THE REPUBLIC OF UGANDA

OFFICE OF THE AUDITOR GENERAL

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ENVIRONMENT AUDIT REPORT ON REGULATION AND MONITORING OF DRILLING WASTE MANAGEMENT IN THE ALBERTINE REGION BY NATIONAL ENVIRONMENT MANAGEMENT MANAGEMENT AUTHORITY (NEMA)

A REPORT BY THE AUDITOR GENERAL

MARCH, 2014

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AUDITOR GENERAL'S MESSAGE

31st March 2014

The Rt. Hon. Speaker of Parliament
Parliament of Uganda
Kampala

VALUE FOR MONEY AUDIT REPORT ON REGULATION AND MONITORING OF DRILLING WASTE IN THE ALBERTINE REGION BY NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

In accordance with Article 163 (3) of the Constitution, I hereby submit my report on the value for money audit undertaken on the Regulation and Monitoring of Drilling Waste in the Albertine Region by NEMA.

My office intends to carry out a follow – up at an appropriate time regarding actions taken in relation to the recommendations in this report.

I would like to thank my staff and consultants from Office of the Auditor General Norway who undertook this audit, and the staff of NEMA and Ministry of Energy and Mineral Development for the assistance offered to my staff during the period of the audit.

John F. S. Muwanga
AUDITOR GENERAL

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LIST OF ABBREVIATIONS

DEA	Directorate of Enviromental Affairs
DEO	District Environment Officer
DFR	Department of Fisheries Resources
DOHS	Department of Occupational, Health and Safety
DWRM	Directorate of Water Resource Management
E&P	Exploration and Production
ETP	Effluent Treatment Plant
MDG	Millenium Development Goal
GDP	Gross Domestic Product
GoU	Government of Uganda
MEMD	Ministry of Environment and Mineral Development
MLHUD	Ministry of Land, Housing and Urban Development
MoFPED	Ministry of Finance, Planning and Economic Development
MTWA	Ministry of Tourism, Wildlife and Antiquities
MWE	Ministry of Water and Environment
NEF	National Environment Fund
NEMA	National Enviroment Management Authority
NFA	National Forestry Authority
PEPD	Petroleum Exploration and Production Department
PPE	Personal Protective Equipment
TEP	Total E&P Uganda
TUOP	Tullow Uganda Operations Pty Limited
UWA	Uganda Wildlife Authority
WCA	Waste Consolidation Area

EXECUTIVE SUMMARY

MOTIVATION

The Albertine Graben is where all Uganda's recently discovered petroleum falls and is the most important eco region in Africa as it hosts the continent's most endemic vertebrate species. It also houses two mostly visited parks in Uganda, that is, Murchison falls and Queen Elizabeth Protected Areas.

With the discovery of viable Oil and Gas reserves in the Albertine Graben, drilling waste is currently generated by the exploration activities, wherefore the proper management of waste from the petroleum activities is of vital importance. Poor waste disposal may lead to degradation of land and water resources, change in the ecosystem, leading to fish stress/kills. To date, drilling waste generated in the Albertine Graben, is not being treated but is stored in designated Waste Consolidation Areas (WCAs).

The purpose of the audit was to assess the efforts of NEMA in securing effective and environmentally sound mechanisms geared towards handling drilling waste in the Albertine Region.

KEY AUDIT FINDINGS

Adequacy of Waste Management Regulations and Guidelines

NEMA is three (3) years late in coming up with revised legislation that would encompass the oil and gas issues considering that a review that had started in 2008/09 and was supposed to end by 2010/11 had not delivered any tangible outputs by the time of audit (March 2014) regulations issued incorporating aspects of drilling waste management had not been by issued by NEMA.

The current operational waste management guidelines for oil and gas operations issued by NEMA do not spell out how drilling waste currently generated in the Albertine Graben should be transported, stored, treated and disposed.

Besides; the relevant stakeholders were not consulted while formulating the Operational Guidelines on Waste Management for oil and gas in the Albertine Graben issued in 2012, and as a result, the guidelines had several gaps that hampered their adoption and/implementation.

Monitoring and Compliance Enforcement of waste management in the Albertine Graben

Oil exploration and production companies did not prepare and submit self-monitoring reports against set parameters as per requirement. A review of their self-monitoring reports for the FYs 2010/11, 2011/12, 2012/13 revealed that out of the expected twelve (12) self-monitoring reports, Tullow (TUOP) had submitted 7 reports (58%) while Total (TEP) and CNOOC were each expected to have submitted six (6) self-monitoring reports but Total (TEP) submitted 3 (50%) and CNOOC none (0%) respectively.

Licensed waste transportation firms did not regularly submit bi-annual reports on the quality and quantity of waste to NEMA as required. Despite the repeated non-compliance of the companies, NEMA did not impose any sanctions or penalties on them.

District Environment Officers (DEOs) are not conducting inspections in the Graben despite the fact that they have been trained to do so by NEMA especially on aspects of monitoring and inspection of oil and gas activities. This has been attributed to the inadequate funding from their respective Local Governments. Inspections were only carried out when NEMA or the oil companies were involved and/or facilitated them.

Multi-sectoral inspections required in the Albertine Graben were not conducted as regularly as required. On average, the multi-stakeholder inspections conducted constituted 18.75% of the expected inspections.

NEMA had done well to conduct inspections over and above (133%) the required frequency in the Albertine Graben in the financial year 2012/13. However, it had not reported and shared the results of these inspections with the concerned companies.

Compliance and Independent verification/ Methodology for inspections

NEMA was not carrying out independent verification of tests of solid and liquid waste samples generated from the drilling activities to corroborate the results they received from the self-monitoring tests carried out by the oil companies.

As a result, it might be very difficult for NEMA to provide assurance that the current environment management practices have not adversely affected the surrounding environment as sample collection and laboratory testing are vital tools in reporting on and/or monitoring compliance with proper waste management practices

ENVIRONMENTAL AND ECONOMIC EFFECTS OF WASTE MANAGEMENT PRACTICES IN THE ALBERTINE GRABEN

Treatment and Disposal of waste

Drilling waste stockpiles in the Albertine Graben for the period kept by TUOP (Tullow) and TEP (Total) for solid and liquid waste stood at 39,625 tons and 8227 cubic meters respectively exclusive of CNOOC which did not provide information on the quantity of drilling waste it generated.

Companies currently licensed by NEMA to treat the waste generated in the Graben cannot treat this waste as required because there are no adequate and relevant waste management regulations specific to Oil and Gas.

As a result, companies are likely to run out of space for waste consolidation and as the country heads into the production phase, more of this waste will be generated to cause the country significant environmental challenge should companies fail to find a suitable treatment method agreeable to both NEMA and themselves.

Environmental effects

The current practices are likely to expose the Albertine Graben to more potential environmental risks since a larger area of land in this sensitive eco-system is cleared, dug up and compressed as a methodology

to handling the waste in the short run, than if waste was treated and disposed of at once; this was evidenced at Bugungu Waste Consolidation Site where waste had been piled above ground level but had not been properly tucked away.

The current waste management practices create a double cost in terms of time, labor and money since the waste has to be re-transported to a final waste treatment and disposal site. This has already cost government significant sums of money, since waste management is part of the recoverable expenditures/ costs as per Uganda's Production Sharing Agreements (PSAs).

From 2010 to 2013 alone, the total expenditure on drilling waste management activities by Oil and production companies amounted to UGX 26.263 billion.

KEY RECOMMENDATIONS

Waste management regulations and guidelines

- NEMA should prioritize and expedite completion of the review of Uganda's legislation to incorporate oil and gas issues to promote better management of drilling waste.
- NEMA should consider adding review of the Operational Waste Management Guidelines on Oil and Gas Operations to the on-going legislative review.
- In future, NEMA should involve stakeholders in formulation of any policies, legislation or guidelines, and seek their input.

Monitoring and compliance enforcement

- NEMA should ensure that the Oil and Exploration companies carry out Self-Monitoring and report the findings to it as required and where necessary, use available sanctions in the Law to compel their compliance.
- NEMA should step up its coordination efforts of the multi-sectoral inspections in order to ensure that the knowledge from the various experts in specialised fields of ecosystem management is harnessed.
- NEMA should expedite its proposal of permanently having its Environment Monitoring staff stationed in the Albertine Graben in order to keep pace with activities of Oil and Gas.
- NEMA should consider ensuring timely communication of inspection findings to inspected entities as per the strategy requirement.
- Government should consider introducing conditional grants for the District Environment Offices to facilitate environmental monitoring. In addition, MoFPED should consider approving/ financing the recommendation by NEMA's Institutional Review Report to employ more environmental monitoring officers (Oil and Gas) and establish regional offices for better environmental monitoring, especially in the oil and gas sector.

Environmental and Economic Effects of waste management practices

- NEMA should routinely carry out laboratory tests to ensure that it keeps track of the effect oil exploration activities (if any) have on the environment.
- NEMA should consider prioritizing acquisition for standard equipment for its existing laboratory so as to enable the regular conducting of verification tests of waste samples obtained from the Albertine Graben.
- NEMA should expedite review of environmental legislation to incorporate management of waste from drilling activities.
- NEMA should as far as possible engage the Oil companies to address their concerns and enable treatment and disposal of waste by the

licensed companies.

- NEMA should liaise with MEMD and PEPD to ensure that it is involved in assessing waste management expenditure proposals/scenarios submitted by the oil E&P companies.

OVERALL AUDIT CONCLUSION

The audit on monitoring and regulation of drilling waste management in the Albertine Graben established that NEMA has made positive strides in ensuring effective and sustainable management of drilling waste in the Albertine Graben. However, existing weakness in the regulatory framework for waste management and capacity gaps in supervision and monitoring by NEMA need to be addressed to ensure proper management of drilling waste in the Garden. In addition, the ongoing baseline survey of the Albertine Garden and the strategic impact assessment under consideration by the sector should be finalized to enable implementation of the proposed mitigation measures.

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CHAPTER ONE

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INTRODUCTION

1.1 MOTIVATION

The Albertine Graben is very rich in biodiversity and is also home to very sensitive ecosystems. This region is where all Uganda's recently discovered oil lies and is the most important eco region in Africa as it hosts the continent's most endemic vertebrate species. Two of the largest wildlife conservation areas which are also the most visited in Uganda that is Murchison falls and Queen Elizabeth, are placed in the Graben which helped most towards the contribution of tourism revenue currently established at USD 1.7 billion to the country's economy. With the discovery of viable Oil and Gas reserves in the Albertine Graben, companies carrying out petroleum exploration activities generate drilling, wherefore the proper management of waste from the petroleum activities is of vital importance.

Poor waste disposal may lead to degradation of land and water resources, change in the ecosystem, leading to fish stress/kills To date, drilling waste generated in the Albertine Graben is not being treated but is stored in designated Waste Consolidation Areas (WCAs).

Protection of the Albertine region has been a government priority to the magnitude that an additional UGX 3.0 billion has been given to the National Environmental Management Authority (NEMA) in FY 2013/14 to conduct the Environmental Impact Assessment for the Gas and Oil exploration and development in the Albertine region.

Waste generated in the Albertine Graben is expected to increase as government starts giving oil companies licenses for the development of petroleum fields. It is against this background that the Office of the Auditor General found it necessary to conduct an Environment Audit on the management of waste in the Albertine region to ascertain whether efforts are on course in this regard. The audit is expected to inform policy on waste management in the Albertine Graben.

1.2 DESCRIPTION OF THE AUDIT AREA

1.2.1 Government Responsibilities

NEMA has the responsibility of playing an oversight role in ensuring that petroleum exploration companies manage waste properly from the point of generation to final disposal.
It has a responsibility of putting in place appropriate legislation and guidelines; issue licenses, supervise and monitor the different activities in the Graben.

1.3 AUDIT OBJECTIVE

The audit objective was to assess the efforts of NEMA in securing effective and environmentally sound mechanisms geared towards handling drilling waste in the Albertine Region.

1.4 AUDIT QUESTIONS

1. To what degree are adequate regulations and guidelines in place to ensure proper handling of drilling waste?

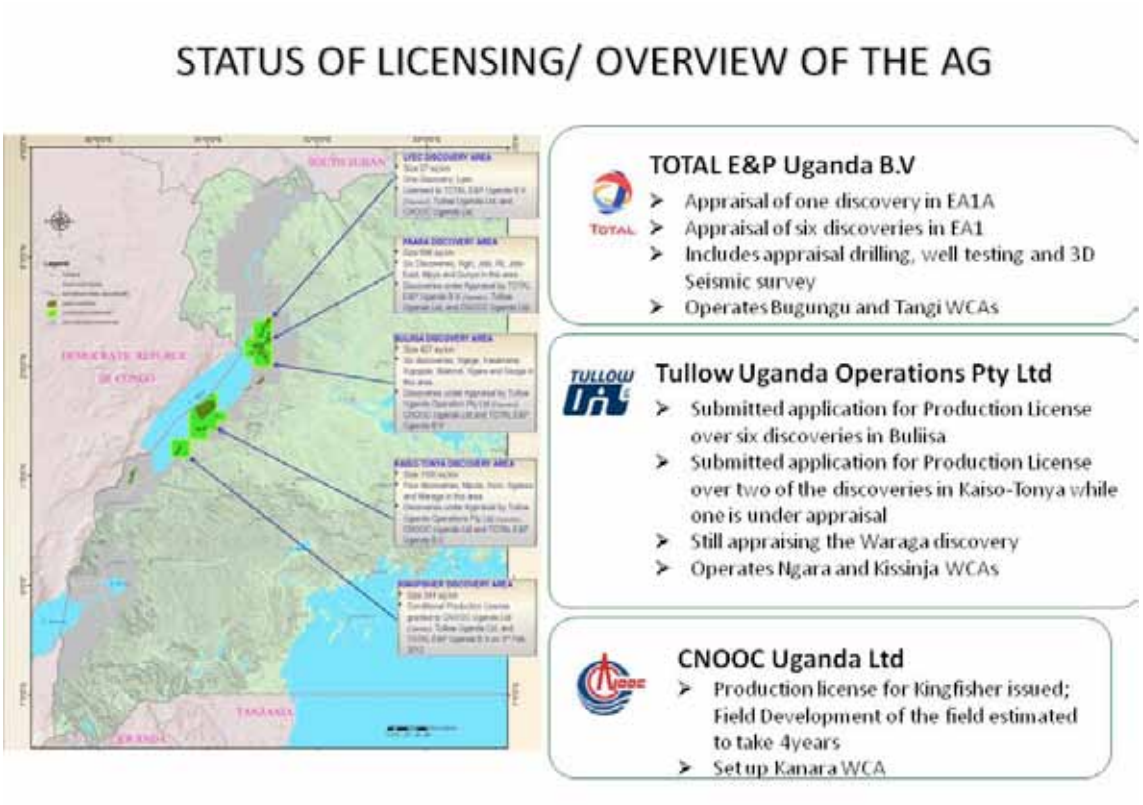
2. To what extent has NEMA put in place an appropriate system for follow up and control of drilling waste?

3. To what degree are the current drilling waste management practices affecting environment and economy?

1.5 AUDIT SCOPE

The audit assessed the adequacy of NEMA's efforts to ensure that drilling waste in the Albertine Graben is handled in an environmentally sound and economic manner. Given the critical nature of oil exploration waste, and the grave environmental impacts of improperly managed waste, the audit covered the period from 2006 when oil exploration activities began in earnest, to June 2013, that is, Financial Years (FYs) 2006/07-2012/13. The audit was carried out within the Albertine Graben since this is the area in which oil exploration is on-going; it is also where all activities aimed at managing oil exploration waste have so far been confined as shown in figure 1 below.

Figure 1: Map showing Oil exploration blocks in the Abertine Graben



Source: Courtesy of PEPD

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CHAPTER TWO

CHAPTER TWO

CHAPTER TWO

AUDIT METHODOLOGY

The audit was carried out in accordance with the International Organisation of Supreme Audit Institutions (INTOSAI) standards and guidelines. The standards require that the audit is planned in a manner which ensures that an audit of high quality is carried out in an economic, efficient and effective way and in a timely manner.

2.1 SAMPLING

Four (4) exploration sites were selected for visits for the purpose of interviews and observations: that is Ngassa - 2, Ngara - 1, Kasemene - 1, and Jobi East–6. Five (5) waste consolidation areas within the Albertine Graben were also visited during the audit to observe on-site waste management practices. The sites are Kisinja and Ngara;1 Bugungu and Tangi;2 and Kanara3. The sites are located in the districts of Hoima, Buliisa, Ntoroko, and Nebbi (Pakwach- including Murchison Falls National Park), all within the Albertine Graben.

2.2 DATA COLLECTION METHODS

The following data collection methods were used:

2.2.1 Document Review

Documents were reviewed to gain an understanding of the major aspects of oil waste generation and management in the Albertine Graben; it was also done to establish the legal mandate, general operation, performance and challenges faced by the key players in the management of oil waste. For details of documents reviewed and purpose for review, refer to Appendix I.

2.2.2 Interviews

The audit team conducted 14 interviews with officials from NEMA, Petroleum Exploration and Production Department (PEPD) and the Oil Exploration and Production (E&P) Companies to assess how NEMA, other environmental pillar member authorities, and prospecting companies were ensuring that waste is properly managed, as well as to corroborate audit evidence obtained from other data collection methods. The list of interviewees and purpose for interview is shown in APPENDIX II.

2.2.3 Observation/ Field inspections

Selected waste consolidation areas, active rig sites and camps were visited to observe drilling waste generation, handling and management activities; at each site, photographic evidence of the status quo was obtained.

1 Operated by Tullow
2 Operated by Total E&P
3 Operated by CNOOC

CHAPTER THREE

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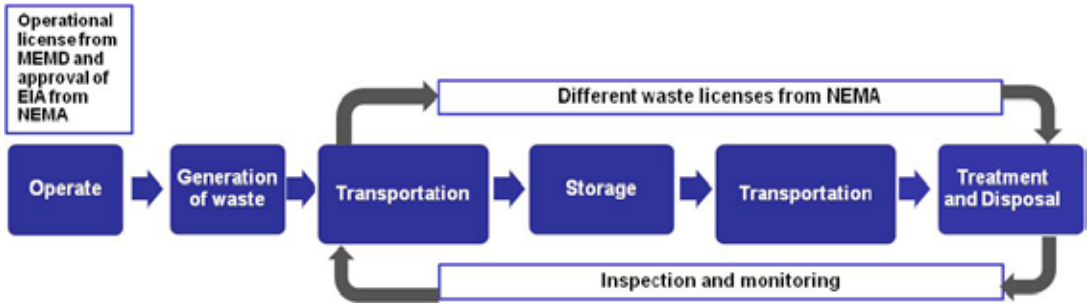
CHAPTER THREE

SYSTEM AND PROCESS DESCRIPTION

WASTE GENERATION AND MANAGEMENT

Figure 2: Description from waste generation to treatment and disposal



Generation of drilling waste

During exploration activities, solid waste is generated during drilling operations. The fluids used to aid the process are usually recovered for re-use, but some eventually ends up as liquid waste. During the exploration activities, there is a mixture of oil and water produced, commonly referred to as slop oil.

Transportation, Storage, treatment and Disposal of Waste

The generated waste is transported off-site to a NEMA-approved storage site known as a Waste Consolidation Area by a waste transportation company. The waste will eventually be transported to a NEMA-approved treatment and/ or disposal facility

3.1 LICENCING AND MONITORING REQUIREMENTS

a) Licensing of Exploration and Production Firms

Before any firm begins prospecting for oil in the Albertine Graben, it must apply for a licence from the Government of Uganda. The licence is issued by the Minister of Energy and Mineral Development on behalf of the Government of Uganda. The licence requires the firm to take all necessary precautions to ensure that possible negative environmental impacts are adequately mitigated.

Once exploration and production activities commence, the wastes generated should be handled, transported, stored and treated by a licensed company, or by the E&P firm, upon authorization by NEMA.

b) Licensing of Waste Management Firms (Pollution Licensing)

All applications for waste management should be submitted to NEMA. The licence applied for may be for transportation, storage, disposal and/or treatment of waste. The application forms for waste handling are picked from NEMA, and the specified application fee for each licence paid to the National Environment Fund (NEF). If the licence sought is for Waste Disposal or operation of an Effluent Treatment Plant (ETP), an Environmental Impact Statement of the proposed ETP location should be submitted together with the application form.

For cases where waste management will involve transportation to, or storage, disposal/ treatment in a district other than the district of origin, a letter of recommendation from the District Environment Officer of the Destination district must be submitted together with the application.

NEMA drafts a Public Notice which the Applicant publishes in the Uganda Gazette and in any other media publication of wide circulation to allow for public comments on the intended activity.

After 30 days, an inspection team comprising NEMA officials and representative(s) of the Technical Committee on Pollution Licensing shall visit the applicant's premises to verify the information provided by the applicant and assess capability of the applicant to handle the said waste. The main areas that shall be assessed include: Waste management plans namely: number of routes planned (for transportation licences), amount of waste transported per route, number and condition of vehicles in place, adequacy of signage on vehicles containers and/or at the disposal/ treatment plant; sufficiency of Personal Protective Equipment (PPE) for staff use; knowledge and training of staff on Waste Management, as well as Health and Safety issues.

The inspection team then shall write a report detailing their findings and forward it to the Technical Committee on Pollution Licensing (TC/PL). The committee meets at least once every quarter to consider the applications received, and advises the Executive Director of NEMA on whether or not a licence should be granted.

Where a licence is granted, the applicant must submit to NEMA bi-annual reports of activities carried out. Where a licence is not granted, NEMA shall write to the applicant communicating the decision and reasons why the licence was denied.

c) Monitoring and Inspection

Oil Exploration and Production (E&P) companies

The Oil Exploration and Production (E&P) Companies should carry out the following:

- keep a log of chemicals used in drilling;
- record quantities and types of waste generated from drilling activities daily;
- periodically carry out laboratory tests to characterize the wastes generated;

A report detailing all the above should be compiled and submitted to NEMA every quarter. However, serious incidences of environmental non-compliance should be reported to NEMA within the shortest time possible.

Waste-handling firms

These shall report bi-annually to NEMA on their activities or more regularly, as may be stipulated in the conditions of approval of a particular licence. They are also required to keep a log of quantities and qualities of wastes handled and submit a bi-annual report on them to NEMA.

NEMA and Multi-stakeholder Inspections

NEMA has a unit at its headquarters specifically dedicated to inspection and monitoring of oil activities. Inspections to the Albertine Graben should be undertaken three (3) times a year.

In addition, a multi-stakeholder team comprising officials from different Lead Agencies4shall carry out quarterly inspections of the Albertine Graben to monitor impacts of oil exploration activities on the environment, as well as compliance to sound environmental management practices, including handling waste.

Prior to any inspection, the inspectors should formulate a checklist of major environmental issues to look out for, including waste management.

Upon completion of the inspection, the findings and mitigation measures should be communicated, in writing, to the management of the Facility. At times, NEMA signs a Compliance Agreement with the management, issues an improvement notice, or closes the facility in cases of gross non-compliance.

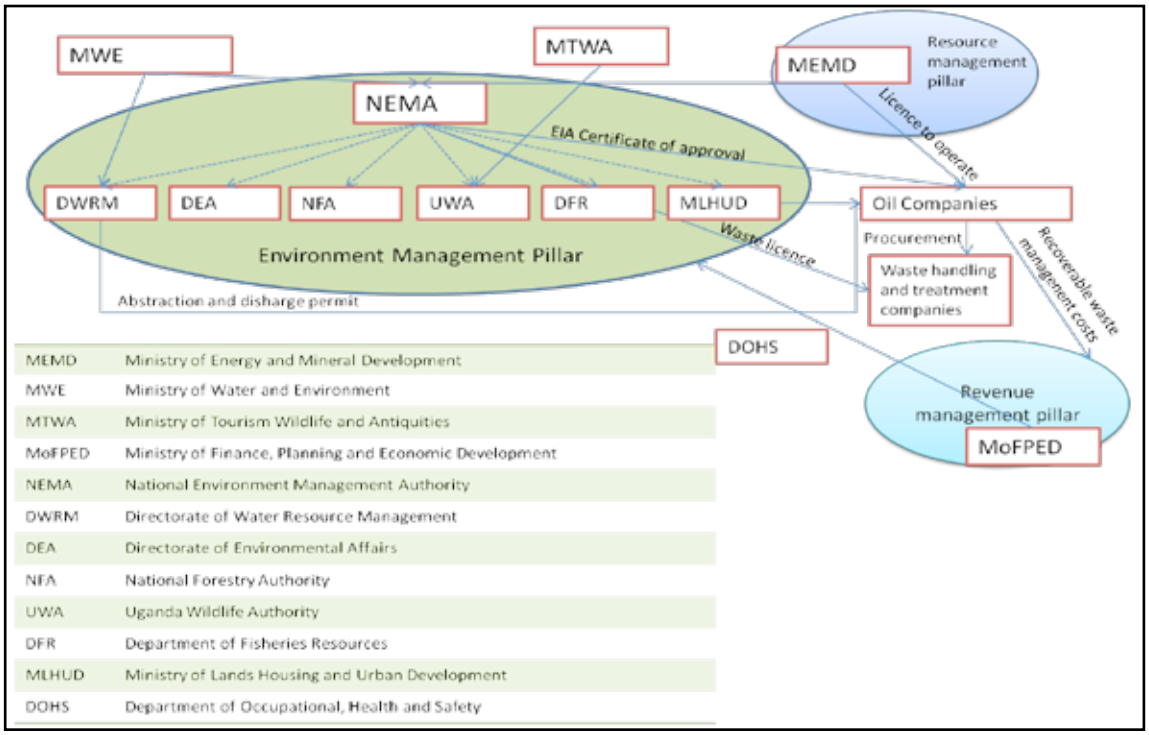
Follow up after an inspection should be done by NEMA officials, gazetted environmental inspectors, Local Authorities or District Environment Officers, to ascertain whether the recommended mitigation measures arising out of the inspection are being implemented. The inspector has the discretion to determine when to follow up after inspection of a Facility.

3.2 ROLES AND RESPONSIBILITIES OF KEY PLAYERS

The Government instituted an environment management pillar headed by NEMA as one of three pillars for the management of oil and gas in the country. The Environment Management Pillar comprises the key players/ institutions with a mandate to manage the impact of oil and gas activities on the environment and biodiversity and whose heads, form the strategic level monitoring team. The institutions are shown in the green oval in **Figure 3** below.

4 These are: NEMA, PEPD, UWA, DWRM, NFA, Fisheries and Department of Occupational Health and Safety.

Figure 3: Showing Key Players and Major Processes in Waste Management



Source: OAG

As the subject of this audit is waste management, this audit focused on the oversight roles and responsibilities of NEMA regarding waste management in the Albertine Graben.

National Environment Management Authority (NEMA)

NEMA is the principal agency charged with regulating, supervising, monitoring and coordinating all environment activities in Uganda. In respect of waste management in the Albertine Graben, the following are NEMA's key roles:

- Co-ordinating the processes of environmental impact assessments for oil and gas activities, with specific conditions on how to manage all wastes generated;
- Issuing pollution licences to all companies that seek to transport, store, dispose of or treat waste generated in the oil exploration areas;
- Carrying out, alongside other stakeholders, environmental monitoring and audits of handling and management of waste from oil and gas activities.
- Ensuring and monitoring compliance of oil and gas activities with environmental/ waste management guidelines.
- Harmonizing national performance standards in the oil and gas sector on environmental sustainability with international standards.
- Coordinating and spearheading multi-sectoral inspection of oil exploration activities, carried out on a quarterly basis.

Petroleum Exploration and Production Department (PEPD)

This department, under the Ministry of Energy and Mineral Development, is charged with oversight over all upstream oil exploration and production activities. The PEPD carries out petroleum exploration promotion, initiates petroleum legislation and monitors oil companies' compliance with existing laws, regulations and agreements. This includes compliance with waste management obligations. The PEPD has permanent field staff stationed at all active oil exploration sites, who are required to submit daily logs/ reports of exploration activities to headquarters. PEPD is also supposed to receive and review field reports from oil exploration activities every day.

District Environment Officers (DEOs)

These shall/should carry out inspections of activities in the oil exploration and production areas as and when directed by NEMA.

Oil Exploration and Production (E&P) Companies

Currently, there are three (3) Oil E&P Companies operating in Uganda, namely: Tullow Uganda Operations Pty Limited (TUOP), Total E&P Uganda (TEP) and CNOOC Uganda Limited. They are charged with:

i) Ensuring compliance with all legislation governing waste management in the Albertine Graben;

ii) Continuous self-monitoring to keep track of compliance with environmental management and international best practice;

iii) Submission of regular self-monitoring reports to relevant Lead Agencies in accordance with the law and relevant conditions of approval of different licences obtained.

Waste management firms

These include companies licensed to transport, store, dispose of or treat all waste (hazardous or non-hazardous) generated in the Albertine Graben. They are obligated to:

i) Comply with the conditions of approval contained in the pollution licence they receive from NEMA;

ii) Submit bi-annual reports of their operations to NEMA, or more frequently as may be stipulated in the conditions of approval.

Multi-stakeholder Inspection team

This comprises officials from different Lead Agencies mandated to monitor different aspects of environmental management in the Graben. They are required to carry out quarterly inspections of the Albertine Graben to monitor impacts of oil exploration activities on the environment, as well as compliance to sound environmental management practices, including management of waste.

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CHAPTER FOUR

CHAPTER FOUR

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

4.1 ADEQUACY OF WASTE MANAGEMENT REGULATIONS AND GUIDELINES

Waste Management Regulations

The National Environment Act, Cap.153, Section 107, provides for the Minister to make regulations generally for better carrying out of the provisions and purposes of the said Act. NEMA is supposed to issue relevant waste management regulations to ensure this. Adequate regulations are a pre-requisite for proper management of waste from the oil and gas activities.

Audit noted through interviews with NEMA's management that there existed waste management regulations[5] but that these regulations did not cater for oil and gas activities (drilling waste). A review of NEMA's annual work plans and budgets for 2008/096, 2009/107, and 2010/118 revealed that NEMA had planned to spend UGX 432,500,000 on Legislative review as indicated in table 1 below. However, a review of its expenditures for the same period revealed that funding had not been released for this activity and that by the time of audit (March 2014), the legislative review process had not been completed.

Table 1: Planned expenditure on Legislative review to incorporate Oil and Gas issues

Year	Activity	Amount (UGX)
2008/09	Development of regulations on air quality and vibrations for oil/gas sector and Review of other policies to incorporate Oil and Gas	153,500,000
2009/10	Legislative review to incorporate Oil and Gas issues	123,000,000
2010/11	Legislative review to incorporate Oil and Gas issues	-
2011/12	Development of regulations on air quality and Review of other regulations to integrate oil/gas related environmental issues (Int. Consultancy)	156,000,000

Source: OAG Analysis of NEMA's budgets and work plans for its legislative review

The NEMA officials interviewed attributed the delay to the freezing of funding by the Norwegian Government (Oil for Development programme) in FY 2012/13, which had been sponsoring the review process. They further explained that upon resumption of funding, the consultants needed to carry out extensive consultations.

Audit, however, attributed the delay to complete the review of the legislation to incorporate the oil

5 The National Environment (Waste Management) Regulations, Statutory Instrument No. 153-2
6 The annual work plan and budgets estimates for 2008/09 page 10
7 The annual work plan and budgets estimates for 2008/09 page 22
8 The annual work plan and budgets estimates for 2008/09 page 14

and gas issues to NEMA's over reliance on donor funding. These donor funds however, normally come conditioned for a specific purpose and activity[9]. Furthermore, a review of NEMA's budgets for the same period had no evidence that alternative funding had been sought from Government of Uganda. As a result, the review process that commenced over five years ago (started in Financial Year 2008/09) was yet to deliver any tangible output by the time of audit (March 2014).

The delay to finalize review of the regulations and give comprehensive guidance on how to properly manage drilling waste resulted in a decision by NEMA that all drilling waste should in the meantime, be consolidated at designated sites, until a satisfactory solution is found.

Guidelines for handling drilling waste in the Graben

According to NEMA's Strategic plan, in FY 2009/10, NEMA was supposed to develop guidelines to ensure sustainable exploitation of the emergent oil resources in Uganda and mineral reserves country-wide, without degrading human health and the natural environment.[10]

Through document review, Audit noted that much as NEMA issued Operational Waste Management Guidelines for Oil and Gas operations to guide oil companies on most appropriate waste disposal methods, the issued guidelines are silent about how the drilling waste currently generated in the Albertine Graben should be transported, stored and/ or treated.

Audit noted, through interviews with NEMA and Oil company officials, that NEMA had changed its position on some of the provisions in the issued guidelines in as far as the generated waste was concerned as illustrated in table 2 below.

Table 2: Waste management Guidance in Operational guidelines vs. NEMA's current guidance

S/N	Guidance as per Waste Management guidelines	NEMA's current position (according to interviews)
1.	**On current consolidated wastes:** "The wastes should be stabilized and buried in lined pits at the sites of the current storage."[11] **On Future Wastes (Exploration and production wastes)** "If the wastes have pollutants that are within the acceptable standards, the waste shall be buried on site in lined pits otherwise, the waste shall be transported to the central waste treatment plant."[12]	All waste will be transported from current WCAs to designated waste treatment (land filling) sites.
2.	**On handling of produced water:** "For production waste, especially produced water shall be re-injected back into the underground formations."[13]	Waste re-injection is not permissible.

Source: Review of Operational Waste Management Guidelines for oil and gas operations and Interviews with NEMA and Oil company staff.

In addition, the Operational Waste Management Guidelines do not provide for the management of liquid waste arising from drilling activities from generation to disposal. They also do not guide on

9 Both parties' interests might vary at a given time
10 NEMA Strategic Plan 2009/10-2013/14; page 118
11 Interim waste management guidelines for oil and gas operations. section 4(i); Recommendations for proper E&P waste management
12 Op.cit; Section 4 (ii) (e)
13 Op.cit; Section 4 (ii) (f)
14 Occurs during the drilling and operation for production wells for oil and gas

handling of slop oil[14].

NEMA attributed its shift in position from the earlier issued guidelines to the fact that new forms of evidence keep coming up as new tests are conducted to ascertain the chemical composition of the generated waste and that this necessitates appropriate measures to deal with the specifics of wastes especially now that the whole concept of oil and gas was a new area to all Ugandan entities, including themselves and that every step was a learning process for them, which necessitated them to change previously held positions in order to better preserve the highly sensitive Albertine Graben ecosystem as and when new evidence came to light.

However, through interviews with NEMA and Oil Companies, Audit established that the inadequacies in the operational waste management guidelines for oil and gas operations mainly came about because NEMA did not adequately involve other stakeholders in the formulation process.

For instance, according to the NEMA officials interviewed, the guidance to bury waste on site (refer to Table 2 above) was opposed by the Uganda Wildlife Authority (UWA) since some of the provisions entailed burying waste at the same point of generation and this meant within Protected Areas (National Parks) where some exploration activities were on-going. This, UWA argued, would endanger burrowing animals which can dig up the waste.

On the other hand, oil companies were reluctant to implement guidelines on handling the generated waste considering the past experience at Purongo[15]. All companies interviewed for this audit (all that are exploring in the Graben) felt that the issued guidelines were too generic/ high-level, and this made it difficult for their implement them hence, NEMA's subsequent decision to withdraw them.

NEMA's delay to come up with adequate environmental regulations and guidelines has had both environmental and economic effects, as detailed in Chapter 4.3.

Management Response:

- Preparation of the interim waste management guidelines was consultative involving stakeholders, sector ministries and oil companies.
- The review of the waste management regulations and guidelines incorporating oil and gas issues is ongoing and supposed to be completed by June 2014 and adopted by December 2014. In addition, the National Environment Act (NEA) and the National Environment Management Policy (NEMP) are also under review and are expected to be completed by December, 2014.
- The current process for review of the above is highly consultative.

Audit Response

NEMA did not provide any evidence that stakeholders (sector ministries and oil companies) were consulted during formulation of the Operational Waste Management Guidelines for oil and gas operations.

Conclusion

NEMA has not completed the review of environment legislation in time, and did not consult relevant stakeholders while formulating the Operational Waste Management Guidelines for oil and gas

15 The Purongo incident involved a case in which one of the Oil companies buried waste, following guidance given by NEMA. However, the surrounding communities protested the action, resulting in a lot of negative press for the company.

operations. Thus proper and efficient management of waste from the oil and gas activities have been hampered.

Recommendations

- NEMA should prioritize and expedite completion of the review of Uganda's legislation to incorporate oil and gas issues to promote better management of drilling waste.
- NEMA should consider adding review of the Operational Waste Management Guidelines for oil and gas operations to the on-going legislative review.
- In future, NEMA should involve stakeholders in formulation of any policies, legislation or guidelines, and seek their input.

4.2 MONITORING AND COMPLIANCE ENFORCEMENT

According to Section 77[16] of the NEMA Act, any person who carries out any activity which has or is likely to have a significant impact on the environment shall keep records relating to the amount of waste and by-products generated by the activity; the extent of his or her activities, indicating the economic value of the activity on the area covered, expressed in the monetary value of the product per year; the observable effects of the activity on the environment; and how far, in the opinion of that person, the provisions of this Act have been complied with.

According to the Strategic Environmental Assessment[17] for Oil and Gas activities in the Albertine Graben, Oil Exploration and Production Companies are required to carry out self-monitoring and submit their data to the various environmental agencies on a quarterly basis.

Oil Exploration and Production (E&P) companies

Audit observed that the Oil companies did not prepare and submit self-monitoring reports against set parameters as per the requirement. Self-monitoring data would have provided a basis for verification of compliance with legal requirements and enforcement by the responsible government agencies, and for calculation of environmental or administrative charges.

For instance, Tullow (TUOP) was expected to have submitted twelve (12) self-monitoring reports for the last three years starting 2011, 2012 and 2013 alone[18], while Total (TEP) and CNOOC were each expected to have submitted six (6) self-monitoring reports[19] in the same period.

However, a review of their self-monitoring reports for the same period revealed that out of the expected self-monitoring reports, TUOP had submitted 7 reports (58%), TEP 3 reports (50%) and CNOOC none (0%) respectively as indicated in Table 3 below.

Table 3: Submissions of self-monitoring reports by E & P companies

COMPANY	FY												TOTAL REPORTS SUBMITTED
	2010/11				2011/12				2012/13				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
TUOP	×	×	×	√	×	√	√	√	√	√	√	×	58%
TEP	N/A	N/A	N/A	N/A	N/A	N/A	×	×	√	√	√	×	50%
CNOOC	N/A	N/A	N/A	N/A	N/A	N/A	×	×	×	×	×	×	0%

16 Record keeping
17 Issued by the MEMD (Section 4.4.1)
18 TUOP began operations way before 2011
19 TEP and CNOOC began operations in February 2012

Source: OAG analysis of self-monitoring reports submitted to NEMA

Audit further noted that even for the submitted reports, NEMA had not issued standardized formats against which the Oil Exploration and production companies would report and as a result, there was no uniformity on issues reported on quarterly by the E&P companies. In the reports availed during the audit, Total(TEP) did not report on quantities of drilling waste generated per quarter while important issues like environmental incidences were missing in some reports.

Audit attributed the inconsistencies in submitting self-monitoring reports by Oil exploration and production companies to NEMA's reluctance to compel the exploration and production companies to comply with the provisions of the law. For instance, CNOOC that had been in operation for over a year (since Feb. 2012) had not submitted any self-monitoring report while TEP and TUOP had only submitted 50% and 58% respectively of the expected submissions without any sanctions imposed on them by NEMA.

In absence of self-monitoring reports from the Oil exploration and Production companies, it might become difficult for NEMA to prioritize allocation of its available resources to ensure that inspections are focused on areas where they are most needed- for instance where there is observed/ consistent non-compliance.

In addition, self-monitoring data would have provided NEMA with a basis to verify the extent to which the companies operating in the Graben are complying with legal requirements and best environmental practices, and for calculation of environmental or administrative charges.

Management Response:

Tullow Uganda has been in operation over the period under review and has routinely submitted annual reports; while TOTAL E&P and CNOOC became operators in 2012. Since then Total has submitted the mandatory report of 2013. However all the companies have been providing interim reports as and when requested.

Audit Response

Given the sensitivity of the Albertine Graben, the Oil E&P Companies should have submitted not only annual reports but also quarterly ones as required.

Waste-transportation firms

The waste management regulations and conditions of approval[20] require waste transportation firms to maintain proper records of the quantity and quality of the waste handled and report bi-annually to NEMA on the same. This was supposed to be ensured by NEMA.

Audit noted through document review that licensed waste transportation firms did not regularly submit bi-annual reports on the quality and quantity of waste to NEMA as required. This, if complied with, would help NEMA to keep track of the waste generated in the Graben, its final destination (and not offsite) in order to ensure that the risk of pollution is minimized.

For instance, a review of documents relating to Epsilon and Strategic Logistics Limited, licensed to transport waste, revealed inconsistencies in reporting as required as illustrated in Table 4 below.

20 For the individual waste management Licenses

Table 4: Expected reports for submission to NEMA vs. actual submitted

S/N	COMPANY	DATE LICENCE WAS ISSUED	EXPECTED REPORTING DATES	ACTUAL SUBMITTED	DATE OF SUBMISSION
1.	EPSILON	7th January, 2007	7th July, 2007	X	
			7th January, 2008	X	
		19th February, 2010	19th July, 2010	X	
			19th February, 2011	X	
		20th June, 2011	20th December, 2011	X	
			20th June 2012	√	26th September, 2013
		3rd December, 2012	3rd June 2013	X	
			3rd December, 2013	X	
2.	Strategic Logistics Limited (SLL)	8th December, 2011	8th June, 2012	X	
			8th December, 2012	X	
		Total submitted		1	
		%		10%	

Source: Analysis of NEMA Transportation Licenses and Bi-annual report submitted to NEMA

From the table above, EPSILON was expected to have submitted eight (8) reports to NEMA by the time of audit. However, it had only submitted one report.[21] On the other hand, there was no record of submission by Strategic Logistics Limited for the period of their license (8th Dec. 2011 to 8th Dec. 2012). Similarly, Audit could not readily verify whether the company's license had been renewed for the period 2013 by the time of audit (March 2014). This represents a 90% gap in the frequency of submission of bi-annual reports by waste-handling firms.

Audit attributed the failure by waste transportation firms to submit their bi-annual reports on the quantity and quality of waste handled to their reluctance to comply with this requirement. Despite this, NEMA did not impose any sanctions or penalties on the said companies in spite of their repeated non-compliance.

In the absence of these reports, NEMA might not be aware of the actual waste transported from the generation points to the consolidation areas.

If NEMA cannot account for all the waste generated and transported in the Graben, it becomes very difficult to rule out dumping of waste. This may have negative consequences on the sensitive eco system of the Graben if the waste generated has undesirable chemical constituents, such as heavy metals. This is a real danger given that Laboratory analysis of the waste transported by EPSILON showed that they contained abnormally high concentrations of Barium, Chromium, and

21 Relating to wastes handled during the period January to June 2013; Received by NEMA on 25th September, 2013.

Lead, among others

Management Response

NEMA will follow up the Companies to make sure that the biannual reports are submitted. In respect to tracking of waste generated in the Albertine Graben, the generators of waste and the transporters use waste manifests that are on record (documented and kept on files which are reviewed by inspectors) in line with S.24 (1) of the waste management regulations. Herein the quantity of waste is tracked and documented at source, during transportation, and at destination – which records the inspectors of NEMA routinely study upon visit to the concerned sites.

Audit Response

Audit notes that whereas there were some manifests at the different generation points (exploration sites) and Waste Consolidation Areas visited, NEMA's inspection reports contained no evidence that these manifests had been reviewed during inspection. In the absence of bi-annual reports submitted by Waste transportation companies and without examination of the waste manifests on site, NEMA cannot account for all the waste generated and transported in the Graben.

Inspections

There are three levels of inspections: Inspections by District Environment Officers (DEOs), Multi-Sectoral inspection teams and by NEMA.

District Environment Officers (DEOs)

Audit noted, through interviews with District Environmental Officers of Bulisa and Hoima, that inspections of the waste consolidation areas within their areas of jurisdiction (within their districts) were not being carried out.

Audit further established, through interviews with NEMA officials, that routine monitoring of activities in the Albertine Graben was the responsibility of the DEOs and that these had been trained by NEMA, especially on aspects of monitoring and inspection of oil and gas activities. Similarly, the DEOs interviewed specified that due to funding constraints and limited equipment, inspections were only carried out when NEMA or the Oil companies involved and/or facilitated them.

However, a review of the work plans for Hoima and Bulisa's District Environment Offices for the period 2011/2012 and 2012/13 revealed that the Districts Environment Officers had not planned for inspections and neither did their planning budgets reflect any provisions for funding for the said activities in the Albertine Graben.

Management Response

The District Environment Officers have not been adequately equipped and financed by their respective local governments as provided by law. NEMA has and will continue to work with Local Governments to ensure that budgetary provisions for environmental management are scaled up. However, the best options would be to introduce conditional grants for the District Environment Offices, or NEMA to establish regional offices.

Multi-stakeholder Inspections

Audit noted through interviews and document review that the multi-sectoral inspection team[22] does not carry out inspections as regularly as required. On average, the multi-stakeholder inspections conducted constituted 18.75% of the expected inspections as indicated in table 5 below

Table 5: Documented Multi-stakeholder inspections

Financial Year	Required number of annual inspections	Actual number of inspections	Performance (%)
2009/10	4	2	50
2010/11	4	1	25
2011/12	4	0	0
2012/13	4	0	0
Average			**18.75**

Source: OAG Analysis of NEMA's multi-sectoral inspection reports

Audit attributed the failure by the Multi-stakeholder inspections team to conduct the required inspections to NEMA's failure to prioritize the inspections. For instance, in the period under review, only three (3) joint inspections were carried out, out of the expected total of sixteen (16), over the last four years alone, as indicated in Table 5 above. It was also noted that the inspections had gradually reduced from two in 2009/10 to no inspections at all in 2012/13.

As a result, the bulk of inspections have been left to NEMA to bear and this deprives the Albertine Graben the benefit of knowledge that would be shared by experts in specialized fields of ecosystem management, such as Wildlife (UWA), Wetland Management (Wetlands Division of the Ministry of Water and Environment), Water quality (DWRM) and Aquatic eco-systems (Fisheries Department), among others.

Management Response

The inspection tiers and protocol referred to are an administrative measure to enhance information sharing, institutional cooperation and compliance to various sectoral environmental regulatory requirements. This administrative initiative does not however overrule the statutory requirements as clearly stated in S.6(3) of the NEA. This was instituted to operate on a quarterly basis subject to availability of funds.

Audit Response

Audit maintains that the activity was not prioritized by NEMA since no evidence in the form of annual or quarterly reports was submitted to Audit as proof that the quarterly inspections were routinely budgeted for.

22 PEPD, NEMA, UWA, NFA, MWE/DWRM, MWE/DEA, the Fisheries Department

Basis and frequency of inspections by NEMA's Inspection team

NEMA is required under law[23] to monitor and inspect the operation of any industry, project or activity. According to NEMA's Compliance and enforcement strategy, the Authority is required to undertake inspections of entities[24] to monitor their environment management practices. This strategy categorizes projects based on associated risks that is high-risk (Category 1), medium-risk (Category 2) or low-risk (Category 3).

Projects located in a Protected Area/ Sensitive Ecosystem or involving Waste Management and Infrastructure are considered high-risk and should be inspected by NEMA's inspection team at least 3 times a year.

Audit noted that the waste management activity within the sensitive Albertine Graben ecosystem had not been reported on and/or inspected by NEMA as per the required frequency. Through review of monitoring reports for the period 2010/11, 2011/12 and 2012/13, Audit noted that NEMA had only carried out one (1) inspection on all sites within the Albertine Graben in 2010/11 and 2011/12. However, its inspections had increased to four (4) in the Financial Year 2012/13, giving an average performance of 66.7% inspections as illustrated in Table 6 below.

Table 6: Showing inspections conducted by NEMA staff

FY	Required number of annual inspections	Actual number of inspections	Performance (%)
2010/11	3	1	33.3%
2011/12	3	1	33.3%
2012/13	3	4	133.33%
Average			**66.7%**

Source: Review of Inspection reports submitted for audit

Similarly, through interviews with NEMA officials, they acknowledged the need to even carry out more inspections than those stipulated in the current strategy because the current inspections, in their view, were not sufficient, given the sensitive nature of oil and gas exploration activities. The Authority would have preferred to station Environmental Monitoring Officers (Oil and Gas) permanently in the Albertine Graben.

Audit attributed the good performance in 2012/13 to the recruitment of two extra Environmental Monitoring Officers, specifically dedicated to Oil and Gas issues. Conversely, the failure to match the number of inspections in the years 2010/11 and 2011/12 was attributed to a limited number of staff allocated to inspections of the Graben then.

As a result of complying with the required inspections, NEMA was able to report on the activities of Oil companies as well as advise Oil companies on how the waste in the Graben should be dealt with in the interim as long lasting solutions on how to treat and dispose of the waste are explored. However, NEMA's two Environmental Monitoring Officers for Oil and Gas cannot adequately monitor activities on the ground to expectation of NEMA's management, considering NEMA has several other activities related to Oil and Gas, which require the input of these officers, such as reviewing EIAs, Environmental Audit reports and other compliance reports submitted by oil companies;

23 Section 23(1) (b) and (2) of the NEMA Act

24 Including oil and exploration companies operating in the Albertine Graben

attending conferences and workshops pertaining to Oil and Gas, and this makes it impossible to station them permanently in the field[25].

Conclusion

Monitoring and supervision of drilling waste management in the Albertine Graben has not been adequately done by the licensed companies, DEOs, NEMA and the multi-stakeholder team. As a result, significant environmental impacts of the current practices may go undetected.

Recommendations

- NEMA should ensure that the Oil E&P companies carry out Self-Monitoring and submit reports to it as required and, where necessary, use available sanctions in the Law to compel their compliance.
- NEMA should prioritize the multi-sectoral inspections in order to ensure that the knowledge from the various experts in specialised fields of ecosystem management is harnessed.
- NEMA should expedite its proposal of permanently having its Environment Monitoring staff stationed in the Albertine Graben in order to keep pace with activities of oil and gas.
- Government should consider introducing conditional grants for the District Environment Offices to facilitate environmental monitoring. In addition, MoFPED should consider approving/ financing the recommendation by NEMA's Institutional Review Report to employ more environmental monitoring officers (oil and gas) and establish regional offices for better environmental monitoring, especially in the oil and gas sector.

Compliance and Independent verification/ Methodology for inspections

NEMA is required[26] to conduct inspections of approved facilities to ascertain compliance or noncompliance with Conditions of Approval independent of information supplied by the developer. This would help NEMA to verify the accuracy of the reports submitted by the developer and support permit development re-issuance or revision.

During a Compliance Sampling Inspection, the Authority will: Collect wastewater samples, which might also include collecting 'split samples' with the operator to compare sample results and document a developer's laboratory techniques. Sample collection and laboratory testing are a vital tool in reporting on and/or monitoring compliance with proper waste management practices.

Audit noted that NEMA was not carrying out independent tests of solid and liquid waste samples generated from the drilling activities to corroborate the results they received from the self -monitoring tests carried out by the oil companies. These tests range from soil characterization, water quality tests, quantity and chemical composition of drilling waste/mud and chemicals being used in the drilling activity, among others.

A review of NEMA's inspection process did not reveal any procedures on the frequency, timing and details of the verifications required for sample collection and laboratory testing. For instance, Audit noted that NEMA had only conducted two verification tests in 2010 and 2012 in the whole period of active Oil exploration in the Graben (since 2006).

NEMA Management explained that independent verification of the test results submitted by the oil companies was primarily the responsibility of relevant lead agencies such as Directorate of Water

25 Interview with Mr. WaiswaAyazika, Director, Environmental Monitoring and Compliance, NEMA

26 NEMA's National Compliance Monitoring and Enforcement Strategy, 2008,Page 23

Resources Management (DWRM) for water quality and PEPD for chemicals used. These would then be required to submit reports on the verification to NEMA.

Audit attributed NEMA's inability to conduct independent verification tests to failure by the Authority to prioritize the activity. The Authority did not budget for independent verification tests and neither had it adequately equipped its laboratory to carry out these tests.

A review of NEMA's budgets for the period 2010/11, 2011/12 and 2012/13 revealed that much as NEMA budgeted and equipped its existing laboratory with tools and consumables for its routine activities, it lacked a budget line item for key equipment, such as: the Air quality testing equipment, Atomic Absorption Spectrophotometer which could have been used for testing heavy metals in the waste being generated.

Conclusion

NEMA did not conduct adequate verification of the information provided by the oil companies. As a result, it might be very difficult for NEMA to provide assurance that the current environment management practices have not adversely affected the surrounding environment.

Management Response

NEMA takes note and shall ensure that;

- Environmental Pillar institutions carry out tests on activities for which they are responsible
- Independent laboratories within or outside Uganda are contracted for verification of results as was done in 2012.
- Oil companies carry out analysis on routine basis on waste they generate.
- It continues to allocate funds for basic analysis at its laboratory.

Recommendations

- NEMA should routinely carry out laboratory tests to ensure that it keeps track of the effect of oil exploration activities on the environment.
- NEMA should consider carrying out routine verification of test results from the self-monitoring reports submitted by the licensed entities operating in the Graben.

Communication of inspection findings and sanctions

According to NEMA's National Compliance Monitoring and Enforcement Strategy, 2008, the Authority, following an inspection, should prepare an Inspection Report to document a developer's[27] compliance and non-compliance with Conditions of Approval. The final Inspection Report should be transmitted to the developer within 10 working days after the inspection or within 20 working days after the inspection if compliance samples were collected to allow time to process the samples and analyze the results. The Inspection Report should clearly note good practice, non-compliance identified, the relevant regulation or statute violated, actions the developer must undertake, and action required to correct problems.

Audit noted that NEMA was not regularly communicating their inspection findings to the Oil companies after field inspection activities. Interviews conducted with NEMA's Environmental Monitoring officers for oil and gas revealed that findings of their inspections are usually communicated through debriefing of the inspected entities for non-serious issues, through written

27 For purposes of this Audit, "developer" refers to Oil and Gas companies operating in the Albertine Graben

communication within 2-3 days where they find serious incidences of non-compliance, and within 2 weeks if there are no serious issues. However, only one reference to a de-briefing session was availed to audit. In addition, only two (2) letters communicating inspection findings to Oil E&P Companies were availed to Audit for the period under review, as illustrated in Table 7 below.

Table 7: Communication of NEMA's Inspection findings

Inspection period	Company operating in inspected area				Total no. of expected communication letters	Actual number
	TUOP	TEP	CNOOC	Dominion		
October –Dec 2010	√	×	×		1	0
October –Dec 2011	√	N/A	N/A	√	2	0
July-September 2012	√	√	×		2	0
October-Dec 2012	√	√	√		3	0
January –March 2013	√	√	√		3	1
April-June 2013	√	√	√		3	1

Source: OAG Analysis of NEMA inspection reports and communications to Oil companies

Audit attributed the inability of NEMA to frequently communicate their inspection findings to the fact that NEMA does not regard it as a requirement to be strictly followed.

In the absence of adequate feedback, companies could not identify areas of improvement or good practices to maintain. They also could not ascertain whether the management of their waste was in line with the leading waste management practices.

Management Response

Inspection findings are routinely communicated to the regulated community (not only the Oil and Gas companies) through official letters either recognizing good performance or highlighting areas of non-compliance that should be addressed. These communications are available for verification.

Audit Response

Only two (2) letters from NEMA to the Oil E&P Companies communicating inspection findings were provided for verification.

Conclusion

NEMA is not regularly communicating its inspection findings to the exploration companies thus making it difficult for them to gauge their performance and track areas of improvement.

Recommendation

NEMA should routinely report key findings to companies after inspections. This will improve NEMA's capability to track compliance to set standards by oil companies.

4.3 ENVIRONMENTAL AND ECONOMIC EFFECTS OF THE CURRENT WASTE MANAGEMENT PRACTICES

Policy Principles 2 and 4 respectively of the National Oil and Gas Policy for Uganda require efficient resource management and protection of the environment and biodiversity.

4.3.1 Treatment and Disposal of waste

According to best practice, drilling waste should be treated and disposed of as soon as possible after generation, in accordance with the prescribed guidelines issued by NEMA. This treatment can be done at the drilling site (on-site), or the waste can be transported from the generation point to a designated waste treatment and disposal facility (off-site).

Audit noted that instead of waste being treated and disposed of after generation as required, it was being transported to waste consolidation areas (WCAs)[28] where it is being held pending treatment. At the time of audit, Uganda's stockpiles for the period kept by TUOP (Tullow) and TEP (Total) for solid and liquid drilling waste stood at 39,625 tons and 8227 cubic meters respectively as broken down in Table **8** below.

Table 8: Quantity of solid and liquid drilling wastes generated to-date

Company	Solid Drilling Waste (Tonnes)	Liquid Drilling Waste (Cubic Metres)
TUOP	29,565	7,579
TEP	10,060	648
CNOOC	Not availed	Not availed
Total	**39,625**	**8,227**

Source: Drilling waste data from TUOP and TEP

According to interviews held with NEMA, the decision to consolidate waste was made because no waste handling company had come up with a proposal to treat the waste. Similarly, NEMA deemed the Oil companies' waste treatment and disposal options unsatisfactory. NEMA explained that the Oil companies had proposed land farming and land spreading of waste as a disposal method following treatment, but NEMA considered that this would expose people, plants and animal species to components in the waste with the potential for bioaccumulation[29], resulting in health

28 Currently, the WCAs are located at Ngara, Bugungu, Tangi, Kisinja and Kanara.

29 Refers to gradual concentration/ accumulation of a substance in the tissues of living things (plant or animal) due to frequent exposure. Sometimes, this may go on until it reaches harmful concentrations.

risks.

Audit attributed NEMA's delay to make a decision on how the current waste being stored should be disposed of to the inadequacy of the existing waste regulations and guidelines that did not cater specifically for Oil and Gas issues at the time of audit. For instance, through documentary reviews, audit noted that whereas, NEMA had licensed three companies to treat the waste generated and being stored in the Graben, by the time of audit, none of these firms had been procured by the Oil exploration companies to help in the waste treatment. This is because the Oil companies felt that even though they went ahead to procure the services of these countries, without specific guidelines from NEMA or adequate waste treatment plant in the country, disposal would still be a challenge.

The current waste management methods, which, use of waste consolidation areas (WCAs) to hold drilling waste, results in double-handling of waste; since this same waste will eventually have to be removed from the current WCAs to the final treatment and disposal areas. The environmental and economic effects of the current waste management practices are explained below:

4.3.2 Environmental effects

The current practices are likely to expose the Albertine Graben to potential environmental risks since a larger area of land in this sensitive ecosystem is cleared, dug up and compressed as a method of handling the waste in the short run. However it would be better if waste was treated and disposed of at once. Furthermore, continued consolidation creates a new risk-centre that could result in environmental degradation if waste is not properly managed at the WCAs.

For instance, field inspections by Audit revealed that at Bugungu Waste Consolidation site, solid drilling waste had been piled up above the ground level, and it was not properly tucked away (see Picture 1 below). This presents a risk that some of the waste will be washed by rainwater into the surrounding areas, resulting in potential contamination of soil and/or change in the soil characteristics.

Picture 1: Showing improperly covered waste at Bugungu WCA

OAG Photo: Picture taken at Bugungu on 27th/Aug/2013 at 4:24 pm

Picture 2: Showing a properly covered Pit at Kisinja WCA

OAG Photo: Picture taken at Kisinja on 26th/Aug/2013 at 4:19 pm

At Ngara WCA, one of the solid waste holding pits was left uncovered and some rainwater had collected in it. During field visits, birds were seen drinking the water that had collected in the open pit, as shown in Picture 3 below. In the event that the drilling waste in this pit contains hazardous constituents, these could be dissolved into the water, and harm the birds that drink from this pit.

Picture 3: Showing a bird drinking from an open solid waste pit at Ngara WCA

OAG Photo: Picture taken at Ngara WCA on 06/Dec/2013 at 1:59 pm

Management Response

NEMA has licenced four Companies to treat waste that is generated by the three oil companies. The licensed companies are: EnviroServe Uganda Ltd, SLL Uganda Ltd, Mc Allister and White Nile Consult. However, none of these companies have been engaged by the oil companies. NEMA is going to follow this up with the Oil companies and the Ministry of Energy and Mineral Development. The current practice which provides for consolidation of waste in one well engineered location to hold all the drilling waste in one smaller, designed location was the best option to minimize pollution and environmental risks. Besides, the Bugungu Waste Consolidation Area (WCA) was found to be non-compliant, and its licence was not renewed.

4.3.3 Economic/ financial effects

The current waste management practices create a double cost in terms of time, labor and money in the handling of this waste. This has already cost government significant sums of money, since waste management is part of the recoverable expenditures/ costs as per Uganda's Production Sharing Agreements (PSAs).

From 2010 to 2013 alone, the total expenditure on drilling waste management activities by Oil and production companies amounted to UGX 26.263 billion as detailed in Table 9 below.

Table 9: Expenditure on drilling waste management (2010-2013)

Year	EXPENDITURE (USD)				TOTAL IN UGX* (Billions)
	TUOP	TEP	CNOOC	TOTAL	
2010	746,228	0	0	746,228	1.866
2011	281,766	0	0	281,766	0.704
2012	1,724,548	1,006,674	1,349,446	4,080,668	10.202
2013	1,678,159	3,718,270	0	5,396,429	13.491
TOTAL	**4,430,701**	**4,724,944**	**1,349,446**	**10,505,091**	**26.263**

***Exchange rate: 1 USD = 2500 UGX**

Source: OAG Analysis of waste management figures from Oil Companies

This cost is set to increase once Uganda enters into the production phase, since the waste generated will increase significantly. As exploration and production companies enter into the production phase, securing new sites will be difficult given that: land in the Albertine Graben is communally owned; the cost of acquisition is expected to be hiked; and the surrounding communities believe that exploration waste is highly toxic.

In addition, the storage of waste near national parks can be considered as a nuisance and reduce tourism in the area, thereby reducing revenue from this industry.

Management Response

The Authority concurs with the concern raised on this expenditure and plans to follow up the issue with Ministry of Energy and Mineral Development who are responsible for costs incurred by the Companies.

Audit Response

Audit notes that NEMA is not involved in assessing the expenditure proposals of Oil E&P Companies to give technical input regarding various options for proposed environment management interventions vis-à-vis their financial implications. As a result, the Authority cannot provide assurance that the waste management options being used now are the most cost-effective.

Conclusion

The current waste management practices have exposed a greater area of the Albertine Graben

ecosystem to potential environmental risks. In addition, the double handling involved implies that the Government of Uganda will have to spend twice on waste management that is, on consolidation, and eventual treatment and disposal. This would have been avoided if the final disposal method had been agreed upon earlier.

Recommendations

- NEMA should expedite review of environmental legislation to incorporate management of waste from drilling activities.
- NEMA should as far as possible engage the Oil companies to address their concerns and enable treatment and disposal of waste by the licenced companies.
- NEMA should liaise with MEMD and PEPD to ensure that it is involved in assessing waste management expenditure proposals/scenarios submitted by the oil E&P companies.

Overall audit Conclusion

The audit on monitoring and regulation of drilling waste management in the Albertine Graben established that NEMA has made positive strides in ensuring effective and sustainable management of drilling waste in the Albertine Graben. However, existing weakness in the regulatory framework for waste management and capacity gaps in supervision and monitoring by NEMA need to be addressed to ensure proper management of drilling waste in the Garden. In addition, the ongoing baseline survey of the Albertine Garden and the strategic impact assessment under consideration by the sector should be finalized to enable implementation of the proposed mitigation measures.

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AUDITOR GENERAL

KAMPALA
31ST MARCH 2014

GLOSSARY OF TERMS

Albertine Graben	The Albertine Graben is situated in the Northern part of the left arm of the East African Rift valley. It runs from south-western Uganda to North-western Uganda and is covered by water bodies (rivers and lakes). It is also rich in natural resources (minerals, petroleum, fauna and flora), has the largest number of protected areas in Uganda, including game reserves, Ramsar sites and a large number of endemic species. It is also endowed with oil and gas resources with large potential for commercial development.
Domestic waste	This refers to waste generated from residences. It includes paper, used bottles, old clothes and furniture, grass cuttings, etc.
Drilling waste	In this audit, drilling waste refers to waste generated as a result of drilling activities. It includes fluids / solid retrieved from the sub-surface during drilling operations, as well as the water/ chemicals used in the drilling process.
Hazardous waste	This is waste that poses a risk to human health or the environment and needs to be handled and disposed of carefully. Examples include waste containing radio-active materials, heavy metals, used oil, used chemicals, etc.
Waste	"Waste" includes any matter prescribed to be waste by the National Environment Act, Chapter 153, and any radioactive matter, whether liquid, solid, gaseous or radioactive which is discharged, emitted or deposited into the environment in such volume, composition or manner as to cause an alteration of the environment.
Waste Consolidation	This refers to the containment of waste within a designated area intended as a temporary measure pending treatment and final disposal.
Waste disposal	This refers to the act of permanently getting rid of waste either by releasing it back into the environment, or permanently containing it in a designated area, with no plan of future treatment.
Waste management	This refers to management of waste from the cradle (point of generation) to the grave (final disposal). It involves collection, handling, transportation, storage treatment and disposal.
Waste treatment	This refers to the activities required to minimize the ability of waste to impact on/ alter/pollute the environment.

APPENDICES

APPENDIX I: DOCUMENTS REVIEWED

S/N	Document reviewed	Purpose
1.	Operational Waste Management Guidelines for Oil and Gas operations (NEMA), June 2012	Obtain information for the motivation
2.	Presentation by Dr. Tom. O. Okurut (Executive Director, NEMA) to journalists at the African Center for Media Excellence; 22nd August ,2012	Obtain background information on the species richness of the AlbertineGraben
3.	Media reports and the Report on a Pubic Talk at the Uganda Museum to discuss the recently discovered oil deposits in the AlbertineGraben	Get acquainted with pubic concerns regarding possible impacts of exploration activities on the environment
4.	Programme Document for the programme "Strengthening the Management of the Oil and Gas Sector in Uganda" signed between GoU and the Norwegian Government	Obtain information on background, composition, expected outputs and funding of the Environment Management Pillar under the programme
5.	National Oil and Gas Policy for Uganda, 2008	Get background information on oil and gas exploration, and roles and responsibilities of key players.
6.	The Strategic Environment Impact Assessment Report for the AlbertineGraben, 2013	Obtain information on coordination between key players, and likely environmental impacts of exploration activities
7.	NEMA field inspection reports	Obtain information on status of waste management in the field.
8.	• The National Environment Act, Cap.153 • National Environment (Waste management) Regulations • Operational Waste Management guidelines for Oil and Gas Operations – NEMA • National Oil and Gas Policy for Uganda • PSAs • The EIA conditions of approval • The Environmental Monitoring plan • NEMA's National Compliance Monitoring and Enforcement Strategy, 2008	Obtain assessment criteria

APPENDIX II: INTERVIEWS CONDUCTED

S/N	Person(s) Interviewed	Number of interviews	Purpose of the interview(s)
1.	Director, Environmental Monitoring and Compliance (also Manager, Environmental Pillar)	01	To get to understand: ● NEMA's role in management of drilling waste and key stakeholders; ● Progress regarding legislative review to incorporate oil and gas issues; ● Levels of environmental monitoring in the Albertine graben; ● challenges with regard to monitoring Oil and Gas activities; ● views on impacts of waste on the environment; ● opinion on the cost of the current waste management practices.
2.	Senior Environment Inspector and Environment Monitoring Officers-Oil and Gas	01	
3.	Environment and/or operations officers at the different exploration areas visited	08	To get appraised with their: ● major responsibilities; ● routine waste management practices; ● interaction with NEMA and other Pillar Agencies on waste management, including support received and challenges with regard to waste management; ● views on impacts of waste on the environment; ● opinion on the cost of the current waste management practices.
4.	District Environment Officers of Buliisa and Hoima	02	To get understand their: ● major responsibilities; ● frequency of inspections to the Oil and Gas exploration areas and WCAs; ● level of interaction with and support received from NEMA; ● challenges with regard to monitoring Oil and Gas activities; ● views on impacts of waste on the environment.

5.	PEPD Officials (Environment Specialist and Lab. Technician)	02	• Description of the key processes involved in the handling and management of waste in the Albertine Graben; • Roles and responsibilities of Key players in the handling and management of waste; • Major wastes (classification and types) of wastes generated.

(Footnotes)

1 Interim Waste Management Guidelines for Oil and Gas Operations. Section 4(i): Recommendations for proper E&P waste management.

2 Op. cit; Section 4(ii)(e)

3 Op. cit. Section 4(ii)(f)

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