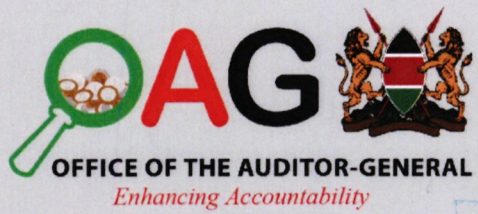
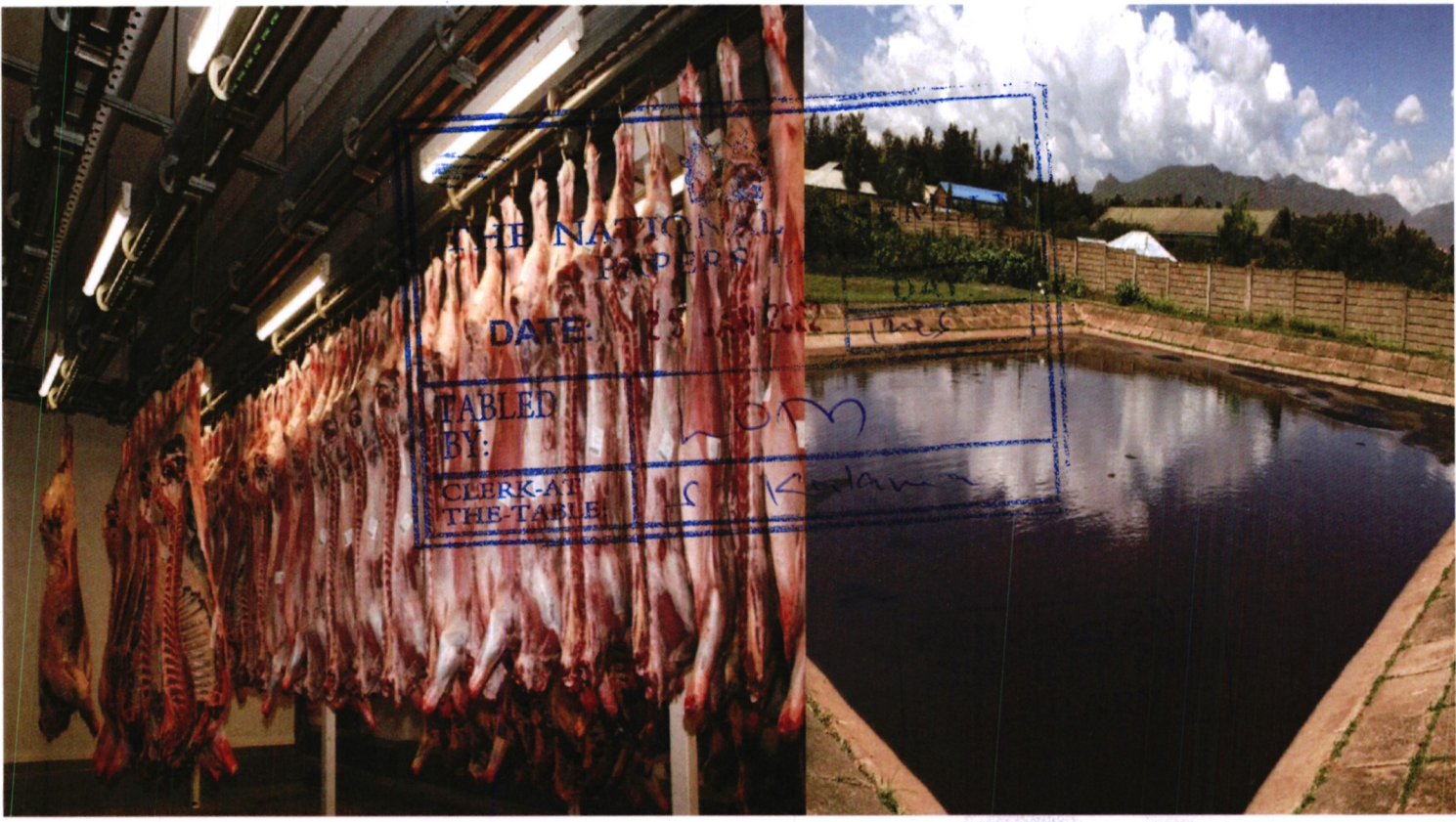


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PERFORMANCE AUDIT REPORT ON
ENFORCEMENT OF ENVIRONMENTAL
REGULATIONS ON EFFLUENT MANAGEMENT IN
SLAUGHTERHOUSES
BY
THE NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY



NOVEMBER 2021

VISION

Making a difference in the lives and livelihoods of Kenyan People.

MISSION

Audit Services that impact on effective and sustainable service delivery

CORE VALUES

Independence

Credibility

Relevance

Accountability

Integrity

MOTTO

Enhancing Accountability


Foreword by the Auditor – General

I am pleased to present this performance audit report on the Management of effluent from slaughterhouses by the National Environmental Management Authority (NEMA). My Office carried out the audit under the mandate conferred on me by Section 36 of the Public Audit Act, 2015. The Act mandates the Office of the Auditor - General to examine the economy, efficiency and effectiveness with which public money has been expended pursuant to Article 229 of the Constitution of Kenya, 2010.

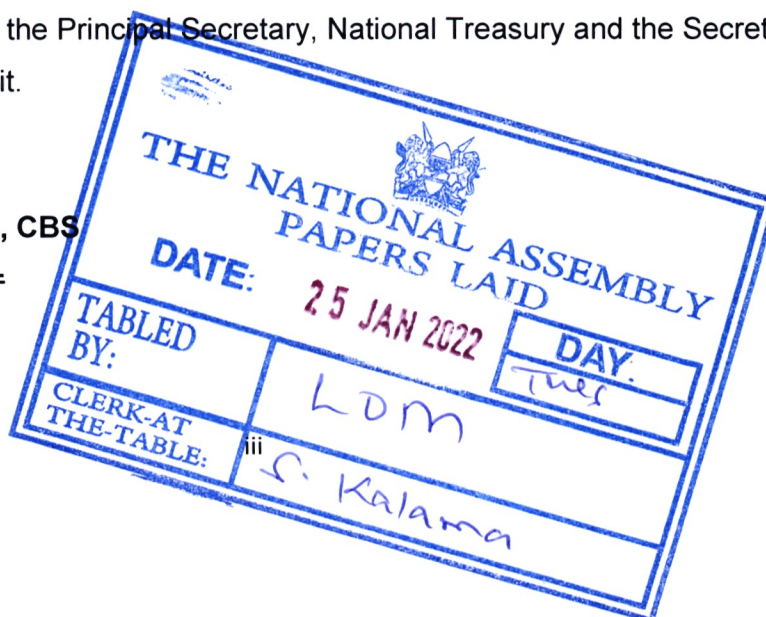
Performance, financial and compliance audits form the three-pillar audit assurance framework that I have established to give focus to the varied and wide scope of the audit work done by my Office. The framework is intended to provide a high level of assurance to stakeholders that public resources are not only correctly disbursed, recorded and accounted for, but their use results in positive impacts on the lives of all citizens. The main goal of our performance audits is to ensure effective use of public resources and promote service delivery to citizens.

The audit has an environmental perspective on management of effluent from slaughterhouses. I am hopeful that corrective action will be taken in line with recommendations in the report. This will contribute towards the realisation of the provision of Article 42, 69 and 70 of our Constitution, which calls for better management of the environment for the benefit of all Kenyans.

The report is submitted to Parliament in accordance with Article 229 (7) of the Constitution of Kenya, 2010 and Section 39 (1) of the Public Audit Act, 2015. In addition, I have submitted copies of the report to the Principal Secretary, Ministry of Environment and Forestry, the Chief Executive Officer, National Environmental Management Authority, the Principal Secretary, National Treasury and the Secretary, President's Delivery Unit.


CPA Nancy Gatungu, CBS
AUDITOR – GENERAL

10 November, 2021



LIST OF ABBREVIATIONS

- CDE - County Director of Environment**
- DVS - Directorate of Veterinary Services**
- EA - Environmental Audit**
- EDL - Effluent Discharge License**
- EIA - Environmental Impact Assessment**
- EMCA - Environmental Management and Coordination Act**
- HWQS - Headquarters Water Quality Section**
- NEMA - National Environment Management Authority**

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EXECUTIVE SUMMARY

Background of the Audit

1. Meat consumption in Kenya was reported to be 593,000 metric tonnes in 2010 and rose to 721,000 metric tonnes in 2019. It is estimated that this will rise to 1,523,000 metric tonnes in the year 2050. The continuous drive to increase meat production in slaughterhouses for nutritional needs of the ever-increasing population, contributes to pollution problems. Pollution arises from activities in meat production as a result of failure to adhere to good manufacturing practices and good hygiene practices.
2. Slaughterhouse waste consists of high organic strength, sufficient organic biological nutrients, adequate alkalinity, toxic materials and relatively high temperature of between 20°C to 30°C. Slaughterhouse waste just like any other waste, can be detrimental to humans and the environment in general where precautions are not taken. Effluent from slaughterhouses is known to contaminate both surface and groundwater, since during slaughterhouse operations, meat tissue, fat, blood, manure and urine drain into natural water passages. This causes air, soil, and water pollution, as well as infestation of flies and other disease vectors.
3. The National Environment Management Authority (NEMA) is mandated to ensure sustainable management of the environment, by supervising and coordinating all matters relating to the environment. This includes ensuring proper management of slaughterhouse waste.

Audit Objective and Scope

4. The audit assessed whether NEMA ensures compliance and enforcement of environmental regulations on effluent management in slaughterhouses. In order to achieve this objective, the audit assessed:
 - i) Whether NEMA ensures compliance with Effluent Discharge Licencing (EDL) conditions;
 - ii) Whether NEMA ensures compliance with Environmental Impact Assessment (EIA) Licencing and Environmental Audit (EA) reports submission requirements;

- iii) The extent to which NEMA monitors the management of effluent by slaughterhouse operators; and
 - iv) Whether NEMA ensures lead experts produce environmental audit reports as per the set standards.
5. The audit assessed enforcement and compliance with effluent discharge licensing conditions, Environmental Impact Assessment (EIA) applications and Environmental Audit (EA) report submission, as well as monitoring of slaughterhouses. The audit covered the period 2014/2015 to October 2019. The audit sampled forty-six (46) slaughterhouses in seven (7) counties. These counties are Nairobi, Nyeri, Embu, Nakuru, Kakamega, Kisumu and Kisii.

Summary of Findings

A. Inadequate Compliance and Enforcement of Effluent Discharge Licensing Conditions

6. According to Section 74 (1) of the Environmental Management and Coordination Act (EMCA), 1999, proponents discharging effluent into the sewer line should apply for an Effluent Discharge Licence (EDL) from the local authority (now County) operating the sewerage system. Further, Section 75 of EMCA, 1999, specifies that no local authority operating a sewerage system or operator of any industrial undertaking shall discharge any effluents into the environment without an Effluent Discharge Licence from NEMA. The issued EDL conditions include, among others; construction of wastewater treatment plant, quarterly analysis of effluent waste and annual renewal of the Effluent Discharge License.
7. The audit revealed that there was non-application and renewal of EDL by slaughterhouse operators. Analysis of data collected from the sampled slaughterhouses revealed that only 8% of the slaughterhouses required to have an EDL from NEMA were in possession of the license.

8. The non-application and renewal of an Effluent Discharge Licence was attributed to:
 - i. Lack of awareness by slaughterhouse operators on the obligation to have a valid EDL;
 - ii. Inadequate enforcement of EDL application and renewal; and
 - iii. Non-standardized requirement on who should apply for an EDL.
9. The audit revealed that there was a variation in the number of slaughterhouses in NEMA's inventory as compared to the inventory at the Department of Veterinary Services. NEMA did not have an explanation on the discrepancy in numbers. This indicated that the Authority could only enforce EDL application on slaughterhouses that were in their inventory.
10. The audit revealed that there was inefficient treatment of effluent waste. All wastewater is supposed to be directed into a wastewater treatment plant before discharge into the environment. However, field verification and analysis of data collected revealed that only 30% of the slaughterhouses had constructed treatment plants. The constructed plants were not working efficiently since there was odour, leach infiltration, blood and fat contents at the final points of the treatment. Further, documentary review of lab test results revealed that waste water treatment plants were discharging effluent that did not meet the recommended standards. The inefficiencies in the treatment plants are attributed to lack of inspection and maintenance of the plants, as well as operational issues like non-segregation of slaughterhouse waste.

B. Inadequate Compliance and Enforcement of the Environmental Impact Assessment Licensing and Environmental Audit Reports Submission

11. According to Section 58 (1) of EMCA, 1999, a proponent of a project shall undertake an Environmental Impact Assessment study and prepare a report thereof. Further, Section 68 (3) states that the proponent shall keep accurate records and make annual reports to the Authority describing how far the project conforms in operation with the statements made in the Environmental Impact

Assessment study report. In addition, Section 31 3(a) and 4(b) of EIA Regulations 2003, indicate that an Initial Environmental Audit study followed by subsequent environmental control audit studies shall be conducted in case of an ongoing project (project in operation before EMCA came into force). Further, the proponent shall also conduct an Environmental Audit within 12 months of the commencement of the operations and not more than 24 months after the completion of a project.

12. Field verification of the forty- six (46) sampled slaughterhouses revealed that only one (1) slaughterhouse, out of the seventeen (17) established before the enactment of EMCA, 1999, had conducted an Initial Audit. Further, only nine (9) slaughterhouses, out of the twenty (20) established after enactment of the Act, had conducted an EIA study. Document review and interviews with the management of the sampled slaughterhouses revealed that 63% of the sampled slaughterhouses had not conducted annual environmental audits.
13. Failure to acquire an Environmental Impact Assessment license or conduct an Initial Audit and an annual Environmental Audit is attributed to laxity of slaughterhouse operators. This is as a result of lack of follow-up and leniency by NEMA. Consequently, slaughterhouses continue to operate without an EIA license, hence environmental impacts are not identified early enough for mitigation measures to be taken.

C. Inadequate Monitoring and Inspection of Slaughterhouses

14. In NEMA's Strategic Plan 2013-2018, the second strategic objective is to ensure compliance with environmental legislations and policies in order to maintain a clean, healthy and sustainable environment by monitoring compliance with conditions of licenses and permits issued. Further, Section 69 (1) of EMCA 1999, requires NEMA to monitor in consultation with other lead agencies; (a) all environmental phenomena with a view to assessing any possible changes in the environment and their possible impacts; or (b) the operation of any industry, project or activity with a view to determining its immediate and long-term effects on the environment. Further, Section 117(2a) of EMCA,1999, states that "An

Environmental Inspector shall monitor compliance with the environmental standards”.

15. Interviews with NEMA officers revealed that the Authority has not been carrying out regular monitoring of slaughterhouses. For instance, Nairobi and Nyeri Counties reported that slaughterhouses were monitored once a year, while in Kisumu, monitoring was conducted twice every year. Further, an analysis of interviews with the management of sampled slaughterhouses on the extent of interactions with NEMA, revealed that 14 had not interacted with NEMA, 11 had minimal interaction and 18 often interacted with NEMA.
16. The inadequate monitoring of slaughterhouses is attributed to NEMA's failure to prioritize slaughterhouses, as the Authority is more focused on other sectors like petrol stations and residential constructions. Further, NEMA does not have monitoring plans for monitoring slaughterhouses. Monitoring and inspection was also affected by inadequate resources in terms of vehicles and personnel, given the areas the officers are required to cover.
17. Inadequate inspection and monitoring has led to continued environmental pollution by activities generating effluent from slaughterhouses. Without regular monitoring, NEMA cannot establish the extent of environmental degradation caused by operations of slaughterhouses.

D. Submission of Substandard Environmental Impact Assessment and Environmental Audit Reports by Licensed Experts

18. According to Section 13(3) of the Environmental Impact Assessment Regulation (2003), a person undertaking an EIA study shall conduct themselves in accordance with an established code of practice issued by NEMA. In addition, Section 11 of the Code of Practice and Professional Ethics for Lead Experts states that an Environmental Assessment Expert shall, based on the Terms of Reference, include all matters as required, by relevant statutory provisions, before submitting such reports to the project proponent or operator. Further, the Expert shall, in undertaking an environmental assessment or audit, bear in mind any previous environmental assessments or audits of a similar project made

under the relevant regulations, but shall not copy the previous documents wholesale.

19. Review of Environmental Impact Assessment and Environmental Audit reports revealed instances where experts duplicated previous reports, contrary to the code of ethics. Submission of substandard reports could be attributed to NEMA not having stringent measures against experts generating sub-standard reports. In addition, NEMA has not been reviewing the submitted reports and taking note of such discrepancies. This indicated that expert verification by NEMA through reports has not been effective.

Conclusion

20. The audit concludes that, although the National Environmental Management Authority (NEMA) has developed regulations that should ensure proper effluent management in slaughterhouses, it has not been able to adequately enforce these regulations. Specifically:

- i) Although NEMA has developed effluent management conditions, the Authority has not been able to consistently enforce these conditions within the slaughterhouses. This was evidenced by a majority of the sampled slaughterhouses not having an Effluent Discharge License, waste treatment plants and not conducting annual Environmental Audits;
- ii) The Authority has not adequately enforced the requirement of the Environmental Management and Co-ordination Act, 1999, for conducting an initial environmental audit for slaughterhouses established before enactment of the Act. In addition, NEMA has not been able to ensure that all the slaughterhouses established after enactment of the Act submit an Environmental Impact Assessment report as required;
- iii) The National Environment Management Authority has not been able to carry out adequate monitoring of slaughterhouses. Therefore, slaughterhouses are still operating without NEMA establishing the extent to which environmental degradation is caused by meat processing operations.

- iv) The National Environment Management Authority, as the licensing Authority for the environmental experts, has not been able to regulate and enforce the code of practice that requires disciplinary measures to be taken against experts submitting sub-standard reports.

Recommendations

21. In view of the findings and conclusions of this audit, the Auditor-General proposes the following recommendations to improve the conditions of effluent discharge by slaughterhouses.

22. The National Environment Management Authority should:

- i. Prioritize monitoring and inspection of slaughterhouses. In addition, NEMA should have a structured collaboration with the Department of Veterinary Services on monitoring of waste management by slaughterhouses;
- ii. Develop guidelines on construction of standard and efficient treatment plants to be adopted by slaughterhouse operators;
- iii. Create awareness on the need for application and renewal of Effluent Discharge Licenses by the slaughterhouses. Further, NEMA should enhance the enforcement processes against slaughterhouses operating without an EDL. Effluent Discharge Licence application requirements for slaughterhouse operators should also be standardized;
- iv. Enhance enforcement processes against slaughterhouse operators without EIA or initial audits. In addition, the Authority should take stringent measures against experts submitting sub-standard reports, as well as slaughterhouse operators who fail to submit annual Environmental Audits; and
- v. Together with the Environment Institute of Kenya, develop and enforce a code of ethics for environmental auditors.

1. BACKGROUND TO THE AUDIT

Introduction

- 1.1 Meat consumption in Kenya was reported to be 593,000 metric tonnes in 2010 and rose to 721,000 metric tonnes in 2019. It is estimated that this will rise to 1,523,000 metric tonnes in the year 2050. The continuous drive to increase meat production at slaughterhouses, for nutritional needs of the ever-increasing population, contributes to pollution problems. Pollution arises from activities in meat production due to failure to adhere to good manufacturing practices and good hygiene practices.
- 1.2 Slaughterhouse waste consists of high organic strength, sufficient organic biological nutrients, adequate alkalinity, toxic materials and relatively high temperature of between 20°C to 30°C. Slaughterhouse waste just like any other waste, can be detrimental to humans and the environment in general where precautions are not taken. Effluent from slaughterhouses is known to contaminate both surface and groundwater, since during slaughterhouse operations, meat tissue, fat, blood, manure and urine drain into natural water passages. This causes air, soil, and water pollution, as well as infestation of flies and other disease vectors.
- 1.3 For hygiene reasons, slaughterhouses use large amounts of water in processing operations, leading to production of large amount of wastewater. The major environmental problem associated with slaughterhouse wastewater is the large volume of suspended solids and liquid waste, as well as noxious odour generation.
- 1.4 The National Environment Management Authority (NEMA) is mandated to ensure sustainable management of the environment by supervising and coordinating all matters relating to the environment. This includes enforcing proper management of slaughterhouse waste.

Motivation of the Audit

1.5 The Auditor- General authorized the audit after considering the following factors:

- i) According to an article in the Standard Newspaper dated 25 April, 2018, there has been a public outcry regarding the state of the environment in areas surrounding slaughterhouses in the country. The article stated that NEMA was to shut down Kiamaiko slaughterhouses over river pollution. Further, contaminated water, according to the World Health Organization (WHO), is a breeding ground for cholera, dysentery, typhoid and diarrhoea, one of the main killers of children under the age of five. It was therefore necessary to assess whether slaughterhouse waste is managed as required.
- ii) Article 42 of the Constitution of Kenya, 2010, states that: “every person has a right to a clean and healthy environment”. Similarly, the Environmental Management and Coordination Act (EMCA), 1999, requires that the environment be safeguarded and enhanced.
- iii) Target 6.3 of the Sustainable Development Goal 6 is on improving water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials to the environment. It was therefore necessary to ascertain whether NEMA was working towards meeting the target.

2. DESIGN OF THE AUDIT

Audit Objective

- 2.1 The audit assessed whether NEMA ensures compliance and enforcement of environmental regulations on effluent management in slaughterhouses.
- 2.2 In order to achieve this objective, the audit assessed;
- i) Whether NEMA ensures compliance with Effluent Discharge Licencing (EDL) conditions.
 - ii) Whether NEMA ensures compliance with Environmental Impact Assessment (EIA) Licencing and Environmental Audit (EA) reports submission requirements.
 - iii) The extent to which NEMA monitors the management of effluent by slaughterhouse operators.
 - iv) Whether NEMA ensures lead experts produce environmental audit reports as per the set standards.

Audit Scope

- 2.3 The audit focused on NEMA's activities that are designed to ensure compliance and enforcement of environmental regulations on waste management in slaughterhouses.
- 2.4 The audit assessed enforcement and compliance with effluent discharge licencing conditions, Environmental Impact Assessment applications and Environmental Audit report submissions as well as monitoring of slaughterhouses. The audit covered the period 2014/2015 to October 2019.

Selection of the Audit Sample

- 2.5 The audit used purposive sampling to select the counties to be audited. Seven (7) out of the forty-seven (47) counties in Kenya were purposively selected. These were; Nairobi, Nyeri, Embu, Nakuru, Kakamega, Kisumu and Kisii. Nyeri, Embu, Nakuru and Kakamega were sampled because they were among the counties with the highest number of slaughterhouses while Nairobi, Kisumu and

Kisii were among the counties with the least number of slaughterhouses as shown in **Appendix 1(a)**. Forty-six (46) slaughterhouses, outlined in **Appendix 2**, were then purposively chosen from the seven (7) sampled counties, to form the units of observation.

Methods Used to Gather Audit Evidence

2.6 The audit was conducted in accordance with International Standards of Supreme Audit Institutions (ISSAIs) issued by the International Organization of Supreme Audit Institutions (INTOSAI), which states that the auditor and the Supreme Audit Institutions must be independent, possess required competence and exercise due care to provide a guide on execution and reporting of audit findings. Further, the audit team adhered to audit policies and procedures established by the Office of the Auditor-General Kenya.

2.7 Audit evidence was gathered through document review, interviews and physical verification.

a) Documentary Review

2.8 To understand compliance with effluent waste management requirements and assess compliance levels, the audit team reviewed; Environmental Impact Assessment reports, Effluent Discharge Licences and their renewals, NEMA effluent registers, Environmental Audit reports, as well as operation procedures and monitoring reports. The list of documents reviewed is outlined in **Appendix 3**.

b) Interviews

2.9 The audit team conducted interviews with NEMA staff who were directly involved in the management of slaughterhouses' waste, both at the headquarters and the sampled counties. In addition, the team interviewed the sampled slaughterhouses' management. **Appendix 4** provides details of the interviews conducted.

c) Observation

2.10 To verify on-site operations of slaughterhouses, the audit team visited 46 sampled slaughterhouse, as shown in **Appendix 2**.

Sources of Assessment Criteria

2.11 The audit assessment criteria were drawn from; the Constitution of Kenya, 2010, the Environmental Management and Coordination Act (EMCA), 1999, the Water Quality Regulations, 2006, the Waste Management Regulations, 2006, the Environmental (Impact Assessment and Audit) Regulations, 2003, and the Code of Practice and Professional Ethics for Integrated Environmental Assessment and Audit Experts, among others. The criteria are discussed in detail in **Appendix 5**.

3. DESCRIPTION OF THE AUDIT AREA

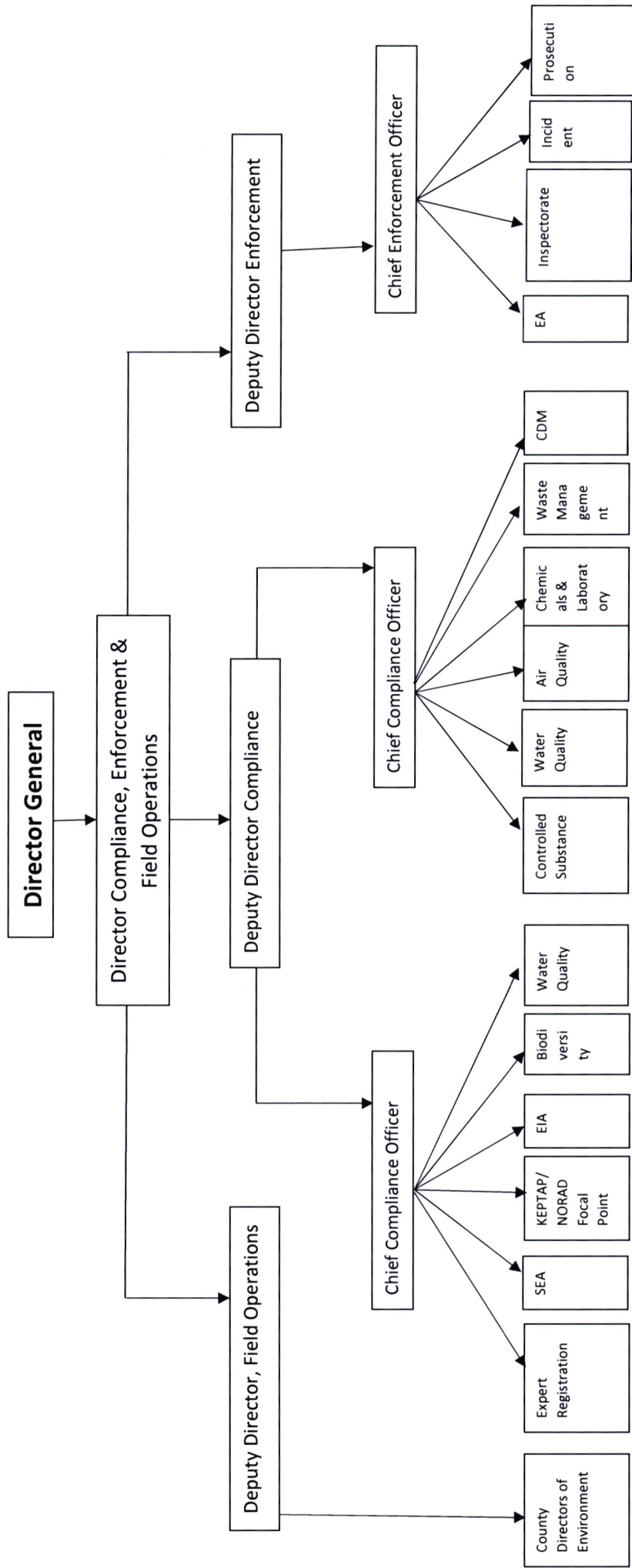
Statutory Mandate of the National Environment Management Authority

- 3.1 The National Environment Management Authority (NEMA), was established under the Environmental Management and Co-ordination Act (EMCA), No. 8 of 1999, as the Government principal instrument for the implementation of all policies relating to the environment. The Authority is a semi-autonomous government agency under the Ministry of Environment and Forestry. The Authority has been in operation since 01 July, 2002.
- 3.2 The National Environment Management Authority has the mandate to monitor and enforce proper effluent management by industries, slaughterhouses being one of them.
- 3.3 The National Environment Management Authority vision is to be a world class environment management authority. Its mission is to safeguard the quality of the environment through coordination, research, facilitation and enforcement while encouraging responsible individuals, corporates, and collective participation towards sustainable development.

The National Environment Management Authority's Organizational Structure

- 3.4 The National Environment Management Authority is headed by a Director-General. The Director-General is assisted by Directors in charge of Legal Services, Environmental Services, Human Resource and Administration, as well as Compliance, Enforcement and Field Operations. Effluent waste management is under the Director, Compliance, Enforcement and Field Operations, who is assisted by three Deputy Directors in charge of Compliance, Enforcement and Field Operations. The organizational structure is illustrated by the organogram in **Figure 1**.

FIGURE 1: ORGANOGRAM FOR THE COMPLIANCE, ENFORCEMENT AND FIELD OPERATIONS DEPARTMENT



Source: NEMA's procedures file (File: NEMA/1300/07)

Functions of the National Environment Management Authority

3.5 Section 9 of Environmental Management and Co-ordination Act, 1999, mandates NEMA to have the following powers and functions, but not limited to:

- i) Identify projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under the Act;
- ii) Monitor and assess activities to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impending environmental emergencies is given; and
- iii) Undertake, in co-operation with relevant lead agencies, programmes intended to enhance environmental education and public awareness about the need for sound environmental management, as well as for enlisting public support and encouraging the effort made by other entities in that regard.

The Compliance and Enforcement Department

3.6 The Compliance and Enforcement Department comprises of the following sections; Water Quality, Environmental Impact Assessment (EIA), Environmental Audit (EA), Field Operations and Inspectorate sections, among other sections as shown in **Figure 1**. The responsibilities of these sections are as described below.

A. The Environmental Impact Assessment Section

3.7 The role of the Environmental Impact Assessment Section is to issue Environmental Impact Assessment (EIA) licenses to slaughterhouse operators. The section also issues EIA licenses to any other person undertaking or proposing to undertake a project that is likely to have an impact on the environment. Slaughterhouse operators are required to submit EIA reports to this section. The reports are reviewed and then the project site is inspected. An EIA license is issued upon satisfaction that the required standards have been met.

B. The Environmental Audit Section

- 3.8 The Environmental Audit (EA) section is tasked to receive EA reports, acknowledge receipt and give a reference number. Once reports are received, they are classified and then desk review is done to identify issues which are verified through a site visit. The reports are reviewed in accordance with the provisions of the Environmental (Impact Assessment and Audit) Regulations, 2003.

C. The Water Quality Section

- 3.9 The Water Quality Section is tasked with the issuance of Effluent Discharge Licenses (EDLs) to slaughterhouse operators and other proponents. A slaughterhouse operator is required to pay an application fee of Ksh. 5,000 as well as submit among other documents; a copy of an Environmental Impact Assessment license or Environmental Audit submission acknowledgement letter, as indicated in **Appendix 6**. The submitted documents are reviewed and upon payment of the prescribed fee, an EDL is issued.

D. The Inspectorate Section

- 3.10 The Inspectorate Section carries out various types of inspections, among them being compliance evaluation, compliance sampling, control audit and follow-up. When a violation is detected, an enforcement officer may initiate an action that compels the violator adhere to compliance requirements. This is done either through issuing a verbal warning, an improvement notice, environmental restoration order, closure or cancelation of a license. The officer may also opt for civil court or criminal court action depending on the nature and severity of the environmental offence.

The Directorate of Veterinary Services

- 3.11 According to the First Schedule of the Meat Control (Local Slaughterhouse) Regulation, 2010, the Directorate of Veterinary Services' role, in control of effluent waste management from slaughterhouses, include but is not limited to:

- i) Issuance of approval for construction of a slaughterhouse, after receiving drawings that indicate the slaughterhouse arrangements, for the safe disposal of waste;
- ii) Ensuring that slaughterhouses have, among others, a waste treatment and disposal system that is adequate in size and one that complies with general and local regulations; and
- iii) Ensuring that slaughterhouses comply with the provisions of the Environmental Management Coordination Act, 1999, on acceptable slaughterhouses environmental pollution control, effluent treatment systems and solid wastes disposal.

3.12 According to the Meat Control (Local Slaughterhouses) Regulations, 2010, the Director of Veterinary Services may order the closure of any slaughterhouse, in the event of non-compliance.

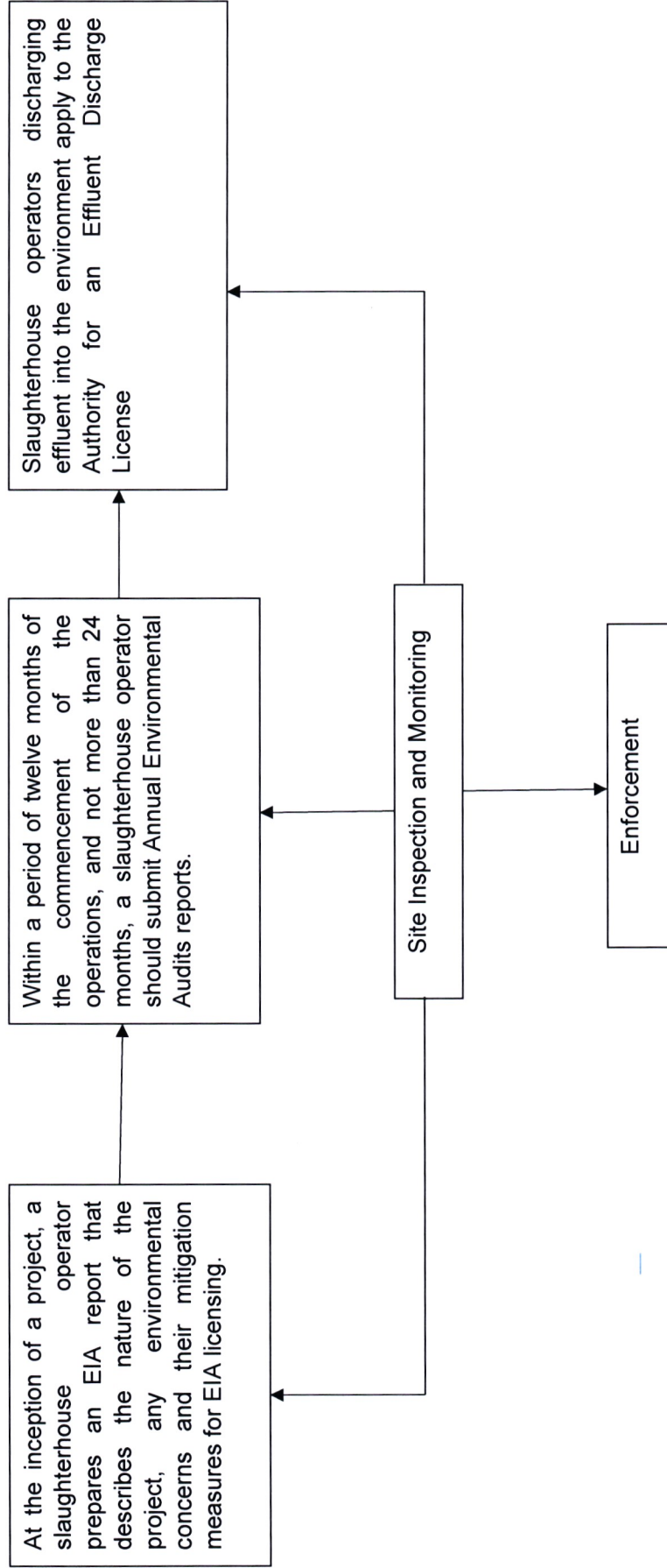
Process Description for Effluent Discharge Management

3.13 Management of effluent waste begins from the inception of a slaughterhouse project. A slaughterhouse operator is required to prepare an EIA report that describes the nature of the project, environmental concerns that are likely to occur and their mitigation measures. The National Environment Management Authority environmental inspectors carry out site verification inspections to confirm that the report submitted is a true reflection of the project described. Upon confirmation, the slaughterhouse operator is issued with an EIA license.

3.14 After commencement of operations, the operator is required to carry out annual environmental audits and submit the report to NEMA. The Authority's environmental inspectors carry out inspection and monitoring of slaughterhouse to ascertain the environmental conditions within the facility.

3.15 Every slaughterhouse operator discharging effluent into the environment is required to apply and obtain an Effluent Discharge License which is to be renewed annually. Environmental Inspectors enforce compliance to the licensing conditions issued with the EDL. The process description is illustrated in **Figure 2**.

FIGURE 2: PROCESS DESCRIPTION FOR EFFLUENT MANAGEMENT



Source: OAG analysis of NEMA documents on effluent management

Funding for the National Environment Management Authority

3.16 The main sources of funding, for the National Environment Management Authority is the Government of Kenya, through the Ministry of Environment and Forestry. **Table 2** presents budgeted funds, allocation and expenditure for the financial years 2014/15 to 2018/19.

TABLE 1: FUNDING FOR THE NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

| Year | Budgeted (Ksh.) | Allocated (Ksh.) | Expenditure (Ksh.) |
|-------------|----------------------------|-----------------------------|-------------------------------|
| 2018/19 | 1,443,200,000 | 1,422,800,000 | 888,598,943 |
| 2017/18 | 1,047,569,115 | 1,045,155,194 | 1,028,274,553 |
| 2016/17 | 1,275,000,000 | 1,245,000,000 | 1,022,498,770 |
| 2015/16 | 308,492,000 | 1,130,055,994 | 930,644,963 |
| 2014/15 | | 922,156,013 | 1,118,132,693 |

Source: OAG analysis of NEMA financial records

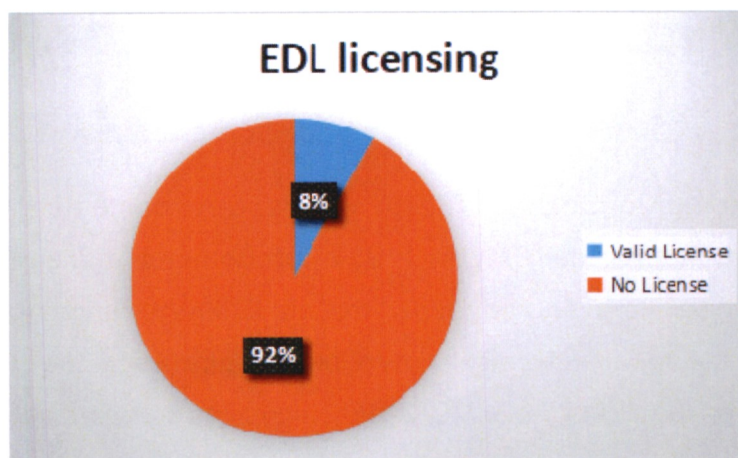
4. AUDIT FINDINGS

A. Inadequate Enforcement of Effluent Discharge Licensing Conditions

I. Non-application and Renewal of Effluent Discharge Licenses

- 4.1 According to Section 74 (1) of the Environmental Management and Coordination Act (EMCA), 1999, proponents discharging effluent into the sewer line should apply for an Effluent Discharge Licence (EDL) from the local authority (now County) operating the sewerage system. Further, Section 75 of EMCA, 1999, specifies that no local authority operating a sewerage system or operator of any industrial undertaking shall discharge any effluents into the environment without an Effluent Discharge Licence from NEMA. The issued EDL conditions include, among others; construction of wastewater treatment plant, quarterly analysis of effluent waste and annual renewal of the Effluent Discharge License as outlined in **Appendix 7**.
- 4.2 Review of documents and interviews with slaughter house operators revealed that nine out of the forty-six sampled slaughterhouses did not require EDL from NEMA because there were discharging effluent into sewer lines. However, four slaughterhouses out of these nine, had been recommended for prosecution by NEMA for lack of an EDL. These were Mutunduri and Karurina Slaughterhouse in Embu County and Nyeri (Munjiru Investment) and Karatina Slaughterhouse in Nyeri County.
- 4.3 Further, out of the remaining thirty-seven slaughterhouses required to have an EDL, only three had an EDL. These were Neema Slaughterhouse in Nairobi County, Star Brilliant Ltd Slaughterhouse in Nakuru County and Ngangarithi Slaughterhouse in Nyeri County. In addition, two of the three slaughterhouses had renewed their licenses.

FIGURE 3:STATUS OF EFFLUENT DISCHARGE LICENSE APPLICATION IN THE SAMPLED SLAUGHTERHOUSES



8% represents 3 slaughterhouses with License while 92% represent 34 slaughterhouses with no licenses.

Source: OAG analysis of EDL application data

4.4 The non-application and renewal of EDL was attributed to:

- i) Lack of awareness by slaughterhouse operators on their obligation to have an EDL. Interviews conducted with slaughterhouses management revealed that they were not aware of the requirements to have a valid EDL. This is because they had not had prior engagement with NEMA before the Rapid Response Initiative (RRI) conducted between June and September 2019. Out of the thirty-four slaughterhouses that did not have an EDL, nine did the first application after the RRI sensitisation as shown in **Appendix 2**;
- ii) Inadequate enforcement on EDL application and renewal; and
- iii) Non-standardized requirement on who should apply for an EDL.

II. Variation of the National Environment Management Authority's Slaughterhouse Inventory with that of the Department of Veterinary Services

4.5 Review of the slaughterhouse inventory from NEMA Headquarters and Department of Veterinary Services documents revealed that the number of slaughterhouses recorded by NEMA headquarters was 46 against 1,831 in the Veterinary Department inventory, as summarised in **Appendix 1(a)** and **(b)**. NEMA did not have an explanation on the discrepancy in the numbers. This

indicated that the Authority could only enforce EDL application on the 46 slaughterhouses that it had in its records.

III. Inefficient Treatment of Effluent Waste

- 4.6 According to NEMA's slaughterhouse Effluent Discharge License condition 2.1, outlined in **Appendix 7**, the owner or operator of a slaughterhouse shall ensure that all raw wastewater from the operations of the facility is directed into the wastewater treatment plant, before discharge into the environment.
- 4.7 Field visits to the 46 sampled slaughterhouses revealed that the main points of discharge were; open land, soak or septic tanks, river and sewer lines, as shown in **Table 2**. The effluent, therefore, required prior treatment before discharge into any of these points.

TABLE 2: MAIN POINTS OF EFFLUENT DISCHARGE BY SLAUGHTERHOUSES

| Point of Discharge | No. of Slaughterhouses | Number of Slaughterhouses in Each County |
|--------------------|------------------------|---|
| Open land | 18 | Nairobi (2), Nakuru (2), Kisumu (1) Kisii (2), Kakamega (3), Nyeri (5) and Embu (3) |
| River | 2 | Kisii (2) |
| Septic or soak pit | 17 | Nairobi (1), Nakuru (3), Kisumu (3), Kisii (1), Kakamega (4), Embu (5) |
| Sewer line | 9 | Nairobi (3), Nakuru (3), Kisumu (1), Nyeri (2) |
| Total | 46 | |

Source: OAG analysis of data from physical inspection

- 4.8 Field verification and analysis of slaughterhouses' management data revealed that only 14 out of the 46 sampled slaughterhouses had constructed treatment plants as shown in **Appendix 8**. However, the constructed plants were not working efficiently since there was odour, leach infiltration, blood and fat contents at the final points of the treatment as shown in **Plate 1**. Further, documentary review of lab test results revealed that waste water treatment plants were discharging effluent that did not meet the recommended standard as shown in **Table 3**.

PLATE 1: STATE OF FINAL DISCHARGE POINTS



Left: Effluent with traces of manure and lumen content at the final discharge point in Ogembo Slaughterhouse was an indication of waste infiltration and poor maintenance.

Right: Effluent with traces of blood and fat content at the final discharge point in Keroka Slaughterhouse indicated inefficient segregation of waste.

Source: Photos captured by the audit team on 9/10/2019

4.9 Inefficiencies in the treatment plants could be attributed to lack of inspection by NEMA. In addition, the plants were not well maintained by the slaughterhouses' management. Analysis of data from sampled slaughterhouses revealed that only seven out of the forty-six slaughterhouses had a designated trained waste handler, as shown in **Appendix 8**. This meant that the responsibility was left to any other person(s) chosen at random to handle slaughterhouse waste.

4.10 Waste water treatment plants functional efficiency was also affected by operational issues like non-segregation of slaughterhouse waste. Slaughterhouse waste segregation includes; separation of blood, lumen, fat contents, pieces of meat, and waste water. Analysis of data revealed that 23 out of the 46 sampled slaughterhouses did not practice waste segregation before discharging into the final collection point, as shown **Appendix 8** and in **Plate 2**. Consequently, all forms of slaughterhouse waste drained into the same point, which resulted to collection tanks filling up fast and producing foul smell. Further, the final discharge comprised of blood and fat contents that took longer to decompose, thus polluting the environment.

PLATE 2: STATE OF WASTE SEGREGATION



Left: Makutano Slaughterhouse in Embu, last collection point had traces of blood, lumen, and fat content. **Right:** Embu Municipal Slaughterhouse final effluent discharge draining to the collection soak pit with traces of blood, fat and pieces of meat.

Source: Photos taken by Auditors on 19 and 20 September, 2019

4.11 The Effluent Discharge License Condition No. 3.6 requires that slaughterhouses should conduct quarterly analysis tests, on the effluent discharged into the environment, then submit the analysis results to NEMA. The testing of the effluent is to keep slaughterhouse operators in the know on the status of the wastewater being discharged to the environment. Out of the forty-six sampled slaughterhouses, only six had conducted lab analysis test. However, the tests were not done quarterly as required. In addition, the results of the test did not meet the required standards, provided in Schedule 5 and 6 of the Water Quality Regulation, as shown in **Table 3**.

TABLE 3: EFFLUENT LAB ANALYSIS RESULTS

| Parameters | Discharge into the Environment | | | | | Discharge into the Sewer line | | |
|--------------------------|--------------------------------|----------------|------------|--------------|-------------|-------------------------------|----------|--------------|
| | Recommended Standard | Star brilliant | Itibo | Kanyage Slab | Ngangarithi | Recommended Standard | Nyongara | Neema |
| Biological oxygen Demand | 30 (mg/L) max | 2250 | 34 | 920 | 202 | 500(mg/L) max | 130 | 150 |
| PH | 6.5 to 8.5 | 7.4 | 7.6 | 7 | 7.1 | 6 to 9 | 7.97 | 7.41 |
| Chemical Oxygen Demand | 50 (mg/L) Max | 6610 | 96 | 1160 | 254 | 1000(mg/L) max | 388 | 150 |
| Temperature | 3 ambient temperature | 20.8 | 26.2 | 22.8 | 23.1 | 20-35 (mg/L) max | 21.9 | Not indicate |
| Total dissolved Solids | 1200 (mg/L) max | 3571.2 | 132 9.5 | 2320.5 | 2740 | 2000(mg/L) max | 2354 | 791 |
| Total Suspended solid | 30(mg/L) max | 132 | 16 | 800 | 439 | 250(mg/L) max | 100 | 112 |

Source: OAG Analysis of lab test results

4.12 Non-application and renewal of EDL, coupled with lack of treatment and inefficient treatment of effluent, has led to slaughterhouses' continued discharge of effluent that does not meet the specified standards. This contributes to pollution of the environment and possibility of disease outbreaks.

B. Inadequate Enforcement of Environmental Impact Assessment Licensing and Environmental Audit Reports Submission

4.13 According to Section 58 (1) of EMCA, 1999, the proponent of a project shall undertake, or cause to be undertaken at his own expense, an environmental impact assessment study, prepare a report thereof and submit to NEMA. After studying the project report submitted, NEMA gives direction accordingly. Further, Section 68 (3) states that the proponent shall keep accurate records and make annual reports to the Authority, describing how far the project conforms in operation with the statements made in the Environmental Impact Assessment (EIA) report.

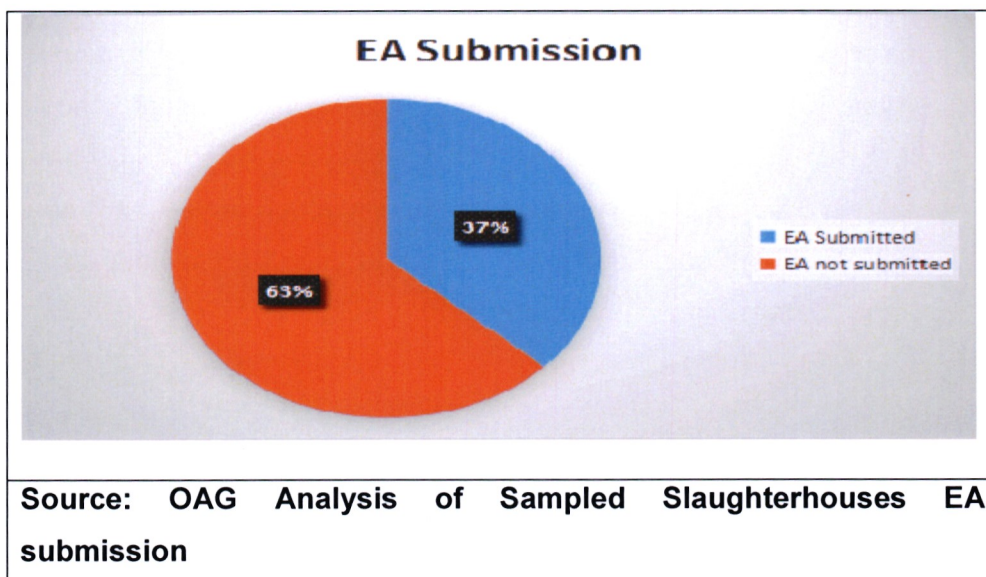
4.14 Section 31 3(a) and 4(b) of Environmental Impact Assessment Regulations, 2003, indicate that an initial environmental audit study, followed by subsequent environmental control audit studies shall be conducted in case of an ongoing project (Project in operation before EMCA, 1999 came into force). Further, the

proponent shall also conduct an environmental audit within 12 months of the commencement of the operations and not more than 24 months after the completion of a project.

4.15 Field verification of the sampled forty-six (46) slaughterhouses revealed that, out of seventeen (17) slaughterhouses established before the enactment of EMCA, 1999, only one (1) had conducted an initial audit. Further, out of twenty (20) slaughterhouses established after enactment of the Act, only nine had conducted an Environmental Impact Assessment. Nine (9) of the slaughterhouses sampled did not provide information on the exact year of establishment. The detailed analysis is shown in **Appendix 9**.

4.16 Document review and interviews with the management of the sampled slaughterhouses revealed that 63% of the 46 sampled slaughterhouses had not conducted annual Environmental Audits, as shown in **Appendix 9** and **Figure 4**;

FIGURE 4: STATUS OF ENVIRONMENTAL AUDIT SUBMISSION



4.17 Failure to acquire an Environmental Impact Assessment license or conduct an Initial Audit and an annual Environmental Audit is attributed to laxity of slaughterhouse operators. This is as a result of lack of follow-up and leniency by NEMA. Consequently, slaughterhouses continue to operate without an EIA

license, hence environmental impacts are not identified early enough for mitigation measures to be taken.

C. Inadequate Monitoring and Inspection of Slaughterhouses

4.18 In NEMA’s Strategic Plan, 2013-2018, the second strategic objective is to ensure compliance with environmental legislations and policies, in order to maintain a clean, healthy and sustainable environment, by monitoring compliance with conditions of licenses and permits issued.

4.19 In addition, Section 69 (1) of EMCA, 1999, indicates that NEMA shall, in consultation with the relevant lead agencies, monitor (a) all environmental phenomena with a view of assessing any possible changes in the environment and their possible impacts; or (b) the operation of any industry, project or activity with a view to determining its immediate and long-term effects on the environment. Further, Section 117(2a) of EMCA states that “An Environmental Inspector shall monitor compliance with the environmental standards”.

4.20 Interviews with NEMA officers revealed that the Authority has not been carrying out regular monitoring of slaughterhouses. For instance, Nairobi and Nyeri Counties reported that slaughterhouses are monitored once a year, while in Kisumu, monitoring is conducted twice in a year, as shown in **Table 4**. Further, the audit revealed that 46 slaughterhouses had been inspected between June and September 2019 and only 10 had been inspected before June 2019 as shown in **Appendix 10**.

TABLE 4: FREQUENCY OF SLAUGHTERHOUSES MONITORING

| County | Nakuru | Nairobi & Nyeri | Kisumu | Embu, Kisii & Kakamega |
|----------------------|--------------|-----------------|--------------|------------------------|
| Monitoring frequency | Once a month | Once a year | Twice a year | No frequency given |

Source: Analysis of sampled counties data on monitoring

4.21 An analysis of interviews with the management of the 46 sampled slaughterhouses, on their engagement or visit with NEMA, revealed that 14

had not interacted with NEMA, 11 had minimal interaction and 18 often interacted with NEMA, as shown in **Appendix 11**.

4.22 The inadequate monitoring is attributed to NEMA's failure to prioritize slaughterhouses, as the Authority is more focused on other sectors like petrol stations and residential constructions. Further, NEMA does not have monitoring plans specific to slaughterhouses.

4.23 Monitoring and inspection was affected by inadequate resources, in terms of vehicles and personnel for NEMA inspectors, given the areas the officers are required to cover. For instance, in Kisii County, interviews revealed that there were nine sub-counties with only two staff who were not able to cover their area of jurisdiction. This was the case in every other sampled county, where there was a maximum of four officers charged with receiving and reviewing Environmental Impact Assessment and Environmental Audit reports, as well as carrying out site verifications for all persons proposing or undertaking a project. In addition, the officers were also tasked with the responsibility of responding to incidences and carrying out routine inspections within their county.

4.24 Inadequate inspection and monitoring has led to continued environmental pollution, by activities generating effluent from slaughterhouses. Without regular monitoring, NEMA was not able to establish the extent of environmental degradation caused by operations of slaughterhouses. Further, NEMA did not avail information on the status of the environment around the sampled slaughterhouses.

D. Submission of Substandard Environmental Impact Assessment and Environmental Audit Reports by Licensed Experts

4.25 According to Section 13(3) of the Environmental Impact Assessment Regulation, 2003, a person undertaking an EIA study shall conduct themselves in accordance with an established code of practice, issued by NEMA. In addition, Section 11 of the Code of Practice and Professional Ethics for Lead Experts states that an Environmental Assessment Expert shall, based on the Terms of Reference, include all matters as required, by relevant statutory provisions, before submitting such reports to the project proponent or operator.

Further, the expert shall, in undertaking an environmental assessment or audit, bear in mind any previous environmental assessments or audits of a similar project made under the relevant regulations, but shall not copy the previous documents wholesale.

4.26 Review of Environmental Impact Assessment and Environmental Audit reports revealed instances where experts duplicated previous reports, contrary to the code of ethics. For instance, EA reports with reference number NEMA/EA/KMB/5/2/2698 had been duplicated from 2014 to 2017, for the same slaughterhouse. Further, two experts had word for word duplicate EA reports, with reference numbers NEMA/EA/EMB/0675 and NEMA/EA/EMB/0658. In addition, report number NEMA/EA/KSM/5/2/0285 for a slaughterhouse contained information on a school, in the report's Environmental Management Plan.

4.27 Submission of substandard reports could be attributed to NEMA not having stringent measures against experts generating sub-standard reports. In addition, NEMA has not been reviewing the submitted reports and taking note of such discrepancies. This indicated that expert verification by NEMA, through reports, has not been effective.

4.28 In view of submission of substandard reports, there is a risk that adverse environmental impacts may not be addressed by slaughterhouses' management. Further, mitigation measures may not be taken.

E. Auditee's Response to Audit Findings

4.29 After the completion of the audit, the Office of the Auditor-General sent a management letter to NEMA for comments, on the audit findings and related matters, but NEMA did not provide any comments.

5. CONCLUSIONS

5.1 The audit concludes that, although the National Environmental Management Authority (NEMA) has developed regulations that should ensure proper effluent management in slaughterhouses, it has not been able to adequately enforce these regulations. Specifically:

- i) Although NEMA has developed effluent management conditions, the Authority has not been able to consistently enforce these conditions within the slaughterhouses. This was evidenced by a majority of the sampled slaughterhouses not having an Effluent Discharge License, waste treatment plants and not conducting annual Environmental Audits;
- ii) The Authority has not adequately enforced the requirement by the Environmental Management and Co-ordination Act, 1999, for conducting an initial environmental audit for slaughterhouses established before enactment of the Act. In addition, NEMA has not been able to ensure that all the slaughterhouses established after enactment of the Act submit an Environmental Impact Assessment report as required;
- iii) The National Environment Management Authority has not been able to carry out adequate monitoring of slaughterhouses. Therefore, slaughterhouses are still operating without NEMA establishing the extent to which environmental degradation is caused by meat processing operations.
- iv) The National Environment Management Authority, as the licensing Authority for the environmental experts, has not been able to regulate and enforce the code of practice that requires disciplinary measures to be taken against experts submitting sub-standard reports.

6. RECOMMENDATIONS

6.1 In view of the findings and conclusions of this audit, the Auditor-General proposes the following recommendations to improve the conditions of effluent discharge by slaughterhouses.

6.2 The National Environment Management Authority should:

- i. Prioritize monitoring and inspection of slaughterhouses. In addition, NEMA should have a structured collaboration with the Department of Veterinary Services on monitoring of waste management by slaughterhouses;
- ii. Develop guidelines on construction of standard and efficient treatment plants to be adopted by slaughterhouse operators;
- iii. Create awareness on the need for application and renewal of Effluent Discharge Licenses by the slaughterhouses. Further, NEMA should enhance the enforcement processes against slaughterhouses operating without an EDL. Effluent Discharge Licence application requirements for slaughterhouse operators should also be standardized;
- iv. Enhance enforcement processes against slaughterhouse operators without EIA or initial audits. In addition, the Authority should take stringent measures against experts submitting sub-standard reports, as well as slaughterhouse operators who fail to submit annual Environmental Audits; and
- v. Together with the Environment Institute of Kenya, develop and enforce a code of ethics for environmental auditors.

APPENDICES

Appendix 1(a): Slaughterhouses in the Directorate of Veterinary Services Records in each County

| County Name | Number of slaughterhouses (A & B Category) | Number of slabs (C category) | Number of Uncategorized Slaughterhouses | Total number of Slaughterhouses | Rank |
|--------------------|--|------------------------------|---|---------------------------------|------|
| 1. Makueni | 3 | 36 | 106 | 145 | 1 |
| 2. Nyeri | 4 | 133 | 0 | 137 | 2 |
| 3. Muranga | 17 | 107 | 0 | 124 | 3 |
| 4. Meru | 4 | 52 | 66 | 122 | 4 |
| 5. Machakos | 13 | 41 | 57 | 111 | 5 |
| 6. Nakuru | 13 | 88 | 0 | 101 | 6 |
| 7. Kiambu | 33 | 61 | 0 | 94 | 7 |
| 8. Embu | 1 | 22 | 71 | 94 | 8 |
| 9. Nyandarua | 4 | 69 | 0 | 73 | 9 |
| 10. Kakamega | 3 | 52 | 16 | 71 | 10 |
| 11. Busia | 0 | 23 | 45 | 68 | 11 |
| 12. Kitui | 0 | 12 | 45 | 57 | 12 |
| 13. Kirinyaga | 7 | 46 | 0 | 53 | 13 |
| 14. Trans Nzoia | 5 | 47 | 0 | 52 | 14 |
| 15. Uasin Gishu | 2 | 41 | 0 | 43 | 15 |
| 16. Nandi | 1 | 42 | 0 | 43 | 16 |
| 17. Kajiado | 18 | 20 | 0 | 38 | 17 |
| 18. Laikipia | 12 | 26 | 0 | 38 | 18 |
| 19. Bungoma | 3 | 6 | 27 | 36 | 19 |
| 20. Kilifi | 3 | 24 | 3 | 30 | 20 |
| 21. Bomet | 0 | 29 | 0 | 29 | 21 |
| 22. Baringo | 3 | 25 | 0 | 28 | 22 |
| 23. Kwale | 7 | 14 | 6 | 27 | 23 |
| 24. Vihiga | 1 | 21 | 5 | 27 | 24 |
| 25. Kericho | 4 | 21 | 0 | 25 | 25 |
| 26. Narok | 5 | 19 | 0 | 24 | 26 |
| 27. Taita Taveta | 1 | 20 | 1 | 22 | 27 |
| 28. Tharaka Nithi | 0 | 0 | 19 | 19 | 28 |
| 29. Nairobi | 6 | 3 | 9 | 18 | 29 |
| 30. Elgeyo Maraket | 1 | 17 | 0 | 18 | 30 |
| 31. Kisumu | 5 | 6 | 0 | 11 | 31 |
| 32. Lamu | 0 | 10 | 0 | 10 | 32 |
| 33. Kisii | 4 | 5 | 0 | 9 | 33 |
| 34. Mombasa | 3 | 4 | 0 | 7 | 34 |
| 35. Isiolo | 1 | 4 | 2 | 7 | 35 |
| 36. Tana River | 0 | 6 | 0 | 6 | 36 |
| 37. Turkana | 1 | 4 | 0 | 5 | 37 |

| County Name | Number of slaughterhouses (A & B Category) | Number of slabs (C category) | Number of Uncategorized Slaughterhouses | Total number of Slaughterhouses | Rank |
|--|--|------------------------------|---|---------------------------------|------|
| 38. West Pokot | 0 | 5 | 0 | 5 | 38 |
| 39. Siaya | 1 | 0 | 0 | 1 | 39 |
| 40. Homa Bay | 1 | 0 | 0 | 1 | 40 |
| 41. Marsabit | 0 | 1 | 0 | 1 | 41 |
| 42. Samburu | 0 | 1 | 0 | 1 | 42 |
| 43. Garissa | 0 | 0 | 0 | 0 | 43 |
| 44. Wajir | 0 | 0 | 0 | 0 | 44 |
| 45. Mandera | 0 | 0 | 0 | 0 | 45 |
| 46. Migori | 0 | 0 | 0 | 0 | 46 |
| 47. Nyamira | 0 | 0 | 0 | 0 | 47 |
| Total Number of Slaughterhouses | | | | 1831 | |

Appendix 1(b): Slaughterhouses as in NEMA Records Per County

| County | Name of Facility | No Per County |
|-----------------|---|---------------|
| Machakos | 1. Masii Slaughterhouse | 2 |
| | 2. Len's Slaughterhouse | |
| Kakamega | 1. Ekeru Slaughterhouse | 2 |
| | 2. Ruth Khasoa Muhuyi Slaughterhouse | |
| Nyandarua | 1. Tumaini Slaughterhouse | 6 |
| | 2. K and K slaughterhouse | |
| | 3. Ndaragua Slaughterhouse | |
| | 4. Kahii Slaughterhouse | |
| | 5. Githumbata Produce Company | |
| | 6. Rironi Slaughterhouse | |
| Bungoma | 1. Mayanja Slaughterhouse | 1 |
| Nakuru | 1. Ewaki Slaughterhouse | 2 |
| | 2. Homabarakiwa Butchers | |
| Elgeyo Marakwet | 1. Nyaru Slaughterhouse | 4 |
| | 2. Kamwasor Slaughterhouse | |
| | 3. Kapsowar Slaughterhouse | |
| | 4. Kapcherop Slaughterhouse | |
| Embu | 1. Done Faith Slaughterhouse | 1 |
| Kiambu | 1. Juja Slaughterhouse | 5 |
| | 2. Dagoretti Slaughterhouse | |
| | 3. Thiani Slaughterhouse | |
| | 4. Mehotoro Slaughterhouse | |
| | 5. Farmers Choice Pig Unit | |
| Kwale | 1. Kasemenu Slaughterhouse | 1 |
| Baringo | 1. Esageri Slaughterhouse | 1 |
| Uasin Gishu | 1. Farmers Choice Eldoret Pig Unit | 2 |
| | 2. Moi's Bridge Slaughterhouse | |
| Kajiado | 1. Isinya Feeds Slaughterhouse | 5 |
| | 2. Peter Kanyoro Slaughterhouse | |
| | 3. Kiserian Butcheries | |
| | 4. Keekonyokie Butcheries | |
| | 5. Tata Chemicals Magadi Slaughterhouse | |
| Meru | 1. Bartholomen Slaughterhouse | 1 |
| Siaya | 1. Kogelo Nyangoma Slaughterhouse | 1 |
| Nairobi | 1. Nyonjoro Slaughterhouse | 2 |
| | 2. Mumu Slaughterhouse | |
| Turkana | 1. Silzha Donkey Export | 1 |

| County | Name of Facility | No Per County |
|--|--|---------------|
| Kilifi | 1. Mombasa Slaughterhouse | 3 |
| | 2. Uwanja wa Ndege Slaughterhouse | |
| | 3. Rabai Slaughterhouse | |
| Laikipia | 1. Mary Wambui Kiburi Slaughterhouse | 2 |
| | 2. Ol Pejeta Slaughterhouse | |
| Nyeri | 1. Mt. Kenya Abattoirs | 1 |
| Narok | 1. East Africa Meat-Ewaso Ngiro Slaughterhouse | 3 |
| | 2. Ololunga Slaughterhouse | |
| | 3. Mara Beef Limited | |
| Total Number of Slaughterhouses | | 46 |

Appendix 2: Summary of Sampled Slaughterhouses Visited in each county

| County | Slaughterhouse Name | Point of Effluent Discharge | EDL Required | EDL Status |
|----------------------------------|---|-----------------------------|--------------|--------------------------------------|
| Nairobi | 1. Kamulu Slaughterhouse | Septic Tank | Yes | No EDL |
| | 2. Kiamaiko Slaughter slabs | Sewer line | No | N/A |
| | 3. Nyongara Slaughterhouse | Sewer line | No | N/A |
| | 4. Lyntano Slaughterhouse | Open Land | Yes | No EDL |
| | 5. Neema Slaughterhouse | Sewer line | No | Had an EDL |
| | 6. Ndumbu-ini Slaughterhouse | Open Land | Yes | No EDL |
| Nakuru | 7. Star Brilliant Ltd Slaughterhouse | Open Land | Yes | Had an EDL |
| | 8. Naivasha Municipal Slaughterhouse | Sewer line | No | N/A |
| | 9. Barnabas Slaughterhouse | Soak pit | Yes | No EDL |
| | 10. Modern Slaughterhouse | Open Land | Yes | No EDL |
| | 11. Free Area Slaughterhouse | Sewer line | No | N/A |
| | 12. Nakuru County Slaughterhouse | Sewer line | No | N/A |
| | 13. Githioro Slaughter Slab | Soak Pit | Yes | No EDL |
| | 14. Mawanga Slaughter Slab | Soak Pit | Yes | No EDL |
| Kisumu | 15. Sondu Slaughterhouse (Kericho Side) | Open Land | Yes | No EDL-Paid Ksh 100,000 for the EDL |
| | 16. Sondu Slaughterhouse (Kisumu Side) | Soak Pit | Yes | No EDL, Applied for EDL in July 2019 |
| | 17. Chulaimbo Modern Slaughterhouse | Soak Pit | Yes | No EDL, Applied for EDL in July 2019 |
| | 18. Mamboleo Slaughterhouse | Sewer line | No | N/A |
| | 19. Rabuor Slaughterhouse | Soak Pit | Yes | No EDL, Applied July 2019 |
| | 20. Kisii Municipal Slaughterhouse | River | Yes | No EDL, Applied for EDL 9/7/2019 |
| Kisii | 21. Itibo Slaughterhouse | River | Yes | No EDL, Applied for EDL 10/7/2019 |
| | 22. Marani Slaughterhouse | Open Land | Yes | No EDL |
| | 23. Ogembo Slaughterhouse | Open Land | Yes | No EDL |
| | 24. Keroka Slaughterhouse | Soak Pit | Yes | No EDL |
| | Kakamega | 25. Shirere Slaughterhouse | Soak Pit | Yes |
| 26. Khayenga Slaughter Slab | | Soak Pit | Yes | No EDL |
| 27. Savona Slaughterhouse | | Soak Pit | Yes | No EDL |
| 28. Ejinja Corner Slaughterhouse | | Open Land | Yes | No EDL |
| 29. Mumias Modern Slaughterhouse | | Open Land | Yes | No EDL |
| 30. Lubao Slaughterhouse | | Open Land | Yes | No EDL |
| 31. Kakunga Slaughterhouse | | Soak Pit | Yes | No EDL |
| Nyeri | 32. Karatina Slaughterhouse | Sewer line | | N/A Recommended for prosecution for |

| County | Slaughterhouse Name | Point of Effluent Discharge | EDL Required | EDL Status |
|----------------------|---|---|------------------------|---|
| | | | No | lack of an EDL |
| | 33. Kanyange Slaughter Slab | Open Land | Yes | No EDL. Had applied for the EDL in 2017, 2018 and 2019 |
| | 34. Gwacucu Slaughter Slab | Open Land | Yes | No EDL |
| | 35. Nyeri (Munjiru Investment) Slaughterhouse | sewer line | No | N/A EDL, Applied the first one in 2019 |
| | 36. Ngangarithi Slaughterhouse (Classic Area) | Open Land | Yes | Had EDL, Application 2017, 2018,2019 |
| | 37. Kagongo-ini Slaughter Slab | Open land | Yes | No EDL, Applied for EDL on 5/7/2019 |
| | 38. Kiamariga Slaughterhouse | Open land | Yes | No EDL |
| Embu | 39. Rukira Slaughter slab | Open Land | Yes | No EDL |
| | 40. Karingare Karonja Slaughterhouse | Open Land | Yes | No EDL |
| | 41. Embu Slaughterhouse | Soak Pit | Yes | No EDL |
| | 42. Manyatta Slaughterhouse | Soak Pit | Yes | No EDL, Paid for 18/9/2019 |
| | 43. Mutunduri Slaughterhouse | Soak Pit | Yes | No EDL, Asked to apply 11/09/2019 |
| | 44. Karurina Slaughterhouse | Soak Pit | Yes | No EDL, Applied for EDL 4/09/2019 |
| | 45. Makutano Slaughterhouse | Soak Pit | Yes | No EDL |
| | 46. Makengi Slaughter Slab | Open land | Yes | No EDL |
| Data Summary: | | Sewerline-9 Soak Pit-17 River-2 Open Land-18 | Yes-37 No-9 | Had EDL-3 (2 renewals) With No EDL-34 N/A-9 Applied During the RRI-9 |

Key: RRI Rapid Response Initiative

Appendix 3: Documents Reviewed

| Document | Information derived |
|--|--|
| The Constitution of Kenya, 2010 | Rights of Kenyans in regards to clean and healthy environment, the provision of sustainable utilization and conservation of natural resources and OAG's mandate in carrying out the audit. |
| Environmental Management and Coordination Act, 1999 | Sets precedence for compliance with environmental standards and particularly with the requirement for the application of an Effluent Discharge License. |
| Water Act, 2002 | The need for compliance to water quality standards and the conditions for this. |
| Water Quality Regulations 2006 | Water quality requirements for effluent emissions to either the sewer system or into the environment through attached schedules. |
| Waste Management Regulations, 2006 | The responsibilities of a proponent as a Waste Generator. |
| Environmental (Impact Assessment and Audit) Regulations, 2003 | The requirements for preparation, submission, review and EIA licensing. |
| NEMA Strategic Plan and Policies | NEMA's vision and mission to succeed as well as various initiatives that have been put in place. |
| Operational Manuals | The Standard Operating Procedures for compliance, as well as the roles and responsibilities of those tasked with ensuring compliance. |
| Environmental Impact Assessment & Audit Reports (EIA&A) | The effluent treatment facilities that would be used in slaughterhouses or conversely, the mitigation measures that would be taken in the event of any incident. |
| Environmental Audit Reports | Gain a better understanding of the annual progress that slaughterhouses achieve. Also important to carry out comparisons and see if indeed change has taken place. |
| Monitoring Reports | How well monitoring and evaluation is carried out especially with regard to compliance with Effluent Discharge Licences. |
| Kenya Meat Control Act, 2012 CAP 356 | To gain an understanding on the categorization of slaughterhouses, as well as the role of the Directorate of Veterinary Services on environmental management. |

Appendix 4: Interviews Conducted

| Person Interviewed | Reasons for Interview |
|--|---|
| Environmental Audit Section Head | To understand and get more information on the mandate of the National Environmental Management Authority (NEMA), Environmental Audit section and specifically on abattoir waste management. |
| Head of the Environmental Impact Assessment Section | To obtain relevant information on how the EIA section is involved in supporting compliance and enforcement section, on abattoirs waste management. |
| Chief Compliance Officer | To obtain relevant information on how the Enforcement section is involved in managing abattoirs waste. |
| Accountant | To gather information on accounts concerning revenue and expenditure of NEMA and specifically the role of finance in supporting the Compliance and Enforcement Department achieve its mandate. |
| Acting Director Field Operations | To understand and get more information on the role of the Field Operations Section in the Compliance and Enforcement Department |
| Principal Compliance Environmental Officer | To understand and get more information on the role of Labs and Chemicals Section in supporting the Compliance and Enforcement Department achieve its mandate. |
| Prosecutor or /Legal Officer | To obtain relevant information on how the Legal Department is involved in supporting the Compliance and Enforcement Section on abattoirs waste management. |
| Compliance Officers | <p>To understand and get more information on the mandate of the National Environment Management Authority and specifically on the curriculum for training Environmental Impact Assessment (EIA) experts.</p> <p>To understand and get more information on the mandate of NEMA and specifically on the Water Quality Section in waste water management in abattoirs.</p> |
| County Directors of Environment-Nairobi, Nyeri, Embu, Nakuru, Kakemega, Kisumu and Kisii. | To obtain relevant information on the management and the status of slaughterhouse waste, at the county level. |
| Slaughterhouse Managers | To obtain relevant information on slaughterhouse waste management. |

Appendix 5: List of Assessment Criteria

| Source of Criteria | Article/Section | Specific information |
|--|---|--|
| Constitution of Kenya, 2010 | Article 42 | Right of a Kenyan to a clean and healthy environment |
| | Article 70 | Enforcement of environmental rights |
| Environmental Management and Coordination Act (EMCA), 1999 | Section 58 | According to EMCA, Section 58 (1), "The proponent of a project shall undertake or cause to be undertaken at his own expense an Environmental Impact Assessment (EIA) study and prepare a report". Where the Authority being satisfied, after studying the report, that the necessary environmental impacts have been addressed, shall issue an EIA License. |
| | Section 59 | Publication of environmental impact Assessment report |
| | Section 60 | Comments on EIA report by lead agencies |
| | Section 63 | EIA licensing |
| | Section 67 | Revocation, suspension or cancellation of EIA license |
| | Section 68 | Section 68 (3) of EMCA, 1999, states that "The owner of the premises or the operator of a project for which an Environmental Impact Assessment study report has been made shall keep accurate records and make annual reports to the Authority, describing how far the project conforms in operation with the statements made in the Environmental Impact Assessment report. |
| | Section 69 | EMCA 1999, Part VII Section 69, Part IX Section 109 (2) and Part X Section 117(2) gives NEMA the mandate to regulate discharge of pollutants into the environment. This is done through facility inspection which is the primary tool for monitoring compliance. |
| | Section 71 | Water Quality Standards |
| | Section 72 | Water pollution prohibition |
| | Section 74 | According to EMCA Section 74 (1), proponents discharging effluent into the sewer line should apply for an effluent discharge license. from the local authority operating the sewerage system. |
| | Section 75 | According to Section 75 (2) of EMCA 1999, every proponent discharging any effluent or other pollutant into the environment shall apply to the Authority for an Effluent Discharge License (EDL). |
| Section 76 | Cancellation of Effluent Discharge License | |
| Section 77 | Registration of Effluent Discharge Licenses | |

| | | |
|---|---------------------|---|
| | Section 117 | Section 117(2a) of EMCA states that "An Environmental Inspector shall monitor compliance with the environmental standards" |
| | Section 118 | Environmental Inspectors powers to prosecute |
| | Section 121 | Records to be kept |
| | Section 122 | Transmission of records to the Authority |
| | Section 137 | Offenses relation to inspection |
| | Section 138 | Offenses relating to Environmental Impact Assessment |
| Water Act, 2002 | Section 81 | Control of water pollution |
| | Section 82 | Effluent discharge into any water resource |
| Water Quality Regulations, 2006 | Regulation 12 | Discharge into the environment |
| | Regulation 13 | Discharge into public sewer |
| | Regulation 14 | Discharge monitoring |
| | Regulation 15 | Review of records |
| | Regulation 16 | Application on EDL |
| | Regulation 17 | EDL |
| Waste Management Regulations, 2006 | Regulation 4 | Responsibility of waste generator |
| | Regulation 5 | Segregation of waste by generator |
| | Parts I to IV | |
| National Environmental Policy, 2013 | Part 6.3 | Environmental Quality and Health |
| Kenya Meat Control Act, 2012 CAP 356 | Section 4 | Categorization of slaughterhouses |
| The Environmental (Impact Assessment And Audit) Regulations, 2003 | Part IV Part III | <p>Section 31 3(a) and 4(b) of EIA Regulations, 2003, indicate that an Initial Environmental Audit study followed by subsequent environmental control audit studies shall be conducted in case of an ongoing project. Further, the proponent shall also conduct an Environmental Audit within 12 months of the commencement of the operations and not more than 24 months after the completion of a project.</p> <p>According to Section 13(3) a person undertaking an EIA study shall conduct themselves in accordance with an established code of practice issued by the Authority.</p> |

| | | |
|---|---------------------|---|
| NEMA Strategic Plan 2013-2018 | Strategic objective | According to NEMA's Strategic Plan, 2013-2018, the second strategic objective is to ensure compliance with environmental legislations and policies in order to maintain a clean, healthy and sustainable environment through monitoring the compliance to conditions of licenses and permits issued. |
| Code of Practice and Professional Ethics for Lead Experts | Section 11 | Section 11 of the Code of Practice and Professional Ethics for Lead Experts states that an Environmental Assessment Expert shall, based on the Terms of Reference, include all matters as required, by relevant statutory provisions, before submitting such reports to the project proponent or operator. Further, the expert shall, in undertaking an environmental assessment or audit, bear in mind any previous environmental assessments or audits of a similar project made under the relevant regulations, but shall not copy the previous documents wholesale. |

Appendix 6: List of Effluent Discharge License Application Requirements

1. Application Requirements for Effluent Discharge License (EDL)

- a) Evidence of land ownership;
- b) Copy of EIA license or EA submission acknowledgement letter;
- c) Current Effluent Quality Analytical Report from NEMA designated laboratories, collected from two NEMA sampling points marked the treatment plant site;
- d) Detailed site layout plan indicating sampling and discharging points clearly marked;
- e) Indicate the number of animals slaughtered per day;
- f) Describe the receiving environment; land, river, canal, among others; and
- g) NEMA official receipt for effluent discharge application fee of Ksh. 5,000.

2. Prescribed EDL fee as per the corrigenda

| Fees charged per category | Amount (Ksh.) |
|---|----------------------|
| Category (i) ≥ 40 animals per day | 100,000 |
| Category (ii) $\geq 20 < 40$ animals per day | 75,000 |
| Category (iii) $\geq 6 \leq 20$ animals per day | 50,000 |
| Category (iv) $<$ animals per day | 20,000 |

Appendix 7: Effluent Discharge Licensing Conditions

1. General Conditions

- 1.1. This licence is valid for a period of 12 months from the date hereof.
- 1.2. The owner or operator is licensed to discharge effluent from the wastewater treatment plant marked on the site layout plan attached to the licence application.
- 1.3. The owner or operator shall display a copy of the Effluent Discharge Licence at the facility offices at all times.
- 1.4. The owner or operator shall submit an annual Environmental Audit together with the application for renewal of this licence.
- 1.5. Without prejudice to the other conditions of this licence, the owner or operator shall implement and maintain an environmental management system, organizational structure and allocate resources that are sufficient to achieve compliance with the requirements and conditions of this licence.
- 1.6. This licence shall not be taken as statutory defence against charges of pollution in respect of any manner of pollution not specified herein.
- 1.7. The Authority shall reserve the right to cancel this licence, in the event of breach of any of the conditions stated herein or any contravention to the Environmental Management and Co-ordination Act, 1999 and regulations thereunder.

2. Operational Conditions

- 2.1 The owner or operator shall ensure that all raw wastewater from the operations of the facility is directed into the wastewater treatment plant, before discharge into the environment.
- 2.2 The owner or operator shall install, operate and maintain a flow measuring device at the entry and exit of the wastewater treatment plant, as per the requirements of the lead agency.
- 2.3 The owner or operator shall recruit competent personnel to operate the wastewater treatment plant.
- 2.4 The owner or operator shall ensure that all staff working at the plant are provided with appropriate Personal Protective Equipment (PPE).
- 2.5 The owner or operator shall provide and display operational procedure for the wastewater treatment plant.
- 2.6 The owner or operator shall ensure that various wastewater streams are segregated and are pre-treated before discharge into wastewater treatment plant.
- 2.7 The owner or operator shall ensure that the wastewater shall be free of solid waste by providing screens before directing into the wastewater treatment plant.
- 2.8 The owner or operator shall treat the effluent to the standards set out in the Third Schedule and monitor as guided by the Fourth Schedule of the Environmental Management and Co-ordination (Water Quality) Regulations, 2006.
- 2.9 The owner or operator shall ensure that condemnation pits, blood tank, ingestor pit and waste disposal pits are impermeable to prevent effluent infiltration from pits.

- 2.10 owner or operator shall provide roofed shed for storing manure (offal waste) and drainage channels for purposes of collecting leachate.
- 2.11 The owner or operator shall ensure that the wastewater from skins and hides treatment unit is discharged into a conservancy tank.
- 2.12 The owner or operator shall discharge within the works design capacity.
- 2.13 The owner or operator shall manage any other solid waste generated in accordance with the Environmental Management and Co-ordination (Waste Management) Regulations 2006.
- 2.14 The owner or operator shall manage the facility strictly in accordance with the Environmental Management Plan (EMP) developed for the operations in accordance with the Environmental Impact Assessment or Environmental Audit Regulations, Legal Notice no.101 of 2003.
- 2.15 The owner or operator shall ensure that operations of the facility are managed in accordance with the EMP developed for the operations in accordance with the approved Environmental Audit.
- 2.16 The owner or operator shall maintain the facility grounds for ease of inspection.
- 2.17 The owner or operator shall ensure that the facility is secured or fenced and grounds maintained.

3. Monitoring Conditions

- 3.1. The owner or operator shall ensure that sampling points are appropriately marked (NEMA sampling points) and maintained as indicated on the site layout plan attached to the licence application.
- 3.2. The owner or operator shall carry out laboratory analysis of water samples collected at the discharge point, upstream and downstream of receiving river within a distance of 50m from the effluent discharge point.
- 3.3. The owner or operator shall compare the obtained results of the parameters against the limits specified in the Third Schedule of the Environmental Management and Co-ordination (Water Quality) Regulations 2006.
- 3.4. The owner or operator shall carry out daily tests and analysis for the following effluent characteristics: Temperature, PH, and Electrical Conductivity (EC).
- 3.5. The owner or operator shall ensure tests and analysis of at least the following effluent parameters: E-coli, Total Coliforms, Biological Oxygen Demand (BOD₅), PH, Temperature, colour, Total Suspended Solids, Total Nitrogen, Total Phosphorous, and Surfactants are carried out *on* Quarterly (three-months) basis by NEMA designated laboratories.
- 3.6. The owner or operator shall submit records of effluent quality and flow on a Quarterly basis to the Authority in the prescribed format (Sixth Schedule) and as guided by condition 3.5 above.
- 3.7. The owner or operator shall give access to Environmental Inspectors from the Authority upon identification, even without prior notice, and provide information, reports, records and data during inspection.

- 3.8. The owner or operator shall develop a pollution incident response plan covering the wastewater treatment plant and allied infrastructure.
- 3.9. The owner or operator shall develop and implement a routine inspection plan for the wastewater treatment plant and allied infrastructure.
- 3.10. The owner or operator shall keep record of environmental pollution related complaints and action taken thereof.

4. Notifications

- 4.1. The owner or operator shall seek written approval from the Authority of any operational changes under this licence.
- 4.2. The owner or operator shall notify the Authority three (3) months in advance, prior to decommissioning of the wastewater treatment plant.
- 4.3. The owner or operator shall report all pollution incidents arising from the effluent treatment facility and allied infrastructure to the Authority, through the incident hotline 0704846019, **0786101100**, email: - **incidence@nema.go.ke** or at the nearest NEMA office within **6 hours**.
- 4.4. The owner or operator shall inform the Authority of the mitigation measures put in place within **18 hours** and submit the same in writing within **24 hours**.

5. Decommissioning Conditions

- 5.1. The owner or operator shall submit a decommissioning plan at least three months prior to decommissioning, for approval by the Authority.
- 5.2. The owner or operator shall decommission wastewater treatment works in accordance with the decommissioning plan approved by the Authority.

Appendix 8: Compliance with EDL Conditions

| Name of slaughterhouse | Treatment plant in place | Treatment plant handler existence | Segregation and pre-treatment of waste before discharge into the treatment plant |
|---------------------------------------|--------------------------|-----------------------------------|--|
| 1. Ndumbu-ini Slaughterhouse | Yes | Yes | No |
| 2. Lyntano Slaughterhouse | Yes | Yes | No |
| 3. Nyonjoro Slaughterhouse | Yes | No | – |
| 4. Kiamaiko Slaughterhouse | No | No | No |
| 5. Nyongara Slaughterhouse | Yes | Yes | Yes |
| 6. Neema Slaughterhouse | Yes | No | Yes |
| 7. Keroka Slaughterhouse | No | No | No |
| 8. Ogembo Slaughterhouse | No | No | No |
| 9. Marani Slaughterhouse | No | No | No |
| 10. Municipal Slaughterhouse | No | No | Yes |
| 11. Itibo Slaughterhouse | Yes | No | Yes |
| 12. Sondu Slaughterhouse | Yes | No | Yes |
| 13. Sondu Slaughterhouse-Kericho Side | No | No | No |
| 14. Chulaimbo Slaughterhouse | No | No | No |
| 15. Rabuor Slaughterhouse | Yes | No | Yes |
| 16. Mamboleo Slaughterhouse | Yes | Yes | Yes |
| 17. Kakunga Slaughter Slab | No | No | Yes |
| 18. Lubao Slaughterhouse | No | No | Yes |
| 19. Mumias Modern Slaughterhouse | No | No | Yes |
| 20. Ejinja Corner Slaughterhouse | No | No | Yes |
| 21. Savona Slaughterhouse | No | No | No |
| 22. khayega Slaughter Slab | No | No | No |
| 23. Shirere Slaughterhouse | No | No | Yes |
| 24. Star Brilliant Ltd Slaughterhouse | Yes | Yes | Yes |
| 25. Naivasha Municipal Slaughterhouse | No | No | Yes |
| 26. Barnabas Slaughterhouse | No | No | No |
| 27. Modern Slaughterhouse | No | No | Yes |
| 28. Free Area Slaughterhouse | Yes | No | No |
| 29. Nakuru County Slaughterhouse | No | No | No |
| 30. Githioro Slaughter Slab | No | No | Yes |
| 31. Mawanga Slaughter Slab | No | No | Yes |
| 32. Karatina Slaughterhouse | No | No | No |
| 33. Kanyange Slaughter slab | Yes | Yes, but not trained | No |
| 34. Kiamariga Slaughterhouse | No | | |
| 35. Gwacucu Slaughter slab | No | No | No |
| 36. Nyeri Slaughterhouse | No | No | No |

| Name of slaughterhouse | Treatment plant in place | Treatment plant handler existence | Segregation and pre-treatment of waste before discharge into the treatment plant |
|--------------------------------------|----------------------------------|-----------------------------------|--|
| (Munjiru Investment) | | | |
| 37. Kagongo-ini Slaughter Slab | No | No specific handler | No |
| 38. Ngangarithi Slaughterhouse | Yes | Yes, but not trained | Yes |
| 39. Mutunduri Slaughterhouse | No | No | Yes |
| 40. Karingare Karonja Slaughterhouse | No | N/A | Yes |
| 41. Rukira Slaughter slab | No | No | Yes |
| 42. Makutano Slaughterhouse | No | N/A | No |
| 43. Makengi Slaughter Slab | No | N/A | No |
| 44. Manyatta Slaughterhouse | No | No | Yes |
| 45. Embu County Slaughterhouse | Yes. May not be fully functional | No | Yes |
| 46. Karurina Slaughterhouse | No | No | N/A |
| Total | 14 | 7 | 23 |

Annexure 9: Compliance and Enforcement of EIA and EA Reports Submission

| COUNTY | NAME OF THE SLAUGHTERHOUSE | Slaughterhouses year of establishment | EIA/IA submission | EA submission |
|----------|---|---------------------------------------|-------------------|---------------|
| Nakuru | 1. Star Brilliant Slaughterhouse | 2016 | Yes | Yes |
| | 2. Naivasha Municipal Slaughterhouse | Not provided | No | No |
| | 3. Barnabas Slaughterhouse | 2015 | Yes | No |
| | 4. Modern Slaughterhouse | Not provided | No | No |
| | 5. Free Area Slaughterhouse | 1980 | No | No |
| | 6. Nakuru County Slaughterhouse | 1974 | No | No |
| | 7. Githioro Slaughter Slab | 2017 | Yes | No |
| | 8. Mawanga Slaughter Slab | Not provided | No | Yes |
| Kisumu | 9. Sondu Slaughterhouse-Kericho Side | 2015 | Yes | No |
| | 10. Sondu Slaughterhouse-Kisumu Side | 1980 | No | Yes |
| | 11. Chulaimbo Modern Slaughterhouse | 2011 | Yes | Yes |
| | 12. Mamboleo Slaughterhouse | 1991 | No | No |
| | 13. Rabuor Slaughterhouse | 1991 | No | No |
| Kisii | 14. Kisii Municipal Slaughterhouse | 1985 | No | No |
| | 15. Itibo Slaughterhouse | 2014 | Yes | Yes |
| | 16. Marani Slaughterhouse | 2012 | Yes | No |
| | 17. Keroka Slaughterhouse | Not provided | | No |
| | 18. Ogembo Slaughterhouse | 2009 | No | No |
| Kakamega | 19. Shirere Slaughterhouse | 2014 | No | No |
| | 20. Khayenga Slaughterhouse | 1999 | No | No |
| | 21. Savona Slaughterhouse | 2002 | No | No |
| | 22. Ejinja Corner Slaughterhouse | 2014 | No | No |
| | 23. Mumias Modern Slaughterhouse | 2013 | No | Yes |
| | 24. Lubao Slaughterhouse | 2019 | No | Yes |
| | 25. Kakunga Slaughterhouse | 1997 | No | No |
| Nairobi | 26. Kamulu Slaughterhouse | 2017 | Yes | YES |
| | 27. Kiamaike Slaughterhouse | 1996 | No | Yes |
| | 28. Nyongara Slaughterhouse | 1970 | No | Yes |
| | 29. Lyntano Slaughterhouse | 1969 | Yes | Yes |
| | 30. Neema Slaughterhouse | 2014 | Yes | Yes |
| | 31. Ndumbu-Ini Slaughterhouse | 1970 | No | Yes |
| Nyeri | 32. Karatina Slaughterhouse | 1974 | No | Yes |
| | 33. Kanyange Slaughter Slab | 1996 | NO | Yes |
| | 34. Gwacucu Slaughter Slab | 2000 | No | No |
| | 35. Nyeri Slaughterhouse (Munjiru Investment) | Not provided | No | Yes |

| | | | | |
|------|--------------------------------------|--------------|----|--------------------|
| | 36. Kiamariga Slaughterhouse | Not provided | | No |
| | 37. Kagongoini Slaughter Slab | Not provided | | No |
| | 38. Ngangarithi Slaughterhouse | 2001 | No | Yes |
| Embu | 39. Rukira Slaughterhouse Slab | 2002 | No | No |
| | 40. Karingare Karonja Slaughterhouse | 1984 | NO | No |
| | 41. Embu county Slaughterhouse | 1972 | No | No |
| | 42. Manyatta Slaughterhouse | 1999 | No | No |
| | 43. Mutunduri Slaughterhouse | 2000 | No | No |
| | 44. Karurina Slaughterhouse | 2017 | No | No |
| | 45. Makutano Slaughterhouse | Not provided | | No |
| | 46. Makengi Slaughter Slab | Not provided | | No |
| | | | | Yes =17 No = 29 |

Environmental Impact Assessment or Initial Audit Submission Summary

| | Slaughterhouse Established before 1999 | Slaughterhouse Established after 1999 |
|-------------------------|---|--|
| Required to conduct EIA | 17 | 20 |
| Conducted EIA | 1 | 9 |

Note: Nine slaughterhouses did not provide information on the exact year of established.

Annexure 10: Improvement and Closure Notices Issued

| County | Name of the Slaughterhouse | Date of issue |
|--------------------------|---------------------------------------|---------------|
| Nairobi | Quality Meat packers | 01/12/2016 |
| | Farmers Choice | 11/07/2017 |
| | Nyongara Slaughterhouse | 25/06/2018 |
| | Dema Slaughterhouses | 06/09/2018 |
| | Kamulu Slaughterhouses | 04/09/2019 |
| | Ndumboini Slaughterhouse | 05/09/2019 |
| Nyeri | Ngangarithi Slaughterhouses | 18/06/2018 |
| | Karatina Slaughter Slab | 01/08/2019 |
| | Kanyange Slaughterhouse | 30/02/2016 |
| Embu | Karurina Slaughterhouse | 03/08/2019 |
| | Siakago Slaughterhouse | 28/08/2019 |
| | Kibugu Slaughterhouse | 03/08/2019 |
| | Maruna Slaughterhouse | 28/08/2019 |
| | Ishiaru Slaughterhouse | 29/08/2019 |
| | Gikuni Slaughterhouse | 29/08/2019 |
| | Kivue Slaughterhouse | 03/09/2019 |
| | Kithimo Slaughterhouse | 03/09/2019 |
| | Njiru Mvunjia Slaughterhouse | 05/09/2019 |
| | Muchangi Slaughterhouse | 05/09/2019 |
| | Rukira Slaughterhouse | 11/09/2019 |
| | Joseph Nyaga Slaughterhouse | 05/09/2019 |
| | Nickson Njeru Slaughterhouse | 11/09/2019 |
| | Elias Karembio Slaughterhouse | 03/09/2019 |
| | Eunice Makengi Slaughterhouse | 11/09/2019 |
| | Martin Nyaga Slaughterhouse | 11/09/2019 |
| | E.K Karanja Slaughterhouse | 11/09/2019 |
| | Grace Wanjiru Slaughterhouse | 11/09/2019 |
| | Mutunduuri Slaughterhouse | 11/09/2019 |
| | Manyatta Slaughterhouse | 11/09/2019 |
| | Kangaru Slaughterhouse | 11/09/2019 |
| | Embu County Government Slaughterhouse | 16/09/2019 |
| Kimangaru Slaughterhouse | 03/09/2019 | |
| Nakuru | Mwangaza Slaughterhouse | 11/12/2017 |
| | Githioro Slaughterhouse | 07/06/2019 |
| | Brotherhood Slaughterhouse | 19/09/2019 |
| | Nakuru County Slaughterhouse | 19/09/2019 |
| | Mawanga Slaughterhouse | 19/09/2019 |
| | Free Area Slaughterhouse | 19/09/2019 |
| | Rongai Slaughter Slab | 24/09/2019 |
| | Salgaa Slaughterhouse | 24/09/2019 |

| County | Name of the Slaughterhouse | Date of issue |
|---------------------|--|--------------------------|
| | Nakuru County Butchers Company | 19th/09/2019 |
| | Modern Slaughterhouse | 01/10/2019 |
| | Hollywood Slaughterhouse | 19/09/2019 |
| | Kampi ya Moto Slaughterhouse | 24/09/2019 |
| Kakakemga | Mumias Modern Slaughterhouse | 17/01/2017 |
| | Khayenga Slaughterhouse | 21/02/2018 |
| | Kakuunga Slaughter slab | 01/10/2019 |
| | Lubao Slaughterhouse | 01/10/2019 |
| | Ejinja Corner Slaughterhouse | 01/10/2019 |
| Kisumu | Chulaimbo Slaughterhouse | 05/07/2019 |
| | Rabuor Slaughterhouse | 08/07/2019 |
| | Ahero Slaughterhouse | 26/09/2019 |
| | Awasi Slaughterhouse | 27/09/2019 |
| Kisii | Itibo Slaughterhouse | 03/07/2019 |
| | Keroka Slaughterhouse | 10/09/2019 |
| | Kisii County Government Slaughterhouse | 3/07/2019, 06/05/2019 |
| Data Summary | Improvement Notices issued before June 2019 | 10 |
| | Improvement Notices issued after June 2019 | <u>46</u> |
| | Total Notices Issued | 56 |

Appendix 11: Interaction with the National Environment Management Authority

| Name of The Slaughterhouse | Year of Establishment | Frequency of NEMA visiting or mode of communication between proponent and NEMA |
|--|-----------------------|--|
| 1. Star Brilliant Slaughterhouse | 2016 | They communicate with NEMA staff |
| 2. Naivasha Municipal Slaughterhouse | 1980 | No communication |
| 3. Barnabas Slaughterhouse | 2015 | Last visited in 2018 |
| 4. Modern Slaughterhouse | | No communication |
| 5. Free Area Slaughterhouse | 1980 | Often visited by NEMA |
| 6. Nakuru County Slaughterhouse | 1974 | Visited four times in 2019 |
| 7. Githioro Slaughter Slab | 2017 | Have contacts with NEMA |
| 8. Mawanga Slaughter Slab | | Often visited by NEMA |
| 9. Sondu Slaughterhouse (Kericho side) | 2015 | Visited three times in 2019 |
| 10. Awasi Slaughterhouse | Closed By NEMA | |
| 11. Ahero Slaughterhouse | Closed By NEMA | |
| 12. Sondu Slaughterhouse (Kisumu side) | 1980 | Visited in 2016 and two times in 2019 |
| 13. Chulaimbo Modern Slaughterhouse | 2011 | Visited by NEMA and closed in July 2019 |
| 14. Mamboleo Slaughterhouse | 1991 | Often visited by NEMA |
| 15. Rabuor Slaughterhouse | 1991 | Often visited by NEMA |
| 16. Kisii Municipal Slaughterhouse | 1985 | Visited two times between August and October in 2019 |
| 17. Itibo Slaughterhouse | 2014 | Visited a number of times in 2019 |
| 18. Marani Slaughterhouse | 2012 | 1st time seeing NEMA (October 2019) |
| 19. Ogembo Slaughterhouse | 2009 | 1st visited on 10th Sept 2019, not visited before |
| 20. Shirere Slaughterhouse | 2014 | NEMA had visited two times in 2019 |
| 21. Khayenga Slaughterhouse | 1999 | Communicate with NEMA through the phone |
| 22. Savona Slaughterhouse | 2002 | Visited three times in 2019 |

| | | |
|--------------------------------------|------|--|
| 23. Ejinja Corner Slaughterhouse | 2014 | No communication exists between NEMA and the slaughterhouse |
| 24. Mumias Modern Slaughterhouse | 2013 | Have had no visit with NEMA |
| 25. Lubao Slaughterhouse | 2019 | Deals directly with expert |
| 26. Kukena Slaughterhouse | 1997 | Have no direct contact with NEMA |
| 27. Kamulu Slaughterhouse | 2017 | Through phone calls |
| 28. Kiamaiko Slaughterhouse | 1996 | The slaughterhouses have tried to comply with the required regulation, Challenge is the slum environments. |
| 29. Nyongara Slaughterhouse | 1970 | Meetings have been held with NEMA |
| 30. Lyntano Slaughterhouse | 1969 | The frequency of interaction is minimal |
| 31. Neema Slaughterhouse | 2015 | The relationship is good, a lot of interactions since inception. NEMA has provided guidance. |
| 32. Ndumbu-ini Slaughterhouse | 1970 | No contacts for communication, NEMA has not visited the facility. |
| 33. Karatina Slaughterhouse | 1974 | There have been interactions through visits |
| 34. Kanyange Slaughter Slab | 1996 | There is communication |
| 35. Gwacucu Slaughter Slab | 2000 | Communicate with NEMA when visited |
| 36. Nyeri Slaughterhouse | N/A | The NEMA office is accessible |
| 37. Ngangarithi Slaughterhouse | 2001 | Inspection by NEMA is done twice in a year |
| 38. Rukira Slaughterhouse | 2002 | NEMA has never ever visited the slaughterhouse |
| 39. Karingare Karonja Slaughterhouse | 1984 | Have communicated with NEMA only once |
| 40. Embu County Slaughterhouse | 1972 | NEMA has visited once in 2019 |
| 41. Manyatta Slaughterhouse | 1999 | NEMA carries out inspection once a month |
| 42. Mutunduri Slaughterhouse | 2000 | There has not been prior engagement prior to the last visit of 11/09/2019 when an improvement notice was issued. |
| 43. Karurina Slaughterhouse | 2017 | There has been engagement with NEMA officers. |

1. Status of Proponent interaction with National Environment Management Authority

| Status of Monitoring Frequency | | | |
|--------------------------------|---------------------------------|--------------------------|-----|
| Interaction status | Frequency count of interviewees | Total number interviewed | % |
| No interaction with NEMA | 14 | 43 | 33 |
| Minimal interaction | 11 | 43 | 25 |
| Often interaction | 18 | 43 | 42 |
| Total | 43 | | 100 |

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