Industrial Wastewater Management Guide for ABATTOIRS

Kampala Pollution Control Task Force
This Wastewater Management Guide provides abattoir operators, regulatory agencies and others with practical information about mitigating water pollution from abattoirs.

The objectives of the Guide are:

- **To provide abattoirs with a reference tool for managing wastewater.**
- **To help better understanding of the need for wastewater management and the associated benefits.**
- **To provide key information on the existing institutional and legal framework as well as best practices for cleaner production and resource recovery and reuse optimization.**

This Guide has been developed in close consultation with key stakeholders and through review of relevant literature regarding best practices and cleaner production in abattoir operations. In addition, formal and informal technical discussions with members of the Kampala Pollution Control Task Force (PTF) have been used to generate expert opinion on wastewater management for abattoirs.

The preparation of the Guide has been supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Reform of the Urban Water and Sanitation Sector Programme (RUWASS) as well as the International Water Stewardship Programme (IWaSP), implemented by GIZ on behalf of German Development Cooperation and DFID.
It’s the law

Proper management of wastewater is required by law. Failure to comply with regulatory and legal requirements may lead to fines and/or other penalties. (See page 10)

It’s better for the environment

Toxic pollutants released in wastewater cause damage to the environment, affecting plant and animal life.

It’s better for public health

Toxic pollutants in wastewater contaminate surface water and ground water, and may end up in the food chain, exposing people to serious public health issues.

It makes financial sense

Water is a resource like any other, and therefore has an associated cost. The more water used, the higher the costs. By reducing the amount of water used, and by recovering and reusing water wherever possible, companies can save money and be more competitive.

In many cases pollutants in wastewater represent wasted raw materials. When properly handled, these can be recovered and reused leading to cleaner wastewater and cost savings on materials for companies.

Reducing the pollution load in water sent for treatment by NWSC will reduce the cost of treatment. This may in turn translate into reduced costs of water procured from NWSC.
When released into water sources, the organic load associated with abattoirs degrades using oxygen, reducing levels of dissolved oxygen in the water body. This may kill or drive away fish. The reduced fish catch in Lake Victoria’s Murchison Bay may partly be attributed to high organic load pollution.

Almost all the surface and ground water in Kampala is polluted and the city’s inhabitants are therefore exposed to serious health risks associated with water pollution. According to Ministry of Health and KCCA, last year’s outbreak of typhoid was partly due to polluted surface and ground water.

After implementing water conservation measures, Ngege Fish Factory reduced its water consumption from 11.8m3 per ton of raw fish to 8.2 m3 per ton of raw fish (30.5% reduction in water usage) translating into savings of $6,338 per year.

For example, since 2010, Leather Industries of Uganda’s investment in cleaner production to prevent pollution and reduce resource consumption has led to a savings of $2.2m (about UGX7.5b) against investment of $1.7m (about UGX5.6b), which represents a healthy return of 130% over six years.
What to avoid

**Improper Cleaning Methods**
Manual cleaning using basic equipment

- More water and cleaning agents used

**Improper Disposal of Pouch Manure**
Pouch contents washed away

- Pollution & waste

**No Roof Cover on Processing Area**
Lack of protection from the elements

- Stormwater contamination

**Improper Disposal of Lairage Effluent**
Untreated animal sewage in wastewater

- Pollution & waste

**Ground Cover Not Impermeable**
Organic load mixes with water and seeps into the groundwater

- Pollution & public health issues

**Improper Handling of Blood By-Products**
Blood drained out on ground

- More organic load in wastewater

**Open Drains and Runoff**
Fats, blood and solid waste are washed away

- High organic load
EFFECTIVE WASTEWATER MANAGEMENT RELIES ON A TWO-STAGE APPROACH

1 Reducing the amount of wastewater generated
Making processes more efficient and reusing water wherever possible will lead to an overall reduction in the amount of wastewater generated.

2 Ensuring wastewater is as clean as possible
Ensuring end-of-pipe wastewater is properly treated and meets effluent discharge standards will lead to a reduction in toxins entering the environment.

1 STEPS TO REDUCE WASTEWATER GENERATION

- Use pre-clean and dry cleanup methods before wet cleaning. This reduces the volume of water used and the volume of wastewater generated.

- Use the minimum amount of cleaning agents and detergents. This saves on the costs of cleaning agents in addition to minimizing the amount of cleaning agent pollution in wastewater.

- Avoid use of wastewater streams as a transport medium. Transfer solids and particulate matter by mechanical means.

- Ensure employees are trained and aware of how to minimize water usage and wastewater generation.

- Fit drains with screen and/or traps to prevent solid materials from entering the effluent system.
Use high pressure hoses fitted with automatic shut off spray nozzles to prevent water loss/wastage. Use cool water for washing carcasses to reduce removal of fats.

Fit drains with screens/sieves which act as a filter, catching the solids but letting the water through. Install fat traps in drainage channels to remove suspended solids and fats.

The process area should have an impermeable ground cover, preferably concrete, graded to wash down drains.

Optimize chemical use and ensure all water from washing and cleaning is directed to a collecting container.

Animals should be left to bleed for a minimum of 7 minutes in an area fitted with troughs to direct the blood flow into the blood collection area. It is recommended that blood is collected and used for human consumption or animal feed production.

Empty paunches without water first and then rinse the sack using an efficient water spray system. Paunch manure should be composted and marketed as fertilizer or soil conditioner.

All collected wastewater should be sent to the treatment plant for treatment prior to reuse or discharge.
EVERY ABATTOIR FACILITY SHOULD HAVE AN EFFLUENT TREATMENT PLANT

Drainage from the lairages must be separated from other effluents and directed to municipal sewage connections where possible. Where no such connections exist, lairage effluents should be treated (separately) prior to discharge.

Small and affordable effluent treatment plants can be assembled using locally available equipment.

Sludge removed from treatment plants can be dried and used/sold as manure.

Treated wastewater that has been disinfected and filtered can be reused for cleaning floors.

Regularly monitor treated water being discharged to ensure compliance with effluent standards.

Managing wastewater
Abattoirs should be aware of and comply with the following basic legal requirements for the operations with a special focus on waste and wastewater.

### Permit/License/Certificate

<table>
<thead>
<tr>
<th>Permit/License/Certificate</th>
<th>Law/Regulations</th>
<th>Fee (UGX)</th>
</tr>
</thead>
</table>
| **EIA Certificate of Approval** (for new, expansions or refurbishments) | • National Environment Act Cap 153  
• National Environment (Impact Assessment) Regulations, 1998 | If project/business cost is:  
- <50M  
- 50M-100M  
- 100M-250M  
- 250M-500M  
- 500M-1B  
- 1B-5B  
- >5B |  
250,000  
500,000  
750,000  
1,000,000  
1,250,000  
2,000,000  
0.1% of the project cost |
| **Pollution License** (for activities polluting the environment in excess of standards) | • National Environment Act Cap 153 | Determined in accordance with Polluter Pays Principle |
| **License to Own and Operate a Wastewater Treatment and Disposal Plant** | • National Environment (Waste) Management Regulations, 1999 | Application fee  
License fee | 50,000  
300,000 |
| **Wastewater Discharge Permit** | • The Water Act, Cap 152  
• The Water (Waste Discharge) Regulations SI 152-1 | Permit processing fees  
Annual discharge fees | 650,000  
depend on volume and the biological and physiochemical quality of waste |
| **License for Waste Storage** | • National Environment (Waste) Management Regulations, 1999 | Application fee  
License fee | 50,000  
200,000 |
| **License to Transport Waste** (this can be outsourced to licensed waste transporters) | • National Environment (Waste) Management Regulations, 1999  
• Basel Convention on Trans-boundary movement of wastes, in case the batteries are imported | Application fee  
License fee | 50,000  
100,000 |
| **Suitability of Premises Certificate - Medical Examination** (required for Suitability of Premises Certificate) | • Public Health Act | Fee | 200,000 |
| **Approval for Discharge into NWSC Sewerlines** | • National Water and Sewerage Corporation Act, 1995 | 80% of water bill  
If not NWSC customer, water consumption is estimated |
<table>
<thead>
<tr>
<th>Issuing Authority</th>
<th>How to Apply</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Environment Management Authority (NEMA)</td>
<td>Carry out an EIA (EIA conducted by certified EIA practitioners)</td>
<td>Has no validity period but it is subject to implementation of the project starting within five (5) years from the date of issuing an EIA certificate of approval</td>
</tr>
<tr>
<td></td>
<td>Submit to NEMA for consideration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution Licensing Committee (PLC) - NEMA</td>
<td>Apply to PLC through NEMA as a secretariat with documents indicating the characteristics and quantity of wastewater that will be discharged</td>
<td>Validity period – determined by the discharge i.e. how long will the facility require before rectifying the problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution Licensing Committee (PLC) - NEMA</td>
<td>Carry out an EIA and obtain an EIA Certificate of Approval</td>
<td>One (1) year</td>
</tr>
<tr>
<td></td>
<td>Apply to PLC through NEMA as a secretariat and attach the plant designs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directorate of Water Resources Management (DWRM) - Ministry of Water and Environment (MWE)</td>
<td>Install a wastewater treatment plant</td>
<td>Permit duration between one (1) year and three (3) years</td>
</tr>
<tr>
<td></td>
<td>Start operations, and then: apply to Director, DWRM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution Licensing Committee (PLC) – NEMA</td>
<td>Apply to PLC through NEMA as a secretariat</td>
<td>One (1) year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution Licensing Committee (PLC) - NEMA</td>
<td>Apply to PLC through NEMA as a secretariat</td>
<td>One (1) year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kampala Capital City Authority (KCCA)</td>
<td>Apply to KCCA for certification KCCA inspects and makes a decision</td>
<td>One (1) calendar year</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kampala Capital City Authority (KCCA)</td>
<td>KCCA examines and makes a decision</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Water and Sewerage Corporation (NWSC)</td>
<td>Must first pre-treat wastewater to meet standards for discharge into sewer lines, apply for approval from sewerage department or water quality management department, NWSC for connection</td>
<td>Open</td>
</tr>
</tbody>
</table>
Periodic checks and audits form an important part of a strategy to identify inefficient use of resources, inadequate management of waste, and opportunities for improvement. Increasing the efficiency of the utilization of resources, and reducing and avoiding the generation of pollutants is integral in protecting and improving the environment, ensuring the health of human beings, promoting sustainable development, and generating economic benefits to businesses.

Below is a summary of periodic checks that may be applicable for abattoirs.

### MANDATORY CHECKS

<table>
<thead>
<tr>
<th>Type</th>
<th>Responsible institution</th>
<th>Frequency</th>
<th>Fees</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance Environmental Audit</td>
<td>National Environmental Management Authority (NEMA)</td>
<td>Annual</td>
<td>No NEMA fees, only the Environmental Auditor needs to be paid</td>
<td>Engage a NEMA certified Environmental Auditor. (List available from NEMA)</td>
</tr>
</tbody>
</table>

### RECOMMENDED CHECKS

<table>
<thead>
<tr>
<th>Type</th>
<th>Responsible institution</th>
<th>Frequency</th>
<th>Fees</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption of Cleaner Production Practices</td>
<td>Uganda Cleaner Production Centre (UCPC)</td>
<td>As and when required</td>
<td>UCPC fees depend on the size of the enterprise Small - up to $2600 Medium - up to $3800 Large - up to $6600</td>
<td>Contact UCPC for more information</td>
</tr>
<tr>
<td>Self-Internal Audits</td>
<td>Firm/NEMA</td>
<td>As and when required</td>
<td>Environmental Auditor fees - depend on the magnitude of work</td>
<td>Engage a NEMA certified Environmental Auditor. (List available from NEMA)</td>
</tr>
</tbody>
</table>
National Environment Management Authority (NEMA)
Website: www.nemaug.org
Email: info@nemaug.org
Tel: +256 414 251068

Directorate of Water Resources Management (DWRM) - Ministry of Water and Environment (MWE)
Website: www.mwe.go.ug
Tel: +256 414 505942

Kampala Capital City Authority (KCCA)
Website: www.kcca.go.ug
Email: info@kcca.go.ug
Tel: +256 204 660800

National Water and Sewerage Corporation (NWSC)
Website: www.nwsc.co.ug
Email: info@nwsc.co.ug
Tel: +256-313 315 100/312-260 414/5

Uganda Cleaner Production Centre (UCPC)
Website: www.ucpc.co.ug
Email: ucpc@ucpc.co.ug
Tel: +256 414 287938

Licensed Waste Handlers

A full list of licensed waste handlers is available from NEMA. It can be downloaded from the NEMA website by going to http://nema.go.ug/index.php/enviromental-mgt-complaince/waste-handlers and clicking on “Click here to download full document”.

For further information or enquiries call the NEMA Hotline on any of the following numbers:

+256 414 251064   +256 414 251065   +256 414 251068
The Kampala Pollution Control Task Force (PTF) was formed with support from the GIZ RUWASS Programme. It comprises of Kampala Capital City Authority (KCCA), the Ministry of Water and Environment’s Directorate of Water Resource Management (DWRM), the National Environmental Management Authority (NEMA), and National Water and Sewerage Corporation (NWSC). Uganda Manufacturers Association (UMA) and Uganda Cleaner Production Centre (UCPC) were also brought on board to enhance the engagement of the industrial sector through a Public-Private Dialogue (PPD) regarding Cleaner Production and improved resource recovery and reuse efficiency, with a focus on water, waste and energy optimization.

Key priorities of the task force include the following:

- **Information exchange and collaboration among key government institutions including: DWRM, KCCA, NEMA, NWSC to jointly engage the public and private sector about legal provisions and regulations on wastewater discharge and pollution control.**

- **Launch campaigns to enhance compliance to DWRM/NEMA permit regulations regarding wastewater discharge.**

- **Conduct joint industrial assessments and disseminate pollution monitoring information to the public and private sector.**

- **Engage potential priority polluters and the private sector in general in a dialogue with the public sector through the Kampala Public – Private Wastewater Dialogue on wastewater management and pollution control to increase awareness and trust.**

For more information please visit the PTF webpage at:

Also available in this series are Industrial Wastewater Management Guides for the following industries:

- Battery Recycling Industries
- Paint Industries
- Soft Drink Industries
- Dairy Industries
- Textile Industries
- Garages
- Steel Rolling Mills