



WASTE MANAGEMENT GUIDELINES FOR UPSTREAM PETROLEUM OPERATIONS IN KENYA 2025

Quality Energy, Quality Life

IN EXERCISE of the powers conferred by Part 1 Section 9 (1) of the Petroleum Act (Cap. 308) the Authority makes the following guidelines: -

CITATION AND COMMENCEMENT

These guidelines may be cited as the Waste Management Guidelines for Upstream Petroleum Operations in Kenya 2025.

DEFINITION OF TERMS

- **“Authority”** means the Energy & Petroleum Regulatory Authority, established as the successor to the Energy Regulatory Commission (ERC) under section 10 of the Energy Act (Cap. 314).
- **“Best petroleum industry practices”** means practices, methods, standards and procedures generally accepted and followed internationally by prudent, diligent, skilled, and experienced operators in upstream petroleum operations including practices, methods, standards and procedures intended to: -
 1. Conserve petroleum by maximizing the recovery of petroleum in a technically and economically sustainable manner.
 2. Promote operational safety and prevention of accidents; and
 3. Protect the environment by minimizing the impact of upstream petroleum operations.
- **“Contractor”** means the person with whom the national government concludes a petroleum agreement.
- **“Facility”** includes-
 1. Any structure, device, roads or other associated installations or infrastructure, including pipelines, rail stations, pump stations, compressor stations and equipment constructed, placed or used to carry out upstream petroleum operations.
 2. Vessel, vehicle, or craft when stationary and used for drilling or support of ongoing upstream petroleum operations.
 3. Vessel, vehicle, or craft for transportation of petroleum in bulk when connected to a facility for loading of petroleum.
- **“Ministry”** means the ministry currently responsible for petroleum in Kenya.
- **“Operator”** means the designated entity responsible for managing the day-to-day operation of oil and gas exploration, development, and production.
- **“Pollution”** means any direct or indirect alteration of the physical, thermal, chemical, biological, or radioactive properties of any part of the environment by discharging, emitting, or depositing wastes or emitting noise to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety, welfare or to animals, birds, wildlife, fish or aquatic life, land, property and water resources or to plants or to cause a contravention of any condition limitation or restriction which is subject to a license under the Petroleum Act (Cap. 308).

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EPRA	Energy & Petroleum Regulatory Authority
EMCA	Environment Management and Coordination Act,1999.
ESIA	Environmental Social Impact Assessment
LSA	Low Specific Activity
MARPOL	International Convention for the Prevention of Pollution from Ships
MSDS	Materials Safety Data Sheets
NORM	Normally Occurring Radioactive Material
NEMA	National Environment Management Authority
O&G	Oil and Gas
UWI	Unique Well Identifier
WMP	Waste Management Plan

1. INTRODUCTION

The upstream petroleum operations produce significant amounts of waste, many of which are toxic and require specialised and adequate management to avoid degradation of the environment and harm to life. These wastes include: -

- **Cuttings** - the small pieces of formation rock and subsurface materials that break away because of the action of drill bit teeth as a well or the direction borehole is being drilled.
- **Drilling muds** - a suspension usually in water but sometimes in oil (natural, synthetic, and diesel), used in rotary drilling, consisting of various substances in a finely divided state (commonly bentonitic clays and chemical additives), introduced continuously down the drill pipe under pressure and through openings in the drill bit and transported back up in the annular space between the pipe and the walls of the hole to a surface pit or tank where it is conditioned and reintroduced into the wellbore.
- **Drilling fluids** - the fluid portion of drilling wastes, consisting of water, drilling muds, fine cuttings and additives.
- **Naturally Occurring Radioactive Materials (NORM)** - materials typically found in certain types of barium or strontium scales that may be deposited in the wellbore or production tubular.
- **Produced water-naturally** present in a reservoir is produced along with hydrocarbons (oil, gas and crude bitumen) from a well.
- **Used Oil** - any semi-solid or liquid product consisting totally or partially of mineral oil or synthesised hydrocarbons (synthetic oils) that has been used and is contaminated by impurities because of such use, rendering it unsuitable for its original use. It includes oily residues from tanks, oil-water mixtures and emulsions.
- **Sludge** - an accumulated free-settling wet solid typically consisting of hydrocarbons, water and inorganic sediments (e.g., sands, silts, etc.).
- **Wastewater** - oily water, pipeline test water, or waste fluids/solids generated from cleaning a pipeline (pipeline pigging water).
- **Contaminated soil** - hydrocarbon-bearing soil, must be remediated or removed.
- **Flow back water** - fluids and solids produced by a well during the flow back process. The process allows these fluids and generated solids to flow from a well following treatment. This can either be in preparation for a follow-up phase of treatment or preparation for clean-up and return of the well to production.

To safeguard the environment and protect life, adequate measures must be taken to ensure that wastes generated during upstream activities are properly managed. As such, clear guidelines are a prerequisite for the industry to ensure that those involved are well-advised on measures that must be taken to achieve the same.

2. PURPOSE

These guidelines are developed to guide upstream petroleum operations operators in achieving or remaining in compliance with existing Kenyan legislation on waste management and adopting best international practices.

Upstream petroleum operations operators must observe the requirements of these guidelines in handling waste from upstream petroleum operations. An Operator will observe other requirements imposed by relevant enacted Kenyan laws, and where there is a variation in the requirements, the more stringent version prevails.

3. SCOPE

These Waste Management Guidelines for Upstream Petroleum operations apply to operators undertaking offshore or onshore upstream petroleum operations activities within Kenya. They similarly apply to entities supporting Operators by providing field services such as rig and drilling, camp management and transportation.

4. GUIDELINES

This section covers actions and practices that upstream petroleum operations should adopt in their projects and activities concerning sound waste management throughout its lifecycle, i.e., from prevention to generation and final disposal.

4.1 REQUIREMENT FOR WASTE CATEGORIZATION AND CLASSIFICATION



4.1.1 The waste generator must characterise each waste stream. Waste characterisation must assess waste's physical, chemical and toxicological characteristics.

4.1.2 The waste generator should define the code or codes that will be used to identify the various waste categories to track the waste throughout its life cycle. Designed codes must ensure they initially classify waste into hazardous or non-hazardous categories.

4.1.3 Operators must properly document each waste stream generated by the facility and keep that documentation for at least three (3) years after the waste is no longer generated, stored, or recycled or until the site is closed.

4.1.4 Operators must have a waste management policy mandated by the Petroleum Act (Cap 308) which establishes the framework and requires Operators to manage waste responsibly. The Environmental Management and Coordination Act (EMCA), (EMCA 1999) sets broader environmental regulations for upstream petroleum activities, including waste management. EPRA oversees waste management practices in the sector and may issue specific regulations. Attached in the appendix is a waste management form.

4.2 STORAGE, COLLECTION, AND HANDLING PROCEDURES FOR HAZARDOUS AND NON-HAZARDOUS WASTE

4.2.1 Waste from upstream petroleum operations, whether hazardous or non-hazardous, must be stored in one of three locations:

- In a storage area in an approved petroleum operations Facility
- At a NEMA-licensed hazardous waste storage Facility.
- At a NEMA-licensed hazardous waste transfer station operated either by the operator or an independent third-party waste receiver.

4.2.2 An Environmental and Social Management Assessment must have been conducted, focusing on the environmental and social implications of policies, plans and programs. NEMA must have issued an Environmental License, which depends on the specific nature and potential impact of their upstream petroleum operations, before developing waste management and transfer facilities.

4.2.3 Hazardous waste must be stored in a secure area with controlled access. Only persons authorised to enter



and trained in waste handling procedures should have access to the storage site.

4.2.4 The operator shall maintain a record of the waste in storage, including type and volumes.

4.2.5 An operator must undertake monthly inspection exercises and immediate maintenance activities to ensure maintenance of the integrity of the primary containment Facility and any associated equipment. Records of the same shall be maintained and availed to EPRA on request.

4.2.6 The operator shall undertake air, groundwater and soil monitoring within the immediate environment every six (6) months. A comprehensive groundwater monitoring program should also be implemented. Records of the same shall be kept available at the Facility and provided on request by EPRA.

4.2.7 Hazardous waste pits should be emptied of water, especially after rains and applied with lime to avoid odour.

4.2.8 Storage sites should have emergency response plans, equipment, materials and trained personnel appropriate for the hazardous waste stored on site.

4.2.9 Hazardous waste storage sites must meet all local by-laws and zoning requirements.

4.2.10 Upstream petroleum operations operators shall document the following information and retain it in the well file of the well that generated the drilling waste and make the information available to the EPRA upon request:

The surface land location, Unique Well Identifier (UWI) and well license number of the well that generated the drilling waste.

- The type of drilling mud system used, including a list and volumes of all fluid additives and mud products used.
- The method used to store the drilling waste and a plot plan identifying the location of the storage system.
- The volumes of drilling waste generated, and the management method used to store them.
- Standards of disposal
 - a. Waste Characterization: Drill cuttings from Oil-Based Mud and Synthetic-Based Mud shall be characterized to determine their chemical composition and level of contamination. This helps determine the most appropriate disposal method.

b. Re-treatment: Depending on the level of



contamination, pre-treatment methods like thermal desorption or solvent extraction may be necessary to reduce the oil content before final disposal.

c. Disposal: Hazardous wastes shall only be disposed of within a NEMA-licensed Facility for hazardous waste disposal. Transportation of hazardous waste shall similarly be undertaken through licensed hazardous waste transporters.

4.2.11 Contractors shall retain the information listed above in the well file until the well site and any associated remote drilling waste storage or biodegradation site have successfully been reclaimed.

4.3 TREATMENT AND DISPOSAL

Synthetic and Oil Based Muds

4.3.1 Operators will avoid the use of oil and synthetic-based drilling muds. The same must be supported by technical justifications to EPRA for approval.

4.3.2 Operators will keep records of the use of such

drilling muds, including quantities and Materials Safety Data Sheets (MSDS) of the chemical.

4.3.3 Drill cuttings from oil-based and synthetic-based mud must only be disposed of by a NEMA-licensed hazardous waste management Facility or through a NEMA-approved approach.

Water Based Muds

4.3.4 Operators may dispose of water-based muds by burying them on-site, reinjecting them into wells (on-site or off-site), or overboard for offshore operations. A Risk Analysis Report, details of the disposal method employed, and quantities shall be supplied to EPRA beforehand.

4.3.5 The operator should take appropriate measures, such as using high-efficiency equipment to minimise the requirement for fluid change and reduce the amount of residual fluids on drilled cuttings.

4.3.6 Pit closures must be completed as soon as practical. However, they should not be completed more than one year after the end of operations.

4.3.7 The pit waste should be analysed, and the maximum lifetime loads should be calculated.

Produced Water

4.3.8 Where produced water is disposed into the sea in offshore operations, the permitting Environmental and Social Impact Assessment Report should provide adequate mitigation measures to meet EMCA Water Quality Regulations.

4.3.9 Produced water shall not be released into surface water environments or land unless prior treatment to meet requirements of the EMCA Water Regulations is undertaken and NEMA issues an effluent discharge license.

4.3.10 Where surface pits are used for wastewater storage or disposal during operations, they should be constructed within well sites and in controlled and secure areas to keep livestock, wildlife and humans away.

4.3.11 Such pits shall not be constructed within environmentally sensitive areas.

4.3.12 Pits must be installed with High-Density Polyethylene Geomembrane liners (or equivalent). The liners should be usable with the material to be stored in them and of sufficient strength, durability and thickness to maintain the pit's integrity.

4.3.13 The pit bottom must be at least ten (10) meters above the seasonal high-water table.

4.3.14 The operator will ensure that pits are installed with a berm to manage surface drainage and avoid content loss or contamination.

4.3.15 The operator will undertake the removal and recovery of free hydrocarbons from the pit regularly.

4.3.16 Any removal of pit contents, including pit liners for disposal, must be to a NEMA-registered hazardous waste management Facility.

4.3.17 Soil samples shall be collected from representative points of the pit bed and subjected to analysis at a registered and accredited laboratory for detection of any contamination.

4.3.18 Pits must be immediately reinstated once project activities cease and the project terminates.

Hydrostatic Testing Water

4.3.19 Hydrostatic Testing water shall be disposed of through one or a combination of the following methods.

- Injection of water into a disposal well.
- Discharge of water to available surface waters or a prepared land surface.
- Discharge to sea for offshore operations.

4.3.20 Prior to any discharge of hydro test water, the operator must prepare a hydro test water disposal plan. The plan will detail discharge points, discharge rates, chemical use and dispersion, the associated environmental risks and monitoring.

4.3.21 The operator shall not dispose of hydro test water into shallow coastal waters, mangrove ecosystems, wetlands, or sensitive ecosystems.

Other Waste Waters

4.3.22 Gray and black water from showers, toilets and kitchen facilities will be treated appropriately in compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78 requirements for offshore operations and the EMCA effluent discharge regulations requirements for onshore activities.

4.3.23 Organic (food) waste should, at a minimum, be macerated to acceptable levels and discharged to sea for offshore operations in compliance with MARPOL 73/78 requirements.

4.3.24 Inorganic non-hazardous waste must be disposed of through a NEMA-licensed waste handler or waste management facility.

4.3.25 All process areas whether offshore or onshore, shall be bundled to ensure controlled drainage of flows into closed drainage systems for appropriate treatment before disposal.

Produced Sand

4.3.26 Produced sand shall be treated as oily waste and disposed of similarly to other wastes of that category,



such as oil-based cuttings.

4.3.27 Where an Operator utilises water to clean produced sand, the water shall be treated to the required EMCA effluent discharge regulations requirements before disposal.

Completion and well work-over fluids

4.3.28 Completion and well work-over fluids, including weighted brines, acids, methanol, glycols and other chemical systems, must be properly disposed of, or treated before disposal.

4.3.29 Disposal may only be by return to the original vendor for recycling, treatment by an approved facility before disposal or injection into a disposal well.

Naturally occurring radioactive materials (NORM)

4.3.30 Operators shall monitor Naturally Occurring Radioactive Material (NORM) in external production units and production equipment environments, including tubing, piping and vessels, Scales and Sludges.

4.3.31 Workers must be provided with appropriate protective gear, especially when opening equipment for inspection to avoid possible gamma radiation if there is NORM presence. This will include Radiation Dosimeter Badges.

4.3.32 Areas with noted external exposure above 2.5 microREM/hr must be identified with posted signs. The signage will be posted away from the exposure area below 2.5 microREM/hr levels.

4.3.33 Where NORM/LSA exposure is noted at levels of 50 microREMs/hr above background concentrations or 30pci/gm, the Operator will undertake a survey to determine the extent and a radiological risk assessment will be undertaken. Similarly, measures will be instituted to minimise the risk of exposure to persons within the premises.

4.3.34 Waste containing NORM shall be disposed of via deep well or annular space injection or to a licensed hazardous waste disposal site in the prescribed fashion as spelt out in Kenya's waste management regulations.

4.4 PREPARATION OF WASTE MANAGEMENT PLAN FOR ALL CATEGORIES OF WASTE

4.4.1 An operator will develop a three (3) year Waste Management Plan (WMP) prior to the commencement of field activities and present it to the relevant Authorities (NEMA & County) for approval. An approved WMP will be submitted to EPRA before commencing field activities. In line with the Sustainable Waste Management Act (2022) requirements, the developed WMP will contain at minimum the following elements.

- Description of project activities generating waste and the expected waste stream characterization and quantities to be generated during the project's operational life.
- Baseline environmental conditions of the project area where operations will be conducted.
- Plans and procedures developed to minimise waste particularly potentially hazardous waste.
- A contamination risk assessment of wastes that will be generated and attendant mitigation measures for the same.

- Pollution prevention plan.
- Waste handling and storage procedures.
- Waste transfer monitoring and control procedures.
- Treatment and final disposal plans, including the designs of any facilities developed for that purpose.
- Decommissioning plan for closure of any proposed waste management Facility.

4.5 AN ENVIRONMENTAL LICENSE ISSUED BY NEMA FOR THE DEVELOPMENT OF THE FACILITY POST-WASTE MANAGEMENT REPORTING

4.5.1 Reporting will be required and mandated by the Upstream Petroleum Regulatory Authority (EPRA) and will vary depending on the specific operation. However, some general requirements will include:

- Annual Waste Reports: Submitted annually to EPRA, detailing the total quantities and types of waste generated, treated, and disposed of during the reporting period. This report should be formatted according to EPRA's latest guidelines.
- Waste Characterization Data: Information on the composition and level of contamination of different waste streams will be crucial for proper treatment and disposal. This data will be included in the annual report or submitted separately if required by EPRA.

- Treatment/Disposal Certificates: Copies of certificates issued by licensed treatment and disposal facilities for each waste stream will be included in the reports or maintained for audit purposes.

4.5.2 Incident Reports: Immediate reporting of any spills or accidents related to waste management is mandatory. These reports will be submitted to both NEMA and EPRA.

EFFECTIVE DATE

The effective date of the guidelines shall be:



30th
June 2025

APPENDIX

APPENDIX 1: ENVIRONMENTAL WASTE MANAGEMENT REPORTING FORM (UPSTREAM PETROLEUM OPERATIONS - KENYA)

Facility Information:.....

Operator Name:.....

Facility Identification:.....

Location:.....

License Number (if applicable):.....

Reporting Period: (From [Start Date]To [End Date]).....
.....

Instructions: Please complete all sections of this form and submit it to the Upstream Petroleum Regulatory Authority (EPRA) by [Due Date]

Section 1: Waste Generation

Waste Type (e.g., Drilling Fluids, Produced Water, Used Oil, Haz-ardous Waste)	Total Quantity Generated (in tonnes or m ³)	Units
TOTAL		

Section 2: Waste Treatment

Waste Type	Treatment methods (e.g recycling incineration, reinjection)	Quantity treated (in tonnes or m3)	Units	Treatment Facility
TOTAL				

Section 3: Waste Disposal

Waste Type	Disposal Method (e.g., Landfill, On-site Disposal Pit)	Quantity Disposed (in tonnes or m ³)	Units	Disposal Facility (if applicable)
TOTAL				



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