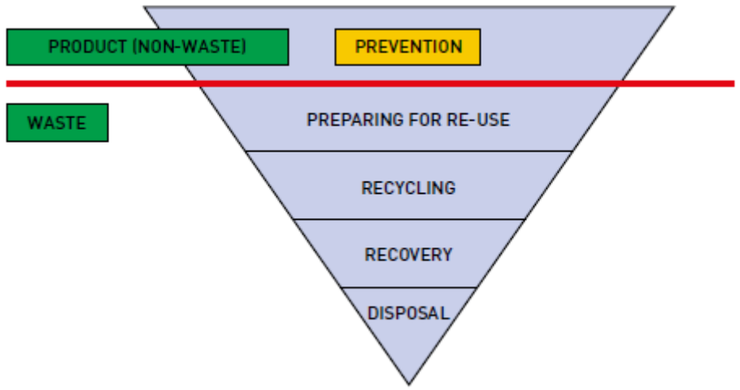
[17] Guidelines for waste management with special focus on areas with limited infrastructure; Report No. 413, rev1.1 September 2008 (updated March 2009)

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference

		plants and animals exposed to the waste
		
		Lower the aesthetic value of the project area
				■ Specify the purchase of only the amount of materials required for a specific task;
				■ Inventory control and management to avoid surplus, such as use of “just in time” delivery of consumables that have a short shelf life;
				■ Purchasing supply contracts must favour bulk purchases to reduce packaging volumes;
				■ Bulk supply of products must be in reusable containers (e.g. chemicals in reusable steel tanks rather than plastic drums);
				■ Preference must be given to less hazardous and “environmentally friendly” (i.e. biodegradable, inert, recyclable) materials or products and purchasing agreements must allow the return of unused materials or products to the vendor. Chemicals and substances that must be avoided are outlined in this table below, in conjunction with suitable alternatives;
				■ All wastes must be segregated, quantified, and recorded to facilitate re-use;
				■ Appropriate community recycling programs must be established and managed;
				■ Promote opportunities for use of the road infrastructure to support the implementation of sustainable reduction, re-use and recycling options in respect of Solid Waste Management. In particular, the urgent need to avoid further impacts on the environment and Lake Albert from plastic waste (and in support of existing legislation;
				■ Ensure that no waste whatsoever, including construction waste is dumped in watercourses or at any site that impacts on villagers or their land use;
				■ In accordance with the requirements of the waste hierarchy, undertake the following:
				  ▪ Update the inventory of hazardous and non-hazardous wastes that will be generated at the CPF, provided in Specialist Study 5;
				  ▪ Confirm the expected quantities of waste generated;
				  ▪ Finalise options for the management of each waste stream, taking into consideration the requirements to avoid, minimize, segregate, reuse and recycle wastes;
				  ▪ Make provision for areas for sorting and segregation of recyclable waste;
				  ▪ Confirm that the design includes for sufficient suitably sized, impervious, bunded, containment (roofed to prevent rainfall ingress) for temporary storage of all hazardous and non-hazardous wastes to be transported off-site by the NEMA-certified waste contractors; and
				  ▪ Ensure that manifests of waste transported and received are maintained and regularly reviewed for the purposes of audit.
				■ It is noted that while options for waste treatment off-site are set out in the table below as examples of best practice, CNOOCs principle responsibilities, for the purposes of this EIA, are related to front-end waste management, being waste minimization, segregation, re-use and recycling and safe temporary storage for collection by the independent waste contractor.				

				Non-hazardous Solid Wastes				
				Food & Vegetable Wastes: ■ Avoid, reduce, reuse, source - segregate and collect all food wastes generated. Also, source-segregate any hazardous waste from the food and vegetable wastes; ■ Preferentially treat all food, kitchen and vegetative wastes via Anaerobic Digestion using low cost, high-tech fabric. Where this is not possible, aerobic composting should be applied; and ■ Use the digestate slurry from anaerobic digester for landscaping, or direct to the wastewater treatment plant.				

Ref.	Aspect	Potential Impact	Objective	Management Action		Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
					Direct the biogas generated from the anaerobic digester to the camp kitchen for use as a cooking fuel.				
				Plastics	■ Avoid, reduce, reuse, source-segregate and collect all plastic wastes generated. Also, source-segregate any hazardous waste from the plastic wastes; ■ Recycle all the readily recyclable plastics; ■ Incinerate any residual plastics via a NEMA-certified waste contractor or dispose at a NEMA-certified non-hazardous landfill if incineration is not possible; and ■ Minimise the use of plastic water bottles by installing water dispensers at convenient locations for use by project personnel.				
				Paper	■ Avoid, reduce, reuse, source-segregate and collect all paper wastes. Also, source-segregate any hazardous waste from the paper wastes; ■ Bale and recycle all the dry, non-blue paper; and ■ Incinerate any residual wet or blue paper via a NEMA-certified waste contractor or dispose at a NEMA-certified non-hazardous landfill if incineration is not possible.				
				Metal	■ Avoid, reduce, reuse, source-segregate and collect all metal wastes generated. Also, source-segregate any hazardous waste from the metal wastes; and ■ Recycle all the readily recyclable metal.				
				Glass	■ Avoid, reduce, reuse, source-segregate and collect all glass waste generated. Also, source-segregate any hazardous wastes from the glass waste; and ■ Dispose any residual glass waste at non-hazardous landfill.				
				Rubber	■ Avoid, reduce, reuse, source-segregate and collect all rubber waste generated. Also, source-segregate any hazardous waste from the rubber wastes; and ■ Incinerate any residual rubber waste via a NEMA-certified waste contractor or dispose at a NEMA-certified non-hazardous landfill if incineration is not possible.				
				Wood	■ Avoid, reduce, reuse, source-segregate and collect all wood waste generated. Also, source-segregate any hazardous waste from the wood wastes; ■ Recycle all the readily recyclable wood; and ■ Incinerate any residual wood waste via a NEMA certified waste contractor or dispose at a NEMA certified non-hazardous landfill if incineration is not possible.				
				C&D wastes	■ Source-segregate any hazardous waste from the C&D wastes; ■ Recycle all the readily recyclable C&D waste; and ■ Dispose any residual C&D waste at a NEMA-certified non-hazardous landfill.				
				Miscellaneous wastes (e.g. used insulation,	■ Source-segregate any hazardous waste from the assorted wastes; ■ Reuse and recycle any readily reusable/recyclable wastes; and				

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				used tyres, hoses, textiles) ■ Incinerate any residual incinerable wastes via a NEMA-certified waste contractor or dispose at a NEMA certified non-hazardous landfill if incineration is not possible.				
				 *Figure 7: The Waste Management Hierarchy (Drilling Waste Management Technology Review, International Association of Oil & Gas Producers (IOGP), Report 557, June 2016)*				
2	Use of Chemicals and substances in operation activities	Pollution of air, water and soil Injury to humans, plants and animals exposed to the waste	Minimise toxicity	Toxicity must be reduced through CNOOC's Waste Management Specification and OGP guidelines that require the use of the following: ■ Non-chlorinated degreasing agents; ■ Water-based paints in preference to solvent-based paints; ■ Biodegradable 'plastics'; ■ Asbestos-free gaskets and insulation; ■ Mercury-free components (this includes lighting); and ■ Hydro-testing using low toxicity (or no) additives.	CNOOC Contractor	Clean environmental audit report.	At all times	Water Management Plan.
3	Use of Chemicals and substances in operation activities	Pollution of air, water and soil Injury to humans, plants and animals exposed to the waste	Enhance waste management strategy through observance of the waste management hierarchy	CNOOC's waste management specification details the following which must be complied with: ■ Waste management processes; ■ Waste identification and classification; ■ Waste segregation and storage; ■ Waste transport; ■ Waste disposal; ■ Reporting; ■ Training; and ■ Hazardous waste spill response. CNOOC's waste management specification must be updated monthly as needed.	CNOOC Contractor	■ Compliance with CNOOC's waste management specification; ■ Documented review of wastes from routine operations as well as incidental and non-routine waste sources (i.e. waste from leak or spill clean-up); ■ Documented characterization of each waste type to hazardous or non-hazardous; ■ Up-to-date waste register; and ■ Appropriate certificates for waste disposal at NEMA certified facilities.	Monthly	CUL-QHSE-L3(GE)-053 Waste Management Specification.
4	Non-hazardous waste management			All non-hazardous waste shall be collected, separated for recycling, temporarily stored, transported and disposed of in accordance with relevant legislation and the requirements set out in the CNOOC Waste Management Specification.	CNOOC Contractor	■ As per CNOOC Waste Management Specification; ■ Records of waste collected and recycling; and	At all times	CUL-QHSE-L3(GE)-053 Waste Management Specification.

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				Non-Hazardous Liquid Wastes *Grey Water* ■ Avoid /Reduce; ■ Reuse/recycle; ■ For the waste water that cannot be reused without prior treatment, treat via the sewage effluent treatment plant; and ■ Use sludge generated from the treatment process in manure application if it meets manure requirements; if it does not meet requirements, treat at a waterworks facility via a NEMA-certified waste contractor. *Boiler Blowdown Water* ■ Avoid/Reduce; ■ Reuse/recycle in the feed water tank; ■ If the water cannot be reused without treatment, treat via Physico-chemical and Biological Effluent Treatment Plant; and ■ Dispose of sludge at a landfill via a NEMA-certified waste contractor. *Storm Water* ■ Separate uncontaminated and potentially oil contaminated (POC) stormwater; ■ Test POC stormwater, and treat in API separators, as necessary; ■ Treat all stormwater from hazardous areas of the plant in API separators; ■ Avoid/reduce stormwater discharge by using underground storage tanks as a rain water harvesting mechanism; and ■ Any water that is not harvested should be directed into drainage outlets that connect to existing drainage networks (refer to recommendations for the management of stormwater discharged into River 1). ■ Potentially oil contaminated stormwater from the parking area and flushing area at the safety check station will be directed through perimeter drains to an oil separator (‘oil water pit’) located at the northwestern corner of the station perimeter		■ Manifests of waste collection and disposal at selected municipal waste disposal site.		
5	Hazardous waste management	Pollution of air, water and soil Injury to humans, plants and animals exposed to the hazardous waste	Minimize hazardous waste generation Improve hazardous waste handling and management	■ All hazardous waste shall be collected, classified, labelled, temporarily stored, transported and disposed of in accordance with relevant legislation and the requirements set out in the CNOOC Waste Management Specification. ■ Potentially oil contaminated stormwater from the parking area and flushing area at the safety check station will be directed through perimeter drains to an oil separator (‘oil water pit’) located at the northwestern corner of the station perimeter ■ Compliance with the generally held principles of prevention, reuse, recycling, recovery and ultimately disposal of waste as embodied in the principles of the waste hierarchy; ■ All camp hazardous waste shall be collected, classified, labelled, temporarily stored, transported and disposed of in accordance with relevant legislation and the requirements set out in the CNOOC Waste Management Specification; ■ Store all potentially hazardous products in fully secured areas, with an impervious floor, bunded perimeter or walls, and roof to avoid rainfall ingress. Place a PPE storage box and spill kit within immediate vicinity of waste storage areas; ■ Temporarily store all hazardous waste, prior to transport off-site, in a fully secured, area, with an impervious floor, bunded perimeter, and roof to avoid rainfall ingress. Design the hazardous waste storage area to have sufficient	CNOOC Contractor	■ As per requirement; ■ Records of waste collected and recycling; and ■ Manifests of waste collection and disposal at appropriately licensed waste disposal site.	Daily inspection and monthly monitoring	CUL-QHSE-L3(GE)-053 Waste Management Specification.

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				capacity to safely contain the flux of wastes generated during construction and to have sufficient ventilation. MSDS's for the waste are to be available at the storage area; ■ Store hazardous waste in sealed containers, labelled in accordance with the Ugandan waste regulations. Ensure that waste transport manifests are signed on departure from the construction site and on receipt at the approved disposal site in accordance with the regulations; ■ Ensure that hazardous waste is regularly collected from site in order to minimise build-up in the temporary storage area; ■ Contract with a specialist hazardous waste contractor for the transport and disposal of all hazardous waste from site; Verify that the selected hazardous disposal site is registered with the Ugandan authorities and is suitable for the hazardous wastes being disposed; ■ Maintain accurate manifests of all hazardous waste that is temporarily stored and transported from site in accordance with Ugandan waste regulations. This will necessitate an appropriate industrial scale to weigh all wastes. Verify that the quantity of waste transported tallies with the amount disposed. ■ Ensure that any water treatment brines or hydrocarbon sludges are in sealed containers to avoid spillage during transport; ■ Conduct all servicing of vehicles or equipment within the designated areas for maintenance; ■ Place any field equipment that could leak oil onto drip trays or plastic liners, to prevent spillage into the environment; ■ Prohibit fuelling of vehicles and mobile equipment outside of the designated fuelling areas; ■ Prohibit the use of equipment with lubricants containing PCBs; ■ Develop and implement a procedure for a rapid response to management of spills. In addition to the above the following wastes should be managed as stipulated below: **Hydrocarbon waste from vehicle maintenance and washing:** Ensure that all vehicle washing and maintenance, and the maintenance of potentially oil contaminated equipment takes place in defined workshop areas which have impermeable floors and have controlled wash water/stormwater drainage through a sump and mechanical oil separator. Test potentially contaminated waste water to ensure it meets the project standard before being released into the environment. **Brines from raw water treatment:** Collect and drum all brines and waste chemicals generated by water treatment and dispose at either a hazardous waste disposal site or a domestic site, to be determined by testing the quality of the brines. **Sludges from sewage treatment:** Collect and remove sewage sludge to a hazardous waste disposal site. **Water from pressure vessel testing:** Prior to release of any water from pressure vessels or flowlines that are hydrotested to check their integrity, pass the water through sand filters and test for toxicity, based on recognised bioassay methodologies. Avoid the use of biocides or corrosion inhibitors by minimising residence time of the water in the vessels. **Waste paints, scale, sand blasting residue, waste glues and sealants:** Prior to release of any water from pressure vessels or flowlines that are hydrotested to check their integrity, pass the water through sand filters and test for toxicity, based on recognised bioassay methodologies. Avoid the use of biocides or corrosion inhibitors by minimising residence time of the water in the vessels. **Hydrocarbon contaminated waste (oily rags, oils sludges, etc.):** Contain and drum all hydrocarbon or hydrocarbon-contaminated residues for disposal at a hazardous waste disposal site.				

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference

Pesticide waste:
Select and use pesticides following the principles set out in the IFC PS3. These include management of the type of pesticides used (extremely hazardous pesticides, as defined by the WHO, are prohibited), and their handling, storage, use and disposal.

Waste fluorescent lights containing mercury:
Store separately and dispose to hazardous waste disposal site

Biomedical waste:

- Store separately and remove to hazardous waste disposal site.

Hazardous Wastes

Waste category	Waste type	International BPEO	Currently Available BPEO		
			Option 1	Option 2	Option 3
Drill cuttings		Biodegradation	Biodegradation [18]	Cement Kiln[19]	Landfill
Drilling fluids	WBDFs / NADFs	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation[20]	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	-	-
Associated hazardous waste	Batteries (wet and dry)	Recycling (wet only)	Recycling (wet only)	Landfill (dry only)	-
	Chemicals residue	Return to manufacturer	Incineration	Landfill	-
	Completion and well work-over fluids	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	-	-
	Contaminated containers (e.g. oil drums)	Re-use of containers[21]	Incineration	Landfill	-
	Contaminated hydrotest water	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	-	-
	Contaminated personal protective equipment (PPE)	Cement Kiln	Cement Kiln	Incineration	Landfill

[18] *Modification of conventional biodegradation process may be required to extract or immobilize elevated levels of heavy metals in the treated materials. This may include for example, using acids, augmented bacteria, stabilization or Dispersal Chemical Reaction.*
[19] *Subject to feasibility study and pilot project.*
[20] *Process changes may be required to adequately treat NADFs.*
[21] *Requires cleaning to remove chemical and oily residues.*

Ref.	Aspect	Potential Impact	Objective	Management Action				Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				Contaminated scrap metal	Recycling[22]	Recycling	Landfill	-			
				Electrical / electronic waste	Refurbishment / recycling	Landfill	-	-			
				Foam	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	Ultrafiltration-Reverse Osmosis / Flocculation-Coagulation	-	-			
				Medical waste	Cement Kiln	Cement Kiln	Incineration				
				Oil contaminated soil	Biodegradation	Biodegradation	Cement Kiln	Landfill			
				Oily rags, filters etc.	Cement Kiln	Cement Kiln	Incineration	Landfill			
				Oily sludges (from the bottom of vessels)	Cement Kiln	Cement Kiln	Incineration	Landfill			
				Pigging wastes	Cement Kiln	Cement Kiln	Incineration	Landfill			
				Paint residue (solid and liquid)	Return to manufacturer	Incineration	Landfill	-			
				Pipe dope	Incineration	Incineration	Landfill	-			
				Sewage	Sewage Treatment Plant	Sewage Treatment Plant	-	-			
				Spent fluorescent tubes and lamps	Recycling	Landfill	-	-			
				Spent welding rods, epoxy coatings, grinder wheels, visors, shot blast etc.	Landfill	Landfill	-	-			
				Used aerosol cans;	Recycling	Landfill	-	-			
				Used fabriqueation material (e.g. paint, cement, insulation);	Landfill	Landfill	-	-			
				Used lubricating / hydraulic oil, grease, solvents and absorbent materials;	Solvent recovery / Central Processing Facility	Cement Kiln	Landfill	-			

[22] *Requires cleaning to remove chemical or oily residues.*

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				■ Ensure that transport and storage of hazardous materials and wastes are comprehensively aligned with regulatory and community health and safety compliance requirements; ■ Ensure that relevant personnel are trained in safe transport, storage, use and handling of hazardous materials as well as use of spill kits and disposal practices; and ■ Ensure that any hazardous material storage areas are provided with containment measures as per regulatory and community health and safety compliance requirements.				
6	Domestic/ Sanitary Waste	Pollution of air, water and soil Injury to humans, plants and animals exposed to the sanitary waste	Prevent Pollution of air, water and soil from domestic / sanitary waste Prevent Injury to humans, plants and animals exposed to the sanitary waste	▪ Sewage effluent must be drained to a brick or concrete-lined sump and treated in a package sewage plant. The sewage plant must be sized to cater for the maximum forecast loads over the period it is in use. Regular compliance monitoring of effluent quality shall be undertaken to ensure sewage effluent meets the standards outlined in **Error! Reference source not found.**. ▪ Monitor treated sewage effluent discharges daily, using automated monitoring instruments for pH, TSS (as turbidity), , nitrogen and phosphorous. BOD is to be monitored weekly via the collection of effluent discharge samples and analysis an appropriate laboratory. ▪ While automated monitoring instruments provide results that are not as accurate as laboratory tests, the information is immediately available which is essential for managing a sewage treatment works in a remote area. Field measurements can be supported by monthly lab tests which serve as quality assurance. ▪ Consider installation of an agricultural irrigation system to discharge treated sewage effluent over defined areas around the work sites. This will maximise uptake of nutrients by terrestrial plants, adding value to pasture grasses while reducing risks of seepage to groundwater. Figure 7-4 in the ESIA shows areas near the camp sewage works that could be considered for irrigation. ▪ Furthermore, during the construction phase, prior to the establishment of the sewerage treatment plant, portable toilets will be used on site and the following should be implemented: ■ Install ventilated chemical toilets at the well pads, along the flowline construction sites and at other work areas where the camp toilets are inaccessible to the work force. Portable toilets should be within easy walking distance of any work site; ■ Ensure that there are sufficient toilets for the workforce at the work site; ■ Keep toilets in a clean and sanitary condition at all times; ■ Add disinfectant to toilets to minimise *E.coli*; ■ Train construction personnel to use the toilets (training to be ongoing, starting at induction and continuing by means of tool box talks); and Monitor the use of site toilets throughout the construction contracts	CNOOC Contractor	Evidence of no eutrophication of surface resulting from waste water disposal Record environmental audit report.	Daily inspections and monthly monitoring	Water Management Plan.
7	Chemical procurement and use	Pollution of air, water and soil from chemicals Injury to humans, plants and animals exposed to the chemicals	Prevent pollution of air, water and soil from chemicals Prevent Injury to humans, plants and animals exposed to the chemicals	Chemicals and Substances to be Avoided (OGP Report No. 413, rev1.1 September 2008, updated March 2009): **Substance to be Avoided** — **Alternatives** Polychlorinated Biphenyls (PCBs). — Silicones, esters, cast resin. Asbestos — Non-asbestos containing materials (e.g. rock wool). Pentachlorophenol (PCP) and — Glutaraldehyde, Isothiazolin (or other low-toxicity biocides).	CNOOC Contractor	Inventory in use.	Daily inspection and monthly monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
				formaldehyde (biocides)				
				Chlorofluorocarbons (CFCs) — CFC alternatives lists can be obtained through: — US EPA – CFR reference, 40 CFR 82 Subpart G Appendices.— UNEP DTIE – Ozone Action Branch.				
				Leaded paints — Unleaded paints. Also, water-based or low-volatility solvent formulations.				
				Chlorinated solvents (e.g., carbon tetrachloride, 1,1,1-trichloroethane, trichloroethylene) — Non-chlorinated hydrocarbon-based solvents, steam cleaning.				
				Heavy metals (in reverse emulsion breakers, barite and grit blast) — Polymer (non-latex)-based formulation, low-metals concentration barite and grit blast.				
				Mercury (in pressure-measuring devices/ instrumentation) — Differential pressure cells/ transmitters, pneumatic or electronic instrumentation.				
				Lead naphthenate (lubricant) — Lead-free lubricants (e.g. graphite, molybdenum disulphide, tungsten disulphide)				
				Leaded thread compound — Lead-free thread compounds (for tubing and casing).				
				Chromate corrosion inhibitors — Sulphite or organic phosphate corrosion inhibitors.				

5.12 Cultural Heritage Management Plan

The Culture Heritage Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-28.

Table 5-28: Cultural heritage management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	operation of CPF wells and Ancillary facilities close to culturally rich sites	Distortion and / or destruction of cultural heritage due to lack cultural heritage knowledge Limiting community right to access cultural heritage sites	Identification of all cultural heritage sites	Cultural heritage sites shall be updated, based on the investigation associated with each activity, and any sites within 500 m of Operation/maintenance activities shall be included in the O-ESMP. Heritage sites shall be georeferenced for easy identification in the field. Where project infrastructure is within 100 m of a cultural heritage site, the area shall be flagged for special attention. In such cases, the precise location of the site shall be confirmed with members of the local community. All Operation/maintenance team personnel, particularly operators of vehicles and heavy equipment, shall be made aware of the site and advised of its importance. If considered necessary by the Contractor, in consultation with local community representatives, the site shall be temporarily fenced or demarcated in order to protect it from damage. The Contractor shall respect local intangible cultural heritage, tradition and taboo during Operation/maintenance so as to ensure that the negative socio-cultural effects are effectively managed. The collection of archaeological or other cultural artefacts found on site by contractor personnel shall be prohibited.	CNOOC	■ Inclusion of updated and geo-referenced cultural heritage site listings in the O-ESMP. ■ Absence of damage to any cultural heritage site; and ■ Absence of complaints from members of the community in the Compliments and Complaints Register. ■ Inclusion of cultural heritage sensitisation in induction programme(s) and contractor tool box talks; and ■ Absence of complaints from members of the community in	Monthly inspections with Annual monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				Community access to sacred sites shall, where necessary, be maintained during the Operation/maintenance period. Access requirements shall be determined by CNOOC in consultation with local communities. Potential archaeological and paleontological finds must be managed through the Chance Find Procedure (CFP) developed by CNOOC. Site specific mitigation may be required during operation. The details of such mitigation should be prepared for inclusion within the Project specific Cultural Heritage Management Plan (CHMP) and include: ■ Demarcation of 'no go' sensitive areas (e.g. cemeteries) and enforcement of avoidance. Although these sites may not be directly affected by operational activities there is a potential for disturbance of community access routes to cultural sites and to the environmental setting of the sites themselves; ■ Enhancement or protection of environmental setting in conjunction with local community approval (e.g. through planting/ screening); ■ Maintaining community access to sacred sites; facilitating respect for local intangible cultural heritage, tradition and taboos, while mitigating negative socio-cultural effects through regular platforms for community liaison; and Culturally significant places must be highlighted to contractors and further managed (e.g. through demarcation/ signage) as required. Provisions for this must be incorporated into the 'site induction' process and detailed within the CHMP.		the Compliments and Complaints Register ■ Records of communication with communities; ■ Maintenance of access, as agreed; and ■ Absence of complaints from members of the community in the Compliments and Complaints Register ■ Records of training of site personnel; and ■ Compliance with CFP ■ Photographic evidence of adequate demarcation; ■ Documented community engagement and approval; ■ Adequate community access to sites; and ■ CHMP awareness training of contractors and signed attendance registers.		
2.	Intangible Cultural Heritage	Destruction / loss of cultural heritage resources	Prevent Destruction / loss of cultural heritage resources	■ There is potential for the disturbance of previously unidentified archaeological material (i.e. accidental damage or chance finds). Prepare a project-specific, 'site ready', Chance Find Procedure. This is a priority since preparation works and environmental studies are ongoing at the project site where highly sensitive artefacts have now been recorded. The Chance Find Procedure must be updated during the course of construction to make provision for a course of action in the event that any cultural heritage artefacts are recovered. It must be presented to the relevant local authority and the National Museum for approval. It must also be provided to all contractors and consultants on the project site during all pre-construction and construction activity and incorporated within the project's 'site induction' process. It must remain in place throughout construction. The Chance Find Procedure is to be a component of a detailed Cultural Heritage Management Plan (CHMP) (as required by IFC PS 8); ■ Hold an urgent discussion with CNOOC to determine strategies for avoidance of those potentially highly sensitive archaeological sites identified within, or in close proximity to, the project footprint, which include sites within the Central Processing Facility; Pads 3 and 4A; the materials yard / the camps; and the jetty area; ■ Undertake a further stage of cultural heritage study, as a priority, to verify the association (if any) of those surface artefacts recovered and potential sub-surface archaeological features indicative of settlement/industry. This would comprise shallow, targeted, hand-dug test pits (e.g., 1 m x 1 m in size) through which the archaeological potential could be firmly established and any further material analysis undertaken. This excavation programme will seek to eliminate the risk of archaeologically-induced delays during the construction phase; and ■ Implement a programme of pre-construction mitigation in the event that these targeted sites yield archaeological material. Avoidance (preservation *in situ)* is preferred but where this is not possible, "preservation by record" through systematic recording (e.g., archaeological excavation) is the only recourse. Such work, where required, must be described in appropriate detailed work programmes and specifications to be prepared by the cultural heritage specialist.	CNOOC Specialist Environmental Consultant	■ Photographic evidence of adequate demarcation; ■ Documented community engagement and approval; ■ Adequate community access to sites; and ■ CHMP awareness training of contractors and signed attendance registers.	As needed	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				To meet the requirements of Ugandan law this work should be carried out by a suitably qualified person under a licence for archaeological survey as issued by the Minister. In the event of artefact recovery, all materials should be surrendered to the National Museum.				

5.13 Pollution Prevention and Response Management Plan

The pollution prevention and response management plan for the operation of the CPF, wells, and ancillary infrastructure is presented in below. The plan also includes oil spill response management.

Table 5-29: Pollution prevention and response management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Handling of chemicals, oils and hazardous material	Pollution of air water and soil from spills	Prevent Pollution of air water and soil from spills	Compliance with CNOOC's spill prevention and control specification in conjunction with the latest IFC general EHS guidelines for hazardous materials management[23] and relevant independent risk assessment (i.e. WorleyParsons Oil Spill Planning and Response: Kingfisher Field, 2017). The following must be implemented: ■ Hazardous, flammable and combustible liquids must be stored in bunded areas with a volume not less than 110% of the largest tank within the bund; ■ The distance between any tank and the bund wall must be such that a leak or rupture near the top of the tank will not result in the stream of liquid falling beyond the bund wall; ■ Above ground storage vessels for LNG, LPG and petrol must be equipped with overhead cooling water sprays; ■ Bunded areas for the storage of oil, diesel or petrol must be equipped with foam-based fire extinguishing systems. Water must not be sprayed onto a liquid hydrocarbon fire; ■ Spill kits to be available on sites where handling of chemicals occurs; ■ Regular inspection of all chemical and diesel storage tanks during the project; ■ Report all spills or accidental chemical contact immediately to the supervisor; ■ If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials; ■ Any spill clean-up is to be appropriately contained and disposed of by a contractor appropriately licenced with NEMA; ■ If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure; and ■ Materials used for the remediation of spills must be used according to product specifications and guidance for use.	CNOOC Contractor	Documented compliance with: ■ CNOOC's spill prevention and control specification; ■ IFC general EHS guidelines for hazardous materials management; and ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field (2017). Documented records of: ■ Chemical inspections; ■ Spills and accidental chemical contact; ■ Communication with NEMA; and ■ Compliance with product specifications.	Monthly inspections of spill kits	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field 2017; ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB; ■ CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0) and ■ Emergency Preparedness and Response procedure (CUL-QHSE-L2-010, version A).
2.	Leak detection and corrosion management	Environmental pollution from leaks	Monitor, minimise and manage leakage	Piping, process equipment and storage tank designs and operational processes must be appropriate to manage corrosion and potential leakage based on the life of infrastructure, and include: ■ Compliance with the current GIIP standards, as applicable (e.g. American Petroleum Institute, API, standards, see project codes and standards in APPENDIX A); ■ Corrosion protection (cathodic protection and corrosion allowance); ■ Pressure monitoring system and automatic pressure loss detectors; ■ Inlet/outlet process safety control Emergency Shut Down (ESD) system; ■ Flowline leak monitoring system (PLMS) which can detect 1% of designed throughput in 10 minutes; ■ Concrete lining of valve stations;	CNOOC Contractor	Documented compliance with the current GIIP standards.	Daily inspection during construction and monthly monitoring.	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response: Kingfisher Field 2017; and ■ KF-FD-RPT-GEN-SA-1007

[23] IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: environmental hazardous materials management

				■ Approved (GIIP) or certified integrity testing methods at regular intervals; ■ Scour protection where flowlines may cross rivers; and ■ An insulation jacket for flowlines as part of the heat tracing.				Safety Case Report REVB.
3.	Overfill protection	Pollution of air water and soil resulting from over filling / overflow	Prevention of overfill	Overfilling of vessels and tanks is a common cause of spills and must be addressed through CNOOC's spill prevention and control specification (which is typically aligned with IFC recommendations) as follows: ■ Checklist of measures to follow during filling operations and the use of filling operators trained in these procedures (see CNOOC Spill prevention and control specification); ■ Installation of gauges on tanks to measure internal volumes; ■ Use of dripless hose connections for vehicle tanks and fixed connections with storage tanks; ■ Provision of automatic fill shutoff valves on storage tanks to prevent overfilling; ■ Use of a catch basin around the fill pipe to collect spills; ■ Use of piping connections with automatic overfill protection (float valve); ■ Pumped volumes must be less than the available capacity of tanks or vessel; and ■ Use of overflow valves or pressure relief valves so that excess hazardous substances can be released (and safely contained) when necessary.	CNOOC Contractor	■ Documented checklists; and ■ Visual verification supported by photographic evidence.	Inspection during petroleum vessel loading and offloading	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ WorleyParsons Oil Spill Planning and Response Kingfisher Field 2017; and ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB.
4.	Maintenance and inspection	Pollution of air water and soil	Adequate maintenance	Maintenance programs must include regular pigging to clean the flowlines and intelligent (e.g. magnetic flux leakage) and ultrasonic pigging should be considered as required. Spill control equipment and materials must be inspected monthly to confirm that all specified equipment is always available and that the equipment has not been utilized for alternative purposes.	CNOOC Contractor	■ Documented inspection at each site; ■ Visual evidence of leaks and/or equipment deterioration supported by photographic evidence; and ■ Spill control equipment and materials are adequately stocked and ready to be used.	Monthly (or as required).	■ CUL-QHSE-L3(GE)-059 Spill Prevention and Control Specification; ■ Worley Parsons Oil Spill Planning and Response Kingfisher Field 2017; and ■ KF-FD-RPT-GEN-SA-1007 Safety Case Report REVB.
5.	Risk	Pollution of air water and soil	Identify all risks related to spill or release of hazardous materials	All activities, equipment, and areas associated with hazardous material (e.g. in storage, handling, maintenance) must be identified and managed appropriately.	CNOOC Contractor	Documented critical equipment/ operation spill control.	Monthly monitoring.	
6.	Offloading of chemicals, servicing and/or refuelling of equipment and vehicles	Pollution of air water and soil	Prevent contamination of surface water from equipment and/or vehicle spillages	■ Soil contaminated by chemicals, fuel or oil spills, will be collected for treatment at a pre-determined and dedicated location, or will be treated *in situ* using bioremediation, in accordance with existing procedures; ■ Vehicles will be maintained regularly and kept in good working order; ■ Chemical storage areas will be adequately bunded to prevent chemicals from entering the storm water system; and ■ Vehicle maintenance will not be carried out on the site, but in contractor workshops as appropriate.	CNOOC Contractor	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Daily inspection and monthly monitoring	Soil Management Plan.
7.	Discharge of effluent	Pollution (eutrophication, siltation) of surface water	No contamination of water resources	Effluent must be treated to acceptable standards prior to discharge (see Table 5-17 in Water Management plan).	Contractor	■ Records of observations in ESO/CLO monthly reports.; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Daily inspection and monthly monitoring.	Water Management Plan.

8.	Storage	Pollution of air water and soil	Safe storage	■ All chemicals stored indoors must have adequate ventilation that maintains ambient air below the corresponding occupational exposure limits and below the threshold limit values; ■ Containers and tanks must be legibly labelled to identify the type of material contained within container/tank and the associated hazards; ■ Equipment relevant to chemicals/fuel on site must comply with the relevant MSDS; ■ Secondary containment must be provided for any stored contaminated material and must also be regularly inspected to identify signs of deterioration, cracking, or general damage to containment. Any signs of damage must be addressed; ■ Provision of emergency shower and eye wash station where handling of hazardous materials occurs; ■ Metal drums shall not be stacked more than four (4) high. Containers shall only be stacked four (4) high on a level, concrete or otherwise stable surface; ■ Plastic drums that are 55 gallons and Tote tanks less than 375 gallons will not be stored more than three (3) high. Containers shall only be stacked three (3) high when placed on a level, concrete or otherwise stable surface; ■ Acids, flammables, combustibles, and oxidizers must not be stored next to or near battery chargers, electric panels, or equipment with the potential for arch flash, sparks, or electrical discharges; ■ Maintain a list of chemicals that are stored or dispensed at the location and identify the hazards associated with the chemicals; ■ Maintain a current SDS for all chemicals on site. The MSDS for each chemical must be available in the area where the chemical is stored or dispensed; ■ All chemical and diesel tanks to be fitted with impermeable secondary containment with a minimum capacity of 110% of the largest tank volume; and ■ Spill kits must be available at storage sites.	CNOOC Contractor	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Daily inspection and monthly monitoring	
9.	Chemical and fuel spillage	Pollution of air water and soil	Adequate response to spills	■ Spill kits to be available on sites where handling of chemicals occurs; ■ Regular inspection of all chemical and diesel storage tanks during the Project; ■ Report all spills or chemical contact immediately to supervisor; ■ If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials; ■ Any spill clean-up is to be appropriately contained and disposed of by a contractor appropriately licenced with NEMA; ■ If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure; and ■ Materials used for the remediation of spills must be used according to product specifications and guidance for use.	CNOOC Contractor	■ Photographs showing appropriate management actions; ■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve issues.	Daily inspection and as needed.	

5.14 Emergency Management Plan

The Emergency management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below.

Table 5-30: Emergency management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	CPF, wells, and ancillary infrastructure	Damage to property, loss time, injury and / or fatality resulting from accidents	Prevent and minimise accidents	Operation/maintenance management system must be implemented and it must include the following general elements: ■ Define the roles and responsibilities of personnel involved in the management of operations during the Project; ■ Identify the training needs of such personnel and provide the training identified; ■ The roles, responsibilities, accountability, authority and interrelation of all personnel who manage, perform or verify work, which affects safety, should be defined with sufficient manpower provided;	CNOOC Contractor	Upkeep and documented reporting of the following where applicable: ■ Fugitive leaks; ■ Spillages; ■ Ignition sources; ■ Fire-fighting equipment; ■ Hot work permit;	Daily inspection and monthly monitoring	■ CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0); and ■ Emergency Preparedness

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				■ Employees and others, for example contractors, present on site, should be involved in the arrangements and their implementation. Particular attention should be paid to contractors to ensure they receive the necessary information and training. They need to be aware of the hazards involved and the roles and responsibilities of key personnel; ■ Adoption and implementation of procedures for systematically identifying hazards arising from operational and maintenance activities and transport and the assessment of their likelihood and severity; ■ The safety management system should describe how hazard identification and evaluation procedures are applied to all relevant stages of operation; ■ Adoption and implementation of procedures and instructions for safe operation, including transport to and from the site; ■ Management of change - adoption and implementation of procedures for operation modifications; ■ Planning for operation and road transport emergencies by adoption and implementation of procedures to identify foreseeable emergencies; prepare, test and review plans to respond to such emergencies; and provide specific training for all operational and transport personnel; ■ Monitoring performance by adoption and implementation of procedures for the on-going assessment of compliance with set objectives, and the mechanisms for investigation and taking corrective action in the case of non-compliance; and ■ Audit and review of the operation and transport accident prevention measures by adoption and implementation of procedures for periodic systematic assessment and the effectiveness.		■ Maintenance permit to work; ■ Offloading and filling operations; ■ Flame proof electrical equipment; ■ Filling arm hose integrity; ■ Pipe condition; ■ Relief and blow down devices; ■ Alarm, interlock and trip testing; ■ Filling batch meter calibration and shut off; ■ Tank bund integrity; ■ Water deluge on fuel tanks; ■ Near miss incidents related to the process risks; and ■ Institute a management of change system for modifications.		and Response procedure (CUL-QHSE-L2-010, version A).
2.	CPF, wells, and ancillary infrastructure	Damage to property, loss time, injury and / or fatality resulting from accidents	Develop specific preventative and protective measures	**Specific preventative and protective measures should include (but not limited to):** **i)** *Provision of special services (but not be limited to) the following:* security: Gas sampling; water levels; soil monitoring/ sampling; explosives; atmospheric monitoring; noise measurements; cleaning services; and precautions for work in confined spaces. ii) *Emergency services required*: Fire; medical & first aid; routes for emergency vehicles; Safety showers; eye-wash facilities; breathing and escape sets; Means of escape (ladders etc.); Handling of accidents on site. *iii) Movement, loading and unloading:* Access/egress for people, plant and equipment; parking; Unloading/loading areas; turning circles; routing; barriers; Tankers, lorries; dumper trucks; cranes; forklifts; Mobile units (pumps, compressors); and Effects on existing site traffic and adjacent public roads; traffic control. *iv) Working conditions during operation/ maintenance:* Noise (compressors; explosion; drills, etc.); time of day, frequency and intensity. Smoke; dust; vehicle fumes; Climatic effects on operation/ maintenance activities (wind, rain, heat, cold; fog). *v) Waste handling:* Wash water; storm/flood and fire water/foam; Contamination and damage to existing drains and sewers; Spillages of chemicals, oil, fuel; Means of disposal and licence. Bunds; pits; sumps; drain isolation; dredging; draining. Tenting; fencing; temporary sheeting; scaffolding. *vi) Operation/maintenance work safety:* Machinery; warning signs; What effect on live plant equipment? What precautions? How will it be coordinated/supervised? Any checks or tests needed? Is it a recognised safe practice or a one-off?	CNOOC Contractor	Upkeep and reporting of: ■ Fugitive leaks; ■ Spillages; ■ Ignition sources; ■ Firefighting equipment; ■ Hot work permit; ■ Maintenance permit to work; ■ Offloading and filling operations; ■ Flame proof electrical equipment; ■ Filling arm hose integrity; ■ Pipe condition; ■ Relief and blow down devices; ■ Alarm, interlock and trip testing; ■ Filling batch meter calibration and shut off; ■ Tank bund integrity; ■ Water deluge on fuel tanks; ■ Near miss incidents related to the process risks; and ■ Institute a management of change system for modifications.	Daily inspection and monthly monitoring	CNOOC's Emergency response philosophy (KF-FS2-RPT-CPF-SA-0009 REV0) and Emergency Preparedness and Response procedure (CUL-QHSE-L2-010, version A).

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
				Is timing critical? Is access/egress and boundary security satisfactory? Work at heights or elevations; Confined spaces; Excavations, trenches, underground; Access for erection and installation, vehicles, cranes. *vii) Management and supervision:* Guidance to operational/ maintenance traffic (route plan, signs etc.) Obstruction to normal traffic/emergency vehicles (e.g. contractors' vehicles); Increase in site traffic- implications? Size of vehicles (pipe bridge clearances?) Quality of safety equipment and signs on new plants (support and fixing durable?) Personal safety equipment (attitudes/quality); Standards of work, safety, cleanliness (contractors' vehicles, tools, methods of working). viii) *Coordination and organising:* Permits to work etc. (linking with plants & service groups - encourages co-operation); Training and awareness; Communications (who needs to know, why, when) *ix) Auditing and inspections:* Safe working practices (e.g. scaffold-tags, permits, safety equipment etc.); Knowledge of the contractor (does he understand? does he know?)				
3.	CPF, wells, and ancillary infrastructure	Damage to property, loss time, injury and / or fatality resulting from accidents	Minimize the risk of fire and explosions Prompt response strategy to fire and explosions minimize risk and reoccurrence of fire and explosion incidents	A site-specific Emergency Response Plan must be prepared that describes actions to be taken in the event of a sudden surge in gas/crude volume.	CNOOC Contractor	Facility personnel must conduct well control drills at regular intervals and key personnel must attend a certified well control school periodically.	Daily inspection and monthly monitoring	

5.15 Influx Management Plan

The Influx management plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-31.

Table 5-31: Influx Management Plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Influx of job / opportunity seekers in the project area	Increased pressure on available resources Over exploitation of available resources	Minimize influx of immigrant job seekers into the project area Minimize the Health, safety and security impact (disease prevalence, reduced sanitation, crime, prostitution	The Communication Plan shall be updated, including national coverage and community communication campaigns, starting prior to establishment on site Implementation of the following recruitment strategies that discourage influx of job seekers into the project area: ■ ; ■ Ensure that the recruitment of un skilled workers is strictly reserved to the local community and the candidates are vetted by the local leadership before enrolment	Contractor CNOOC	■ Monitoring records. ■ Demographic records at district and national levels ■ Records of origin of recruited unskilled labor force	Monthly monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
		Encroachment and destruction of natural habitats Increased disease prevalence and crime Distortion of the social economic fabrique	etc) arising from influx to the host community Minimize influx related pressure on local resources (water, food, shelter, infrastructure etc) that would undermine the health and livelihood of the host community	■ Avoid or reduce influx of opportunity seekers through preferential sourcing of local goods and services from local suppliers thus discouraging immigrants that will not contribute to development and upliftment of local communities; ■ Avoid procurement of casual goods and services at the gate or around the project fence ■ Proactively supporting programs that attract skilled people such as teachers, health workers, and experienced traders and entrepreneurs; ■ Manage such undesired influx as cannot be avoided through support to existing Government and donor initiatives for planning and development of the kikuube District, and ■ Implement the Influx Management Plan ■ Support the local and central government to strengthen controls to immigrant influx into the project area				
2.	Employment of labour force	Lack Transparency and equitability in recruitment of workers	Transparency and equitability in recruitment of workers	■ Implement the actions set out in the ESIPPS (2015) Labour Force Management Plan (LFMP). Ensure that all contractors who work on site during the production phase of the project are aware of and comply with the management framework for casual labour set out in this document; ■ Update the framework to be fully applicable to CNOOCs full time production staff as well, carrying forward all relevant requirements set out in ESIPPS (2015) LFMP; ■ Preferentially hire local people, in accordance with CNOOC policies and agreements with Government. Advertise employment opportunities within the local fishing villages (local labour market) so that community members are employed who can continue to live with their families as they offer their services to the project. Directly project-affected people should be given priority to win operational phase jobs, subject to their meeting the necessary employment requirements; ■ Ensure that permanent employment is done via CULs Kampala head office in order to discourage job seekers at the gate of the production facility. Widely advertise the employment process for the production phase so as to ensure local understanding of employment criteria and processes; ■ Develop and implement training and skills development programmes in the production workforce to expand the human capital available within the local economy; and ■ Consider offering bursaries or internships to promising students (refer to discussion on the community development impacts) to build a sustainable and educated future workforce.	Contractor CNOOC	■ Compliance with LFMP; and Records from Community Liaison Forum.	Monthly monitoring	
3.	In-Migration	Increased pressure on available resources Over exploitation of available resources	Minimize influx of immigrant employment seekers into the project area	■ Engage closely with government to monitor land ownership and changes thereto surrounding the project development; ■ Implement the recommendations of the Influx Management Strategy and Framework Plan; ■ Prepare to accommodate the changes arising from the population influx by sensitising the LC system. This is particularly important, as it is at this level that the stability of a village is decided, including the establishment of checks and balances for maintaining individual rights and responsibilities, and for managing crime; ■ Undertake a regular census in the area and, in collaboration with all relevant central, district and local authorities and develop strategic plans to ensure	CNOOC	■ Demographic reports at the district and national levels ; and ■ Records from the CDP.	Quarterly monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
		Encroachment and destruction of natural habitats Increased disease prevalence and crime Distortion of the social		adequate provision of basic services such as housing, water and sanitation, power, education and health care; ■ Support capacity building for town planning in anticipation of influx and growth in key settlements; ■ Establish collaborative initiatives with central, district and local authorities to support the development and establishment of current and projected essential infrastructure related to water supply, health and education services as well as sanitation and solid waste management; ■ Support the development of local capacity to offer effective crime prevention, safety, security and policing services; ■ Ensure that the Livelihoods Restoration Plan, as well as the Community Development Plan actively take on board practical mechanisms and mitigation strategies for minimising pressure on infrastructure and social services posed by ongoing in-migration; ■ Provide support in alleviating the cumulative pressures on social infrastructure through the timely provision of information to service providers relating to the size and demographic make-up of the projected operations workforce who may need to utilise social services, including any potential additional requirements to adequately respond to potential emergencies; ■ Establish a baseline and surveillance system for the state of housing in the area using techniques such as mapping and review of satellite images. Review this regularly to show change from baseline and to support future interventions with the local or district authorities; ■ Develop an adequate baseline to describe the water and sanitation conditions in the community prior to the Project development, including the resettlement areas and areas where influx is likely to occur; and ■ Support the development of sustainable alternatives to the use of wood fuel and charcoal.				

5.16 Ecosystem Services Management Plan

The ecosystem services management plan for the operation of the CPF, wells, and ancillary infrastructure is presented below in Table 5-32.

5.16.1 Food provision Ecosystem Services

Table 5-32: Ecosystem services management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Operations of KFDA facilities in former grazing grounds	Livelihood deprivation of the herding community due to reduced grazing area Food insecurity resulting from displacement of herding community	Compensation / Livelihood compensation for loss of grazing	The project must (where feasible) support: ■ Local sustainable food economies (i.e. markets that do not significantly diminish the capacity of a food source to replenish itself). For example, only sustainable, established and locally sourced meat should be purchased; and ■ Sub-county administration strategies to solve regional farming difficulties such as crop failure due to disease and drought (e.g. introduction of modern farming methods, training farmers in post-harvest techniques, and sensitising farmers about land degradation) as part of the Community Development Plan/ Corporate Social Responsibility initiatives (e.g. CNOOC's Community Development Specification).	CNOOC	Compliance with community development plan.	Monthly Monitoring	CNOOC Community Development Specification

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
2.	Fisheries[24] productivity and fishing community livelihood	Over fishing due to increased demand and a wider market Food insecurity resulting from dwindling fish catches	Minimise over fishing through influx management.	The Influx Management Plan will be updated to address appropriate measures to mitigate the expected Project-associated in-migration effects on capture fisheries.	CNOOC	Inclusion and implementation of appropriate management measures in the Influx Management Plan. Engagement records with NaFIRRI and the Fisheries Department.	Quarterly Monitoring	■ Influx Management Plan; and ■ Fish Act (Cap 197, 1951).
3.	Hunting and sport fishing by project personnel	Increased demand pressure on the limited ecosystem goods / food resources	Minimize demand pressure to the limited ecosystem goods / food resources	■ Enforcement of a complete ban on wildlife harvesting (hunting/ trapping/ fishing) for all Project personnel; CNOOC should support the fisheries department in efforcement programs to check overfishing and illegal fishing techniques; ■ CNOOC should support NaFIRRI in research programs aimed at improving fish stock in Lake Albert; and ■ No personnel and/or contractors allowed beyond footprint of Project.	CNOOC Contractor	■ No personnel and/or contractors beyond footprint of Project; ■ Complaints registered in grievance procedure; ■ Identification of personnel and/or contractors outside of project footprint; AND ■ Identification of personnel and/or contractors that do not use project mess facilities.	Daily inspections and monthly monitoring	■ Biodiversity Management Plan; AND ■ Fish Act (Cap 197, 1951).
4.	Captured Fisheries		Control of food sourcing	■ Supporting local communities in developing sustainable farming, ecotourism or other activities that provide alternative food sources and income. ■ Support scientific studies and monitoring programs aimed at assessing the sustainability of using local resources, as part of Corporate Social Responsibility initiatives. ■ Enforcement of a complete ban on wildlife harvesting (hunting/ trapping/ fishing) for all project personnel. ■ No personnel and/or contractors allowed beyond footprint of Project. ■ Inclusion of mess facilities for staff to control food provision. The mess facility must be the primary means of food provision and employees must be discouraged from using local external food sources (e.g. unsustainable fish markets).	CNOOC Contractor	■ Compliance with livelihood restoration plan ■ Complaints registered in grievance procedure; ■ Identification of personnel and/or contractors frequenting external food sources; and ■ Identification of personnel and/or contractors that do not use project mess facilities.	Monthly monitoring	Fish Act (Cap 197, 1951) CNOOC KFDA RAP Project 2016 – Phase 1 Resettlement Action Plan (2017

5.16.2 Biomass Fuel Ecosystem Services

Table 5-33: Biomass Fuel – firewood and charcoal

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Exploitation of biomass Fuel	Deforestation of the escarpment woody	■ Reduce local dependence on firewood and charcoal ■ CNOOC should support tree planting initiatives within the community	Supply of cheap alternatives (e.g. gas) to local markets by CNOOC to be investigated. If feasible, CNOOC must facilitate the supply of the alternative fuels in line with the	CNOOC	Documented investigations into the feasibility of supplying	Bi-annually	Procurement of Local Goods and Services.

[24] Fish stocks and catch success

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
		vegetation cover Soil erosion due to deforestation of the hilly / escarpment area	■ Stock should work with the communal land association to indentify and provide land for establishment of a communal wood lot ■ Support scientific studies and monitoring programs aimed at assessing the sustainability of using commercially-planted forms of biomass fuel, such as Jatropha and construction of biogas generating toilets in the community ■ Enforcement of a complete ban on harvesting of firewood by all project personnel.	requirements of General Administration and Liaison. Support scientific studies and monitoring programs aimed at assessing the sustainability of using commercially-planted forms of biomass fuel, such as Jatropha. Enforcement of a complete ban on harvesting of firewood by all project personnel.		alternative fuels to firewood and charcoal to local markets.		

5.16.3 Fresh Water Ecosystem Services

Table 5-34: Fresh Water

Ref.	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Fresh Water (Type I)[25] Fresh Water (Type I) Fresh Water (Type I)	Pollution of surface water Destruction / degradation of surface water Deprivation of the community from fresh water supply	Appropriate water pollution control measures.	The Project footprint may impact the supply of fresh water for beneficiaries, particularly near areas where the infrastructure will intercept drainage lines, streams, rivers and/or swamps. CNOOC must: ■ Reduce water volumes needed by Project activities through treatment and re-use of process water and waste water; and ■ Implement appropriate water pollution control measures such as oil interceptors and treatment of sewage.	CNOOC	Documented compliance with the Water Management Plan.	Daily Inspection and monthly monitoring	Water Management Plan.
2.			Non-exceedance of lake Albert's carrying capacity[26]	Continued assessment of the natural capacity of Lake Albert to provide waste assimilation services, and insurance through monitoring and analysis that these are not exceeded.		Documented monitoring of lake water quality.		Cumulative Impact Assessment.
3.			Appropriate waste management	Update of the Influx Management Plan to identify and maintain appropriate measures to mitigate the expected increased waste-loading to surface water systems resulting from in-migration (due to the presence of the Project).		Documented compliance with Influx Management Plan.		Influx Management Plan.
4.	Fresh Water (Type II)[27]	Pollution of surface water Deprivation of the community from fresh water supply	Collaborative catchment management	Degradation of ecosystem services that maintain the Project's social license to operate must be avoided by: ■ Reducing water volumes needed by Project activities through treatment and re-use of process water and waste water; and ■ Contributing to water catchment management in association with other Projects in neighbouring exploration blocks to promote equitable sharing of the fresh water resources of Lake Albert.	CNOOC	Documented collaboration with neighbouring companies extracting water from Lake Albert.	Daily inspection and monthly monitoring	Cumulative Impact Assessment.

[25] Services that potentially affect beneficiaries' livelihoods, health, safety or culture

[26] Carrying capacity is defined as the number of people, animals, or crops which Lake Albert can support without environmental degradation of the Lake occurring.

[27] Services that potentially affect the project and ability to achieve operational performance (i.e., impact the Project) (Type II).

5.16.4 Water Ecosystem Services

Table 5-35: Water Ecosystem Services: flow, timing, purification, and waste treatment

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Waste discharge	Destruction of the ecosystem functionality and services	Maintain carrying capacity of Lake Albert	Monitoring and analysis of the natural capacity[28] of Lake Albert and Project-affected wetlands to quantify water filtration and waste assimilation services.	CNOOC	■ Documented investigation by suitably qualified professionals; and ■ No complaints received through grievance procedure.	Monthly monitoring	
2.	Waste water disposal	Pollution of the aquatic habitat and destruction of the ecosystem functionality and services	Appropriate management of waste	■ Appropriate sewerage facilities and wastewater treatment systems to be maintained ■ Daily monitoring of the disposed waste water to ensure that it meets the discharge standard at all times. ■ The Influx Management Plan will identify appropriate measures to mitigate the expected increased waste loading to surface water systems resulting from in-migration of people.	CNOOC	Documented compliance with Water and Waste Management Plan.	Daily inspection and monthly monitoring	■ Water Management Plan; and ■ Waste management Plan.

5.16.5 Cultural Heritage Ecosystem Services

Table 5-36: Cultural Heritage Ecosystem Services

	Aspect/ Activity	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Cultural resource management	Destruction / loss of cultural heritage resources	Appropriate management of cultural heritage resources	Comply with Cultural Heritage Plan and IFC Performance Standard (PS) 8 (Cultural Heritage) by continually identifying and avoiding critical cultural heritage that is essential to the cultural, ceremonial, and spiritual aspects of beneficiaries' lives.	CNOOC	■ Documented compliance with Cultural Heritage Plan and IFC PS 8 (Cultural Heritage); and ■ Documented Informed Consultation and Participation of the affected communities.	At all times	■ Cultural Heritage Plan; and ■ Historical Monuments Act (1968, Cap. 46).
2.	Access of cultural heritage resources c	Destruction / loss of cultural heritage resources Deprivation of access for the community to the cultural resources	Restrict access to project personnel	Ongoing protection of the environmental setting for sacred sites close to Project activities by ensuring: ■ No personnel and/or contractors allowed beyond footprint of Project; ■ Designated no-go areas, e.g., sacred sites, ritual sites; and ■ Screening planting around Project facilities to maintain views.	CNOOC Contractor	Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage).	At all times	Cultural Heritage Plan.
3.	Education	Destruction / loss of cultural heritage resources	Sensitisation of employees regarding sensitivity and importance local culture and heritage	Cultural sensitivity training must be provided to Project staff and incorporated into relevant site induction processes to ensure appropriate respect (sensitivity) for local intangible cultural heritage, traditions, and taboos. Community access to sacred sites must be maintained.	CNOOC Contractor	Documented compliance with Cultural Heritage Plan and IFC PS 1 and 8 (Cultural Heritage).	At all times	Cultural Heritage Plan.

[28] Carrying capacity is defined as the number of people, animals, or crops which Lake Albert can support without environmental degradation of the Lake occurring.

5.17 Visual Assessment Management Plan

The visual management plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-37.

Table 5-37: Visual Management Plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	frequency Monitoring	Additional Reference
1.		Reductions in Habitat quality Degradation of the aesthetic value	Minimise degradation of the aesthetic value	■ Control Night lighting; ■ Where feasible, avoid white or shiny roofing and cladding material (e.g. bare galvanized steel) that causes glare or brightly coloured materials; ■ Paint buildings and workshop exteriors in colours that are complementary to the surrounding landscape, such as olive green, light grey, blue-grey, or variations of tan and ochre; ■ Retain existing trees; ■ Implement appropriate landscaping using indigenous vegetation within the permanent camp facility as well as entrance areas to other facilities, in order to create a more welcoming overall appearance; ■ Create vegetation screens to interrupt views of the production facility and well pads along key view lines. In order to do this, undertake the following: ▪ Identify optimal locations for proposed vegetation screens on site, based on the results of the VIA. The extent and orientation of the individual tree screens should be determined on site by conducting line-of-sight evaluations from the respective villages to the individual project infrastructure sites. Provisional screen locations are shown the ESIA. The night time and daytime effects of screens are shown in the ESIA. ■ Conduct trials to identify the most suitable tree and shrub species to be utilised for establishing the vegetative screens. The selection of plant species must be cognisant of local soil conditions and rainfall, maintenance requirements, and expected lifespan and foliage density into consideration. In this regard it is anticipated that *Eucalyptus saligna* will likely be suitable, although management measures would need to be put in place to ensure that the plants do not become invasive and spread beyond the screens.	CNOOC Contractor	■ All night lighting should face inwards towards the Project footprint; ■ No lights face out towards the lake; ■ Lighting should be kept to a functional minimum in all areas; ■ Lamps should not emit light at angles greater than 70°; ■ Lights that emit a broad spectrum of light with a high UV component should be avoided; ■ Polarised light sources should not be used; and ■ Establishment of tree screens.	Daily inspection and monthly monitoring	
2.	Generation of artificial light	Light intrusion distorting the human and animal behavioural patterns	Minimise artificial light footprint	■ High-level, high-intensity lighting must be avoided unless there is a strong safety case and motion sensor control should be considered to reduce anthropogenic light to a minimum; ■ Artificial lighting must be positioned so that the extent of light emissions beyond the site boundary is minimised (e.g. direct lighting downwards and inwards towards site and avoid up-lighting of structures); and ■ Community awareness of lighting requirements should be carried out. Full cut-off shielding (a zone of tree stand) in light fixtures is proposed at the CPF for both glare and sky glow. A lamp should send all of its light more or less downwards where the light is intended to be used, and not upward or sideways. "Full cut off" is usually taken to mean that no direct light rays from the fixture shine above the horizon, and that at least 90 percent of the light is blocked in the near-sideways range, from 0° to 20° below the horizontal plane. Light that shines in this near-sideways range impacts on	CNOOC Contractor	■ Records of observations in ESO/CLO monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve complaints.	Monthly monitoring	

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	frequency Monitoring	Additional Reference
				nearby receptors and contributes nothing to most lighting needs, as it merely dissipates u into the distance. To minimise both direct glare and indirect sky glow or haze, the following measures are recommended: ■ Identify zones of high and low lighting requirements, focusing on only illuminating areas to the minimum extent to allow safe operations at night and for security surveillance; ■ Plan the lighting requirements of the facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination; ■ Reduce the heights of light posts and develop a lighting plan that focusses on illuminating the required areas through strategically placed individual lights rather than mass light flooding; ■ Utilise security lights that are movement activated rather than permanently switched on, where feasible, to prevent unnecessary constant illumination; ■ Fit all security lighting with 'blinkers' or specifically designed fixtures, to ensure light is directed downwards while preventing side spill. Light fixtures of this description are commonly available for a variety of uses and should be used to the greatest extent; and ■ Eliminate any ground-level spotlights as these invariably result in both direct glare and increased sky glow and cannot be effectively mitigated.				
3.	Housekeeping	Degradation of the aesthetic value	Minimize Dust and improve the general appearance of the project environment and infrastructure Avoid littering and irresponsible disposal of refuse on site	■ A high standard of general housekeeping and management all operational areas must be maintained; ■ Water down any large bare areas associated with ongoing building activity/murram access roads during the operational phase, to minimize airborne dust. This is expected to be occasional and far less frequent than the construction phase; ■ Rehabilitate any temporary bare areas as soon as feasible using appropriate vegetation species; ■ Apply chemical dust suppressants if wet dust suppression is insufficient; ■ Maintain the dust monitoring system installed during construction and monitor dust levels around the production facility and at a control site unaffected by project activities (refer to Air Quality for details); ■ Maintain the production facility in a neat and orderly condition at all times; ■ Create designated areas for material storage, waste sorting and temporary storage, batching, and other potentially intrusive activities; ■ Limit the physical extent of areas cleared for material laydown, vehicle parking and the like; and ■ Repair project related erosion damage to steep or bare slopes and re-vegetate these areas using a suitable mix of indigenous grass species.	CNOOC Contractor	Clean and well managed operational areas.	Daily inspection and Monthly Monitoring	

5.18 Soil Management Plan

The soil management plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-38.

Table 5-38: Soil management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Machinery and vehicle maintenance	Soil pollution due to contamination from vehicles and machinery Reduced soil productivity due to contamination	No soil contamination	The following must be undertaken: ■ Vehicles and machinery must be subjected to daily inspections for leakages and damages that could cause leakage; ■ Vehicles and machinery must be maintained regularly and kept in good working order; ■ Maintenance tasks must be restricted to designated workshops and must not be conducted on site; ■ Spill kits should be on-hand to deal with immediate oil/fuel spills; ■ Vehicles and equipment must be regularly serviced off site; and ■ Vehicles must remain on designated roads to avoid disturbance beyond the Project footprint.	CNOOC Contractor	■ Appropriate journey management plans; ■ Photographs showing appropriate management actions; ■ Records of observations in monthly reports; ■ Complaints recorded in Compliments and Complaints Register; and ■ Records of timeous corrective action to resolve complaints.	Daily inspection and monthly monitoring	
2.	Machinery and vehicle maintenance	Soil contamination	Appropriate and prompt treatment of contamination	The following must be undertaken: ■ All containment structures must be maintained and regularly monitored; ■ Where hazardous substances are required to be moved, it must be safely contained and transported to minimise the risk of spilling; ■ In the event of a spillage or leakage the emergency response plan must be initiated and trained personnel must be ready to deal with it; ■ Where seepages and leakages are noted, it must be treated according to an effective procedure as determined by a plan of action for the specific type of disturbance; ■ A leakage detection/monitoring system should be installed in identified high risk areas; ■ Adequate waste facilities must be provided and maintained at plant, accommodation and operational facilities; ■ Personnel must be trained to deal appropriately with contamination; ■ Storage of fuel/fluids and chemicals – should only occur in appropriately bunded are where all spills can be contained. Contractor shall be consulted to ensure that appropriate chemicals are stored together to prevent chemicals reacting with one another; ■ Spill contingency measures and spill kits must be available on site; ■ Any large scale spill clean-up are to be appropriately contained and disposed of by a contractor appropriately registered with NEMA. Small scale spills may be may be contained and disposed of by CNOOC. All clean up waste is to be disposed of in an appropriately permitted waste site; and ■ Hazardous chemicals (e.g. Fuel, Lube oil and solvents, used fuel storage containers) must be contained in impenetrable bunds (of 110% capacity of the stored material.	CNOOC Contractor	■ Records of observations in monthly reports; ■ Photographs showing appropriate management actions; and ■ Appropriate journey management plans.	Monthly monitoring	

5.19 Greenhouse Gas Management Plan

The Greenhouse Gas (GHG) Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented in Table 5-39.

Table 5-39: Greenhouse gas management plan

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring Frequency	Additional Reference
1.	Operation of CPF, wells, and ancillary infrastructure)	Air emissions Greenhouse gasses (GHG	Minimise and control GHG	GHG include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. CNOOC's Greenhouse gas management specification must be complied with and the following must be undertaken where feasible: ■ Enhancement of energy efficiency (see CNOOC's energy management specification); ■ Protection and enhancement of sinks and reservoirs of greenhouse gases (i.e. mechanisms to trap or slow the release of GHG); ■ Minimisation of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy; ■ Promotion of sustainable agriculture and animal husbandry; ■ Use and promotion of renewable forms of energy; ■ Use of carbon capture and storage technologies[29]; ■ Vehicles and equipment must be designed, maintained, and operated in accordance with Good International Industry Practice (GIIP) and the manufacturer's specifications; and ■ Vehicles and machinery must use low-sulphur fuels or biofuels.	CNOOC Contractor	■ Documented information suitable to assess GHG produced by the project; ■ Up to date GHG Emissions Inventory; ■ Calculation of Industry GHG Emissions; and ■ Appropriate implementation of emissions reduction and offset measures.	Monitoring must be representative of emission discharged by the project over time	
2.	Vehicle use on project access routes	Atmospheric emissions	Minimise emissions from vehicles	■ Selected roads must, avoid steep gradients and sharp turns which may increase congestion (traffic) and atmospheric emissions; ■ A journey management plan must be developed to minimise vehicle travel (i.e. trips to and from locations). Halving the number of trips undertaken can halve the GHG emissions from the vehicle; ■ Diesel-fuelled mobile equipment should be replaced with electrical equipment (supplied by municipal mains), utilizing solar-powered back-up; ■ Low-sulphur fuels or bio-fuels should be used where the use of electrical equipment is not feasible; and ■ Idling of vehicles must be minimised (i.e. drivers must switch engines off when not in use).	Contractor	■ Appropriate journey management plans; ■ Records of observations in monthly reports ■ Records of observations in monthly reports and ■ Records of observations in monthly reports..	Monthly	CUL-QHSE-L3(GE)-023 Land Transportation Specification.

5.20 Health Management Plan

The Health Management Plan for the operation of the CPF, wells, and ancillary infrastructure is presented below and should be read in conjunction with the Community Health, Safety and Security Plan.

Table 5-40: Project induced influx and unplanned settlements/'urbanization

[29] Carbon dioxide capture and storage (CCS) comprises separation and isolation of carbon dioxide from industrial and energy-related sources; transport to a storage location; and long-term isolation from the atmosphere (air).

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Monitoring frequency	Additional Reference
1.	Population Influx dynamic in KFDA	Disease prevalence due to influx	Minimize Disease prevalence due to influx	Update the Influx Management Plan (IMP) to include consideration of health determinants and labour recruitment (Table 5-31)	CNOOC Contractor	■ Up-to-date Influx Management Plan with health determinants and labour recruitment; and ■ Documented compliance (Table 5-31)	IMP prior to commencement of operations and compliance at all times thereafter.	■ Influx Management Plan; and ■ Labour, working conditions, and employment management plan.
2.	Population Influx dynamic in KFDA	Disease prevalence and poor standard of living due to un matched physical planning to population growth Increased Pressure on the limited existing medical services	Support physical planning in settlement growth	■ Support opportunities for health systems strengthening (HSS) and support the development and implementation of a clear, integrated district health strategy, which can plan for influx and requirements to upgrade health services in alignment with government structures, but ideally focused at the entire district and especially the oil development nodes; and ■ CNOOC must maintain a partnership with government to support public health services. All actions should be performed after a formal memorandum of understanding is concluded that defines each party's role and responsibilities and deliver timeframes. These agreements must be based on sound sustainability principles. ■ Support capacity building for town planning in anticipation of Project induced influx and growth in existing settlements. This should be part of a broader district plan to avoid local make-shift settlements and allow established villages to develop through a clear plan. ■ Avoid the recruitment of local medical staff to work on Project medical services and work with the government to support ways to attract medical staff to work in the public health facilities in the study area. ■ CNOOC should support the medical personnel through for example providing remuneration subsidies to attract medical personnel in the project area ■ Support capacity building for town planning in anticipation of Project induced influx and growth in existing settlements. This should be part of a broader district plan to avoid local make-shift settlements and allow established villages to develop through a clear plan.	CNOOC	Documented support of government regarding town planning.	Quarterly monitoring prior to construction and monthly monitoring during	
3.	Population Influx dynamic in KFDA	Prevalence of communicable diseases in the community Loss time, injury and / or fatality due to communicable disease prevalence	Control of communicable diseases in the community and project personnel	■ Maintain communicable disease strategies with the objective of promoting/ protecting workplace and community health; ■ Screen local employees/contractors for TB at recruitment and provide adequate care and treatment programs from the Project's workplace medical service while complying with the requirements of the national TB program; ■ Develop a site-based TB management programme; ■ Evaluate the origin of any incoming contracted construction workers (especially from high burden TB	CNOOC	Documented implementation of strategies to deal with communicable diseases.	Monthly monitoring.	

				countries) and understand TB and MDR risks in this group. Ensure effective TB screening in the external contracted workforce prior to final appointment and mobilization as part of the Project's Fitness to Work (FTW) procedures to ensure that diseases are not introduced in the study area; ■ Develop a vaccine preventable disease programme for all employees, and visitors based on risk for travellers and at-risk occupations. All employees and contractors residing in close contact in camps should receive the quadrivalent meningococcal meningitis vaccine; ■ Develop an integrated workplace malaria and vector control programme to include source reduction and environmental management of breeding sites, routine inspections of accommodation units, appropriate IEC programmes for the workforce and contractors prior to secondment and for use in country, policies and programmes related to use of protective clothing and the use of malaria chemoprophylaxis and surveillance programmes between the workplace medical service and vector control team to determine the likely origin of, and root cause of malaria cases; ■ Reduce potential human vector contact and control of breeding sites of disease vectors such as mosquitoes. Continually monitor activities on site to ensure adequate drainage and management of storm water to minimise breeding in the area; ■ Ensure that all accommodation units in the permanent camp are proofed against mosquitoes; ■ Develop a clear HIV policy and programme in the workplace which includes ensuring that there is adequate accommodation capacity at the temporary personnel camps to eliminate the need for contractors or visitors to seek accommodation in the local villages; ■ Develop a code of conduct that actively discourages sexual relationships between the workforce and the local community; ■ Work with the village and traditional leaders to manage truck stops, as well as district authorities to report any increase in high-risk sexual behaviour from elements of the workforce, including the collection of baseline data; ■ Develop and implement an HIV and STI management programme in the workforce, to include awareness and education, treatment services that link to the public health service, provision of free condoms, access to counselling, proper provisioning of the work camps to dissuade workers travelling into communities for entertainment and support of family friendly accommodation in the camps; ■ Develop and implement an HIV and STI prevention programme for suppliers, which is to include awareness and education about STI's. The design and placement of rest stops for drivers transporting goods and materials to and from the production facility should be away from local communities and properly subsidised for cheap food / entertainment;				

				■ Implement camp curfews from 19:00 (as is the current CNOOC practice) after which time workers who reside in the camp must be in camp; ■ Prohibit all drivers (permanent employees, contractors and suppliers) from giving lifts to the local community; ■ Screen for STIs and hepatitis B/C virus as part of pre-employment fitness to work process. Treatable causes should be managed, and chronic carriers excluded from employment until managed; ■ Support a HBV vaccination campaign/ or antibody testing on employee who may have not been vaccinated as a child; ■ Develop nutritional programmes that promote proper nutritional practices at the workplace to prevent obesity and related health impacts, including education programmes in the workforce on financial management and support of the household units in employees that have traditionally followed a subsistence lifestyle; ■ Develop a programme to address education about and management of non-communicable diseases related to use of drugs, alcohol and oral health issues; ■ Incorporate veterinary concerns into the OHS management plan to include appropriate waste management to mitigate against feral dogs and an awareness of the risk of snake bites and other wild animal threats; ■ Update the outbreak control risk assessment and appropriately plan for communicable disease (e.g. influenza and meningitis); ■ Maintain information, education and communication (IEC) programmes in the community to increase awareness and reduce communicable disease risks. Ideally, support the development of village health teams (VHTs) to deliver these (in partnership with the health department or non-governmental organisation); ■ Maintain site based medical services that can cater for all workplace health needs so that local health services are not overburdened with medical cases from the workforce; and ■ Train employees to ensure that they are aware of the requirements of the Occupational Health and Safety standards established by the Government of Uganda.			
4.	Population Influx dynamic in KFDA	Disease prevalence arising from consumption and / or interaction with livestock products	Promote veterinary health	Support selected veterinary health programmes in the KFDA, including vaccination of domestic animals for rabies and cattle for brucellosis. Support rodent control in settlements likely to receive the bulk of influx and ensure effective camp management to prevent attraction of rodents.	CNOOC	Recorded results of programmes.	Ongoing.	
5.	Population Influx dynamic in KFDA	Food insecurity resulting malnutrition related diseases	Enable sustainable fishing and agriculture practices	Support sustainable fishing practices through education, assisting with enforcement of fishing laws and economic interventions to manage demand so that overfishing is managed. In a similar way, support agriculture (such as conservation farming) to increase yields on land that will reduce in availability.	CNOOC	Records of support for fishing laws and conservation farming.	Bi Annual Monitoring .	

6.	Population Influx dynamic in KFDA	Poverty leading to psychological disorders	Minimise debt	Information, Education and Communication (IEC) campaigns to educate the local workforce (and contractors) on financial management.	CNOOC	Records of campaigns.	Quarterly monitoring	
7.	Population Influx dynamic in KFDA	Health disorders due to distress of the vulnerable groups (children, women, the elderly and disabled)	Empowerment and equality of the vulnerable groups	Support to Potentially Affected Communities (PACs) and vulnerable groups on gender empowerment, local development programmes and health issues.	CNOOC Contractor	Records of such support.	Quarterly monitoring	
8.	Population Influx dynamic in KFDA		Empowerment and equality	Maintain inflation management and monitoring programs and support vulnerable groups.	CNOOC Contractor	Records of such support.	Annually	
				Evaluate opportunities to maintain local cultures and norms and build an equitable society, taking note of especially vulnerable groups.	CNOOC Contractor	Records of such support.	Annually	
				Evaluate opportunities to maintain local cultures and norms and build an equitable society, taking note of especially vulnerable groups.	CNOOC Contractor	Records of such support.	Ongoing	

5.20.1 Workforce health

Table 5-41: Workforce health

Ref.	Aspect	Potential Impact	Objective	Management Action	Responsibility	Indicator / Performance Criteria	Schedule	Additional Reference
1.	Workforce activities at the CPF, Wells, and ancillary facilities	Loss time, injury and / or fatality due to disease / illness	Minimise influence of Workforce health on local population.	The incoming workforce has the potential to exacerbate the communicable disease burden associated with poor socio-economic and living conditions, especially those transmitted by close contact. The following must be undertaken: ■ Maintain a workplace TB, HIV, STI and malaria management plan as part of the communicable disease strategy; ■ Evaluate the origin of any incoming contracted workforce and screen for TB and associated communicable diseases as part of the Projects fitness to work programme; ■ Support effective vaccine preventable disease programmes; ■ Develop effective design and planning of workplace accommodation to prevent overcrowding; ■ Develop effective workplace medical services; ■ Wellness programmes in workforce to prevent non-communicable diseases (NCDs); and ■ These plans must make provision for contractors or be part of formal contractor management plans.	CNOOC Contractor	Documented management plan and records of its implementation.	Upon recruitment and annual medical check ups	
2.	Sexually transmitted infections (STIs) and HIV/AIDS.	Increased prevalence of STIs in project personnel and the community Loss time, injury and / fatality from STIs	Minimise influence of Workforce health on local population.	There is a risk of increasing STIs in the community from the workforce which must be minimised through the following: ■ Maintain programmes for high-risk groups including transport workers; ■ Develop a code of conduct that prohibits sexual fraternisation within the workforce, especially women that originate from the local community. Maintain a closed camp status; ■ Screen for STIs as part of fitness to work programme in both the contracted and full time workforce; ■ Support health systems strengthening activities with the local health authorities and other organisations to develop a co-ordinated approach to STI/HIV prevention and management in the broader area;	CNOOC Contractor	Documented management plan and records of its implementation.	Monthly monitoring	

				■ Support IEC programmes on awareness and education, and use of VHTs to spread messaging, as well as supporting HIV counselling/testing and referral for care/treatment; ■ HSS in the local health centres to be able to provide effective care and treatment services; and ■ Support women and young girl empowerment programmes.				

5.21 Responsibilities for Managing Cumulative Impacts

The management of cumulative impacts associated with oil industry development in in Albertine Graben Uganda will require the involvement of Government, the oil industry and individual developers. Each party bears different responsibilities in this process. For clarity, key identified cumulative impacts are tabulated below and the broad responsibilities of Government, the oil industry as a collective and CNOOC as an individual developer are described in relation to each identified impact in Table 5-42: Description of the responsibilities of Government, the Oil Industry and CNOOC for management of cumulative impactsTable 5-42. This table should be used as a guide in interpreting the responsibilities described in the management plans above should there be any uncertainty. CNOOC is only responsible for baring their part of collective management responsibility where cumulative impacts are applicable. In many instances, Government of Uganda is responsible for the primary management of the cumulative impact and to ensure that associated planning is in place. To the extent agreed with the oil industry, the oil industry has a role to play. Similarly, individual companies, and CNOOC specifically within the zone of influence of the Kingfisher Field Development Area, is encouraged to play an active supporting role in the mitigation of cumulative impact as they relate to the proposed urbanisation of the Buhuka Flats, threats to critical biodiversity habitat and species and the multiple impacts identified in relation to growing population pressure in the local area.

Table 5-42: Description of the responsibilities of Government, the Oil Industry and CNOOC for management of cumulative impacts

	Cumulative impact or identified risk	**Government Responsibilities**	**Suggested support to be provided by the Oil Industry**	**The responsibility of CNOOC in such initiatives**
Infrastructure	Capacity of key regional roads to accommodate oil industry traffic volumes	The Government of Uganda is upgrading the P1 road between the Buhuka Flats in Kikuube and Hoima (P1). The ESIA recommends that this road be tarred to limit dust through villages.	Oil industry alignment on regional biodiversity planning and support of regional biodiversity initiatives	CNOOC to engage with Government and pursue a decision on the tarring of the road. Should Government not intend to proceed with tarring of the road, CNOOC to take responsibility for control of dust along this road during the construction period. The air quality management plan should then be amended to include responsibility for control of dust on the P1 during the construction period, paying particular attention to application of dust suppressants on roads passing through villages.
	The proposed upgrade of R5 Northern Road through Bugoma Forest as an oil road	Government proposal to upgrade R5: recommendation that Government reconsider this decision in light of biodiversity sensitivity of ecosystem, particularly in support of Eastern chimpanzee	Oil industry alignment on regional biodiversity planning and support of regional biodiversity initiatives	CNOOC to indicate clearly to government that this particular road is not required for their proposed operation during either construction or operational period (letter has already been sent to Government). CNOOC to engage with government to encourage a decision not to upgrade this road.
Emergency response capability	Limited emergency response capability within the region	It is Government's responsibility to provide urbanised areas with emergency response services	The oil industry is encouraged to engage with government in the development of an emergency response plan, training program and support for the development of appropriate resources in the local area to respond to pollution and civil emergencies such as residential/urban fires	CNOOC to actively engage with physical development plan and local government to ensure that proposed urbanisation that will result from physical development plan is supported by appropriate emergency's response capability within the local area. The extent of such support to be determined in discussion with government.
Urbanisation	Increased urbanisation due to in migration with associated reduced reliance on traditional lifestyles	It is government's responsibility to pursue and implement the development of villages, towns and associated support infrastructure	Oil industry encouraged to support the development of town planning capacity, to actively participate with government in regional planning to ensure that future urban plans do not impact negatively upon the requirements of the oil industry (encroachment into buffer areas) or result in undue environmental deterioration through unstructured planning and settlement	CNOOC to actively engage with government in relation to the proposed Buhuka flats physical development plan and specifically as it relates the requirements to revise the plan to ensure that the Kingfisher Field development Area project environmental impacts, as currently assessed, are appropriately considered by government in finalisation of the physical development plan.
Biodiversity	Threat to regionally important biodiversity	It is the responsibility of Government to manage biodiversity resources within the regional area. Specifically, to ensure that there is adequate enforcement and protection provided to such resources and that appropriate plans are in place to monitor change on	Industry encouraged to establish a forum to identify areas of importance within areas of project cumulative influence and pursue regional biodiversity plans and support the implementation of such plans. Specifically, a focus on research, long-term management of population health &	CNOOC to participate actively in the establishment and running of an industry collective aimed at regional biodiversity management and bear their share of costs in support of regional biodiversity initiatives. Specifically, to ensure that regional biodiversity plans cater for the

	Cumulative impact or identified risk	Government Responsibilities	Suggested support to be provided by the Oil Industry	The responsibility of CNOOC in such initiatives
		biodiversity protected areas and biodiversity critical habitats	reproduction and detection of change within both habitat and species	following species of concern: - Grey crowned crane - Eastern Chimpanzee - Nahan's francolin - Mud snail if confirmed present in the KFDA
	Increased pressure on natural resource use	It is the responsibility of government to manage population distribution within the region, access to and limitation on the harvest of natural resources and management and stewardship of forest resources	Industry support for regional biodiversity planning and support for identification and development of appropriate programs to reduce the reliance on traditional materials for construction and biomass burning for purposes of cooking.	CNOOC to actively participate in regional biodiversity planning and bear their share of cost associated with such efforts
	Threat to Lake fish stocks due to over exploitation	It is the responsibility of government to appropriately regulate and control the fishing industry. This includes commercial and subsistence fishing.	Lake fish stocks are not limited to the Kingfisher Field development area only where enhanced road access has exacerbated the over-exploitation of fish stock. The oil industry is encouraged to engage with government to support the development of a Lake Albert fisheries plan, support Government in the implementation of the plan and support the development of an appropriate long-term monitoring program to detect change in key indicator species. The oil industry is also encouraged to consider initiatives to introduce local species aqua-culture to provide additional protein into the local community to alleviate pressure on wild stock; also, to consider the development of aquaculture for purposes of restocking depleted lake populations	CNOOC to actively participate in support of oil industry initiative to support government to manage fish stock and threat on fishing industries. CNOOC to bear their portion of cost in this regard.
Food security	In-migration posing a risk to food security	Ugandan local Government Sub-county administration are in process of pursuing strategies aimed at improving agricultural production. The intent is to both solve regional farming problems affecting production such as crop failures due to disease and drought. Interventions may include introduction of modern farming methods, training of farmers in post-harvest techniques, development of accessible market access mechanisms, and sensitising farmers about land degradation.	Provide support to this regional agricultural program particularly centred around the oil development node at Kabaale. Increasing sustainable food production, and improving agricultural capacity and access to markets, will in the long term reduce pressure to convert new areas of natural land to agricultural use and decrease reliance on forest harvested products.	CNOOC to participate actively in the regional agricultural program and co-ordinate the involvement of the oil industry in support of this initiative
In migration: Veterinary	In migration will introduce additional pressure on local government resources to provide Veterinary control with associated risk of a break of Veterinary diseases	It is the responsibility of government to provide a regional Veterinary service to ensure that the risk of outbreak of Veterinary disease is appropriately controlled	The oil industry is encouraged to work with government to develop a regional Veterinary control plan to ensure that in migration associated with the oil industry does not result in outbreak of Veterinary disease, in particular vaccination programs against rabies in domesticated animals and brucellosis in cattle	CNOOC to actively support industry initiatives to develop joint Veterinary control plans with in the region and specifically to support the Government in local Veterinary control plans and vaccination programs targeting the KFDA
In migration: human health	In migration is likely to overtax the already limited regional health facilities under strain from a burgeoning population and refugee influx into the Western Ugandan area.	It is the responsibility of government to provide a regional health service and appropriate preventative medical programs	The oil industry is encouraged to support government in the planning and development of appropriate health control plans for the cumulative regional areas. Specifically, health emergency response plans in the event of communicable disease outbreak (haemorrhagic fevers in particular) and waterborne vector control (malaria and similar)	CNOOC to support local health programs and participate actively in oil industry regional initiatives in support of government health program and preventative medicine programs and emergency response to health incidence

6.0 PERFORMANCE ASSESSMENT, CORRECTIVE ACTION, MANAGEMENT REVIEW AND AUDITING

The assessment of performance and provision for corrective actions has the following aims:

- Confirmation of compliance with the requirements as set out in the O-ESMP, i.e. Operational contractor performance measured against the O-ESMP;
- Measurement of environmental and social performance (degree of success of the O-ESMP specifications in managing social and environmental impacts); and
- Ensuring that any deficiencies in the Contractor's performance or the O-ESMP itself are identified and remedied.

Aims must be met by responsible parties identified by CNOOC and entail:

- Ongoing monitoring / inspections undertaken by full time site staff (e.g. ESO(s) and CLO(s) as part of CNOOC's team);
- Senior staff review (e.g. CNOOC Environmental Coordinator) as well as review by independent consultants (e.g. where considered necessary by the Contractor or CNOOC Environmental Coordinator);
- Auditing by independent consultants; and
- Corrective action by the Operational/maintenance contractor shall ensure that any identified problem areas identified by CNOOC's team are effectively addressed. Specifications for monitoring, review and auditing are provided in the sections below.

CNOOC must establish a database management system to store and track the findings of the various monitoring programmes so that the appropriate modifications to the plans can be made.

6.1 Environmental Monitoring Strategy

A monitoring[30] strategy must be defined to ensure that the effectiveness of mitigation measures can be tracked and corrective action taken (Table 6-1). Monitoring is not only intended to verify the contractor's compliance with the O-ESMP but also to assess the effectiveness of environmental management, irrespective of whether the specifications in the O-ESMP have been complied with.

Table 6-1 defines, in broad terms, the monitoring requirements necessary during the operational phase of the project. Monitoring is undertaken by the CNOOC's team, with assistance where necessary, from the CNOOC Environmental Coordinator and from Specialist Consultants. Much of the monitoring involves the ESO or CLO being present when potentially significant activities are taking place, being observant, and checking that the Contractor is not materially deviating from the requirements set out in the O-ESMP.

There are some specific metrics that define performance and are based on actual quantitative measurements (dust and noise are examples), but much of the monitoring is simply careful observation to check that the Contractor is meeting the obligations set out in the O-ESMP. Even in the case of noise and dust, it is not always necessary to measure performance against the quantifiable standards, and this judgement must be made at the time by the ESO and the EC, depending on the circumstances. The performance standards often provide an indirect measure of effectiveness – for example, the monitoring of the Contractor's compliance with local employment requirements and the communication of these requirements widely is an indirect measure of the control of in-migration. It must be noted that this monitoring strategy must be considered a live strategy and must be updated and amended as required, based on the findings of the various monitoring plans.

[30] *Monitoring is a process of surveillance, based on specified approaches and schedules, used to detect whether any changes have occurred in the predefined, quantifiable properties of the particular environment under consideration.*

Unless otherwise indicated, it is the responsibility of CNOOC to ensure that monitoring is undertaken to demonstrate compliance with the requirements of the O-ESMP. Performance indicators have been indicated in the ESMPs and additional monitoring is required over and above that is presented in the table.

Table 6-1: Monitoring requirements

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
Community Nuisance (Dust)	To be based on the location of sensitive receptors in relation to operational activities. ESO/CLO to prioritise locations in which monitoring is required	Daily observation at key locations where dust is being generated near sensitive receptors Passive sampling when specified by the ESO/CLO in cases where dust impact is in question either due to visible evidence or public complaint	**Observation:** ■ ESO to monitor and log dust incidents where dust control is ineffective or only partially effective in sensitive areas. Log to include time of day, period over which incident occurs, and apparent severity (low, medium, high); and ■ Data from dust fall buckets measuring dust fall must be compared with standards for residential and industrial/mining areas. **Community Concerns:** ■ Number of community complaints recorded in the Compliments and Complaints register or made directly to the CLO. **Quantitative Monitoring** ■ Dust fall 600 mg/m^2/day.	■ Passive sampling results (when specified); and ■ Monthly ESO/CLO progress reports.	ESO/CLO	■ Air Quality Management Plan; ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification; ■ CUL-QHSE-L2-016 Monitoring and Measurement Equipment Management Procedure; and ■ CUL-QHSE-L2-017 Monitoring and Measurement Management Procedure.
Air quality	Suitable ambient air quality monitoring network based on the optimisation of the construction phase	Ongoing	■ Fine PM_{10} particulate monitoring via active monitoring methodologies; ■ Monitoring of gaseous trace gas pollutants (i.e. SO_2, NO_2, O_3 etc) with passive diffusion tubes should be undertaken biannually (twice a year during construction); and ■ Audit and optimise the air quality monitoring network annually audit to ensure that it is maintained in accordance with best practice and is relevant to the key emission sources on the ground. **Quantitative Monitoring:** ■ Suspended Particulates (Ugandan daily standard): ≤200 µg/m^3; ■ PM_{10} (IFC daily standard): ≤50 µg /m^3; ■ PM_{10} (IFC annual standard): ≤20 µg/m^3; and ■ Respirable particulate matter (<10µm) (Ugandan daily standard <100 µg/m^3).	Monthly air quality monitoring reports.	ESO/CLO	Air Quality Management Plan.
Community Nuisance (Noise)*	To be based on the location of sensitive receptors in relation to operational activities. ESO/CLO to prioritise locations in which monitoring is required	Daily observation at key locations where noise is being generated near sensitive receptors. Noise monitoring using an integrating noise meter as specified by the ESO/CLO when there is clear evidence of community nuisance.	**Observation:** ■ ESO to monitor and log noise incidents where noise control is ineffective or only partially effective in sensitive areas. Log to include time of day, period over which incident occurs, and apparent severity (low, medium, high). **Community Concerns:** ■ Number of community complaints recorded in the Compliments and Complaints register or made directly to the CLO. **Quantitative Monitoring:** ■ Need to be in compliance with Ugandan Noise standards for operations. In their absence, the World Health Organization guidelines for daytime and night-time noise should be adopted.	Weekly ESO/CLO monitoring results Monthly ESO/CLO reports	ESO/CLO	■ Noise and Vibration Management plan; ■ CUL-QHSE-L3(GE)-056 Noise Management Specification; ■ CUL-QHSE-L3(GE)-023 Land Transportation Specification; and ■ CUL-QHSE-L3(GE)-069 Environmental Monitoring Specification.

** Note: Noise levels to be monitored using a calibrated integrating sound level meter in accordance with the methods specified in SANS 10103: 2008. Measurement period shall be of sufficient length for the readings on the equivalent*

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
A-weighted setting (LAeq) to stabilize (typically 10 - 15 minutes). Readings shall be taken when the drilling rig Is fully operational. Notes shall be taken to characterise the sound.						
Population influx and social pathologies	Accommodation sites, work sites	Ongoing watching brief	■ Compliance with LFMP employment requirements; ■ No ad hoc employment at the work sites or camp sites; ■ Adherence to closed camp, alcohol-free camp policy; ■ Evidence of implementation of communicable disease programmes; and ■ Compliments and Complaints Register.	■ Contractor; ■ Communications Plan; and ■ ESO/CLO progress reports.	CLO/ESO Contractor	Influx Management Plan.
Communicable Diseases	Non-specific	Ongoing watching brief	■ CNOOC-approved STI Management Plan; ■ Number and nature of initiatives as per the plan; ■ CNOOC-approved Malaria Management Plan; ■ Record of actions taken in accordance with the Malaria Management Plan; ■ Record of STI and malaria incidents recorded among Contractor staff; and ■ Record of induction training and tool box talks.	■ STD Management Plan; ■ Malaria Management Plan; ■ ESO/CLO monthly reports; and ■ Malaria/STD incidence reports.	ESO/CLO Contractor	Community Health, Safety, and Security Management Plan.
Traffic and Pedestrian Safety	Principally areas where households and operational teams interact	Ongoing watching brief	■ Vehicle accident records; ■ Pedestrian accident records; ■ Near misses; ■ Compliance with speed limits; ■ Advanced driver training for Contractor heavy vehicle staff; ■ Record of disciplinary action taken against drivers and other project personnel; ■ Community safety references in induction briefings and ongoing toolbox talks; ■ Safety briefings of communities; and ■ Compliments and Complaints Register.	■ Accident/incident reports; and ■ ESO/CLO progress reports.	ESO/CLO Contractor	Traffic Management Plan.
Water Management	Community boreholes within 1 km of project boreholes Water abstraction sites	Ongoing	■ Records of groundwater use; ■ Licence for use of water from the Directorate of Water Resources Management (DWRM); ■ Records of monitoring of impact on community water supply when Project supply closer than 1 km to community borehole; ■ Records of corrective action, where necessary; and ■ Record of authorisation of use of surface water. **Quantitative Monitoring:** Discharged sewage water must meet the following criteria: ■ pH: 6-8[31]; ■ Biochemical oxygen demand (BOD): 30 mg/l; ■ Total Nitrogen: ≤10 mg/l; ■ Total Phosphorus: ≤2 mg/l; ■ Oil & Grease: ≤10 mg/l; ■ Total suspended solids (TSS): ≤50 mg/l; and ■ Total Coliform Bacteria: ≤400 MPN (most probable No.) per 100 ml. Discharged produced and storm water must meet the following criteria[32]:	■ Record of community borehole monitoring; ■ Groundwater abstraction report; ■ Surface water abstraction report; and ■ ESO monthly report.	Contractor ESO	■ Water Management Plan; ■ Water Act (Cap 152); and ■ Uganda Bureau of Standards (US 201) Specification for Drinking (Potable Water; 1994).

[31] In line with CNOOC CUL-QHSE-L3(GE)-054 Water Management Specification

[32] Emissions, Effluent and Waste Levels from Onshore Oil and Gas Development (International Finance Corporation, 2007)

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Total hydrocarbon content: ≤10 mg/l: ■ pH: 6 to 8[10]; ■ BOD: ≤25 mg/l; ■ Chemical oxygen demand (COD): ≤125 mg/l; ■ Total dissolved solids (TSS): ≤35 mg/l; ■ Phenols: ≤0.5 mg/l; ■ Sulphides: ≤1 mg/l; ■ Heavy metals[33] (total): ≤5 mg/l; ■ Total hydrocarbon content ≤10 mg/l; and ■ Chlorides: ≤600 mg/l (average) and ≤1 200 mg/l (maximum). Effluent should result in a temperature increase of no more than 3°C at the edge of the zone where initial mixing and dilution take place. Where the zone is not defined, use 100 m from point of discharge.			
Vehicle and Materials Management	Camp sites, work sites	Ongoing watching brief	■ Records of inspection and maintenance of vehicles and equipment; ■ Approved method statement for handling of hazardous materials on site; ■ Compliance with requirements of approved method statement; ■ Inventory of hazardous materials and Contractor's Documentation available at specified locations; ■ Documentation confirming PCB and CFC free equipment; ■ Protection of fuel storage and camp generators as per requirement; ■ Availability of spill / drip clean-up materials at specified locations; ■ Availability of sheeting / drip trays in all key vehicles; ■ Incident and corrective action records; ■ Provision of appropriate PPE to employees; ■ Records of induction training and tool box talks; and ■ Records of bio-remediation.	■ ESO progress reports; ■ Logistics Superintendent progress reports; ■ SHE advisor progress reports; and ■ Camp manager progress reports.	Contractor	■ Traffic Management Plan; and ■ Waste Management Plan.
Natural Heritage – general and bush clearing	Project footprint and surrounding areas	Ongoing watching brief	■ Induction and toolbox talks about protection of plants and wild animals; ■ Record of training of dozer operators to minimise Project footprint; ■ Record of training vehicle operators to remain within the approved Project footprint; ■ Records of removal of dangerous animal from work sites; ■ Records of communication with IUCN regarding reptile identification; ■ Absence of evidence of hunting or animal harassment; ■ Absence of evidence of unauthorised vehicle access outsider of the approved Project footprint; and ■ Footprint compliance with O-ESMP buffer zones and access restrictions.	ESO progress reports.	ESO	Cultural Heritage Management Plan.
Natural Heritage – alien invasive species	Project footprint and surrounds	Ongoing watching brief	■ Records of wash-down of site vehicles and equipment prior to use on site to remove alien weeds; ■ Production of illustrated alien invasive species booklet; ■ Photographic record and GPS locations of alien infestation in Project footprint area; and	■ Records of vehicle wash-down; ■ Records of alien plant identification and removal; and	ESO	Biodiversity Management Plan.

[33] Heavy metals include: Arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc.

Parameters / Activities to be monitored	Monitoring location	Frequency of monitoring	Performance indicator/threshold value	Reporting	Responsibility	Additional reference
			■ Records of application of removal strategy.	■ ESO monthly report.		
Cultural Heritage	Project footprint and surrounding area	Ongoing watching brief	■ Records of training of key personnel to identify cultural/ archaeological artefacts; ■ Record of communication with communities to verify location of sacred sites when operation/ maintenance is within 100 m of a known cultural heritage site; ■ Compliments and Complaints Register; and ■ Compliance with Chance Find Procedure and subsequent recommendations by specialist where artefacts are found.	■ Specialist Report (if significant artefacts found); and ■ ESO/CLO monthly report.	ESO/CLO Specialist archaeologist	
Employment	Project Area	Ongoing watching brief	■ Signed Project Labour Agreement (PLA); ■ Evidence of maximising labour use in preference to machinery; ■ Compliance with the Community Liaison Forum procedure for selection and vetting of unskilled personnel; ■ Compliance with the PLA; ■ Records of communication initiatives to improve understanding of Project-affected communities about how to apply for a job; ■ Percentage of unskilled workers from Project-affected communities; ■ Evidence of vetting semi-skilled and skilled workers according to the 'spiral' principle; ■ Percentage of women, disabled or otherwise disadvantaged people employed; ■ Provision and briefing of personnel about the grievance procedure; ■ Workers understanding and use of the Grievance Procedure; and ■ Frequency of complaints in the Compliments and Complaints Register and the Grievance Procedure.	■ Project Labour Agreement; ■ Records of employment; ■ Grievance Procedure; and ■ CNOOC Local Procurement Officer monthly report.	Contractor CNOOC Local Procurement Officer	Labour, Working Condition, and Employment Management Plan.
Local Procurement	Project Area	Ongoing watching brief	■ Implementation of CNOOC procurement of local Goods and services; ■ Local procurement records in compliance with approved Local Content Plan, developed in accordance with the CNOOC procedure; and ■ Local content spend in relation to total spend.	■ Contractor; ■ Local Content Plan; and ■ CNOOC Local Procurement Officer monthly report.	Contractor CNOOC Local Procurement Officer	Procurement of Local Goods and Services Management Plan.

In addition to the above the following must be implemented:

Groundwater monitoring

The following locations must be **sampled and monitored quarterly** (every 3months) during the Operational phase of the project.

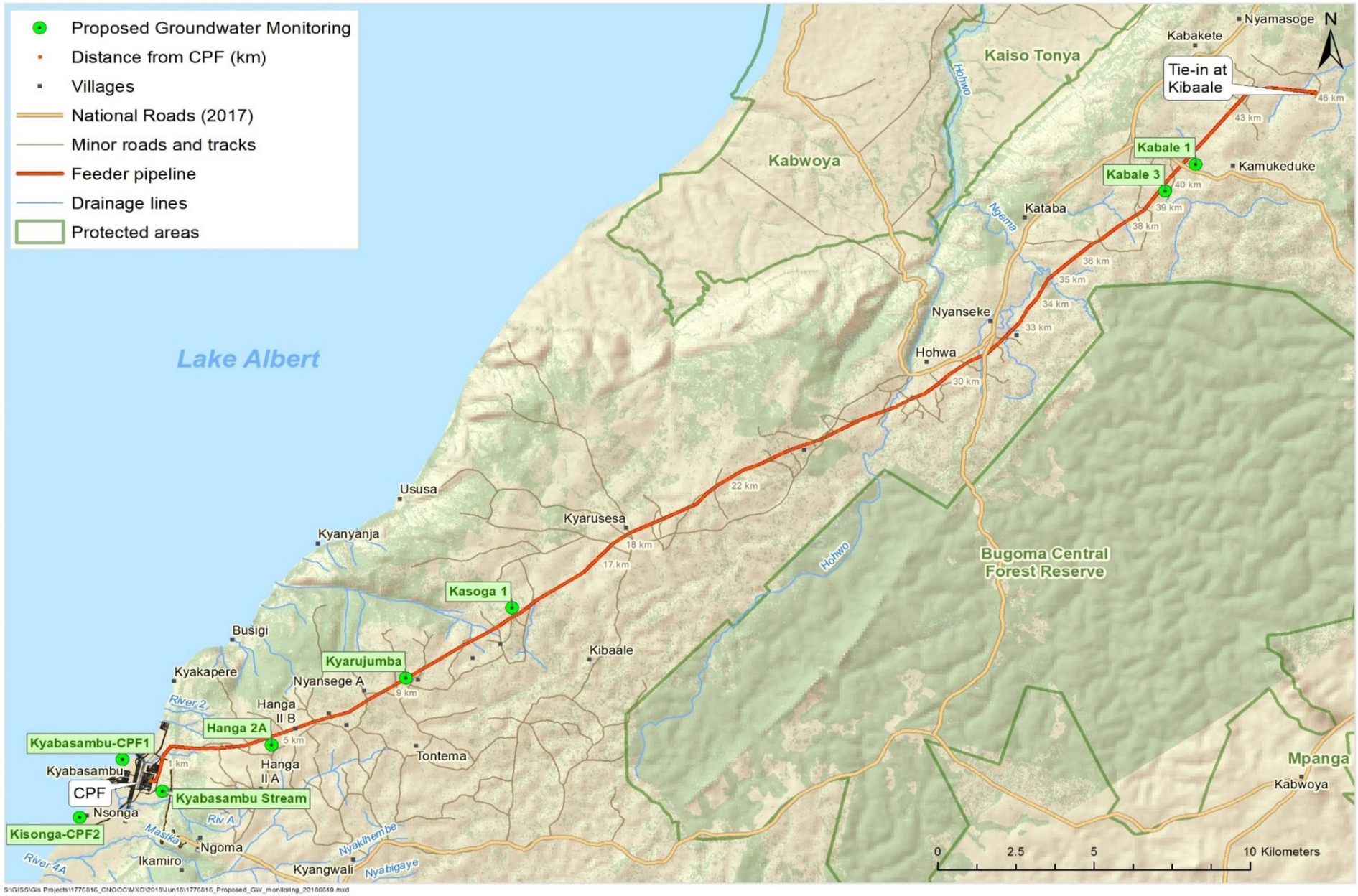


Figure 8: Proposed Groundwater monitoring sites

The Table below outlines the location and parameters that should be monitored for the groundwater sampling sites:

Table 6-2: Water quality sampling for selected groundwater sites for the CPF, wells and ancillary infrastructure

Sample Description	Coordinates (Decimal Degrees)		pH	EC (mS/m)	Total Hardness ($CaCO_3$)	Total Alkalinity ($CaCO_3$)	TDS	Sulphate (SO_4)--	Nitrate (NO_3-N)	Calcium	Magnesium	Sodium	Chloride	Aluminium	Lead	Mercury	Iron	Copper	Manganese	Selenium	Nickel	Chromium	Faecal Coliforms (Y/N)
	North	East																					
US 201 Potable Water Standard (Class 2)			**6.5 – 8.5**	**250**			**1200**			**75**	**50**	**400**	**500**	**0.2**	**0.01**	**0.001**	**0.03 - 3.5**		**0.1 – 0.5**	**0.01**		**0.05**	
Ugandan Drinking Water Standard (NEMA, 1996			**6.5 – 8.0**	**250**	**500**		**600**	**200**	**5**	**-**	**-**	**-**	**-**	**0.2**	**0.01**	**0.001**	**0.03 - 0,5**	**1**	**0.1 - 0.5**	**0.01**	**0.02**	**0.05**	**N**
Kyabasambu (CPF 1)	1.25287	30.744691	7.1	719.3	1362	304	4776		2.21	262.4	168	858.9	2420.9	-	0.02	-	0.04	-	1.54	-	-	-	Y
Kisonga – CPF2	1.234941	30.732276	10.03	58.9	-	88	387.8	-	0.11	16	48	-	0.03	0.03	0.0025	0.0011	0.04	-	0.0007	0.014	-	0.0003	Y
Kyabasambu stream	1.242998	30.756071	10	35.1	-	76	284	-	1.3	48	19.2	-	0.03	-	-	0.001	0.05	-	0.0016	0.01	-	-	Y

Surface water monitoring

The following locations must be **sampled and monitored quarterly** during the operational phase of the project:

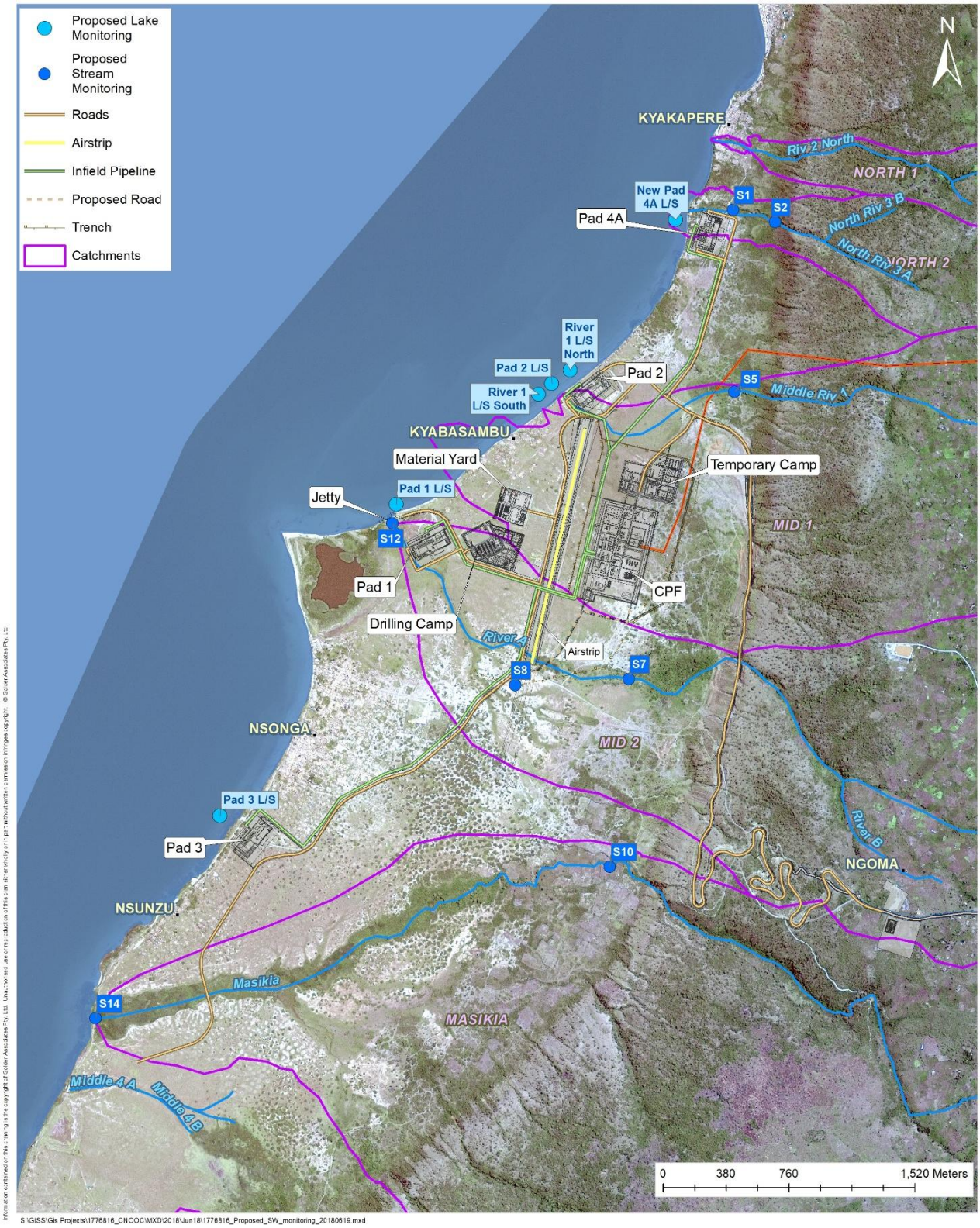


Figure 9: Proposed Surface Water monitoring points

The Tables below outline the location and parameters that should be monitored for the surface water and lake shore sampling sites:

Table 6-3: Location of surface water monitoring points

Monitoring Point ID	Name or Description	Coordinates (Decimal Degrees)	
		North	East
S1	Tributary associated with proposed road cross section 3 (Kyakapere)	1.26472	30.75764
S2	Upstream of cross section 3 - Kyakapere (upstream)	1.22883	30.75097
S5	Upstream of Spoil Area A(Quarry and Asphalt Plant) (Kowet)	1.21694	30.72425
S7	Kamansinig river upstream of the airstrip	1.20750	30.73461
S8	Culvert on Kamansinig river western side of the proposed airstrip	1.20769	30.73378
S10	Maslka river downstream of proposed Spoils Area B (Nyakateke)	1.23925	30.74886
S12	Kamansinig river inflow to Bugoma Lagoon and adjacent to Jetty (associated with Pad 1)	1.38586	30.99458
S14	Downstream of Maslka prior to entering Lake Albert	1.26797	30.75853
Pad 1 L/S	Lake shore monitoring point adjacent to Drill Pad 1	1.248617	30.739358
Pad 2 L/S	Lake shore monitoring point adjacent to Drill Pad 2	1.255222	30.747797
Pad 3 L/S	Lake shore monitoring point adjacent to Drill Pad 3	1.231594	30.729817
New Pad 4A L/S*	Lake shore monitoring point adjacent to Drill Pad 4A	1.264184	30.754502
River 1 L/S North*	Lake shore monitoring point +/- 100m North of Drill Pad 4A	1.255964	30.748796
River 1 L/S South*	Lake shore monitoring point +/- 100m South of Drill Pad 4A	1.254638	30.747085
Sewage treatment plant *	Treated sewage effluent from both sewage plants	-	-

* = new monitoring point

Table 6-4: Parameters to monitor for surface water monitoring sites

Sample Description	pH	EC (mS/m)	Total Hardness ($CaCO_3$)	Total Alkalinity ($CaCO_3$)	TDS	Sulphate (SO_4)--	Ammonia Nitrogen (NH_3N)	Nitrate (NO_3-N)	Calcium	Magnesium	Sodium	Chloride	Aluminium	Lead	Mercury	Iron	Copper	Manganese	Selenium	Cadmium	Arsenic	Nickel	Chromium	Faecal Coliforms (Y/N)
US 201 Potable Water Standard (Class 2)	**6.5 – 8.5**	**250**			**1200**				**75**	**50**	**400**	**500**	**0.2**	**0.01**	**0.001**	**0.03 - 3.5**		**0.1 – 0.5**	**0.01**	**0.01**	**0.01**		**0.05**	
Ugandan Drinking Water Standard (NEMA, 1996)	**6.5 – 8.0**	**250**	**500**		**600**	**200**	**1**	**5**	**-**	**-**	**-**	**-**	**0.2**	**0.01**	**0.001**	**0.03 - 0,5**	**1**	**0.1 - 0.5**	**0.01**	**0.01**	**0.01**	**0.02**	**0.05**	**N**
S01																								
S02																								
S05																								
S07																								
S08																								
S10																								
S12																								
S14																								

Table 6-5: Monitoring parameters for Lakeshore monitoring sites

Parameters	Units	*Nat Std	Pad 1 L/S	Pad 2 L/S	Pad 3 L/S	New Pad 4A L/S*	River 1 L/S North*	River 1 L/S South*
Total Depth	m		1.5	2.6	1.8			
Secchi Depth	m		0.7	0.81	0.71			
Dissolved Oxygen	mg/L	**NS**	7.53	7.03	7.56			
Temp	°C	**20-35***	28.4	27.8	28.5			
Conductivity	µS/cm	**2500**	634	633	632			
pH	--	**6.5-8.5**	9.60	9.61	9.45			
Alkalinity	mg/L	**500**	316	316	324			
Hardness	mg/L	**500**	180	160	180			
TDS	mg/L	**1200**	304	317	310			
TSS	mg/L	**0**	3	1	2			
Turbidity	NTU	**10**	2	2	4			
Calcium: Ca^{2+}	mg/L	**75.0**	20.8	24	24			
Magnesium: Mg^{2+}	mg/L	**50.0**	30.7	24	28.8			
Fluoride: F^-	mg/L	**1.5**	1.2	1.2	1.1			
Iron	mg/L	**5**	0.01	0.02	0.04			
Sulphate	mg/L	**200**	11	10	11			
Chloride: Cl^-	mg/L	**500**	0.05	0.05	0.05			
BOD_5 at 20°C	mg/L	**30***	0.0	0.9	0.5			
COD	mg/L	**100***	11	11	7			
SRP	mg/L	**5000***	0.003	0.001	0.002			
TP	mg/L	**10**	0.026	0.029	0.044			
Nitrate	mg/L	**4.5**	0.023	0.095	0.055			
Nitrite	mg/L	**3**	0.008	0.010	0.002			
Ammonia	mg/L	**1**	0.008	0.022	0.015			
Total Nitrogen	mg/L	**10**	0.32	0.185	0.122			
Chlorophyll a	µg/L	**NS**	2.1	2.1	1.0			
Faecal coliform	CFU/ 100mL	**0**	50	2	10			

Noise monitoring

The locations surrounding the CPF must be **monitored quarterly during the operational phase of the project**. The findings of this monitoring must then be used to adapt the Noise Management Plan for a more effective management. Furthermore, once the Physical Development Plan is finalised, these management and monitoring plans must be revised.

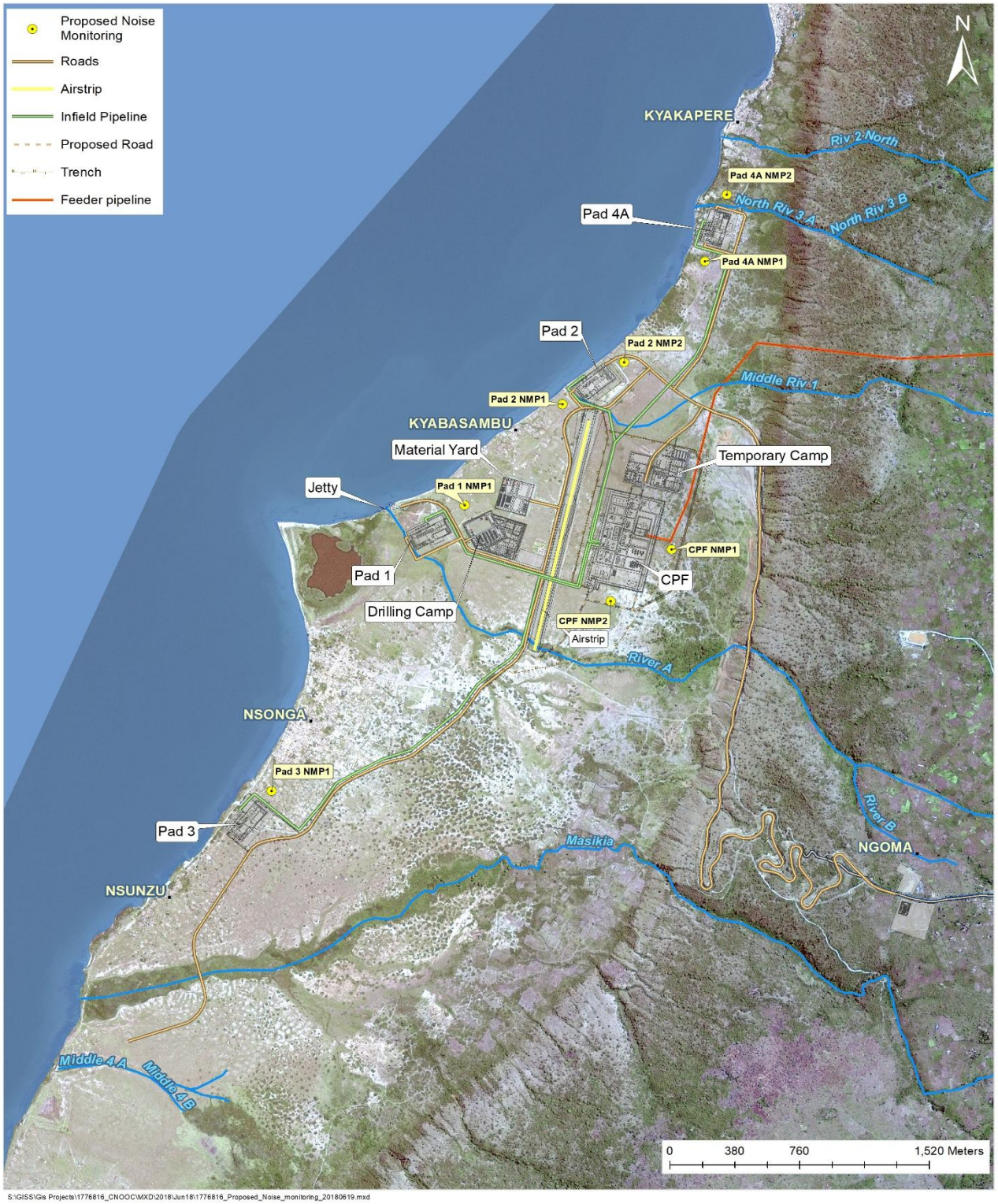


Figure 10: Proposed Noise Monitoring Locations

Table 6-6: Noise monitoring location co-ordinates

Monitoring Location Number	Decimal Degrees	
	North	East
CPF NMP1	1.245564	30.753945
CPF NMP2	1.242676	30.750739

Socio-Economic monitoring

When monitoring the effectiveness of the Resettlement process, the RAP monitoring programme must be implemented and should incorporate the relevant IFC standards. It is recommended that the social management plans outlined in this document may need to be re-visited and adapted to take into account the Physical Development plan, should it be implemented by the Government of Uganda.

Biophysical monitoring

It is recommended that a full suite of tissue analysis occurs on samples of fish caught from Lake Albert once every 3 years during the operational phase of the project.

6.2 Inspections and Reporting

6.2.1 Monthly Reporting

The ESO and CLO shall be full time appointments for all projects that require NEMA authorisation, and shall produce a monthly compliance monitoring report, which covers all aspects of compliance with the specification in this O-ESMP. The content of the report shall include, but not be limited to:

- Main site activities during the month;
- Community nuisance (e.g. dust, noise);
- Community health and safety;
- Traffic and pedestrian safety;
- Hazardous waste management;
- Non-hazardous waste management;
- Spills and hazardous product management;
- Wastewater management;
- Cultural heritage;
- Natural heritage;
- Rehabilitation;
- Control of alien invasive plants;
- Erosion and sedimentation;
- Communication with stakeholders;
- Compliments and complaints;
- Trends in performance;
- Disciplinary action;
- Communicable diseases;
- Corrective actions / Conformance Certificate; and
- The format of the report may be modified with the agreement of the CNOOC Environmental Coordinator and Public Affairs Coordinator.

6.2.2 Corrective and Preventive Action

The need for corrective action shall arise from material deviations from:

- A predetermined baseline or limit (as detected by monitoring); or
- General inspections based on O-ESMP requirements.

CNOOC shall establish an incident and non-conformance reporting procedure which shall be implemented prior to the initiation of any works. The procedure shall set out a structure for the proper recording of incidents / non-conformances and shall determine the necessary reporting channels.

Incident recording shall include a brief description of the non-conformance with the contract specification, the date it was first logged, the reason for the non-conformance, the responsible party, the result (consequence), the corrective action taken, and any necessary follow up required. Repeated non-compliances in respect of the same issue shall be highlighted. Corrective actions may include:

- Implementation of a specific action to remedy an identified non-conformance; or
- A recommended change to the targets or objectives set in the O-ESMPs[34]. In this case, following discussion and agreement with CNOOC, the proposed change shall be brought about in the O-ESMP, which shall be submitted to Government as a part of CNOOC's six monthly reporting cycle.

Should a Government Authority audit find that operation/ maintenance activities are causing unacceptable environmental damage, the Contractor shall immediately consult with CNOOC and agree, in consultation with the Government, the remedial measures to be undertaken. Such agreed measures shall be implemented quickly to prevent further damage and to repair any damage that may have occurred.

6.2.3 Environmental Committee Meetings and Reporting

CNOOC must establish an environmental committee that includes as a minimum: the ESO, the EC, a member of the Community Liaison Team, and the Contractor's environmental representative. This committee shall meet every two weeks to review environmental performance, including incidents/non-conformances reported, corrective actions implemented, monitoring results and O-ESMP compliance. The meetings must be documented.

6.2.4 Six-Monthly Report

The CNOOC Environmental Coordinator must prepare a report every six months for submission to CNOOC management and NEMA. The report must:

- Summarise environmental and social performance over the 6-month period and examine any trends and corrective actions taken to comply with the O-ESMP;
- Evaluate environmental performance by reviewing monitoring results;
- Consider trends over the period as an indication of improving or deteriorating performance;
- Identify any critical areas of performance that requires immediate improvement;
- Evaluate changing circumstances and lessons learned that may need to influence and be reflected in the O-ESMP; and
- Set new objectives or specifications in the O-ESMP, as appropriate.

6.2.5 Independent Audits

An independent auditor shall prepare the project audits. An audit procedure shall be developed by CNOOC to ensure that audits are sufficiently comprehensive and comply with the relevant requirements of the government of Uganda. The audit procedure shall include:

- Audit approach;
- Scheduling;
- Reporting; and
- Responsibilities.

[34] Modification to the ESMPs may only be made by the CNOOC Environmental Co-ordinator. If the changes are major or are material changes as defined in CNOOCs license, an independent environmental specialist must verify their applicability and the ESMP must be submitted to NEMA.

There shall be two audits, scheduled as follows:

- Post-operation audit report based on a site visit, the review of monthly monitoring reports and discussion with the Contractor's environmental team, CNOOC's environmental team and any other party whose views/ opinions are relevant; and
- Final audit report at the end of the operation contract and at the end of the maintenance period (one year post contract sign-off), prior to CNOOC's representative issuing a closure certificate for rehabilitation.

Auditing shall consider monitoring results to assess whether O-ESMP objectives and targets have been met, and whether there has been any significant non-conformance with the O-ESMP and/ or legal requirements. The audit shall also assess whether EMP implementation has been undertaken according to the planned staffing and administrative arrangements and that respective EMPs are being appropriately updated. The audit shall confirm if any identified corrective action has been undertaken and assess the effectiveness of the action as a basis for recommendations to improve contractor performance and the effectiveness of the O-ESMP.

7.0 COMPETENCY, TRAINING AND AWARENESS CREATION

7.1 General Training Requirements

The Contractor shall ensure that training is provided to all employees about CNOOC's commitment to conduct the proposed activities in a manner that is respectful to local people, and which minimises impact on their land, resources and the natural environment. Training shall take the form of, but not be limited to:

- Induction training;
- Use of educational posters; and
- Daily environmental discussion topics prior to the start of each shift (toolbox talks).

The Contractor shall provide induction training material and key educational posters to the Engineer for approval prior to establishment on site. Ongoing toolbox talks and other educational posters shall be structured to meet specific needs, depending on the activity being undertaken. The Contractor shall maintain an updated list of all training sessions for review at the monthly meetings. For induction training, the material shall include (but not be limited to) the following:

- CNOOC's corporate environmental, health and safety policies and applicable Ugandan environmental regulations;
- Avoidance of activity outside of the approved operational/ maintenance right of way;
- Traffic and pedestrian safety;
- Permitted communication and courteous behaviour in interactions with communities;
- Purchase of food and goods from hawkers;
- Management of STIs and Malaria;
- Alcohol and drug policy;
- Minimising nuisance impacts in local communities;
- Minimising impacts on cultural heritage (including Chance Find procedure);
- Minimising impacts on natural heritage (hunting, harassing animals, plant collection, animal collection for sale as pets);
- Dealing with dangerous animals;

- Handling potentially hazardous and polluting substances;
- Use of sanitary facilities on site;
- Dealing with pollution spills;
- Littering;
- Firefighting procedures;
- Procedures for emergency response; and
- Reporting of incidents.

Toolbox talks shall be structured to provide more detail around the specific tasks that are the responsibility of the operation/ maintenance crew. Contractors and CNOOC shall make financial provision for unforeseen potential impacts that may require specific mitigation / management measures.

7.2 Specialist Training Material

CNOOC shall prepare and provide to the Contractor the following field booklets for use by key members of staff and for dissemination to employees, as requested:

- 'Encountering Wild Animals': the booklet shall contain easy to understand, fully illustrated information about wild animals that could be encountered, whether they are dangerous, and the necessary actions to be taken in the event that they are found;
- 'Managing Alien Invasive Plant Species': The booklet is to include all alien plant species listed in the O-ESMP, with clear illustrations and recommended methods of eradication; and
- 'Good Relationships with Communities'. The booklet is to provide all personnel with basic rules of courteous communication with community members when encountered in the field.

7.3 Handling of Snakes and other Potentially Dangerous Animals

The Contractor is to train selected members of staff in safe methods of handling snakes and other potentially dangerous animals. Sufficient capacity shall be developed to ensure that there is always a trained member of staff on site in the event that a snake needs to be removed from a work site or camp. The necessary snake handling equipment is to be provided to the employees responsible for removing snakes. All animal relocations are to be photographed, logged and reported at the monthly meetings.

In cases where reptiles that are captured could be rare (including snakes, skinks, lizards) they should be photographed and temporarily kept in safe containment until they can be positively identified and safely relocated by a suitably qualified professional.

8.0 EMERGENCY PREPAREDNESS AND RESPONSE

All emergencies shall be handled according to the existing CNOOC Emergency Plan. CNOOC's Emergency Response Team shall provide immediate response to any significant incident, and the emergency contingency plan will also be integrated with that of the local Municipality, if required.

The Project and Contract manager shall establish and maintain procedures to identify the potential for, and the response to, new accidents and emergency situations in accordance with recognised international standards. The procedure shall also address measures to prevent such situations and to mitigate environmental impacts that may be associated with them.

It is also recommended that the Emergency Response Plan is finalized and reviewed by independent experts, taking into consideration the sensitivities in the project area and the need for very rapid response times in the event of an accident.

Finally, it is recommended that CNOOC's safety management systems and risk management performance in respect of accidents is reviewed annually by external auditors with extensive experience of hazard management and best safety practices in oil industry facilities.

Emergency plan update

When preparing additional measures for dealing with emergencies, the following aspects must be taken into account:

- An evacuation procedure that is consistent to that of the neighbouring activities, and which includes the consideration of shelter in case of gas releases;
- Details of the method for identifying and accounting for the number of persons on site at all times;
- Means of visitor control;
- All employees, contractors and visitors will be made aware / trained on the contents of the Emergency plan;
- Allocated responsibilities and specific action details;
- Training of staff to manage emergencies on site;
- Frequency of revision and update of the plan;
- A procedure for activating the emergency plan;
- An Emergency Control Centre (ECC) available on site, complete with:
  - Copies of the most recent version of the emergency plan and the most recent version of the site layout and location plans / maps;
  - Diagrams of those service facilities, communications, fire hydrants, safety refuges, building emergency exits and muster points required in an emergency;
  - Relevant equipment for both internal and external communications;
  - A readily available means of recording messages and communications in chronological order; and
  - Sufficient room to accommodate the emergency management personnel.
- Emergency resources including but not limited to:
  - On-site first aid services and facilities must be available;
  - A vehicle, suitable for the transport of casualties, must be available on site at all times;
  - Fixed location firefighting equipment (extinguishers, hose reels, etc.) must be distributed and located where necessary, accordingly to a risk analysis and maintained in accordance with the manufacturer's instructions;
  - Fire extinguishers must be available in all vehicles and accommodation/administration facilities;
  - A fire water main system, which would include a fire water source, must be available and in good operating condition;
  - All construction personnel must receive basic training in firefighting, first aid and other emergency responses;
  - Regular (quarterly) emergency response drills should be held; and

  - The coordination and approach regarding these resources must be consistent with neighbouring operations.

- An incident command protocol must be drawn up and agreed upon by the local Fire Service to avoid conflict when they arrive on site for large incidents;
- A Mutual Aid corporation agreement with neighbouring sites should be negotiated. This agreement should address all relevant factors, such as financial contributions by both parties, maintenance of equipment, emergency response plan shared between the two sites, location of emergency response vehicles, training etc.;
- Measures to be taken in respect of unplanned fires and explosion hazards are:
  - The CPF control room lies within a damage zone affected by an explosion. A blast proof design should be considered;
  - The consequences of an explosion or a fire on the well pads would exceed the maximum threshold values at the duty room, living quarters, manager's room, meeting room, security room in all cases for an explosion and in some cases for a fire. The study recommends that prevention measures will need to be considered for the construction phase (i.e.: drilling). Flammable gas detectors must be available on the well pads (location and number to be determined). All staff must be required to leave the well pad in the event of gas detection; and
  - The airstrip will be decommissioned during construction and converted to a laydown area in order to minimise the risk caused by an aircraft crashing directly into one of the CPF or well pad installations, with potentially catastrophic circumstances.

In terms of the Bureau Veritas (2017) 8 critical groups for an effective management strategy on major hazards, Group D and F in particular require the following from CNOOC Uganda:

- Continuous monitoring through a Facility Status Management (FSM) system – the FSM shall provide a continuous status monitoring of Preventative Maintenance (PM) and Corrective Maintenance (CM) tasks in PMMS; and provide an indication of the state of technical integrity on the facility;
- Operations / Asset management and Technical Authorities shall review FSM at any stage and look into performance issues of a specific piece of equipment on the facility, or gain an overall picture / trend of the integrity of the facility; and
- Periodic monitoring through Audits – there are a number of specific audits which will assure the performance of SCEs and validate the daily monitoring / control through FSM:
  - Audits or any program to verify the barrier integrity and effectiveness i.e. regular Barrier Health Checks by Technical Authorities, Maintenance, Operations and Asset team members;
  - Structured technical integrity audits – such as Independent Asset Integrity Review, by technical authorities or external party; and
  - Technical Integrity Framework Review – to validate the process underpinning the technical integrity monitoring.

The following prevention and control measures must be implemented within the design of the Kingfisher Field Development Area:

Sources	Prevention and Control Measures
Storage tanks	■ Bund 110%; ■ Overfilling protection (level protection ESD – HHLL); and ■ Local level indication (DCS) – no actions.

Sources	Prevention and Control Measures
Oil production manifold	■ Process safety control; ■ Well pad bunded and drainage system; ■ Pressure control system (HHLL, HLL etc. with automatic link to ESD); ■ Emergency shutdown control (ESD); ■ Thick walls (over pressure not possible); and ■ Corrosion prevention and allowance.
Christmas tree	■ Process safety control; ■ Pressure control system (HHLL, HLL etc. with automatic link to ESD); ■ Emergency shutdown control (ESD); ■ Wellhead control system (subsurface safety valve and surface safety valve and choke valve); and ■ Drainage system.
Well casing	■ Well integrity control; ■ Pressure control system; ■ Wellhead control system (subsurface safety valve and surface safety valve and choke valve); and ■ Drainage system.
Closed drain drum	■ Process safety control; ■ Concrete lined; and ■ Inspection regime.
Wastewater pit / underground storages	■ Concrete lined and secondary HDPE.
Infield flowlines	■ Corrosion protection (cathodic protection and allowance); ■ Automatic pressure loss detectors; and ■ Process safety control ESD system.
CPF piping	■ Insulated which will contain small leaks; ■ Corrosion allowance; ■ Isolation valves; ■ Gas detection; ■ ESD (pressure control); and ■ Drainage system.

9.0 DOCUMENT CONTROL

The O-ESMP forms the basis for the management of environmental and social impacts on site, during the operation phase. Based on the results of the performance assessment and review process, the O-ESMP may be modified as the project progresses. Modifications shall only be permitted by the CNOOC Environmental Co-ordinator (EC), who shall retain a single master copy of the O-ESMP on site (hard copy and electronic format). All changes to the O-ESMP must be tracked, including details of the change, date of the change and name of the reviewer. The EC shall ensure that any modifications in the O-ESMP are communicated, explained to and discussed with all affected parties (the Contractor, CNOOC management and any directly affected party who requests this information), and shall be submitted to and approved by NEMA.

CNOOC shall prepare a document control procedure which the Contractor shall comply with. This procedure shall define the following aspects; Document distribution; Document retention; Management of O-ESMP revisions; and the document control procedure shall also apply to the Incident and Non-Conformance Reporting.

APPENDIX A

Environmental, Health and Safety Specifications, and Applicable Design Codes and Standards

Environmental, Health and Safety Specifications

Specification code	Specification Name
QHSE-MS - General Volume (L2)	
CUL-QHSE-L2-001	QHSE Committee Rules
CUL-QHSE-L2-002	Infrastructure and Equipment Management Procedure
CUL-QHSE-L2-003	Training Management Procedure
CUL-QHSE-L2-004	Contractor QHSE Management Procedure
CUL-QHSE-L2-005	Communication Management Procedure
CUL-QHSE-L2-006	Document Management Procedure
CUL-QHSE-L2-007	Hazard Identification and Risk Assessment Procedure
CUL-QHSE-L2-008	Legal and Other Requirements Management Procedure
CUL-QHSE-L2-009	MOC Procedure
CUL-QHSE-L2-010	Emergency Preparedness and Response Procedure
CUL-QHSE-L2-011	Engineering Quality Management Procedure
CUL-QHSE-L2-012	Engineering Schedule Control Procedure
CUL-QHSE-L2-013	Preservation of Products and Deliverables Procedure
CUL-QHSE-L2-014	Identification and Traceability Management Procedure
CUL-QHSE-L2-015	Partner Property Management Procedure
CUL-QHSE-L2-016	Monitoring and Measurement Equipment Management Procedure
CUL-QHSE-L2-017	Monitoring and Measurement Management Procedure
CUL-QHSE-L2-018	Audit Management Procedure
CUL-QHSE-L2-019	Incident Management Procedure
CUL-QHSE-L2-020	Nonconforming Product Management Procedure
CUL-QHSE-L2-021	Corrective and Preventive Action Procedure
CUL-QHSE-L2-022	Management Review Procedure
CUL-QHSE-L2-023	QAQC Procedure
QHSE-MS - General Volume (L3)	
CUL-QHSE-L3(GE)-001	QHSE Responsibility Management Specification
CUL-QHSE-L3(GE)-002	Contract QHSE Clause Specification
CUL-QHSE-L3(GE)-003	Quality Management Survey Specification for Contractor Pre-Qualification
CUL-QHSE-L3(GE)-004	QHSE Meeting Management Specification
CUL-QHSE-L3(GE)-005	Employee Participation Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-006	Stakeholder Engagement Specification
CUL-QHSE-L3(GE)-007	Respiratory Protection Specification
CUL-QHSE-L3(GE)-008	Hearing Conservation Specification
CUL-QHSE-L3(GE)-009	Radiation Management Specification
CUL-QHSE-L3(GE)-010	Ergonomics Management Specification
CUL-QHSE-L3(GE)-011	Fitness For Duty Management Specification
CUL-QHSE-L3(GE)-012	Heat Stress at Work Specification
CUL-QHSE-L3(GE)-013	Alcohol & Drugs Management Specification
CUL-QHSE-L3(GE)-014	Food & Drinking water Hygiene Management Specification
CUL-QHSE-L3(GE)-015	Medical Service Management Specification
CUL-QHSE-L3(GE)-016	Communicable Disease Management Specification
CUL-QHSE-L3(GE)-017	Stress & Fatigue Management Specification
CUL-QHSE-L3(GE)-018	Office HSE Management Specification
CUL-QHSE-L3(GE)-019	Festival and Holiday Safety Specification
CUL-QHSE-L3(GE)-020	Business Travel Specification
CUL-QHSE-L3(GE)-021	Marine Operation Specification
CUL-QHSE-L3(GE)-022	Aviation Management Specification
CUL-QHSE-L3(GE)-023	Land Transportation Specification
CUL-QHSE-L3(GE)-024	Workplace Transportation Specification
CUL-QHSE-L3(GE)-025	PPE Management Specification
CUL-QHSE-L3(GE)-026	Sign and Signal Management Specification
CUL-QHSE-L3(GE)-027	Behavior Based Safety Specification
CUL-QHSE-L3(GE)-028	Job Hazard Analysis Specification
CUL-QHSE-L3(GE)-029	PTW Management Specification
CUL-QHSE-L3(GE)-030	Excavation Management Specification
CUL-QHSE-L3(GE)-031	Confined Space Entry Specification
CUL-QHSE-L3(GE)-032	Lifting Operation Specification
CUL-QHSE-L3(GE)-033	Electrical Safety Specification
CUL-QHSE-L3(GE)-034	Hot Work Specification
CUL-QHSE-L3(GE)-035	Fire Safety Specification
CUL-QHSE-L3(GE)-036	Working at Height Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-037	Fall Prevention Specification
CUL-QHSE-L3(GE)-038	Scaffolding Operation Specification
CUL-QHSE-L3(GE)-039	Slip and Trip Prevention Specification
CUL-QHSE-L3(GE)-040	Industry Safety Specification
CUL-QHSE-L3(GE)-041	Suspension and Resumption Specification
CUL-QHSE-L3(GE)-042	Energy Isolation Specification
CUL-QHSE-L3(GE)-043	SIMOPS Specification
CUL-QHSE-L3(GE)-044	Camp Management Specification
CUL-QHSE-L3(GE)-045	Hazardous Chemicals Management Specification
CUL-QHSE-L3(GE)-046	Explosive Management Specification
CUL-QHSE-L3(GE)-047	H2S Prevention Specification
CUL-QHSE-L3(GE)-048	Fuel Management Specification
CUL-QHSE-L3(GE)-049	Fieldwork Management Specification
CUL-QHSE-L3(GE)-050	Working Near or Over Water Specification
CUL-QHSE-L3(GE)-051	Personnel Dynamic Information Management Specification
CUL-QHSE-L3(GE)-052	Environmental Permitting Management Specification
CUL-QHSE-L3(GE)-053	Waste Management Specification
CUL-QHSE-L3(GE)-054	Water Management Specification
CUL-QHSE-L3(GE)-055	Air Quality Management Specification
CUL-QHSE-L3(GE)-056	Noise Management Specification
CUL-QHSE-L3(GE)-057	Biodiversity Management Specification
CUL-QHSE-L3(GE)-058	Aquatic and Terrestrial Habitat Management Specification
CUL-QHSE-L3(GE)-059	Spill prevention and Control Specification
CUL-QHSE-L3(GE)-060	Sediment and Erosion Control Specification
CUL-QHSE-L3(GE)-061	NORM Management Specification
CUL-QHSE-L3(GE)-062	Greenhouse Gas Management Specification
CUL-QHSE-L3(GE)-063	Energy Management Specification
CUL-QHSE-L3(GE)-064	Quality Control Reporting Specification
CUL-QHSE-L3(GE)-065	Materials Inspection and Acceptance Specification
CUL-QHSE-L3(GE)-066	QHSE Inspection Specification
CUL-QHSE-L3(GE)-067	Occupational Health Monitoring Specification

Specification code	Specification Name
CUL-QHSE-L3(GE)-068	Occupational Health Surveillance Specification
CUL-QHSE-L3(GE)-069	Environmental Monitoring Specification
CUL-QHSE-L3(GE)-070	HSE Award Specification

APPENDIX B

Guide to Permits, Licenses and Approvals

This table is a non-exhaustive guide only and it is responsibility of CNOOC and contractors to ensure all relevant permits, licenses, and approvals are acquired and complied with

Type of permit/approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Groundwater Abstraction Permit/Surface Water Abstraction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	Any abstraction of water from natural surface waters (lake, river or stream) and groundwater (aquifer, spring, etc.)	Directorate of Water Resource Management (DWRM)	■ Form A: Application for a Surface Water Permit. ■ Form B: Application for a Ground Water Permit.	Prior to any project-related surface or groundwater abstraction
	The Water Resources Regulations, 1998	Regulation 3, sub-regulation (1): A person who, a) occupies or intends to occupy any land; (b) wishes to construct, own, occupy or control any works on or adjacent to the land referred to in Regulation 10; and May apply to the Director for a water permit.				
		Regulation 3, Sub-regulation (2): An application referred to under sub-regulation (1) shall, (a) be in the form specified in the First Schedule to these regulations except that, i) Form A shall be used for surface water permits; and ii) Form B shall be used for ground water permits.				
Construction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	■ Any works or structures constructed in or adjacent to natural waters (rivers or lakes) whether temporary or permanent. ■ Any abstraction of groundwater requiring construction of a borehole.	DWRM	Form F1: Application for Construction Permit	Prior to any project-related water abstraction construction of works or structures in or adjacent to natural waters
	The Water Resources Regulations, 1998	Regulation 16, Sub-regulation (2): A person who wishes to engage a driller under sub-regulation (1) to construct a borehole on his or her land for the purpose of, (a) using water; (b) re-charging an aquifer; or (c) fitting a motorised pump to a borehole; and May apply to the Director for a construction permit in Form F1 of the Sixth Schedule.				
Waste Water Discharge Permit	The Water (Waste Discharge) Regulations, 1998	Regulation 4, sub-regulation (1): No person shall discharge effluent or waste on land or into the aquatic environment contrary to the standards established under regulation 3 unless he or she has a permit in the format specified in the First Schedule issued by the Director.	Any project likely to result in the discharge of effluent or waste water (treated or untreated) onto land or into a water body.	DWRM	Form A: Application for a Waste Discharge Permit	Prior to construction of project facilities (e.g. camps, well pads)
Licence to Emit Noise in Excess of Permissible Noise Levels	The National Environment (Noise Standards and Control) Regulations, 2003	Regulation 12, Sub-regulation (1): An owner or occupier of premises whose works or activities are likely to emit noise in excess of the permissible noise levels shall apply to the Executive Director in the form prescribed in Part I of the Second Schedule, for a Licence to Emit Noise in Excess of the Permissible Levels.	Projects in which it is highly likely that noise levels generated by the proposed activity will exceed permissible levels and cause a significant nuisance effect (e.g. flaring and quarrying).	NEMA	Form NEMA/NC: Application for A Licence To Emit Noise In Excess Of Permissible Noise Levels	Prior to commencement of activities likely to emit noise in excess of permissible levels

Type of permit/approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000	■ Regulation 12, Sub-regulation (1): Subject to the provisions of Regulations, a person shall not carry out any activity in a wetland without a permit issued by the Executive Director. ■ Regulation 12, Sub-regulation (2): Any person intending to carry out an activity listed in the Second schedule to these Regulations shall apply to the Executive Director for a permit in Form A of the First Schedule. Regulation 23, Sub-regulation (1): A person who intends to carry out any of the following activities shall make an application to the executive Director in Form A set out in the First Schedule to these Regulations - (a) use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, under, or over the river banks or lake shore; (b) excavate, drill, tunnel or otherwise disturb the river bank or lake shore; (c) introduce or plant any of a plant whether alien or indigenous on a river bank or lake shore; (d) introduce any animal or micro-organism, whether alien or indigenous in any river bank or lake shore; or (e) deposit any substance on a riverbank or lakeshore if that substance would or is likely to have adverse effects on the environment.	■ Any regulated activity (listed in the Second Schedule to the Regulations) undertaken in a wetland, or within the protection zone of a riverbank; ■ 100 m from the highest watermark of a river listed in the Sixth Schedule; 30 m for a non-listed river; and ■ 200 m from the low watermark for a listed lake; 100 m for a non-listed lake.	NEMA	Form A: Application for a Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	Prior to undertaking any project activities within wetlands, riverbanks or lake shores
Registration of a Workplace	The Occupational Safety and Health Act, 2006	Section 40, Subsection (2): a person shall not less than one month before he or she begins to occupy any premises as a workplace, serve on the Commissioner, a notice with the particulars prescribed in Schedule 3.	Any project requiring the establishment of a work place (e.g. drill site or camp).	■ Department of Occupational Safety and Health; and ■ Ministry of Gender, Labour and Social Development.	Particulars to be Submitted When Applying for the Registration of a Workplace or a Change in the Registered Occupier	Immediately upon (not later than one month) prior to undertaking any site works (construction, operation, pre-construction surveys)
Development Permission	The Physical Planning Act, 2010	Section 33, Subsection (1): A person shall not carry out a development within a planning area without obtaining development permission from a physical planning committee.	Any development involving construction of permanent or semi-permanent structures or establishments such as base camps	District Technical Planning Committee	Form PPA 1: Application for Development Permission	Before commencement of any project activities
Licence for Storage of Hazardous / Non-Hazardous Waste	The National Environment (Waste Management) Regulations, 1999	Regulation 6, Sub-regulation (1): A person intending to store waste on his or her premises shall apply to the Authority for a licence in Form III set out in the First Schedule.	Any project requiring construction or operation of a storage facility for hazardous or non-hazardous waste (e.g. drill cuttings)	NEMA	Form III: Application for a Licence for Storage of Hazardous Waste	Prior to commencement of any activity requiring temporary storage of hazardous waste
Authorisation to use radioactive sources	The Atomic Energy Act, (Cap 143)	Section 32, Subsection (1): Subject to section 33, no person shall acquire, own, possess, operate, import, export, hire, loan, receive, use, install, commission, decommission, transport, store, sell, distribute, dispose of, transfer, modify, upgrade, process, manufacture or undertake any practice related to the application of	Projects requiring the use of radioactive materials e.g. oil well drilling	Atomic Energy Council, Ministry of Energy and Mineral Development	Notification of Council (requirements listed in Section 34 (2)) Application for an Authorisation (required	Prior to commencement of project activities (specifically well drilling)

Type of permit/approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
		atomic energy and regulated by this Act unless permitted by an authorisation issued under this Act.			information listed in Section 35 (1) of the Act	
Licence to erect or carry on a magazine	The Explosives Act, (Cap 298)	Section 22, Subsection (1): Any person desiring to erect or carry on a magazine for the storage of explosives shall make application for a licence to erect or carry on a magazine.	Activities requiring the temporary storage of explosives	Ministry of Internal Affairs	Licence to erect or carry on a magazine	Prior to procurement and/or use of explosives
Lease Agreement	The Registration of Titles Act, (Cap 230)	Section 101: The proprietor of any freehold under the operation of this Act may, subject to any law or agreement for the time being in force, lease that land for any term exceeding three years by signing a lease of it in the form in the Eighth Schedule to this Act.	Access to or use of land for project activities	District Land Board	Application for Lease	Prior to temporary use of or access to land for project activities.
	The Land Act, (Cap 227)	Section 73: Where it is necessary to execute public works on any land, an authorised undertaker shall enter into mutual agreement with the occupier or owner of the land in accordance with this Act; and where no agreement is reached, the Minister may, compulsorily acquire land in accordance with section 42.				
	The Land Acquisition Act, (Cap 226)	Section 19: Nothing in this Act shall prevent the Government from entering into an agreement with a person having an interest in land by which— a. that person's interest in land is acquired by the Government; or b. that person's claim to compensation for land under this Act is settled by the grant of other land or in any other way.				

November 2019

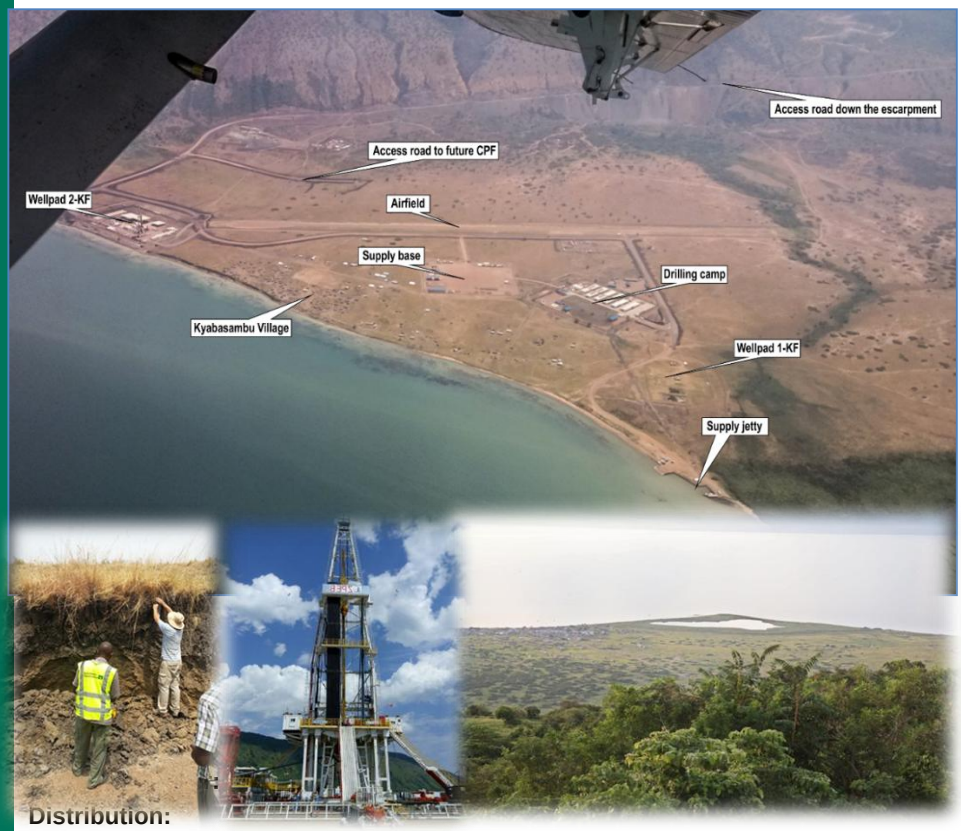
REPORT – VOLUME 2, PART 3

CNOOC UGANDA LIMITED

Environmental and Social Impact Assessment for Kingfisher Field Development Area in Hoima & Kikuube Districts, Uganda

CPF, Wells and Ancillary Infrastructure Decommission - Framework ESMP

Submitted to:
The Executive National Environmental Management Authority
NEMA House, Plot 17/19/21 Jinja Road
P.O. Box 22255 Kampala, Uganda



Distribution:

Table of Contents

TABLES

No table of figures entries found.

FIGURES

APPENDICES

List of Acronyms and Abbreviations

Acronym	Description
3LPP	3 Layer Polypropylene
BAT	Best Available Technology
BLPD	Barrels of Liquid per Day
BOPD	Barrels of Oil per Day
BS&W	Basic sediment and water content of crude oil. Part of quality specifications.
BVS	Block Valve Station
BWPD	Barrels of Water per Day
CCO	Customary Certificate of Ownership
CCR	Central Control Room
CCTV	Closed Circuit Television
CDP	Community Development Plan
CFP	Chance Find Procedure
CFR	Central Forest Reserve
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLF	Community Liaison Forum
CLOs	Community Liaison Officers
CNOOC	China National Offshore Oil Corporation
CO_2	Carbon Dioxide
CPF	Central Processing Facility
CR	Critically Endangered
CUL	CNOOC Uganda Limited
CV	Curriculum Vitae
DEO	The District Environment Officer
D-ESMP	Decommissioning Environmental and Social Management Plan
DRC	Democratic Republic of Congo
DWRM	Directorate of Water Resources Management
EA	Exploration Areas
EACOP	East African Crude Oil Pipeline
EBRD	European Bank for Reconstruction and Development
EBS	Environmental Baseline Study
EC	Environmental Coordinator
ECC	Emergency Control Centre
EFOs	Environmental Field Officers
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement

Acronym	Description
EMS	Environmental Management System
EP C-ESMP	Construction Environmental and Social Management Plan
ES	Ecosystem Services
ESD	Enterprise and Supplier Development
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental and Social Management Plan
ESO	Environmental Site Officer
ESP	Electric Submersible Pump
FD-ESMP	Framework Decommissioning Environmental and Social Management Plan
GIIP	Good International Industry Practice
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ICSS	Integrated Control and Safety Systems
IFC	International Finance Corporation
IMP	Influx Management Plan
IPIECA	International Petroleum Industry Environment and Conservation Association
IT	Information Technology
IUCN	International Union for Conservation of Nature
KFDA	Kingfisher Field Development Area
LC	Least Concern
LC	Local Council
LOCSA	Liaison Officer-Community and Stakeholder Affairs
LP	Liquefied Petroleum
LPG	Liquefied Petroleum Gas
LSA	Local Study Area
mbgl	metres below ground level
MEMD	Ministry of Energy and Mineral Development
MGLSD	Department of Occupational Safety and Health, Ministry of Gender Labour and Social Development
MMS	Machine Monitoring System
MPFM	Multiphase Flow Meter
MSDS	Material Safety Data Sheets
MTWH	Department of Museums and Monuments, Ministry of Tourism, Wildlife and Heritage
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGO	Non-governmental Organisations
NORM	Naturally Occurring Radioactive Materials
NOx	Oxides of Nitrogen
NPSH	Net Positive Suction Head
NSRs	Noise Sensitive Receptors

Acronym	Description
OGP	International Association of Oil and Gas Producers
PEPD	Petroleum Exploration and Production Department
PLA	Project Labour Agreement
PLDS	Pipeline Leak detection System
PLMS	Pipeline Leak Monitoring System
PM	Particulate Matter
PPE	Personal Protective Equipment
PS	Performance Standards
PSAs	Production Sharing Agreements
Ptb	Pounds per Thousand Barrel
RAP	Resettlement Action Plan
RoW	Right of Way
RSA	Regional Study Area
RTU	Remote Terminal Unit
RVP	Reid vapour pressure (RVP) is a common measure of the volatility of gasoline.
SCADA	Supervisory Control and Data Acquisition
SEHT	Skin-effect Heat Tracing System
SO_2	Sulphur Dioxide
SoCs	Species of Conservation Status
SOW	Scope of Work
SPT	Sewage Treatment Plant
STI	Sexually Transmitted Infections
UCPs	Unit Control Panels
UNRA	Uganda National Roads Authority
UWA	Uganda Wildlife Authority
VOC	Volatile Organic Compounds
VOIP	Voice over Internet Protocol
WAT	Wax Appearance Temperature
WHCP	Hydraulic Wellhead Control Panel
WHO	World Health Organisation
WMD	Wetlands Management Department
WRMD	Water Resource Management Directorate

1.0 INTRODUCTION

This Framework Decommissioning Environmental and Social Management Plan (FD-ESMP) provides environmental and social management guidance for the decommissioning phase of the Central Processing Facility (CPF), wells, and ancillary infrastructure component of CNOOC's proposed development of the Kingfisher Field Development Area (KFDA), hereafter referred to as the project. Decommissioning refers to the dismantling, decontamination, and removal of process equipment and facility structures and any appropriate remediation. Decommissioning will be undertaken in accordance with Ugandan legislation, International standards, and best practice. Decommissioning is implemented after a facility has ceased operation and equipment has been deactivated.

The CPF FD-ESMP will be updated and finalised in advance of project decommissioning, when details of all decommissioning requirements become available. Environmental and social management of the decommissioning phase of the Feeder Pipeline is addressed separately from the CPF FD-ESMP (i.e. in the FFP-ESMP, 2019).

The CPF FD-ESMP has been informed by CNOOC's Kingfisher Field Development Plan and the ESIA (and associated specialist studies) conducted by Independent Consultants who were appointed by CNOOC. Key objectives of the FFD-ESMP are to:

- Provide a framework for the final decommissioning of CNOOC's facilities in compliance with Ugandan legislative and regulatory requirements for a decommissioning plan;
- Investigate different options for decommissioning (including handing over useful assets to the project's Partners or other third parties);
- Ensure that as much as possible of the work necessary for decommissioning is done before final closure of the project;
- Ensure that measures are in place to maximise, to the greatest reasonable extent, the recycling and re-use of decommissioned plant, materials, equipment and infrastructure to the benefit of people in Uganda and local project-affected people in particular;
- Ensure that measures are in place to safely dispose of all wastes that cannot be recycled and to clean up any contaminated areas on site;
- Provide initial guidelines for reinstatement of land and rehabilitation requirements;
- Provide initial guidelines and future reporting requirements concerning the decommissioning of wells and flowlines and the rehabilitation of well pads and flowline rights of way;
- Ensure that as much as reasonably possible is done to minimise the impact of job losses that will result from the closure of the project;
- Provide guidelines for the process to be followed to update the FD-ESMP, at the time of project decommissioning, including requirements for public participation; and
- Provide requirements for assessment, monitoring and auditing, during and after decommissioning.

The CPF FD-ESMP is a "living document" and information contained in this version will be reviewed and, where necessary, updated. The findings and recommendations of environmental and social monitoring assessments (annually or more frequently) by internal / external auditors will form the basis of updates to the FD-ESMP, as required.

CNOOC will develop and implement an Environmental and Social Management System (ESMS) in accordance with their environmental policies to ensure that environmental impacts caused by project are continually monitored and improved. The ESMS will be in place prior to decommissioning and will accommodate the stipulations contained in the relevant environmental laws and regulations of Uganda.

1.1 Report Structure and Content

The CPF FD-ESMP is structured as follows:

- Chapter 2: Outlines the Project in conjunction with obligations and responsibilities;
- Chapter 3: Describes decommissioning principles;
- Chapter 4: Describes general requirements for decommissioning, including the transfer of responsibility for equipment and infrastructure left for community use, recycling and reuse of materials and wastes, contaminated land management and non-recyclable waste, re-contouring, reinstatement and rehabilitation and socio-economic considerations;
- Chapter 5: Considers specific requirements for the closure of the CPF, wells, and ancillary infrastructure;
- Chapter 6: Describes closure, post closure monitoring and reporting;
- Chapter 7: Outlines the management of decommissioning costs and the provision of funds to cover these costs;
- Chapter 8: Refers to ongoing liability for the management of any risks or pollution after decommissioning; and
- Chapter 9: Outlines the control of the CPF FD-ESMP and procedure for updating the document.

Note: Above we make reference to Chapters but in reality these are Sections in the form of the current document. At the time that the report must be expanded in the years immediately prior to decommissioning commencing, the document will logically have an expanded format where these Sections feature a largely as individual chapters.

1.2 Key point of contact

The key point of contact for the Kingfisher Field Development Area is indicated in Table 1-1.

Table 1-1: Details of the developer, CNOOC

Title	**CNOOC Uganda Limited (CNOOC)**
Organisation	CNOOC Uganda Limited (CNOOC)
Postal address	CNOOC Uganda Limited Simba Towers, Plot 22 Acacia Avenue, P.O BOX 7862, Kololo, KAMPALA, UGANDA
Contact Name	Andrew OTUBA
Telephone	+256 204 500223
Cellular phone	+256 772 798111
E-mail	Andrew.OTUBA@cnoocuganda.com

2.0 PROJECT DESCRIPTION

This section describes the project area and the nature of the activities covered by the CPF FD-ESMP. While the CPF FD-ESMP relates solely to the decommissioning phase of the flowlines, central processing facility (CPF) and supporting infrastructure, there is a separate framework decommissioning plan that relates to the feeder pipeline connecting the Kingfisher Field development area to the export pipeline at Kabaale.

This document should be read together with the ESIA summary and construction and operational management plans for the associated infrastructure, in which the infrastructure components themselves are described in greater detail.

2.1 Wells, flowlines, CPF and supporting infrastructure

The wells, flowlines, central processing facility (CPF) and supporting infrastructure are situated on the Buhuka Flats in the Kingfisher Field Development Area (KFDA), on the south-eastern shores of Lake Albert. The project entails the drilling of wells from four onshore well pads, namely Pad 1, Pad 2, and Pad 3 (where exploration wells have already been drilled) together with Pad 4A (where no drilling has yet taken place). A total of 31 wells are planned to be drilled and commissioned as part of the development, 20 of which will be production wells and 11 to be used as water reinjection wells.

The four well pads are located on the lake shore. From the well pads and horizontal drilling will be utilised to reach the target formation located deep below Lake Albert. The configuration of infrastructure and well pads together with the extent of the proposed wells is indicated in Figure 1.

Once commissioned and in production, the produced well fluids will be conveyed to the CPF through buried infield flow lines connecting each well pad to the CPF. Well fluids will be separated at the CPF to yield produced water, sand, salts and associated gas (together with small quantities of other material) and crude oil of a quality that will meet the crude oil export standard.

At the CPF the associated gas will be utilised for production of power or LPG for local market. Power will serve the requirements of the Kingfisher Field development Area but in later years is likely to be in excess of project requirements and will be exported to the national grid. No gas flaring is contemplated except in cases of emergency.

Supporting infrastructure associated with the production facility will include in-field access roads and flowlines, a jetty, and a water abstraction station on Lake Albert, a permanent camp, a material yard (or ‘supply base’), and a safety check station at the top of the escarpment. In bringing the project into development additional infrastructure was constructed which includes the exploration well pads (1, 2 and 3), associated roads and drilling camp together with waste handling facilities for drill cutting and drill fluids at the site of Pad 2.

The CPF FD-ESMP applies to the Kingfisher Field Development Area (KFDA, Figure 1) along the eastern border of Lake Albert and it is ~15 km long by 3 km wide, with an area of 32.3 km^2. In this figure the extent of additional oil developments in proximity to Lake Albert are also indicated for completeness. This provides context to the tie-in point for the feeder pipeline at Kabaale. In this figure the Kaisa-Tonya (KT) field is also indicated. The reader’s attention is drawn to this point specifically because the design intent for the KFDA infrastructure is that as KFDA production decreases in future years, it will be made up from the KT Field. No specific infrastructure has been allowed for to give effect to this importation of well fluids from KT other than allowing for the tie-in of a pipeline from that field within the CPF layout. However, by the time that the decommissioning plan for the KFDA must be expanded, it will be necessary to establish specifically whether well fluids will be brought in from KT (which would extend the life and defer the decommissioning date) or whether planning has changed to the extent that decommissioning of the infrastructure should be contemplated earlier than is currently the case.

Project components relevant to the CPF FD-ESMP are illustrated in Figure 2 and labelled in a manner that is consistent with the description above for ease of interpretation.

2.2 Feeder Pipeline

From Figure 1 can be seen that a feeder pipeline exits from the CPF and extends to the north running from the CPF storage tanks to a delivery point near Kabaale. While the feeder pipeline is addressed through a separate decommissioning plan it is described very briefly here for context. The feeder pipeline exits the CPF on the east side, running almost due north to the base of the escarpment, where the alignment turns to the East climbing the escarpment. The average gradient in this section of the route is 1:3 (Vertical: Horizontal), rising from roughly 650 to 1 040 mamsl. within a horizontal distance of 740 m. From the point at which the feeder pipeline crests the escarpment, the pipeline route runs to the north-east through gently undulating terrain that is extensively cultivated. This landscape includes a number of rural settlements. The route passes south-east of Hohwa and Kaseeta villages and passes immediately north of the planned Kabaale Airport, turning eastward to the terminal point at the proposed Kabaale Refinery. The total length of the pipeline is 46.2 km.

At Kabaale, the Government of Uganda is planning an industrial park which, among other facilities, will include a refinery, associated petrochemical processing plants, an international airport and related supporting infrastructure.

At the delivery point, there will be metering of the crude oil, which will be piped either to the industrial park to feed the refinery and associated petrochemical industry or exported through the East African Crude Oil Pipeline (EACOP), planned from Kabaale to the Tanga sea port in Tanzania. The EACOP will be a public - private partnership between the governments of Uganda, Tanzania and oil company(s).

The Feeder Pipeline ends at the delivery point in Kabaale. The industrial park and the EACOP are independent projects that do not feature further in the FD-ESMP.

3.0 ENVIRONMENTAL AND SOCIAL CONTEXT

The KFDA ESIA describes the baseline environmental conditions in detail. For purposes of this framework decommissioning plan is important to merely describe the high-level sensitivity of the receiving environment so that the reader has context to measures proposed. In this regard following key points are deemed relevant:

- The Kingfisher Field development area is located on the south-eastern shores of Lake Albert in Western Uganda. The Albertine rift system is a primary tributary of the Nile River. The water quality is largely unaffected by development, supports high diversity of aquatic fisheries on which Lakeshore communities make their living;
- The Buhuka flats on the shores of Lake Albert represent a small terrace of land at the foot slope of the escarpment. This land mass contains five villages which were largely isolated from easy access to market prior to initiation of the oil industry. Road development has changed this situation. Notwithstanding this, the development of a large petroleum processing facility (wells, flowlines and CPF with supporting infrastructure located on the Buhuka flats) will bring about further change during the life of the project area;
- The largely rural nature of the community prior to petroleum development is rapidly changing and will have changed significantly by the time that decommissioning is contemplated. This will need to be carefully assessed, as it has been during conceptualisation of the project, to ensure that the wind down of the petroleum production facility in this area into decommissioning is handled in a manner that is sensible, sensitive to and responsive to the needs of community that are likely to have developed some dependency on the industry, and
- The Government of Uganda have indicated their intent to put in place a physical development plan for the Buhuka flats in particular that will see structured development of this area. The extent to which this materialises in the years to come is yet to be proven but, it is important in this framework plan to acknowledge the development plan and draw the attention of CNOOC and the reader to the need to

contemplate future decommissioning of the production infrastructure in a manner that seeks to extract mutual benefit from infrastructure which may no longer be required for petroleum production at that future point in time. Consequently, planned decommissioning of the facility will need to be carefully discussed and planned together with government to ensure that the interests of both government, local communities and the production licence holder are best met, specifically in regards to future beneficial use of infrastructure no longer required for purposes of petroleum production.

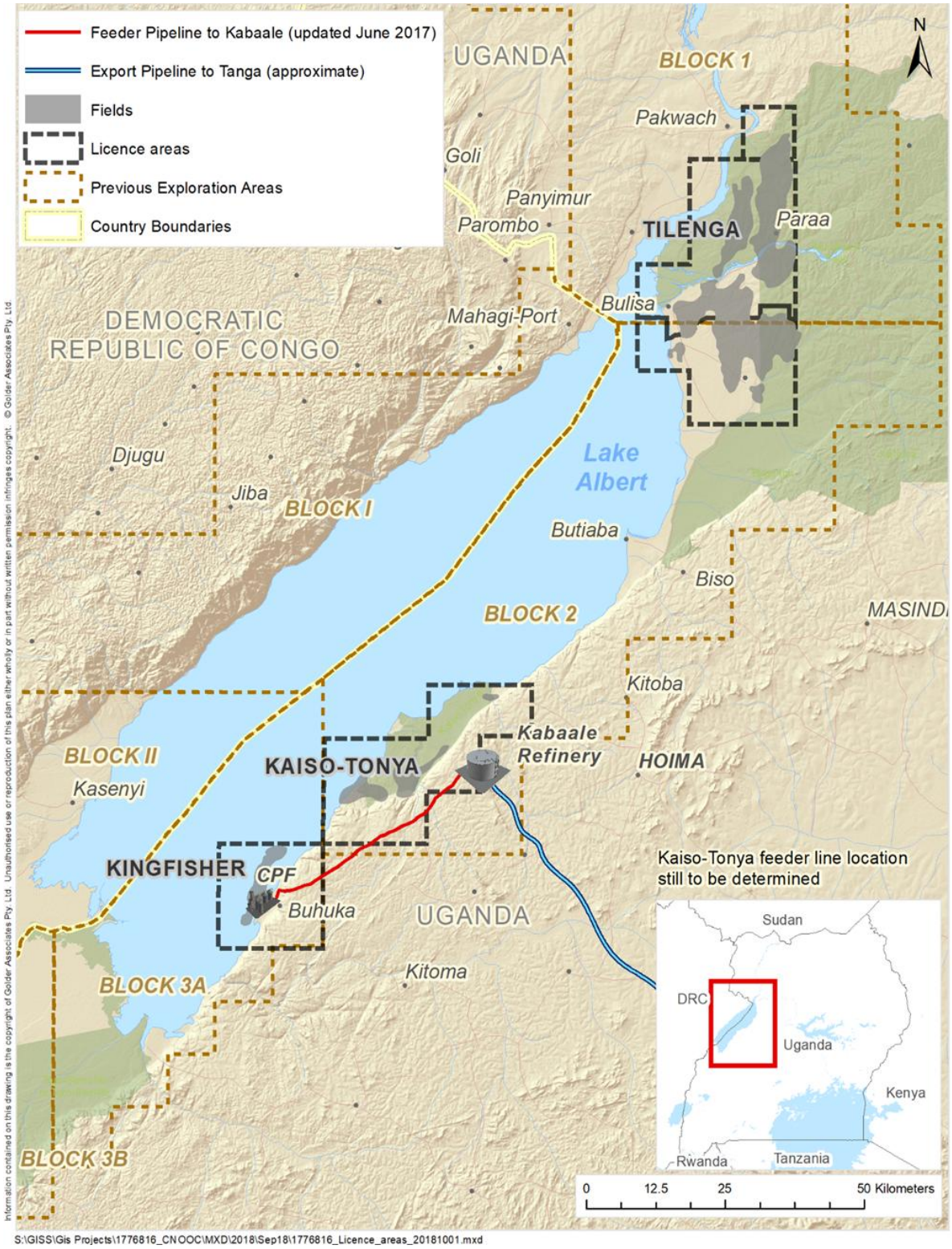


Figure 1: The Kingfisher Field Development Area (KFDA), Kaiso-Tonya License Area and the Tilega License Area

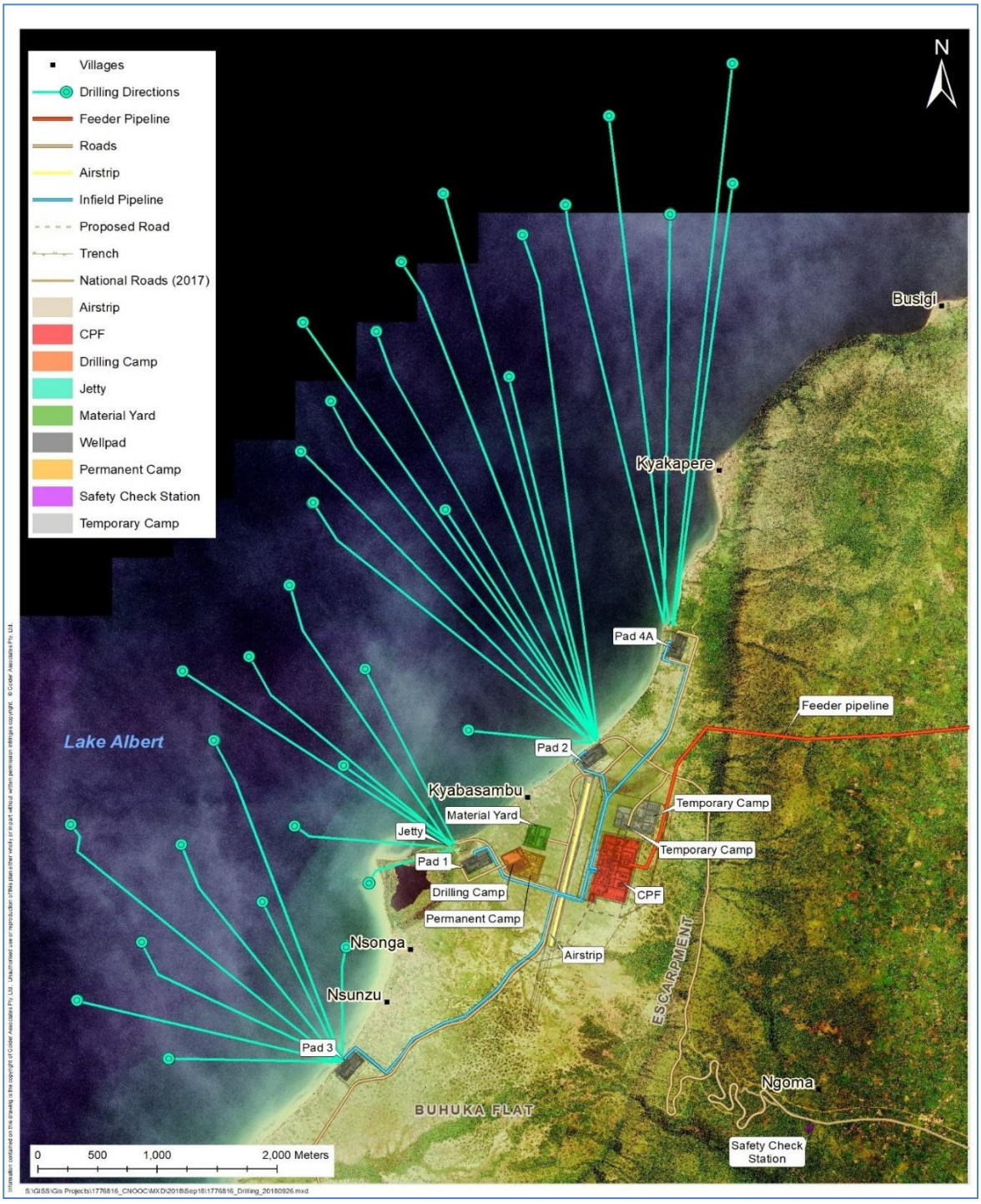


Figure 2: Approximate locations of the production wells and associated infrastructure, flowlines, and CPF. Note that flowlines are between Pads and CPF.

4.0 OBLIGATIONS AND RESPONSIBILITIES

4.1 CNOOC

CNOOC has the overall responsibility for ensuring that the project is undertaken in accordance with Ugandan legislation and the recommendations of this FD-ESMP. CNOOC is also responsible for updating the FD-ESMP, as and when necessary, during the life cycle of the project and must ensure that its contractors adhere to the stipulations of the FD-ESMP. Similarly, to ensure that all work conducted during construction and operation of the Kingfisher field development area takes place in a manner that minimises unnecessary land take and seeks to avoid pollution and contamination so as to limit the requirements for decommissioning and clean-up once operations approach the state of decommissioning.

Consequently, CNOOC undertakes to manage all project activities in a manner that minimises adverse effects on the environment and the public, maximises socio-economic benefits for the project area and protects the health and safety of employees, contractors, visitors and the general public.

To this end, CNOOC will:

1) Ensure that the CPF FD-ESMP forms an integral part of the environmental management planning at the facility and that the document is available to all of their staff, consultants and contractors, as necessary;

2) Educate its personnel, contractors and visitors with regard to the safety, health and environmental (SHE) requirements applicable in general to the project;

3) Provide professional staff to give effect to its safety, health and environmental management commitments;

4) Appoint a competent Management Team to oversee all aspects of the project;

5) Appoint a competent CNOOC Environmental Coordinator (EC) prior to the commencement of decommissioning activities. The EC will perform regular inspections to monitor compliance with the FD-ESMP, provide the appropriate level of management within CNOOC with monthly reports on environmental compliance and performance and provide guidance on the remediation of any unplanned environmental impacts. The EC will also motivate and draft any updates to the CPF FD-ESMP as and when they become necessary;

6) Undertake internal CPF FD-ESMP compliance inspections and audits. These inspections and audits will include all activities associated with the CNOOC project site in its entirety, including activities undertaken by CNOOC's contractors and agents;

7) Monitor, evaluate and report performance regarding safety, health and environmental protection to the relevant management level within CNOOC; and

8) CNOOC and its contractors will be responsible for implementation of the FD-ESMP.

4.2 Contractors

Obligations and responsibilities of contractors are outlined below. Contractors shall:

1) Be required to enter into a contractual commitment with CNOOC to adhere to the requirements of this CPF FD-ESMP and the environmental guidelines and standards contained therein;

2) Familiarise themselves with the undertakings and requirements relevant to the project activities contained in this FD-ESMP, educate their personnel accordingly and ensure that such undertakings and requirements are adhered to;

3) Prepare method statements describing the methods through which compliance with environmental standards will be guaranteed and submit them to CNOOC for approval. Although CNOOC may comment on any inadequacies in these statements, the contractor is solely and exclusively responsible in case of non-compliance with the standards contained in this document;

4) Employ techniques, practices and methods that ensure the fulfilment of these requirements, with specific reference to the control of waste and pollution, the prevention of loss or damage to natural resources and the minimisation of adverse effects on users and holders of neighbouring land and the public in general;

5) Take cognisance of the basic information provided in this FD-ESMP, but shall also verify the accuracy of any information provided, report any inaccuracies or omissions to CNOOC's Management and Field Environmental Manager and, irrespective of any inaccuracies or omissions, comply with the intentions of the requirements stated in this FD-ESMP;

6) Undertake any remedial measures within a reasonable period following the receipt of a written instruction from CNOOC to do so;

7) Take all reasonable and prudent measures to prevent the occurrence of accidents that may compromise the integrity of the environment and/or the health and safety of all persons on site, of all persons on neighbouring land and of the public;

8) Report to CNOOC or its representative all incidents, including but not limited to, environmental damage, injuries and/or loss of or damage to CNOOC's physical assets or corporate image;

9) In the event of an incident as described in point 8 (above) occurring, present a detailed plan to:

   a) Restore the environmental conditions, in so far as it is possible to do so, to a state similar to that existing before the incident;

   b) Address any injuries caused in a manner satisfactory to the injured party or parties and CNOOC; and

   c) Prevent the future occurrence of similar incidents.

10) Comply with CNOOC's internal environmental and social policies and standards;

11) Cooperate in periodic CPF FD-ESMP compliance audits by CNOOC, its external auditors and/or relevant government bodies and provide the necessary information to this effect; and

12) Should government authorities be of the opinion that any activities executed by the contractor cause unacceptable environmental damage, or are inadequate to mitigate environmental damage, the contractor shall immediately consult the competent government authorities and CNOOC and reach an agreement about the remedial measures to be implemented. The measures agreed upon shall be implemented as soon as possible, so as to avoid the occurrence of further damage and to repair any damage that may have occurred. The contractor will be responsible for all relevant costs related to the applicable environmental damage.

4.3 Communication with Government, Communities and Stakeholders

Communication with the Ugandan Government regarding environmental management matters will be via CNOOC's Environmental Coordinator and Liaison Officer – Community and Stakeholder Affairs (LOCSA). Communication with local structures shall be undertaken by the Community Liaison Officer(s) (CLOs) appointed for the decommissioning period, with assistance, where necessary, from the LOCSA.

4.4 Permits and licenses

National laws and regulations require many permits, licences and approvals that could apply to the project or specific activities. All applicable approvals, permits, consents, and licenses relating to the environment must be in place prior to any construction activities and must be stored in a location which is easily accessible to appropriate staff on site. A non-exhaustive guide to permits, licenses, and approvals is provided in APPENDIX B and it is responsibility of CNOOC and contractors to ensure all relevant permits, licenses, and approvals are acquired and complied with.

5.0 DECOMMISSIONING PRINCIPLES

There is no single 'across the board' principle that will best fit all activities, and no single infrastructure component need set a precedent for any other, although opportunities for generic approaches should be followed, where appropriate.

As the Kingfisher field development area approaches a mature stage of its life it will be necessary to evaluate the fate of infrastructure developed at the site and the feeder pipeline. Specifically, with regards to the life of the project is currently contemplated. In its current state of the project has been developed in a manner that the processing capability of the facility will handle the production profile of the Kingfisher field development area and, as this field matures and begins to taper off in terms of production, the produced fluids from the KT development will need to be tied into the CPF, or alternatively decisions taken on early decommissioning of the Kingfisher field development area infrastructure. The latter scenario is not currently being contemplated. Thus, for purposes of framework decommissioning planning the activities that need to be considered *per se* are discussed irrespective of when in time detailed planning for decommissioning must commence

Decommissioning must follow precautionary principles, be risk based and cost effective. The following broad decommissioning principles apply:

- Carefully consider long term social and environmental liability of all proposed development actions during the lifespan of the project and, where feasible, implement alternatives that minimise long term risks;
- Follow an incremental approach to decommissioning by minimising the project footprint during the project lifespan and by decommissioning and rehabilitating areas as their productive use and is and they become available for decommissioning and relinquishment. Having said this, the nature of the operation is such that little land falls into this class and consequently in the latter phases of production, the bulk of the facility as described will remain in production and need to be planned for decommissioning as a whole. The benefit of early decommissioning of components of the site is that they can be rehabilitated and monitored during the latter phases of productive life of the facility allowing knowledge to be developed in relation to final rehabilitation. This opportunity should not be overlooked where possible;
- Legislation will change over the productive life of the facility. Consequently it will be necessary to carefully review and adapt to the relevant legislation where this is required in order to ensure that decommissioning planning takes place in a manner that is aligned with the requirements of the Government of Uganda together with CNOOC. Where applicable, use existing CNOOC management plans (e.g. CUL-QHSE-L3(GE)-053 Waste Management Specification) to manage aspects of decommissioning;
- Adapted to changes in the local environment, particularly taking account of the proposed physical development plan for the Buhuka Flats and associated areas which stands to materially influence the environment within which the project has been operated and may well influence certain decisions in relation to decommissioning. Consequently, the decommissioning framework will need to be re-evaluated periodically to ensure that it remains aligned with physical development planning changes likely to occur within the local area;
- Maximise efforts to assist local communities to build capacity throughout the life of the project to reduce the impact of job losses due to decommissioning and the termination of CNOOC's contribution to development in the area. Specifically, to plan adequately in advance to agree to people and re-skill people to ensure that the local workforce are able to transition economically to other forms of employment once petroleum production reaches an end;
- Systematically shut down the operating processes in a manner which minimises risks to project personnel, the environment, and the surrounding communities, both during and after decommissioning; and

- Provide early warning to stakeholders who are likely to be affected by the decommissioning.

6.0 DECOMMISSIONING GENERAL REQUIREMENTS

6.1 Transfer of Responsibility for Equipment and Infrastructure left for Community Use

The Government of Uganda are well underway at the time of completion of the ESIA with drafting a physical development plan for the Buhuka flats. This plan was only released in first form as the ESIA was being finalised and consequently is not considered in great detail during the impact assessment. However, by the time that the Kingfisher field development area is in a mature state and decommissioning is being contemplated, the Buhuka flats will have changed considerably through a combination of structured government planning and influx to this development node. It is reasonable and common when a large infrastructure facility of this nature is decommissioned that infrastructure which has benefit to local communities and government be considered and that planning takes place for the transfer of ownership and responsibility for such infrastructure to 3rd parties or government rather than demolition of that infrastructure. To achieve greatest effect this needs to be carefully planned taking account of a number of factors, some of which are elaborated on below:

- The decommissioning planning process should be systematic and carefully consider each component of infrastructure that may have beneficial use. This consideration should not be limited only to infrastructure about which some interest has been expressed by third parties (government, communities, other parties et cetera). It should be a structured process that looks at the benefit of infrastructure that can be derived, together with liabilities associated with that infrastructure and consideration of the remaining life and maintenance costs of such infrastructure;
- Consideration needs to be given to the mechanisms to relinquish responsibility for infrastructure or components of the site and the future costs associated with such infrastructure or land. All too often heavy industry infrastructure is handed over for community use without due provision to accommodate the running and maintenance costs of such infrastructure and typically these costs exceed the economic bearing capacity of a non-industrial use and consequently need to be provided for through other mechanisms if the infrastructure is to be handed over for third party use;
- Local district and regional government should be consulted with prior to removal of any roads to ensure that they cannot optimally be utilised. In the relation to the current project however the road network developed to gain access to well pads will be utilised by the community and is consequently likely to stay. However, roads within the footprint of the facility will need to be removed. Before ripping and rehabilitating such roads, consult with local, district and regional Government to determine whether they could be useful if left in place, while taking into consideration the ecological risk of induced impacts (unsustainable resource harvesting). If roads are to be left open, the transfer of the responsibility of maintaining them shall be considered - any conflicts between local, district and provincial interests regarding the maintenance of the roads must be resolved by the competent Government authorities;
- Consider the feasibility of transferring other fixed assets with beneficial re-use to third parties. Where practical, safe and useful options exist, which are agreed to by the parties, formally transfer responsibility (for maintenance and legal compliance) of specifically defined remaining infrastructure and equipment to identified third parties. Verify that the recipient of any infrastructure is properly instructed in the safe operating methods and appropriate maintenance of the equipment or infrastructure. If the recipient cannot demonstrate competence to safely manage the infrastructure, then it shall be removed or the necessary training shall be provided to ensure that it is safely managed;
- Obtain the approval of the relevant regulatory authorities and potentially affected community leaders before a decision is made to leave any equipment or infrastructure on site for third party use. Provision shall be made to ensure that this infrastructure or equipment does not create a safety hazard. Agreement will need to be reached and documented in such cases for these parties to take over liability for the equipment/infrastructure; and

- Document appropriate options for flowline/pipeline decommissioning including leaving them in place, or removing them for re-use, recycling or disposal.

  All relevant factors should be taken into account in this decision, including environmental risks of re-excavating the trenches if they are to be removed, pollution and ground settlement risks of leaving them in situ, financial cost, reuse and recycling value and any other considerations raised by Government and other stakeholders. It is common practice within the industry to flush and clean buried pipelines and leave them in situ rather than going through the process of excavation in landscapes that will have re-established and stabilised during the production life of the facility.

6.2 Recycling and Reuse of Materials and Wastes

Sites with the potential for hydrocarbon contamination will be identified, characterised, and assessed for contamination. Contaminated soils will be removed and replaced with clean fill or remediated *in situ* in accordance with applicable regulations and standard industry practices in place at the time of actual decommissioning.

Remediation and/or treatment methods will be selected, based on proven and effective technologies that will minimise or eliminate the potential for further contamination of the environment. Containers such as empty drums, portable tanks, and storage bins will be returned to vendors and: cleaned and recycled; cleaned and crushed for scrap; or landfilled.

Fluids and/or sludge from process vessels and storage tanks will be recovered and properly disposed. Any hazardous materials will be packaged, labelled, and taken to the project's hazardous waste facility for disposal. Project solid waste landfills will comply with a final closure plan.

Recycling and reuse of materials and waste is a key component of CNOOC's overall waste management strategy and this FD-ESMP. The following general requirements apply:

- Dismantle equipment and materials that will not to be left *in situ*;
- Identify suitable recycling options for the equipment and materials that are dismantled, in line with best management principles of the waste hierarchy. Recycling and reuse of materials is to be maximised to the greatest extent possible, subject to safety and pollution considerations;
- Maintain a detailed log of all recycled materials, including auditable chain of custody information;
- Contract with an accredited recycling contractor for removal of all recycled waste;
- Recycling and reuse of materials is to be maximised to the greatest extent possible, subject to safety and contamination considerations;
- Management of decommissioned infrastructure earmarked for recycling or re-use shall be done in accordance with the most recent updates of CNOOC's Waste Management Plan, Ugandan domestic waste regulations, and any other relevant regulations applicable at the time;
- Comply with the specific requirements that are set out in CNOOC's Waste Management Plan and relevant Ugandan legislation concerning the identification, separation, temporary storage, and transport of recyclable and reusable materials. Materials for which separation and recycling is a requirement are:

- Paper or cardboard;
- Plastic;
- Electronic equipment;
- Metals;
- Textiles;
- Rubber (e.g. tyres);
- Timber;
- Electrical cables;
- Glass; and
- Scrap wood.

- Maintain a detailed manifest of all recycled and reused materials and equipment, including auditable chain of custody information; and
- As far as reasonably practical, and subject to considerations about safety and pollution, provide local people with first choice concerning acquisition of recyclable or reusable materials and infrastructure, non-polluting waste (such as uncontaminated timber), parts, and equipment.

6.3 Contaminated Land Management and Non-Recyclable Waste

During the operational life of the facility any inadvertent spills to the environment will be cleaned and contamination remediated. Consequently it is not anticipated that large areas of contamination will be present when decommissioning commences, provided that effective environmental management has been practised at the site. However, all land used during the productive life of the facility must nonetheless be tested and sampled to prove that the land is free of contamination. This is a structured and well documented process followed by the petroleum industry. It must be done. This step should not be avoided or bypassed in any way. It is not always possible to anticipate whether contamination has or has not taken place.

The following requirements set out the general procedures to be followed to rehabilitate contaminated land areas, should they be identified, and to dispose of non-recyclable waste generated during decommissioning:

- Preparation of a Contaminated Land Assessment that identifies all areas of contaminated land, the nature of the contamination and the necessary measures to contain and rehabilitate these sites. Specifications are to include *in situ* bioremediation, where feasible, or other measures to remediate the area in accordance with Ugandan legislation and good industry practice, including the removal of the contamination to an appropriate hazardous waste disposal site, if no other options are available;
- Contain liquid and solid hazardous wastes for temporary storage and safe disposal, in accordance with Ugandan legal standards, the CNOOC Waste Management Plan and any other appropriate standards and guidelines applicable at the time. This includes any wastewater generated by flushing and cleaning of pipelines and tanks to remove hydrocarbons and solid or liquid wastes generated during the decommissioning of wells;
- Prepare manifests of all hazardous wastes to be disposed in accordance with the CNOOC Waste Management Plan and Ugandan legislation;
- Prepare an inventory of all hazardous materials and wastes to be disposed of and specify the method of disposal in accordance with the MSDS, current Ugandan legislation at the time and best practice industry standards;

- Remove and dispose of uncontaminated concrete demolition waste at an appropriate certified waste disposal facility or as otherwise agreed with relevant authorities (e.g. NEMA);
- Remove and dispose of all litter, used parts, non-recyclable equipment, and general mixed non-recyclable domestic waste at an appropriately certified disposal site; and
- Disassemble and remove all non-recyclable parts, equipment and machinery from the site. If contaminated, either clean to remove hydrocarbons for disposal at a municipal landfill or dispose of in accordance with the hazardous waste requirements of CNOOC's Waste Management Plan (CUL-QHSE-L3(GE)-053) and Ugandan legislation.

Naturally occurring radioactive material (NORM)

Depending on the field reservoir characteristics, naturally occurring radioactive material (NORM) may precipitate as scale or sludge.

Where NORM is present, a NORM management program must be developed so that appropriate handling procedures are followed. Procedures should determine the classification of the area where NORM is present and the level of supervision and control required. Facilities are considered impacted when surface levels are greater than 4.0 Bq/cm^2 for gamma/beta radiation and 0.4 Bq/cm^2 for alpha radiation[1]. CNOOC must determine, in consultation with relevant authorities, whether to leave the NORM in-situ, or to clean up and decontaminate by removal for disposal.

Sludge, scale, or NORM-impacted equipment should be treated, processed, or isolated so that potential future human exposures to the treated waste would be within internationally accepted risk-based limits. Recognized industrial practices must be used for disposal. If waste is sent to an external facility for disposal, the facility must be licensed to receive such waste and proper records must be kept.

6.4 Re-contouring, Reinstatement and Rehabilitation

Disturbed areas will be returned to natural contours where possible. Areas of high erosion will be identified in the field and treated with special design measures that may include anti-erosion mats or mulching. Compaction of the subsoil will be relieved by scarification in areas of disturbance. The topsoil stored during the clearing phase of construction will be returned to the site, evenly spread and lightly packed to prevent depressions and water pockets. In areas where topsoil was not stripped, the surface will be ripped or scarified to relieve compaction. Grading and surface reclamation activities will not take place when the topsoil is muddy or the subsoil is wet.

The general recommendations in this regard are a guide to preparing a more detailed, site specific Rehabilitation Plan, prior to closure, as a part of the final Decommissioning Plan:

- Shape, level, and de-compact the affected land after removal of project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species. Commission specialists to assist in planning re-vegetation and the management of environmental impacts, as required;
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as practicable;
- Shape all other channels and drains to smooth slopes and integrate into the natural drainage pattern;
- Construct contour banks and energy dissipating structures as necessary to protect disturbed areas from erosion prior to stabilisation;
- Promote re-vegetation through the encouragement of the natural process of secondary succession. Natural re-vegetation is dependent on de-compaction of subsoils and adequate replacement of the

[1] IFC Environmental, Health, and Safety Guidelines Onshore Oil and Gas Development (2007)

accumulated reserves of topsoil (for example, over the well sites) to encourage the establishment of pioneer vegetation;

- Seed will be applied uniformly in a manner appropriate for the type of seed used, and will be placed in a firm, moist seedbed at a suitable depth. Seedlings will be planted at a density and in a manner conducive to successful growth;
- In disturbed areas with little topsoil or naturally sparse vegetation, fertilization and mulching may be included in the site reclamation work. Seeded or planted sites failing to show successful growth after one growing season will be assessed to determine causes for failure, and corrections will be made as appropriate;
- Remove alien and/or exotic vegetation; and
- Undertake a seeding programme only where necessary, and as agreed with a re-vegetation specialist.

Natural re-seeding is generally regarded as being the most effective means of rehabilitation, subject to proper reinstatement of topsoil. Acceptable cover from which typically occurs over two or three rainy seasons.

6.5 Socio-Economic Considerations

The closure of the project will present socio-economic challenges for the local communities. For example, loss of direct and indirect business and work opportunities due to the closure of operations may lead to increased unemployment and secondary negative socio-economic impacts. Most of the impacts will be related to the closure of the CPF, since few direct jobs are associated with the flowlines and wells.

At the time of closure, CNOOC must consider the potential effects resulting from the decommissioning of the project and work closely with local communities to:

- Ensure that employees are fully informed about decommissioning and how it will affect them well before the project finally closes;
- Build community capacity to manage opportunities and impacts arising from the decommissioning of the project;
- Providing training to build local skills tailored to project decommissioning and post-decommissioning activities (equipment dismantling, rehabilitation activities, monitoring etc.). This will promote local communities (local labour) benefits from some employment opportunities created during decommissioning and post decommissioning phases; and
- Provide training to transfer project-learned skills to alternative and secondary industries (tailored to respond to a market economy).

7.0 DECOMMISIONING SPECIFIC REQUIREMENTS

7.1 Wells

After field production ceases, all wells will be decommissioned in accordance with relevant Ugandan legislation and recognised international industry standards. The productive horizon will be isolated with concrete. The wellheads will be removed and the structures dismantled and disposed of safely and in accordance with legislation. The wells will be permanently plugged with concrete and abandoned in such a way as to protect groundwater resources. Well casings will be cut off below ground, capped, and backfilled. Well pads will be removed and integrated into the surrounding terrain. The land surface will be re-contoured and appropriate vegetation will be planted to prevent soil erosion. Decommissioning of wells must entail the following:

- Abandon wells in a safe and stable condition. Determine the method of plugging and abandonment of each well using an internationally recognised guideline such as the UK Oil and Gas, "*Guidelines for the Abandonment of Wells, Issue 5, July 2015",* as updated. Design the method to ensure that aquifers are

isolated and the long-term risk of aquifer or surface pollution is negligible. Whatever method is chosen, it must be designed to ensure that aquifers are isolated and the long term risk of aquifer or surface water pollution is minimised;

- Prepare a detailed Well Abandonment Plan in accordance with the Petroleum Operations Regulations (Decree 34/2015 of 31 December), and the requirements of the UK Oil and Gas standard referenced above or other appropriate international standards. This plan is to be approved by NEMA before proceeding with well decommissioning;
- Remove all associated infrastructure to a depth which permits the return of the land to natural habitat or productive agricultural use;
- Capture and manage all hydrocarbon wastes generated during decommissioning in accordance with the general requirements;
- Undertake well pad rehabilitation in accordance with the general specifications. Replace topsoil over the well pad from stockpiles around the perimeter of the well, removed during clearing and well establishment;
- Monitor rehabilitation and water quality around the well pad in accordance with the requirements. It is noted that monitoring of water boreholes at oil wells is a requirement of ongoing operation, and that this monitoring will be continued during and after decommissioning; and
- Prepare a surface and groundwater monitoring programme to be implemented post-closure for a specified period of time.

7.2 CPF

The CPF comprises different types of physical infrastructure, including process equipment and support infrastructure. The infrastructure and associated equipment will be dismantled and scrapped or disposed of in compliance with applicable Ugandan legislation and best industry practice. Reusable components will be reconditioned or recycled for future use with permission of the government. Buildings will be demolished and disposed of properly or ownership will be transferred to the government. The land surface will be re-contoured and appropriate vegetation will be planted to prevent soil erosion. The following requirements shall apply and details shall be included in the CPF Closure Plan:

- All equipment and infrastructure shall be fully inventoried and its hazard status determined;
- Decisions shall be made about partial or full abandonment of different parts of the site. Where third party use of some of the facilities on the site is negotiated, requirements shall apply;
- Fluids and sludge must be recovered from process vessels (separation/dehydration vessels etc.) and tanks in conjunction with hydrocarbons. Sludge materials and decontamination residues shall be dewatered where possible to reduce bulk and disposal costs. Recommendations for management and disposal shall be made based on legislation and best practice current at the time; and
- Emphasis must be placed on the management and disposal of:
  - Hydrocarbon liquids/sludge and other hazardous materials;
  - Lubricating oils from rotating equipment (pumps, compressors, etc.);
  - Asbestos containing materials in insulation, gaskets, packing, partition boards and cement roof sheets;
  - Pyrophoric iron scale in vessels and pipes, containing iron sulphides prone to spontaneous combustion (important to keep these wet);
  - Contamination in scale and sludge, arising from Naturally Occurring Radioactive Material (NORM).

- Mercury (and other heavy metals) in sludge; and
- Polychlorinated biphenyls (PCBs) in oils from capacitors, transformers and other electrical switchgear.

7.3 Flowlines

CNOOC's flowlines are likely to be decommissioned in a single campaign at the end of the project life. Due to the impacts associated with removing buried flowlines, it is expected that most of them will be left *in situ*. Flowlines and other components damaged by surface activities will be removed for recycling or scrap. Buried flowlines will be drained, cleaned, filled with an inert substance, capped, and abandoned in place. If deemed advisable by a suitably qualified environmental scientist (and following a risk assessment), flowlines in some locations could be removed at the end of field operations. The following requirements shall apply:

- Prepare a detailed and site-specific Flowline Decommissioning Plan in accordance with the guidelines outlined in APPENDIX A of this report. This plan shall be approved by NEMA as a part of the final D-ESMP before proceeding with pipeline decommissioning and rehabilitation;
- Where flowlines are left *in situ*, leave them in a safe and stable condition that minimises the risks of hydrocarbon pollution, land settlement and erosion;
- Flush and clean flowlines in accordance with industry best practice guidelines and any relevant legislation at the time. Prior to disconnection and isolation, pig and purge all pipelines/flowlines to remove residual fluids and residues using the Best Available Technology (BAT) to ensure effective cleaning. A project specific "Cleaning and Disposal Plan" shall be developed as a part of the Pipeline Decommissioning Plan;
- If it is necessary to remove Naturally Occurring Radioactive Materials (NORM) from the pipelines, prepare a project-specific 'Decontamination and Disposal Plan'. Appoint specialist contractors with a proven track record in this regard to manage and dispose of this waste;
- Provide relevant Ugandan authorities and local communities with information regarding the depth, position, size and condition of any pipelines left *in situ* to ensure that the pipelines do not become an obstruction or hindrance to any future land management activities and utilities;
- Where applicable, take suitable measures (such as concrete plugs) in sloping areas to ensure that the pipeline route does not become a conduit for runoff water;
- Where possible, recycle or reuse all surface infrastructure, or dispose of it in accordance with the requirements;
- Use Best Available Technology in the appropriate areas to prevent the risk of future subsidence or erosion (road crossings, wetland/river crossings, steep slopes);
- Reinstate land in accordance with the requirements; and
- Prepare a monitoring and audit programme in accordance with the general guidelines.

7.4 Water Supply Boreholes

Boreholes used for water supply on the project shall be closed and sealed, except for those which are to be used for long term monitoring or where the boreholes could reasonably be used by local communities for domestic water supply. CNOOC shall consult with all relevant stakeholders in this regard. A formal request shall be made to the local authorities to allow any monitoring boreholes to remain –after decommissioning.

7.5 Borrow Pits

Borrow pits are generally decommissioned during the operational life of the project, once the specific requirement for materials in the local area has ended. The following requirements shall apply:

- Ensure that sufficient material is left at the top of the quarry to permit the final contouring without encroaching further on surrounding land use;
- Cut back the sides of the borrow pit to a maximum slope of 25° to encourage vegetation growth and minimise erosion risk;
- De-compact the base of the pit and the entrance to the quarry by ripping and breaking up of the soils;
- Contour the slope and bottom of the borrow pit and evenly cover them with the topsoil that was stripped and stockpiled prior to opening of the quarry;
- Install berms, where necessary, to divert storm water runoff from entering the quarry;
- The quarry entrance shall be closed off, either with branches or a trench so that vehicular access is no longer possible;
- Notify communities via the CLO if the borrow pit is to be made available for agricultural purposes;
- Encourage natural revegetation in accordance with the general rehabilitation requirements; and
- Monitor rehabilitation in accordance with the requirements.

8.0 CLOSURE AND POST-CLOSURE MONITORING, AUDITING AND REPORTING

8.1 Monitoring

Prior to undertaking decommissioning and rehabilitation activities, a Monitoring Plan shall be developed and submitted to NEMA for approval. The plan must cover proposed monitoring during and after the closure of the project and shall include verification of the following:

- Waste, wastewater, or other pollutants generated as a result of decommissioning are appropriately managed, in accordance with the detailed requirements set out in the Decommissioning Plan;
- De-contaminated sites are free of residual pollution after decommissioning;
- Flowlines left in-situ have been cleaned and are left in a safe condition that minimises the risks of pollution, ground settlement, and erosion, and all surface infrastructure has been removed;
- Verification that abandoned wells are safe and are not resulting in a pollution hazard. Post-closure monitoring of abandoned wells must include continued inspection and testing of water quality from monitoring boreholes situated to provide an early warning of any contamination risks, and from Lake Albert in the vicinity of the well pads;
- Areas where drill cuttings have been disposed are rehabilitated and have a minimal residual pollution risk; and
- Progress towards an acceptable vegetation cover is being made in areas where natural vegetation is being re-established. ‘Acceptable cover’ means re-establishment of a mixture of indigenous herbaceous and woody plant communities over the disturbed areas which is at a density that represents surrounding undisturbed areas, non-eroding, and free of invasive alien plants.

8.2 Reporting and Auditing

Annual environmental reporting to NEMA and other relevant government departments is recommended **for at least three years** after decommissioning. In the case of the CPF and well sites, the frequency of this reporting period may be extended to include longer term water quality monitoring, at intervals to be agreed with NEMA and relevant authorities.

Monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure left behind remains safe and pollution free and that rehabilitated project sites are in a stable condition,

progressing towards 'acceptable cover', and free of alien invasive species. Monitoring reports may be prepared by experienced CNOOC personnel or by appropriately qualified independent specialists.

A final audit report of all decommissioning activities shall be prepared by an appropriately qualified independent specialist consultant, with experience of final project closure in the oil and gas industry on final project closure. Any post closure audit requirements shall be determined in consultation with NEMA and other relevant authorities. This report shall cover all environmental and social aspects described in the final FD-ESMP.

9.0 DECOMMISSIONING COSTS

CNOOC shall prepare a decommissioning cost estimate and establish a fund to cover these costs. The estimate and the fund must be updated annually.

Costs should continue to be updated and should include the possible costs associated with ongoing monitoring that is required in the period after decommissioning.

10.0 POST DECOMMISSIONING LIABILITY

Any residual liability arising from (or relating to) decommissioning will remain with CNOOC in perpetuity. The Company will remain responsible for complying with any conditions attached to the Authority's approval of the Decommissioning and Rehabilitation programme; provided, however, that such residual liability will not extend to any damages and losses arising out of acts or omissions attributable to a third party. A "third party" will include (but not be limited to) new owners, operators or licensees. In no event will the Company be held liable for losses or damages caused by any parties other than itself.

11.0 DOCUMENT CONTROL

All changes to the CPF FD-ESMP must be tracked, including details of the change, date of the change and name of the reviewer. The EC shall ensure that any modifications are communicated, explained to and discussed with all affected parties (the Contractor, CNOOC management and any directly affected party who requests this information), and shall be submitted to and be approved by NEMA. CNOOC shall prepare a document control procedure which the Contractor shall comply with. This procedure shall define:

- Document distribution;
- Document retention; and
- Management of CPF FD-ESMP revisions.

APPENDIX A

Flowline Decommissioning Plan

Technical Specifications

Inventory information describing: length; depth; diameter and wall thickness; material; type of service (oil, gas, multi-phase); fluid composition (from well head); corrosion coating; remaining life of cathodic protection; design structural life; associated surface structures and/or valve assemblies.

Historical Data

A summary of historical records to be compiled, including the following:

- Installation period;
- Flowline route map (topographic and aerial or satellite images); Original condition of right-of-way (RoW);
- Land use map;
- Documented as-built information;
- Landowner RoW agreements;
- Recent inspection and corrosion records; and
- Damage and repairs during flowline life.

Survey Data Requirements

Coordinates and mapping of all flowlines to be decommissioned. Recent aerial photos or satellite images; details of present condition of the RoW, (erosion, vegetation cover and land use) and flowline corrosion report.

Decommissioning Options

The flowline network (trunk and flowlines) may require decommissioning using one or a combination of options, as determined by the conclusions of the site-specific assessment. Decommissioning options are to be set out in the report, taking into consideration all factors applicable at the time and based on discussions with all relevant stakeholders.

Reuse

If an opportunity for reuse can be identified, a preliminary assessment should be performed to evaluate its feasibility. When assessing the reuse of flowlines in situ, CNOOC should consider, inter alia, the following:

- The flowline design life along with structural condition and integrity;
- The cleanliness of the flowline; and
- The transfer of liabilities.

Assessment of Environmental Impact

The report shall include an assessment of environmental impact, the content of which will depend on the decommissioning options selected. The assessment shall include issues such as:

- Landowner and local administrative preferences;
- Flowline cleaning and decontamination;
- Environmental management and disposal of waste water and residues;
- Land use management and land rights;
- Ground subsidence;

- Erosion;
- Creation of runoff water conduits;
- Rehabilitation; and
- Control of alien species.

Recommended Management and Mitigation

Proposed management and mitigation measures shall be set out, taking into account the following:

Cleaning Requirements

Prior to disconnection, isolation and/or removal, all flowlines should be pigged and purged to flush residual fluids and residues using the Best Available Technology (BAT) to ensure effective cleaning. A project specific "Cleaning and Disposal Plan" shall be developed as a part of the final decommissioning plan, detailing the following:

- Historical information about the well fluids (fluid composition, operating and maintenance records);
- Details of the water source, equipment, chemicals and techniques used for purging (gases) and/or scraping (solids);
- The measures taken to contain solid and liquid wastes and prevent spills during the cleaning process and/or the disposal methods of hydrocarbon gases (venting or flaring); and
- The management (analysis, treatment, transportation and final disposal destination) of residual wastes from the cleaning process, in accordance with the CNOOC Waste Management EMP, as amended on the basis of current Ugandan legislation.

Decontamination Requirements

It is possible that decontamination of radioactive residues (NORM) will be necessary. Where the removal of NORM is identified as a requirement of flowline decommissioning, the documentation must include a project specific "Decontamination and Disposal Plan" as part of the final decommissioning plan and consist of, but not be limited to, the following:

- Estimate of the nature and quantity of contaminated materials & residues;
- The method of decontamination and the types of chemicals used;
- The equipment and storage capacity to contain decontamination fluids and wastes;
- Mitigation measures to minimise potential environmental impacts; and
- The management, transport and final disposal destination of residual wastes from the decontamination process.

Any removal of NORM shall be undertaken by a specialist contractor with a proven track record for the management of radioactive wastes. The location of the proposed disposal site shall be agreed with relevant authorities in advance of disposal.

Communication with Stakeholders

Stakeholder consultation shall be undertaken as a basis for the assessment of impact and proposed mitigation. Stakeholders shall include relevant Government departments at National, Provincial, District and Local level and local communities in the Project Area. A record of all stakeholder meetings shall be kept and stakeholder views shall be described in a Comment and Response Report.

APPENDIX B

Guide to Permits, Licenses and Approvals

This table is a non-exhaustive guide only and must be and it is responsibility of CNOOC and contractors to ensure all relevant permits, licenses, and approvals are acquired and complied with.

Type of permit/approval	Supporting legislation	Requirement	Applies to	Approving authority	Type of application submitted	Stage at which approval is required
Groundwater Abstraction Permit/Surface Water Abstraction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	Any abstraction of water from natural surface waters (lake, river or stream) and groundwater (aquifer, spring, etc.)	Directorate of Water Resource Management (DWRM)	■ Form A: Application for a Surface Water Permit. ■ Form B: Application for a Ground Water Permit.	Prior to any project-related surface or groundwater abstraction
	The Water Resources Regulations, 1998	Regulation 3, sub-regulation (1): A person who, a) occupies or intends to occupy any land; (b) wishes to construct, own, occupy or control any works on or adjacent to the land referred to in Regulation 10; and May apply to the Director for a water permit.				
		Regulation 3, Sub-regulation (2): An application referred to under sub-regulation (1) shall, (a) be in the form specified in the First Schedule to these regulations except that, i) Form A shall be used for surface water permits; and ii) Form B shall be used for ground water permits.				
Construction Permit	The Water Act, Cap 152	■ Section 18: Subsection (1): No person shall construct or operate any works unless authorized to do so under this Part of the Act. ■ Section 18: Subsection (2): A person wishing to construct any works or to take and use water may apply to the director in the prescribed form for a permit to do so.	■ Any works or structures constructed in or adjacent to natural waters (rivers or lakes) whether temporary or permanent. ■ Any abstraction of groundwater requiring construction of a borehole.	DWRM	Form F1: Application for Construction Permit	Prior to any project-related water abstraction construction of works or structures in or adjacent to natural waters
	The Water Resources Regulations, 1998	Regulation 16, Sub-regulation (2): A person who wishes to engage a driller under sub-regulation (1) to construct a borehole on his or her land for the purpose of, (a) using water; (b) re-charging an aquifer; or (c) fitting a motorised pump to a borehole; and May apply to the Director for a construction permit in Form F1 of the Sixth Schedule.				
Waste Water Discharge Permit	The Water (Waste Discharge) Regulations, 1998	Regulation 4, sub-regulation (1): No person shall discharge effluent or waste on land or into the aquatic environment contrary to the standards established under regulation 3 unless he or she has a permit in the format specified in the First Schedule issued by the Director.	Any project likely to result in the discharge of effluent or waste water (treated or untreated) onto land or into a water body.	DWRM	Form A: Application for a Waste Discharge Permit	Prior to construction of project facilities (e.g. camps, well pads)
Licence to Emit Noise in Excess of Permissible Noise Levels	The National Environment (Noise Standards and Control) Regulations, 2003	Regulation 12, Sub-regulation (1): An owner or occupier of premises whose works or activities are likely to emit noise in excess of the permissible noise levels shall apply to the Executive Director in the form prescribed in Part I of the Second Schedule, for a Licence to Emit Noise in Excess of the Permissible Levels.	Projects in which it is highly likely that noise levels generated by the proposed activity will exceed permissible levels and cause a significant nuisance effect (e.g. flaring and quarrying).	NEMA	Form NEMA/NC: Application for A Licence To Emit Noise In Excess Of Permissible Noise Levels	Prior to commencement of activities likely to emit noise in excess of permissible levels

Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	The National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, 2000	■ Regulation 12, Sub-regulation (1): Subject to the provisions of Regulations, a person shall not carry out any activity in a wetland without a permit issued by the Executive Director. ■ Regulation 12, Sub-regulation (2): Any person intending to carry out an activity listed in the Second schedule to these Regulations shall apply to the Executive Director for a permit in Form A of the First Schedule. Regulation 23, Sub-regulation (1): A person who intends to carry out any of the following activities shall make an application to the executive Director in Form A set out in the First Schedule to these Regulations - (a) use, erect, reconstruct, place, alter, extend, remove or demolish any structure or part of any structure in, under, or over the river banks or lake shore; (b) excavate, drill, tunnel or otherwise disturb the river bank or lake shore; (c) introduce or plant any of a plant whether alien or indigenous on a river bank or lake shore; (d) introduce any animal or micro-organism, whether alien or indigenous in any river bank or lake shore; or (e) deposit any substance on a riverbank or lakeshore if that substance would or is likely to have adverse effects on the environment.	■ Any regulated activity (listed in the Second Schedule to the Regulations) undertaken in a wetland, or within the protection zone of a riverbank; ■ 100 m from the highest watermark of a river listed in the Sixth Schedule; 30 m for a non-listed river; and ■ 200 m from the low watermark for a listed lake; 100 m for a non-listed lake.	NEMA	Form A: Application for a Permit to Carry Out a Regulated Activity in a Wetland/River Bank/Lake Shore	Prior to undertaking any project activities within wetlands, riverbanks or lake shores
Registration of a Workplace	The Occupational Safety and Health Act, 2006	Section 40, Subsection (2): a person shall not less than one month before he or she begins to occupy any premises as a workplace, serve on the Commissioner, a notice with the particulars prescribed in Schedule 3.	Any project requiring the establishment of a work place (e.g. drill site or camp).	■ Department of Occupational Safety and Health; and ■ Ministry of Gender, Labour and Social Development.	Particulars to be Submitted When Applying for the Registration of a Workplace or a Change in the Registered Occupier	Immediately upon (not later than one month) prior to undertaking any site works (construction, operation, pre-construction surveys)
Development Permission	The Physical Planning Act, 2010	Section 33, Subsection (1): A person shall not carry out a development within a planning area without obtaining development permission from a physical planning committee.	Any development involving construction of permanent or semi-permanent structures or establishments such as base camps	District Technical Planning Committee	Form PPA 1: Application for Development Permission	Before commencement of any project activities
Licence for Storage of Hazardous / Non-Hazardous Waste	The National Environment (Waste Management) Regulations, 1999	Regulation 6, Sub-regulation (1): A person intending to store waste on his or her premises shall apply to the Authority for a licence in Form III set out in the First Schedule.	Any project requiring construction or operation of a storage facility for hazardous or non-hazardous waste (e.g. drill cuttings)	NEMA	Form III: Application for a Licence for Storage of Hazardous Waste	Prior to commencement of any activity requiring temporary storage of hazardous waste
Authorisation to use radioactive sources	The Atomic Energy Act, (Cap 143)	Section 32, Subsection (1): Subject to section 33, no person shall acquire, own, possess, operate, import, export, hire, loan, receive, use, install, commission, decommission, transport, store, sell, distribute, dispose of, transfer, modify, upgrade, process, manufacture or undertake any practice related to the application of atomic energy and regulated by this Act unless permitted by an authorisation issued under this Act.	Projects requiring the use of radioactive materials e.g. oil well drilling	Atomic Energy Council, Ministry of Energy and Mineral Development	Notification of Council (requirements listed in Section 34 (2)) Application for an Authorisation (required information listed in Section 35 (1) of the Act	Prior to commencement of project activities (specifically well drilling)

Licence to erect or carry on a magazine	The Explosives Act, (Cap 298)	Section 22, Subsection (1): Any person desiring to erect or carry on a magazine for the storage of explosives shall make application for a licence to erect or carry on a magazine.	Activities requiring the temporary storage of explosives	Ministry of Internal Affairs	Licence to erect or carry on a magazine	Prior to procurement and/or use of explosives
Lease Agreement	The Registration of Titles Act, (Cap 230)	Section 101: The proprietor of any freehold under the operation of this Act may, subject to any law or agreement for the time being in force, lease that land for any term exceeding three years by signing a lease of it in the form in the Eighth Schedule to this Act.	Access to or use of land for project activities	District Land Board	Application for Lease	Prior to temporary use of or access to land for project activities.
	The Land Act, (Cap 227)	Section 73: Where it is necessary to execute public works on any land, an authorised undertaker shall enter into mutual agreement with the occupier or owner of the land in accordance with this Act; and where no agreement is reached, the Minister may, compulsorily acquire land in accordance with section 42.				
	The Land Acquisition Act, (Cap 226)	Section 19: Nothing in this Act shall prevent the Government from entering into an agreement with a person having an interest in land by which— a. that person's interest in land is acquired by the Government; or b. that person's claim to compensation for land under this Act is settled by the grant of other land or in any other way.				